

# HX9800R-PTN

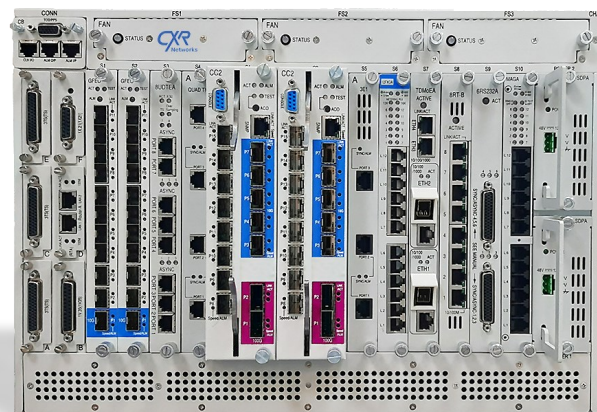
## MPLS/CE PACKET TRANSPORT NETWORK

### Description

HX9800R-PTN supports both MPLS-TP and Carrier Ethernet (EPL, EVPL, EPLAN, EVC defined in MEF) for packet transportation. In addition to native Ethernet transport, HX9800R-PTN can be used as the gateway for PDH and SDH/SONET networks to enter PSNs using Circuit Emulation and Encapsulation technologies. Encapsulation technologies include TDMoE, TDMoIP, and TDMoMPLS. Circuit Emulation include CESoPSN (NxDS0/64K), SAToP (Unframed E1/T1), and CEP (SDH/SONET paths). Pseudowires make grooming and multiplexing DS0, E1/T1, and SDH/SONET paths easier, and service integrity can also be monitored and protected via packet network protection schemes.

One HX9800R-PTN with core switching bandwidth up to 400Gbps supports 100GE, 40GE, 10GE and 1GE along with additional TDM interfaces, including STM-n/OC-n, E1/T1, and a rich variety of low-speed DS0 interfaces. The system is a perfect combination of PTN/CE, SDH, and PDH technologies.

HX9800R-PTN provides high availability and reliability required by Carrier, Power Utility, Military, Government and Transportation applications by supporting MPLS-TP LSP 1:1/1+1 protection and ERPS, with protection switching time <50ms. Ethernet and MPLS section and end-to-end OAM are also provided for monitoring service integrity and performance. The HX9800R-PTN is 7U in height, and its powerful functions enable customers to provision a service-grooming hub, ring, or mesh 10G packet network with ultimate ease.



CXR-HX9800R-PTN-CHA	7U height rack chassis for HX9800R-PTN
CXR-HX9800R-PTN-CC2	Controller/CPU with RS232 console port. Supports 400Gbps core switching bandwidth and up to 396Gbps I/O bandwidth with full-duplex at wire-speed. This module supports built-in line interfaces including: 5 x 10GE SFP+ ports 8 x 1GE SFP ports 2 x 100GE/40GE ports (Option / License)

## Features

Mechanical and Electrical
<ul style="list-style-type: none"> <li>7U height, 19" width ETSI unit (front access)</li> <li>Power supply: hot swappable DC, dual for redundancy</li> <li>Operating Temperature: -10 °C to 55 °C</li> </ul>
System Capacity
<ul style="list-style-type: none"> <li>Up to 2 x 100GE/40GE ports</li> <li>Up to 302 x 10GE</li> <li>Up to 70 x 1GE</li> <li>Up to 80 x FE BaseT</li> <li>Up to 320 x E1/T1 ports</li> <li>Up to 160 x DS3 ports</li> <li>Up to 56 x STM-1 ports</li> <li>Up to 38 x STM4 ports</li> <li>Up to 8 x STM-16 ports</li> </ul>
MPLS-TP
<ul style="list-style-type: none"> <li>Any Ethernet port can be configured as NNI (MPLS port) or UNI (Ethernet service port)</li> <li>Bi-directional LSP</li> <li>Static LSP/PW provisioning via NMS</li> <li>Ethernet (VPWS, VPLS, H-VPLS) and TDM (CESoPSN, CEP, and SAToP) services</li> <li>MPLS-TP OAM and QoS</li> <li>TDM PW Support per card : <ul style="list-style-type: none"> <li>32TE1 card: up to 256 pseudowires</li> <li>B16 card: up to 1024 pseudowires</li> </ul> </li> </ul>
Carrier Ethernet
<ul style="list-style-type: none"> <li>L2 Switching/Bridging</li> <li>STP, RSTP, MSTP</li> <li>Port based VLAN and port isolation</li> <li>VLAN Stacking (Q-in-Q)</li> <li>CE OAM <ul style="list-style-type: none"> <li>CFM: Ethernet Service OAM (802.1ag/Y1731)</li> <li>EFM: Ethernet Link OAM (802.3ah)</li> </ul> </li> <li>Flow Control</li> <li>Link Aggregation Control Protocol (LACP)</li> <li>Jumbo Frame (MTU) = 9600</li> <li>EPL, EVPL, EP-LAN, EPV-LAN, EP-Tree</li> <li>E-Access: EPL-Access, EPVL-Access</li> </ul>
Carrier Ethernet
<ul style="list-style-type: none"> <li>MPLS-TP <ul style="list-style-type: none"> <li>LSP 1+1/1:1</li> <li>LSP E2E protection switching &lt; 50ms</li> <li>PW Redundancy</li> <li>Based on TP OAM for fault detection</li> </ul> </li> <li>CE <ul style="list-style-type: none"> <li>ERPS Ring (G.8032) Protection</li> <li>ELPS (G.8031) Linear Protection</li> </ul> </li> <li>SDH/SONET <ul style="list-style-type: none"> <li>STM-n/OC-n MSP 1+1 Protection</li> </ul> </li> </ul>

TDM Pseudowire Services
<ul style="list-style-type: none"> <li>Circuit Emulation <ul style="list-style-type: none"> <li>DS0 (64K timeslots): CES &amp; multiframe PW</li> <li>Unframed E1/T1: SAToP PW</li> <li>VC-3/4/11/12, VT-1.5/2, STS-1/3: CEP PW</li> </ul> </li> <li>PDH Timing recovery: ACR/DCR/System</li> <li>ACR/DCR support</li> <li>SDH Circuit Emulation over Packet (CEP)</li> <li>Encapsulation <ul style="list-style-type: none"> <li>PW/LSP (TDM over MPLS-TP),</li> <li>"Dry martini", MEF 8 (TDM over Ethernet),</li> <li>TDM over IP</li> </ul> </li> <li>DS0 cross-connection <ul style="list-style-type: none"> <li>Two-way FE1(N*DS0) to FE1/VC12/STM1 cross-connection</li> <li>Two-way FE1(N*DS0) to FE1(N*DS0) cross-connection</li> </ul> </li> </ul>
Ethernet Pseudowire Services
<ul style="list-style-type: none"> <li>E-Line, E-LAN, E-Tree services as defined by MEF 9 and 14 and using VPWS/VPLS</li> <li>Native Ethernet packets supported</li> <li>Encapsulation: PW/LSP (MPLS-TP), VLAN tagging (1Q), VLAN double tagging (Q-in-Q)</li> </ul>
VPLS
<ul style="list-style-type: none"> <li>VPLS bridging</li> <li>H-VPLS bridging</li> <li>128K MAC addresses</li> <li>2K VPLS instances per device</li> <li>Split horizon to prevent forwarding loops</li> </ul>
CoS/QoS
<ul style="list-style-type: none"> <li>8 Priority Queues</li> <li>Scheduling: Strict Priority, WRR with Hierarchy</li> <li>Ingress Policing &amp; Egress Shaping per service</li> <li>CIR / PIR (EIR) 2-rate-3-color</li> <li>MPLS: TC/EXP-Inferred-PSC (Per Hop Behavior Scheduling Class) LSP</li> </ul>
Timing
<ul style="list-style-type: none"> <li>SSM quality level compatible</li> <li>IEEE 1588 v2 (via SyncE only)</li> <li>PTP Clocks: Ordinary/Boundary/Transparent</li> <li>ToD (Time of day)</li> <li>1-PPS (One Pulse per second) output interface</li> <li>G.8265.1 Profile (Frequency Synchronization)</li> <li>SyncE</li> <li>Synchronous Ethernet from all built-in and plug-in GbE, 10GbE ports</li> <li>ITU-T Ethernet Synchronous Message Channel (ESMC)</li> <li>Stratum 3 timing</li> <li>TDM line clock: E1/T1 and STM/OC ports</li> <li>External clock input and output (2 Mbps / 2 MHz)</li> </ul>

## Features

Management
<ul style="list-style-type: none"> <li>• Fully manageable via SNMP (v1, v2, v3)</li> <li>• Fully manageable via CLI               <ul style="list-style-type: none"> <li>◊ Serial port</li> <li>◊ SSH, Telnet via Ethernet</li> </ul> </li> <li>• GbE Interface in-bands</li> <li>• Account Security               <ul style="list-style-type: none"> <li>◊ Two types of privileges: Operator (read only) and Administrator (read and write)</li> <li>◊ Radius Client and 802.1x Authentication</li> </ul> </li> <li>• Upload/Download NE configuration through TFTP/SFTP</li> <li>• Syslog, NTP</li> <li>• SNMP Port 1:1 Protection</li> <li>• Console 1+1 Protection</li> </ul>
Network Security
<ul style="list-style-type: none"> <li>• MACSec (Media Access Control Security)               <ul style="list-style-type: none"> <li>◊ IEEE 802.1AE MACsec</li> <li>◊ AES-128-CMAC or AES-256-CMAC</li> <li>◊ Authentication using Certificate or Pre-Shared Keys (PSK)</li> <li>◊ Switch-to-Switch (static CAK) mode</li> <li>◊ Switch-to-Host (dynamic CAK) mode</li> </ul> </li> <li>• IPsec (Internet Protocol Security)               <ul style="list-style-type: none"> <li>◊ IPsec/IKE VPN tunnel for Control-plane</li> <li>◊ IKEv1/IKEv2 support</li> <li>◊ Support encryption algorithms: AES128, AES256</li> <li>◊ Support integrity algorithms – md5, sha1, sha256</li> <li>◊ Password – (PSK) based and certificate - (pubkey) based keys</li> </ul> </li> </ul>

L3
<ul style="list-style-type: none"> <li>• VRF without multicast protocols</li> <li>• ARP, Ping, Trace route</li> <li>• VRRP</li> <li>• Static Route</li> <li>• RIP v1/v2</li> <li>• OSPF v2</li> <li>• Routing among Physical Ethernet ports, VLAN virtual port (VLAN routing), and PW ports.</li> <li>• 32 Sub interfaces</li> <li>• IGMP v2/v3</li> <li>• PIM-SM</li> <li>• NTP server/client</li> </ul>



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