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### NEC's Packet-optical Transport for Metro/Regional Networks

# **XTM Series**

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#### 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 industryleading 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 packetoptical 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.







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 multilayer 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.



## **XTM-Series**

#### **Technical Specifications**

Chassis       Type       TM-102/ll       TM-301/ll       TM-3000/ll         Card Slot       1 full size in that fisze       1 full size in that fisze <td< th=""><th></th><th></th><th></th><th></th><th></th><th></th></td<>						
Card Slot       1 full size +1 half size       4 full size can be used as half.) is ze can be used as half.)       10 full size can be used as half.)         Power Supply       90 to 264V AC, -48V DC, max 850W       90 to 264V AC, -48V DC, max 567W       480 (11U) x 298 x 442         Trans- ponder       TP010GFEC/1       470 fGFC FC, TD-100 class-A       121 Line formator       121 Line formator         1006       TP100GOTN       1000 Tunable Transponder for 10005E-LAN, 0TU4 (05FF28 types on the client port), Line formato TU4       1000 Tunable Transponder for 10005E-LAN, 0TU4 (05FF28 types on the client port), Line formato TU4         Mux- ponder       46       MS-MXP10G       10xMutiservice FCC, STM-14/16, OC-3/12/48, Gbe, 16/2G/46 FC, Line Protection, B1/2RC monitor       10xMutiservice for Mobile Front Haul, CPR 12 AG/30G, FE, GbE       10xMutiservice for Mobile Front Haul, CPR 12 AG/30G, FE, GbE       10xMutiservice for Mobile Front	Chassis	Туре		TM-102/II	TM-301/II	TM-3000/II
Power Supply       90 to 264V AC, -48V DC, max 667W       90 to 264V AC, -48V DC, max 567W       90 to 264V AC, -48V DC, max 100W         Dimensions (H X D x W) mm       44 (1U) x 249 x 449.4       133 (3U) x 280 x 47.4       499 (1UU) x 298 x 442         Rack Type       ETSI Rack, Hole Activity       ETSI Rack, Hole Activity       499 (1UU) x 298 x 442         Rack Type       ETSI Rack, Hole Activity       ETSI Rack, Hole Activity       499 (1UU) x 298 x 442         Rack Type       ETSI Rack, Hole Activity       ETSI Rack, 494 x 42, 323 chn Rack       499 (1UU) x 298 x 442         Rack Type       ETSI Rack, Hole Activity       ETSI Rack, 194 Activity, 233 chn Rack       499 (1UU) x 298 x 442         Rack Type       ETSI Rack, 106 Choe Activity, 233 chn Rack       ETSI Rack, 106 Choe Activity, 233 chn Rack       499 (1UU) x 298 x 442         Rack Type       ETSI Rack, 106 Choe Activity, 233 chn Rack       ETSI Rack, 106 Choe Activity, 233 chn Rack       499 (1UU) x 298 x 442         Rack Type       ETSI Rack, 106 Choe Activity, 233 chn Rack       ETSI Rack, 106 Choe Activity, 233 chn Rack       123 chn Rack         Max MDP Coord       Coord Thoo Choe Activity, 106 Choe Activity, 106 Choe Activity, 107 Choe Activity, 108 Choe Activity,		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.)
Dimensions (H × D x W) mm       44 (10) x 249 x 449.4       [13] (3U) x 280 x 447.4       [489 (11U) x 298 x 442         ENC       ETSI Rax, 19-inch Rack, 23-inch Rack       [EMC       ETSI Rax, 19-inch Rack, 23-inch Rack         Trans- ponder       TOG       TPQ10GFEC/I       4x10G FEC 1019 G5ELAN, NSTM-64, OC 192, 1+3 Line Protection, CRC/B1 monitor         TPMEX       TPHEX10GGTN       KoSTM-64/0C-192, 10G5E-LAN, OTU2/2e       CTU-2/2e, CPRI/OBSAI         T00G       TP100GOTN       100G Tunable Transponder for 10005E-LAN, OTU4 (QSFP28 types on the client port), 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         Mux- ponder       4G       MS-MXP/10G       ToMMultiservice FC, STM-1/4/16, OC-3/12/48, Line Protection, In-band management VLAN MW/10GOTN       10x0/2b(via ODU0), STM-16/0C-48(via ODU1), 10, 2, 2, 4GFC, Line Format OTU2         Mux- ponder       FHAU (Fromhaul Access Unit)       CPR(loption3, 5, 6, 7), 0BSA1, 072, 6, 14405ps, Sync-E, Protection with delay compensation         Ethermet       GBE22-EMXP10/0T       10x3DE, 2x10G5DE       E1/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2/2		Power Supply		90 to 264V AC, -48V DC, max 85W	90 to 264V AC, -48V DC, max 567W	90 to 264V AC, -48V DC, max 1000W
Rack Type       ETSI Rack, 19-inch Rack, 23-inch Rack         Trans- ponder       IOG       TP1005CFEC/I       4x10G FEC for 1002bE-LAN/WAN, STM-64, OC-192, 1+3 Line Protection, CRC/B1 monitor         TPHEX10GOTN       6xSTM-64/0CC-192, 1002bE-LAN/WAN, STM-64, OC-192, 1+3 Line Protection, CRC/B1 monitor         1006       TP1005OTN       1005 Tunable Transponder for 1002bE-LAN, OTU2/2e, CPRI/OBSAI         1007       TP1005OTN/I       1005 Tunable Transponder for 1002bE-LAN, OTU4, Line format OTU4         Mux- ponder       MS-MXP       GbE, 1G/2G FC, STM-1/4/16, OC-3/12/48, Line Protection, B1 monitor, Regenerator         1008       MS-MXP/1006       100/MUiservice FC, STM-1/4/16, OC-3/12/48, Line Protection, B1 monitor, Regenerator         1097       MS-MXP/100F       100/MUiservice FC, STM-1/4/16, OC-3/12/48, Line Protection, in-band management VLAN         MXP100GOTN       100/MUiservice FC, STM-1/4/16, OC-3/12/48, DE-10/2G/46 FC, Line format OTU2         1006       MXP100GOTN       100/MOBE/K4/OC-192, OTU-2/2e, Line format OTU2         1009       MXP100GOTN       100/MOBE/K4/OC-192, OTU-2/2e, Line format OTU2         1006       MXP100GOTN       100/MOBE/K4/OC-192, OTU-2/2e, Line format OTU4         FH-MXP100F       100/MDE/K4/OC-192, OTU-2/2e, Line format OTU4       EVELAN/LAN         1006       MXP100GOTN       100/MDE/K6/DE/LAN, 0/NDE/LAN, 0/NDE		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		
EMC       ETSLEM 300 0191-3 class 13.1, VCC1 class-A         ponder       10G       TPQ10GFEC1 wit06FEC for 1006E-LANN, ON STM-64, OC-192, 1+3 Line Protection, CRC/B1 monitor         inormalian       TPHEX10GOTM       6xSTM-64/OC-192, 10GbE-LANN, OTU2/2e       CPRI/OBSAI         100G       TP100GOTN       100G runable Transponder for 1006BE-LAN, OTU4, Line format OTU4         TP100GOTN       100G runable Transponder for 1006BE-LAN, OTU4, Line format OTU4         TP100GOTN/I       100G runable Transponder for 1006BE-LAN, OTU4, Line format OTU4         Mux-       4G       MS-MXP       GbE, 10/2G FC, STM-11/4/16, OC-3/12/48, Line Protection, B1 monitor, Regenerator         100G       MS-MXP/10G       100xGBE/LAN, I0XSTM-64/OC-S112/48, Line Protection, in-band management VLAN         MXP10GOTN       10xGbE/LAN, 10XSTM-64/OC-192, OTU-2/2e, Line format OTU2         100G       MXP100GOTN       10xGbE/LAN, 10XSTM-64/OC-192, OTU-2/2e, Line format OTU2         100G       MXP100GOTN       10xGbE/LAN, 10XSTM-64/OC-192, OTU-2/2e, Line format OTU4         Flexpender       FH4U (Fronthaul Access Unit)       10xGbE/LAN, 10XSTM-64/OC-192, OTU-2/2e, Line format OTU4         GBE10-EMXP10/II       10xGbE/LAN, 10XSTM-64/OC-192, OTU-2/2e, Line format OTU4       GBE22-EMXP10/II         GBE22-EMXP10/II       10xGbE/LAN, 10XSTM-64/OC-192, OTU-2/2E, Line format OTU4       GBE2		Rack Type		ETSI Rack, 19-inch Rack, 23-inch Rack		
Trans- ponder       Tod G       TPOT0GFEC/I       4x100 FEC for 1005E-LAN/WAN, S1M-43, OC 192, 143 Line Protection, CRC/B1 monitor TPIMREX2/16G         100G       TPIXEX200TN       6x5TM-44/6C-192, 1005E-LAN, OTU2/2e         TPMRHEX1/16G       6x5TM-44/6C-192, 1005E-LAN, OTU2/2e         TPMRHEX1/16G       6x5TM-44/664, 14R, OTU2/2e         TPI00GOTNI       100G Tunable Transponder for 1005E-LAN, OTU4 (QSFP28 types on the client port), Line format OTU4         Mux- ponder       4G       MS-MXP         4G       MS-MXP       GbE, 10/2G 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-MXP10G       10xMultiservice for Mobile Front Haul, CPRI 2.4G/3.0G, FE, GbE         GBE10-EMXP10/II       10xGbE/LAN, 10xSTM-64/OC-192, OTU-2/2e, Line format OTU2         100G       MXP100GOTN       10x 105E/L-XN, 10XSTM-64/OC-192, OTU-2/2e, Line format OTU2         Flexponder       FHAU (Fronthaul Access Unit)       CPRI(option3,5.6.7),OBSAI3.072, 6.144Gbps, Sync-E, Protection with delay compensation         Ethernet       MXP100/II       22xGbE,2x10GbE       E-Line (EPL and EVPL), E-LAN (EP-LAN) and EVPL-AN)         EMXP42/IIE       22xGbE,4x10GbE       E-Line (EPL and EVPL), E-LAN (EP-LAN) and EVPL-AN) <tr< td=""><td>_</td><td colspan="2"></td><td colspan="3">ETSLEN 300 019-1-3 class 13.1, VCCI class-A</td></tr<>	_			ETSLEN 300 019-1-3 class 13.1, VCCI class-A		
Particitie       THEX10201N       Exst IM-64/0C-192, 10GbE - LAN, 01U2/2e         TPMRHEX-1/16G       6xMutrate, 10bE-100BE, STM-41/664, 1GFC-16GFC, OTU-2/2e, CPRI/OBSAI         100G       TP100GOTN       100G tunable transponder for 100GbE-LAN, OTU4, Line format OTU4         TP100GOTN/II       100G tunable transponder for 100GbE-LAN, OTU4, Line format OTU4         Mux- ponder       4G       MS-MXP       GbE, 102/2F (C, STM-11/4/16, OC-3/12/48, Line Protection, B1 monitor, Regenerator         100G       TP100GOTN       100G tunable transponder for 100GbE-LAN, OTU4, USFP24 types on the client port), Line format OTU4         Mux- ponder       MS-MXP/10G       100Muttiservice FC, STM-11/4/16, OC-3/12/48, Line Protection, B1 monitor, Regenerator         100G       MXP100GOTN       10xGbE-LAN, 10xSTM-16/0C-48(via ODU), 1G, 2G, 4GFC, Line format OTU2         100G       MXP100GOTN       10xGbE-LAN, 10xSTM-64/0C-192, CTU-2/2e, Line format OTU4         Flexponder       FH-MX (Fronthau Access Unit)       CPRI(option 3,5,6.7), OBSA13 072, 6.144Gbps, Syn-cE, Protection with delay compensation         Ethernet       GBE22-EMXP10/II       10xGbE-2x10GbE       E-Tree(FP-Tree), E-ACcess CE2.0       Complant, MEF 9414         Policing using bandwidth profiles, Flexible Traffic Classification e.g. based on DSCP, COS, pot and inner/outer VLAN, 6.302 ERP/2, MPLS-Transport Profile RFC5860       SFP STM-10/CO-3, STM-4/0C-12, STM-4/0C-48, E1 via circ	Trans- ponder	10G	TPQ10GFEC/I	4XTUG FEC TOF TUGDE-LAN/WAN, STM-64, UC-192, 1+3 Line Protection, CRC/B1 monitor		
Instruction       Instruction       Instruction       Instruction         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         100G       MS-MXP/10G       10xMultiservice FEC, STM-1/4/16, OC-3/12/48, GbE, 16/2G/4G FC, Line Protection, B1/CRC monitor       B1/CRC monitor         100G       MS-MXP/10G       10xMultiservice FC, STM-1/4/16, OC-3/12/48, GbE, 16/2G/4G FC, Line Protection, B1/CRC monitor       B1/CRC monitor         100G       MS-MXP/10G       10xMultiservice FC Mobile Front Haul, CPR1 2.4G/3.0G, FE, GbE         100G       MXP106QOTN       10xdbE(via ODU0), STM-16/OC-48(via ODU1), 16, 26, 4GFC, Line format OTU2         100G       MXP100GOTN       10xdbE(via ODU0), STM-16/OC-48(via ODU1), 16, 26, 4GFC, Line format OTU4         Flexponder       GBE10-EMXP10/II       10xdbE/2x10GbE       E-Line (FPL and FVPL), E-LAN (FPL-AN and EVPL-AN)         Mur- ponder       GBE10-EMXP10/II       10xdbE/2x10GbE       E-Line (FPL and EVPL), E-LAN (FPL-AN and EVPL-AN)         GBE20-EMXP10/II       22xGbE, 2x10GbE       E-Line (FPL and EVPL), E-LAN (FPL-AN and EVPL-AN)       GBE10-EMXP10/II         GBE20-EMXP10/II       22xGbE, 2x10GbE       E-Line (FPL and EVPL), E-LAN (FP			TPHEX10GOIN	6X51M-64/UU-192, 10GDE-LAN, U1U2/20		
100G       1P100GOTN/II       100G       100G Tunable Transponder for 100GbE-LAN, OTU4, Line format OTU4         Mux- ponder       4       MS-MXP       GbE, 16/2G FC, STM-11/4/16, OC-3/12/48, Line Protection, B1 monitor, Regenerator         10G       MS-MXP/10G       10xMultiservice FEC, STM-11/4/16, OC-3/12/48, Line Protection, B1 monitor, Regenerator         10G       MS-MXP/10G       10xMultiservice for Mobile Front Haul, CPRI 2.4G/3.0G, FE, GbE         GBE0-MXP10GFEC       9x0bE, Dual 10G FEC Line Ports, 1+1 Line Protection, in-band management VLAN         10xG       MXP100GOTN       10x 10x6E-LAN, 10x8TM-64/OC-192, OTU-2/2e, Line format OTU2         10xG       MXP100GOTN       10x 10x6E-LAN, 10x8TM-64/OC-192, OTU-2/2e, Line format OTU4         Flexponder       FH4U (Fronthaul Access Unit)       CPRI(option 3.5,6,7),0BSAI3.072, 6.144(Dps, Sync-E, Protection with delay compensation         Ethernett       GBE10-EMXP10/II       10xGbE_2X10GbE       E-Line (EPL and EVPL), E-LAN (EP-LAN and EVP-LAN)         Mux- ponder       GBE22-EMXP10/II       22xGbE_2X10GbE       E-Line (GP-Tree), E-Access CE2.0 Compliant, MEP 9+14         EMXP62/IIe       22xGbE_4x10GbE       E-Line (GP-Tree), E-Access CE2.0 Compliant, MEP 9+14       Subaed on D VWR CoS, port and inner/our VLAN WRED         EMXP62/IIe       22xGbE_4x10GbE       E-Line (GP-Tree), E-Access CE2.0 Compliant, MEP 9+14 <td< td=""><td></td><td>TPMRHEX-L/16G</td><td colspan="3">bxMultirate, 1GbE-10GbE, STM-4/16/64, 1GFC-16GFC, OTU-2/2e, CPRI/OBSAI</td></td<>			TPMRHEX-L/16G	bxMultirate, 1GbE-10GbE, STM-4/16/64, 1GFC-16GFC, OTU-2/2e, CPRI/OBSAI		
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, Line Protection, B1 monitor, Regenerator         10G       MS-MXP/10G       10xMultiservice FEC, 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/GG FC, Line Protection, B1//GRC monitor         FH-MXP710G       10xMultiservice for Mobile Front Haul, CPR1 2, 4G/3.0G, FE, GbE       GBE9-MXP10GFEC         GBE9-MXP10GFID       10xGbE, Dual 10G FEC Line Ports, 1+1 Line Protection, in-band management VLAN         MXP10GOTN       10xGbE, Zx10GbE       Elstenet         FHAU (Fronthaul Access Unit)       CPRI(option3,5,6,7),0BSAI3.072, 6.144Gbps, SyncE, Protection with delay compensation         Bi/rocmatul Access Unit)       CPRI(option3,5,6,7),0BSAI3.072, 8.144Gbps, SyncE, Protection with delay compensation         GBE10-EMXP10/II       2xxGbE,2x10GbE       El-Line (EPL and EVPL), E-LAN (EP-LAN and EVP-LAN)         EMXP42/IIe       2xxGbE,4x10GbE       El-Line (EPL and EVPL), E-LAN (CP-LAN and EVP-LAN)         EMXP20/IIe       12x10GbE       El-Line (EPL and EVPL), E-LAN (CP-LAN and EVP-LAN)         EMXP20/IIe       12x10GbE       Isrc printry / WRR queues, Min and Max Shaping, WRED		100G	TP100GOTN	100G Lunable Transponder for 100GbE-LAN, OTU4, Line format OTU4		
Mux- ponder       46       MS-MXP       GbE, 1G/2G FC, STM-1/4/16, OC-3/12/48, Line Protection, B1 monitor, Regenerator         10G       MS-MXP/10G       10/Multiservice FEC, STM-1/4/16, OC-3/12/48, GbE, 1G/2G/4G FC, Line Protection, B1/CRC monitor         10G       MS-MXP/10G       10/Multiservice for Mobile Front Haul, CPRI 2.4G/3.0G, FE, GbE         GBE9-MXP10GFEC       9xGbE, Dual 100 FEC Line Ports, 1+1 Line Protection, in-band management VLAN         MXP10GOTN       10xGbE(via ODU0), STM-16/OC-48(via ODU1), 1G, 2G, 4GFC, Line format OTU2         100G       MXP100GOTN       10x 10GbE-LAN, 10xSTM-64/OC-192, OTU-2/2e, Line format OTU4         Flexponder       FHAU (Fronthaul Access Unit)       CPR(option3, 67, 7).0SSA13.072, 6.144Gbps, Synce: F, Protection with delay compensation         Ethernet       GBE10-EMXP10/II       10xGbE, 2x10GbE       E-tine (EPL and EVPL), E-LAN (EPL-LAN and EVP-LAN)         GBE22-EMXP10/II       10xGbE, 2x10GbE       E-tine (EPL and EVPL), E-LAN (EPL-LAN and EVP-LAN)         GBE22-EMXP10/II       12x10GbE       E-tine (EPL and EVPL), E-LAN (EPL-LAN and EVP-LAN)         GBE20-EMXP10/II       12x10GbE       E-tine (EPL and EVPL), E-LAN (EPL-LAN and EVP-LAN)         EMXP420/IIe       22xGbE, 2x10GbE       E-tine (EPL and EVPL), E-LAN (EPL-LAN and EVP-LAN)         EMXP420/IIe       12x10GbE       E0X124, UNAN       S6/22 ENV2, MIAS Transp			TP100GOTN/II	100G I unable Transponder for 100GbE-LAN, OTU4 (QSFP28 types on the client port), Line format OTU4		
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, 1-11 Line Protection, in-band management VLAN MXP10GOTN       MXP100GTN     10x6bE(via ODU), STM-16/NC-48(via ODU) 1, 10, 22, 4GFC, Line format OTU2       100G     MXP100GTN     10x6bE(via ODU), STM-16/NC-48(via ODU), 11, 0, 22, 4GFC, Line format OTU2       100G     MXP100GTN     10x10gbE-LAN, 10xSTM-64/OC-192, OTU-2/2e, Line format OTU4       Flexponder     FHAU (Fronthaul Access Unit)     CPRI(option3,5,6.7),OBSA/3.072, 6.144Gbps, Sync.E, Protection with delay compensation       6BE10-EMXP10/II     22xGbE,2x10GbE     E-Line (EPL, and EVPL), E-LAN (EPLAN and EVPLAN)       Mwx     GBE22-EMXP10/II     22xGbE,4x10GbE     E-Tree(EP-Tree), E-Access CE2.0 Compliant, MEF 9+14       EMXP420/IIe     12x10GbE     8 Strict pricing using bandwidth profiles, Flexible Trafile Classification e.g. based on DSCP, CoS, port and inner/outer VLAN, G.802 ERP2, MPLS-Transport Profile RFCS960     Strict pricing UNAN, Independent learning per VLAN, G.802 ERP2, MPLS-Transport Profile RFCS960       EMXP240/IIe     24x10GbE     Strict pricing, 10xG, 100G (LR4) or OTU4 via TP100GOTN     Fhabric       PT-     EMXP/10G     72 x10G LAN or OTU2e with MPO connector     Strict pricing, 10xG, 10xG, 10xG, 10	Mux- ponder	4G	MS-MXP	GbE, 1G/2G FC, STM-1/4/16, OC-3/12/48, Line Protection, B1 monitor, Regenerator		
Provide Fiber Name       Emandation       Emandation       Emandation         Response       FH-MXP/10G       10xMultiservice for Mobile Front Haul, CPRI 2.46/3.0G, FE, GbE       GBE9-MXP100GFE       9xGbE, Dual 10G FEC Line Ports, 1+1 Line Protection, in-band management VLAN         MWP106OTN       10xGbE(via ODU0), STM-16/0C-48(via ODU1), 1G, 2G, 4GFC, Line format OTU2       10xG       MXP100GOTN       10xGbE(zia ODU0), STM-16/0C-48(via ODU1), 1G, 2G, 4GFC, Line format OTU4         Flexponder       FH4U (Fronthaul Access Unit)       CPRI(option3.5,6,7),OBSAI3.072, 6.144Gbps, Sync-E, Protection with delay compensation         Biterio-EMXP10/II       22xGbE,2x10GbE       E-Line (EPL and EVPL), FLAN (BFC/HAN and EVP-LAN)         GBE2-EMXP10/II       22xGbE,4x10GbE       E-Line (EPL and EVPL), FLAN (BFC/HAN and EVP-LAN)         EMXP420/IIe       8xGbE,4x10GbE       E-Line (EPL and V/RR queues, Min and Max Shaping, WRED         EMXP120/IIe       12x10GbE       821ad O-in-O SVLAN, Independent learning per VLAN, (ERVERVAR)         EMXP240/IIE       2x410GbE       821ad O-in-O SVLAN, Independent learning per VLAN, (ERVERVAR)         FT-       Fabric       EMXP11       8xMPO 100G (SR10), 10G or OTU2e via PTIO-10G, 100G(LR4) or OTU4 via TP100GOTN         FT-       Fabric       EMXP11       8xMPO 100G(SR10), 10G or OTU2e via PTIO-10G, 100G(LR4) or OTU4 via TP100GOTN         PT-		10G	MS-MXP/10G	10xMultiservice FEC, STM-1/4/16, OC-3/12/48, GbE, 1G/2G/4G FC, Line Protection, B1/CRC monitor		
Bit MixP10GFEC       9xGbE, Dual 10G FEC Line Ports, 1+1 Line Protection, in-band management VLAN         MXP10GOTN       10xGbE(via ODU0), STM-16/OC-48(via ODU1), 1G, 2G, 4GFC, Line format OTU2         100G       MXP100GOTN       10xGbE(via ODU0), STM-16/OC-48(via ODU1), 1G, 2G, 4GFC, Line format OTU4         Flexponder       FHAU (Fronthaul Access Unit)       CPRI(option3,5,6,7),OBSAI3.072, 6.144Gbps, Sync-E, Protection with delay compensation         Ethernet Mux- ponder       GBE10-EMXP10/II       10xGbE,2x10GbE       E-Line (EPL and EVPL), E-LAN (EP-LAN and EVP-LAN)         EMXP48/Ile       BXGbE,4x10GbE       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       8021 ad Q-in-0 SVLAN, Independent learning per VLAN, B021 ad Q-in-0 SVLAN, Independent learning per VLAN, G8032 ERPV2, MPLS-Transport Profile RFC5960         EMXP120/II=       12x10GbE,1x100GE       ISFP STM-1/0C-3, STM-4/OC-12, STM-16/OC-48, E1 via circuit emulation over Ethernet         PT- Fabric       EMXP/IIII       8xMPO 100G(SR10), 10G or OTU2e via PTIO-10G, 100G(LR4) or OTU4 via TP100GOTN         PT- Fabric       Fiber Pair       80ch/80, @50GHz spacing, 40ch/40, @100GHz spacing         Bidrectional       8ch/160, (1270 to 1610nm)       Bidrectional         Bidrectional       8ch/160, (1270 to 1610nm)       Bidrectional			FH-MXP/10G	10xMultiservice for Mobile Front Haul, CPRI 2.4G/3.0G, FE, GbE		
MXP10GOTN       10xGbE(via ODU0), STM-16/OC-48(via ODU1), 1G, 2G, 4GFC, Line format OTU2         100G       MXP100GOTN       10x 10GbE-LAN, 10xSTM-64/OC-48(via ODU1), 1G, 2G, 4GFC, Line format OTU4         Flexponder       FHAU (Fronthaul Access Unit)       CPRI(options,5,6,7),0BSAI3.072, 6.144Gbps, Sync-E, Protection with delay compensation         Mux-ponder       GBE10-EMXP10/II       10xGbE,2x10GbE       E-Line (EPL and EVPL), E-LAN (EP-LAN and EVP-LAN)         Fitzeparter       GBE10-EMXP10/II       22xGbE,4x10GbE       E-Line (EPL and EVPL), E-LAN (EP-LAN and EVP-LAN)         Fitzeparter       GBE22-EMXP10/II       22xGbE,4x10GbE       E-Line (EPL and EVPL), E-LAN (EP-LAN and EVP-LAN)         EMXP48/III       8xGbE,4x10GbE       E-Line (EPL and EVPL), E-LAN (EP-LAN and EVP-LAN)       Elastication         EMXP120/IIE       8xGbE,4x10GbE       8 Strict priority / WRR queues, Min and Max Shaping, WRED       8 Strict priority / WRR queues, Min and Max Shaping, WRED         EMXP120/IIE       12x10GbE       isFP STM-1/0C-3, STM-4/0C-12, STM-16/0C-48, E1 via       circuit emulation over Ethernet         PT-       EMXP120/IIE       12x10GbE       circuit emulation over Ethernet       Ethernet         PT       EMXP120/IIE       8xtif Priority / WRR queues, Min and Max Shaping, WRED       Strict priority / WRR queues, Min and Max Shaping, WRED         Bidirectional </td <td>GBE9-MXP10GFEC</td> <td colspan="3">9xGbE, Dual 10G FEC Line Ports, 1+1 Line Protection, in-band management VLAN</td>			GBE9-MXP10GFEC	9xGbE, Dual 10G FEC Line Ports, 1+1 Line Protection, in-band management VLAN		
100G       MXP100GOTN       10x 10GbE-LAN, 10xSTM-64/QC-192, OTU-2/2e, Line format OTU4         Flexponder       FHAU (Fronthaul Access Unit)       CPRI(option3,5,6,7),OBSAI3.072, 6.144Gbps, Sync-E, Protection with delay compensation         Bitternet       GBE10-EMXP10/II       10xGbE_2x10GbE       E-Line (EPL and EVPL, E-LAN (EP-LAN and EVP-LAN)         GBE22-EMXP10/II       20xGbE_2x10GbE       E-Line (EPL and EVPL, E-LAN (EP-LAN and EVP-LAN)         EMXP48/IIe       8xGbE_4x10GbE       E-Line (EPL and EVPL, E-LAN (EP-LAN and EVP-LAN)         EMXP62/IIe       22xGbE,4x10GbE       Estict priority /WRR queues, Min and Max Shaping, WRED         BMXP62/IIe       12x10GbE,1x100GbE       802.1ad Q-in-Q SVLAN, Independent learning per VLAN, G302 ERPv2, MPLS-Transport Profile RFC5960         EMXP120/IIe       24x10GbE       EMXP100GOTN       72 x10G LAN or OTU2e with MPO connector         EMXP240/IIe       24x10GbE       EMXP/II       80ch/803, @50GHz spacing, 40ch/403, @100GHz spacing         EMXP240/IIe       24x10GbE       EMXP/II       80ch/803, @50GHz spacing       40ch/403, @100GHz spacing         EMXP240/IIe       24x10GbE       EMXP/III       80ch/803, @50GHZ spacing       40ch/403, @100GHz spacing         Others       Fiber Pair       Bidirectional       20ch/403, @100GHz spacing       40ch/403, @100GHz spacing			MXP10GOTN	10xGbE(via ODU0), STM-16/OC-48(via ODU1), 1G, 2G, 4GFC, Line format OTU2		
Flexponder     FHAU (Fronthaul Access Unit)     CPRI(option3,5,6,7),OBSAI3.072, 6.1446bps, SyncE, Protection with delay compensation       Ethernet Mux- ponder     GBE10-EMXP10/II     10xGbE,2x10GbE     E-Line (EPL and EVPL), E-LAN (EP-LAN and EVP-LAN)       GBE22-EMXP10/II     22xGbE,2x10GbE     E-Tree(EP-Tree), E-Access CE2.0 Compliant, MEF 9+14       FMXP48/II     8xGbE,4x10GbE     e.J. based on DSCP, CoS, port and inner/outer VLAN       EMXP20/II     22xGbE,4x10GbE     8Strict priority / WRR queues, Min and Max Shaping, WRED       BMXP220/II     12x10GbE,1x100GbE     8Strict priority / WRR queues, Min and Max Shaping, WRED       BMXP220/II     12x10GbE,1x100GbE     BSTP STIM-1/0C-3, STM-4/0C-12, STM-16/0C-48, E1 via       FMXP240/II     2x410GbE     circuit emulation over Ethernet       PT- Fabric     EMXP/III     8xMPO 100G(SR10), 10G or OTU2e via PTIO-10G, 100G(LR4) or OTU4 via TP100GOTN       Fiber Pair     80ch/800, @50GHz spacing, 40ch/400, @100GHz spacing       Bidirectional     20ch/400, @100GHz spacing       CWDM     Fiber Pair     16ch/160, (1270 to 1610nm)       Bidirectional     8ch/160, (1270 to 1610nm)       Bidirectional     8ch/160, (1270 to 1610nm)       CWDM     Fiber Pair     16ch/160, (1270 to 1610nm)       Bidirectional     8ch/160, (1270 to 1		100G	MXP100GOTN	10x 10GbE-LAN, 10xSTM-64/OC-192, OTU-2/2e, Line format OTU4		
Ethemet Mux- ponder       GBE10-EMXP10/II       10xGbE,2x10GbE       E-Line (EPL and EVPL,).       E-LAN (EP-LAN and EVP-LAN))         GBE22-EMXP10/II       22xGbE,2x10GbE       E-Line (EPL and EVPL), E-LAN (EP-LAN and EVP-LAN))         GBE22-EMXP10/II       22xGbE,2x10GbE       E-Line (EPL and EVPL), E-LAN (EP-LAN and EVP-LAN))         EMXP62/II       8xGbE,4x10GbE       e.g. based on DSCP, CoS, port and inner/outer VLAN         EMXP220/II       22xGbE,4x10GbE       8 Strict priority / VRR queues, Min and Max Shaping, WRED         B02.1ad Q-In-Q SVLAN, Independent learning per VLAN,       68.032 ERPV2, MPLS-Transport Profile RPC5960         EMXP220/II       12x10GbE,1x100GbE       ISFP STM-1/0C-3, STM-4/OC-12, STM-16/OC-48, E1 via         FT-readic       EMXP/III       8xMPO 100G(SR10), 10G or OTU2e via PTIO-10G, 100G(LR4) or OTU4 via TP100GOTN         Fabric       Fiber Pair       80ch/800, @50GHz spacing, 40ch/40, @ 100GHz spacing         CWDM       Fiber Pair       80ch/800, @50GHz spacing, 40ch/40, @ 100GHz spacing         Bidirectional       20ch/40, @ 100GHz spacing       1x2 ROADM @ 50GHz/100GHz spacing         CWDM       Fiber Pair       16ch/16\lambda (1270 to 1610nm)       1x2 ROADM @ 50GHz/100GHz spacing, 1x4 ROADM @ 100GHz, 1x8 ROADM @ 50GHz         Tunable Filter       16bc oftical/ Editical client port, OAM, loss/delay measurement       1bC oftical	Flexponder	r FHAU (Fronthaul Access Unit)		CPRI(option3,5,6,7),OBSAI3.072, 6.144Gbps, Sync-E, Protection with delay compensation		
MUX- ponder       GBE22-EMXP10/II       22xGbE,2x10GbE       E-Tree(P-Tree), 2-Addess C2:0 Colliption, the P+14 Policing using bandwidth profiles, Flexible Traffic Classification e.g. based on DSCP, CoS, port and inner/outer VLAN e.g. based on DSCP, CoS, port and inner vLAN e.g. based on DSCP, CoS, port and inner vLAN e.g. based in there t.g. based in ther	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	
EMXP48/IIe     8xGbE,4x10GbE     e.g. based on DSCP, CoS, port and inner/outer VLAN       EMXP62/IIe     22xGbE,4x10GbE     8 Strict priority / WRR queues, Min and Max Shaping, WRED       EMXP120/IIe     12x10GbE     8 Strict priority / WRR queues, Min and Max Shaping, WRED       EMXP240/IIe     12x10GbE     8 Strict priority / WRR queues, Min and Max Shaping, WRED       EMXP240/IIe     12x10GbE     8 Strict priority / WRR queues, Min and Max Shaping, WRED       Fabric     EMXP240/IIe     12x10GbE, 1x100GbE     15FP STM-1/OC-3, STM-4/OC-12, STM-16/OC-48, E1 via       EMXP240/IIe     24x10GbE     circuit emulation over Ethernet     6.032 ERPv2, MPLS-Transport Profile RFC5960       Lambda     DWDM     Fiber Pair     80ch/80.@50GHz spacing, 40ch/40.@100GHz spacing     circuit emulation over Ethernet       Lambda     DWDM     Fiber Pair     80ch/80.@50GHz spacing     02ch/40.@100GHz spacing       CWDM     Fiber Pair     80ch/80.@50GHz spacing     12x10GbE////////////////////////////////////		GBE22-EMXP10/II		22xGbE,2x10GbE		
EMXP62/Ile       22xGbE,4x10GbE       8 Strict priority / WRR queues, Min and Max Shaping, WRED         EMXP120/Ile       12x10GbE       8 Strict priority / WRR queues, Min and Max Shaping, WRED         EMXP120/Ile       12x10GbE       8 Strict priority / WRR queues, Min and Max Shaping, WRED         EMXP220/Ile       12x10GbE       8 Strict priority / WRR queues, Min and Max Shaping, WRED         EMXP220/Ile       12x10GbE,1x100GbE       052.1a0 Q-in-Q SVLAN, Independent learning per VLAN, G.8032 ERPv2, MPLS-Transport Profile RFC5960         EMXP240/Ile       24x10GbE       052.57.57.57.57.57.57.57.57.57.57.57.57.57.		EMXP48/IIe		8xGbE,4x10GbE		
EMXP120/IIe   12x10GbE     EMXP220/IIe   12x10GbE,1x100GbE     EMXP220/IIe   12x10GbE,1x100GbE     EMXP240/IIe   24x10GbE     PT- Fabric   EMXP/III     BWDM   EMXP/III     Bidirectional   20ch/40 @100G(SR10), 10G or OTU2e via PTIO-10G, 100G(LR4) or OTU4 via TP100GOTN     Image: Terminal content of the animal stress of the animal st		EMXP62/IIe		22xGbE,4x10GbE		
EMXP220/IIe   12x10GbE,1x100GbE   iSFP STM-1/OC-3, STM-4/OC-12, STM-16/OC-48, E1 via     EMXP240/IIe   24x10GbE   circuit emulation over Ethernet     PT- Fabric   EMXP/III   8xMPO 100G(SR10), 10G or OTU2e via PTIO-10G, 100G(LR4) or OTU4 via TP100GOTN     Lambda   PTIO-10G   72 x10G LAN or OTU2e with MPO connector     Lambda   OWDM   Fiber Pair   80ch/80\.@50GHz spacing     CWDM   Fiber Pair   80ch/80\.@50GHz spacing     CWDM   Fiber Pair   16ch/16\. (1270 to 1610nm)     Bidirectional   8ch/16\. (1270 to 1610nm)     Bidirectional   8ch/16\. (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   DNA-M   Windows ~100NE   OS : Windows Server 2008, 2012 R2 64-bit or 2016     Ethernet   Cincut   CS : Windows 7 Professional or later , CPU: Intel Pentium 2.0 GHz, Memory:4GB, JRE8, Web browser     ENM   Browser   Internet Explorer, Firefox		EMXP120/IIe		12x10GbE		
PT- Fabric     EMXP/III     8xMPO 100G(SR10), 10G or OTU2e via PTIO-10G, 100G(LR4) or OTU4 via TP100GOTN       Lambda     DWDM     Fiber Pair     80ch/80, @50GHz spacing, 40ch/40, @100GHz spacing       CWDM     Fiber Pair     80ch/80, @50GHz spacing, 40ch/40, @100GHz spacing       CWDM     Fiber Pair     16ch/16, (1270 to 1610nm)       Bidirectional     20ch/40, @100GHz spacing       CWDM     Fiber Pair     16ch/16, (1270 to 1610nm)       Bidirectional     8ch/16, (1270 to 1610nm)       Bidirectional     8ch/16, (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     DNA-M Server     Windows ~100NE     OS : Windows Server 2008, 2012 R2 64-bit or 2016       DNA-M Client     Windows     OS : Windows 7 Professional or later , CPU: Intel Pentium 2.0 GHz, Memory:4GB, JRE8, Web browser       ENM     Browser     Internet Explorer, Firefox     ONM-		EMXP220/IIe EMXP240/IIe		12x10GbE,1x100GbE i		
Fabric     PTIO-10G     72 x10G LAN or OTU2e with MPO connector       Lambda     PWDM     Fiber Pair     80ch/80λ. @50GHz spacing, 40ch/40λ. @100GHz spacing       CWDM     Fiber Pair     80ch/80λ. @50GHz spacing, 40ch/40λ. @100GHz spacing       CWDM     Fiber Pair     16ch/16λ. (1270 to 1610nm)       Bidirectional     20ch/40λ. @100GHz spacing, 1x4 ROADM @100GHz, 1x8 ROADM @50GHz       Others     ROADM     1x2 ROADM @50GHz/100GHz spacing, 1x4 ROADM @100GHz, 1x8 ROADM @50GHz       Imable 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     DNA-M     Windows ~100NE     OS : Windows Server 2008, 2012 R2 64-bit or 2016       Erver     Linux ~6000NE     OS : Red Hat Enterprise Linux 6.6, 7.1 or Cent OS 7 x86-64       DNA-M     Windows     OS : Windows 7 Professional or later , CPU: Intel Pentium 2.0 GHz, Memory:4GB, JRE8, Web browser       ENtert     Intermet Explorer, Firefox     Other       ENtert     Other     Other		PT- FMXP/III		8xMPO 100G(SR10), 10G or OTU2e via PTIO-10G, 100G(I R4) or OTU4 via TP100GOTN		
Lambda       DWDM       Fiber Pair       80ch/80λ. @50GHz spacing, 40ch/40λ. @100GHz spacing         CWDM       Fiber Pair       16ch/16λ. (1270 to 1610nm)         Bidirectional       20ch/40λ. @100GHz spacing         CWDM       Fiber Pair       16ch/16λ. (1270 to 1610nm)         Bidirectional       8ch/16λ. (1270 to 1610nm)         Others       ROADM       1x2 ROADM @50GHz Filter         OCM       1x2 ROADM @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       Windows ~100NE       OS : Windows Server 2008, 2012 R2 64-bit or 2016         Linux ~6000NE       OS : Red Hat Enterprise Linux 6.6, 7.1 or Cent OS 7 x86-64         DNA-M       Windows       OS : Windows 7 Professional or later , CPU: Intel Pentium 2.0 GHz, Memory:4GB, JRE8, Web browser         ENM       Browser       Internet Explorer, Firefox		Fabric	PTIO-10G	72 x10G LAN or OTU2e with MPO connector		
Bidirectional     20ch/40\lambda, @100GHz spacing       CWDM     Fiber Pair     16ch/16\lambda, (1270 to 1610nm)       Bidirectional     8ch/16\lambda, (1270 to 1610nm)       Bidirectional     8ch/16\lambda, (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     DNA-M Server     Windows ~100NE     OS : Windows Server 2008, 2012 R2 64-bit or 2016       Linux     ~6000NE     OS : Red Hat Enterprise Linux 6.6, 7.1 or Cent OS 7 x86-64       DNA-M Client     Windows     OS : Windows 7 Professional or later , CPU: Intel Pentium 2.0 GHz, Memory:4GB, JRE8, Web browser       ENM     Browser     Internet Explorer, Firefox       ONM     Browser     Internet Explorer, Firefox	Lambda	DWDM	Fiber Pair	80ch/80λ @50GHz spacing, 40ch/40λ @100GHz spacing		
CWDM       Fiber Pair       16ch/16\lambda (1270 to 1610nm)         Bidirectional       8ch/16\lambda (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       DNA-M Server       Windows ~100NE       OS : Windows Server 2008, 2012 R2 64-bit or 2016         DNA-M Client       Windows       OS : Windows 7 Professional or later , CPU: Intel Pentium 2.0 GHz, Memory:4GB, JRE8, Web browser         ENM       Browser       Internet Explorer, Firefox		CWDM	Bidirectional	20ch/40λ @100GHz spacing		
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       0CM         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       NA-M Server       Windows ~100NE       OS : Windows Server 2008, 2012 R2 64-bit or 2016         DNA-M Client       Windows       OS : Windows 7 Professional or later , CPU: Intel Pentium 2.0 GHz, Memory:4GB, JRE8, Web browser         ENM       Browser       Internet Explorer, Firefox			Fiber Pair	16ch/16λ (1270 to 1610nm)		
Others       ROADM       1x2 ROADM @50GHz/100GHz spacing, 1x4 ROADM @100GHz, 1x8 ROADM @50GHz         Tunable Filter       16port Colorless 50GHz Filter       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       NA-M Server       Windows ~100NE       OS : Windows Server 2008, 2012 R2 64-bit or 2016         DNA-M Client       Windows       OS : Red Hat Enterprise Linux 6.6, 7.1 or Cent OS 7 x86-64         DNA-M Client       Windows       OS : Windows 7 Professional or later , CPU: Intel Pentium 2.0 GHz, Memory:4GB, JRE8, Web browser         ENM       Browser       Internet Explorer, Firefox       Internet Explorer, Firefox			Bidirectional	8ch/16λ (1270 to 1610nm)		
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     DNA-M Server     Windows ~100NE     OS : Windows Server 2008, 2012 R2 64-bit or 2016       DNA-M Client     Windows     OS : Red Hat Enterprise Linux 6.6, 7.1 or Cent OS 7 x86-64       DNA-M Client     Windows     OS : Windows 7 Professional or later , CPU: Intel Pentium 2.0 GHz, Memory:4GB, JRE8, Web browser       ENM     Browser     Internet Explorer, Firefox	Others	ROADM		1x2 ROADM @50GHz/100GHz spacing, 1x4 ROADM @100GHz, 1x8 ROADM @50GHz		
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     NA-M Server     Windows ~100NE     OS : Windows Server 2008, 2012 R2 64-bit or 2016       DNA-M Client     Windows     OS : Red Hat Enterprise Linux 6.6, 7.1 or Cent OS 7 x86-64       DNA-M Client     Windows     OS : Windows 7 Professional or later , CPU: Intel Pentium 2.0 GHz, Memory:4GB, JRE8, Web browser       ENM     Browser     Internet Explorer, Firefox       ONA-m     Windows     OND talenet		Tunable Filter		16port Colorless 50GHz Filter		
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     NMS     Windows ~100NE     OS : Windows Server 2008, 2012 R2 64-bit or 2016       Ever     Linux ~6000NE     OS : Red Hat Enterprise Linux 6.6, 7.1 or Cent OS 7 x86-64       DNA-M     Windows     OS : Windows 7 Professional or later , CPU: Intel Pentium 2.0 GHz, Memory:4GB, JRE8, Web browser       ENM     Browser     Internet Explorer, Firefox		OCM		2 port Optical Channel Monitor, monitoring OAMP/ROADM and controlling VOA for flatness		
Ethernet       Demarcation       Unit       EDU 1G type, EDU 10G type, in-service packet jitter/latency measurement         NMS       DNA-M Server       Windows ~100NE       OS : Windows Server 2008, 2012 R2 64-bit or 2016         DNA-M Client       Windows       OS : Red Hat Enterprise Linux 6.6, 7.1 or Cent OS 7 x86-64         DNA-M Client       Windows       OS : Windows 7 Professional or later , CPU: Intel Pentium 2.0 GHz, Memory:4GB, JRE8, Web browser         ENM       Browser       Internet Explorer, Firefox		NID-GE (media converter)		1GbE optical/electrical client port, OAM, loss/delay measurement		
NMS       Windows       ~100NE       OS : Windows Server 2008, 2012 R2 64-bit or 2016         Linux       ~6000NE       OS : Red Hat Enterprise Linux 6.6, 7.1 or Cent OS 7 x86-64         DNA-M       Windows       OS : Windows 7 Professional or later , CPU: Intel Pentium 2.0 GHz, Memory:4GB, JRE8, Web browser         ENM       Browser       Internet Explorer, Firefox		Ethernet Demarcation Unit		EDU 1G type, EDU 10G type, in-service packet iitter/latency measurement		
Server       Linux       ~6000NE       OS : Red Hat Enterprise Linux 6.6, 7.1 or Cent OS 7 x86-64         DNA-M Client       Windows       OS : Windows 7 Professional or later , CPU: Intel Pentium 2.0 GHz, Memory:4GB, JRE8, Web browser         ENM       Browser       Internet Explorer, Firefox	NMS	DNA-M	Windows ~100NE	OS : Windows Server 2008. 2012 R2 64-bit or 2016		
DNA-M Client       Windows       OS : Windows 7 Professional or later , CPU: Intel Pentium 2.0 GHz, Memory:4GB, JRE8, Web browser         ENM       Browser       Internet Explorer, Firefox		Server	Linux ~6000NE	OS : Red Hat Enterprise Linux 6.6. 7.1 or Cent OS 7 x86-64		
ENM Browser Internet Explorer, Firefox		DNA-M Client	Windows	OS : Windows 7 Professional or later , CPU: Intel Pentium 2.0 GHz, Memory:4GB, JRE8, Web browser		
Othere ONIAD taleat		ENM Browser Internet Explorer, Firefox				
Others Sinite, teinet		Others		SNMP, telnet		

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