

CORIANT IS NOW PART OF INFINERA

7090-2 CEM Packet Transport Platforms

Compact MPLS-TP Edge Devices for Demarcation & Metro Access

EXTENDING MPLS-TP TO THE NETWORK EDGE

The Coriant® 7090 M/CEM Packet Transport Solutions provide MPLS-TP enabled packet transport addressing a wide range of applications including Layer 2 enterprise services, mobile and fixed broadband backhaul, and TDM migration, either as a standalone solution or together with other solutions in the Coriant packet optical portfolio, including the Coriant® 7100 Packet Optical Transport Solutions and the Coriant® mTera® Universal Transport Platform (UTP). In the 7090 M/CEM Series, the compact and cost-effective Coriant® 7090-2 CEM Packet Transport Platform, Coriant® 7090-2/B CEM Packet Transport Platform, and Coriant® 7090-2/C CEM Packet Transport Platform provide options for extending MPLS-TP to the edge, including demarcation and Gigabit Ethernet access ring applications, as shown in Figure 1, while also providing options for TDM circuit emulation and Power over Ethernet (PoE).

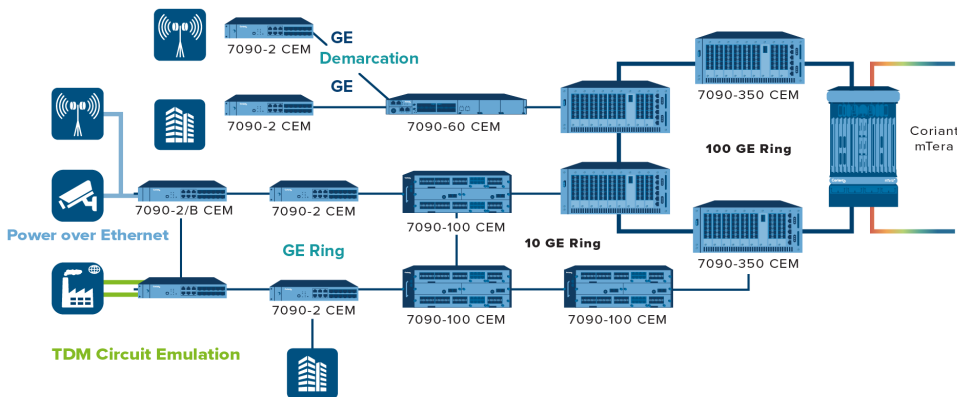


Figure 1 — Extending MPLS-TP to the Edge

MPLS-TP provides a scalable, transport-oriented option for packet switching. Comprehensive MPLS-TP support includes static LSPs, single segment and multi-segment pseudowires, Virtual Private LAN Service (VPLS), and Hierarchical Virtual Private LAN Service (H-VPLS). MPLS-TP OAM includes G.8113.1 and G.8113.2. Additional Ethernet OAM capabilities include Y.1731, 802.3 Link OAM, and 802.1 CFM OAM. MPLS-TP protection features include 1:1 LSP protection, LSP SNC, MPLS-TP ring protection, MPLS-TP dual homing and dual star protection, and both 1:1 single segment and 1:1 multi-segment pseudowire protection.

BENEFITS OF THE CORIANT® 7090-2 CEM

- **Minimize** space and power with compact 1RU platforms that only consume between 25 W and 40 W
- **Migrate** TDM traffic to packet transport cost effectively with the 7090-2/C CEM that provides four integrated E1 interfaces, and with a range of CES SFPs including E1, T1, DS3, STM-1/OC-3, and STM-4/OC-12
- **Simplify** the deployment of small cells, Wi-Fi hotspots, and video surveillance cameras with eight Power over Ethernet ports on the 7090-2/B CEM
- **Backhaul** mobile traffic including LTE-TDD and LTE-Advanced with comprehensive synchronization support including Synchronous Ethernet and 1588v2 boundary clock on the 7090-2 CEM and 7090-2/C CEM
- **Maximize** Ethernet service revenues with comprehensive quality of service and network protection capabilities and with MEF CE 2.0 compliance



7090-2 CEM



7090-2/B CEM



7090-2/C CEM

MIGRATING TDM SERVICES TO PACKET TRANSPORT WITH CIRCUIT EMULATION

The 7090-2 CEM, 7090-2/B CEM, and 7090-2/C CEM provide a number of options for delivering TDM services over packet leveraging circuit emulation standards including Structure-Agnostic TDM over Packet (SAToP) and Transparent SONET/SDH over Packet (TSoP). The 7090-2 CEM provides two integrated STM-1 ports while the 7090-2/C CEM provides four integrated E1 ports. Furthermore, Smart SFPs are available for E1, T1, DS3, STM-1/OC-3, and STM-4/OC-12 circuit emulation. TDM quality is assured by frequency synchronization over packet options including Synchronous Ethernet, 1588v2 frequency profile, and a hybrid option that combines Synchronous Ethernet and 1588v2.

SIMPLIFYING THE DEPLOYMENTS OF SMALL CELLS, WI-FI HOTSPOTS, AND VIDEO SURVEILLANCE WITH POWER OVER ETHERNET

The 7090-2/B CEM provides the option of PoE on its eight 100M/1000M RJ45 ports. PoE enables it to deliver both Layer 2 connectivity services and power to devices, such as small cells, Wi-Fi hotspots, and surveillance cameras, simplifying deployment and reducing operational costs. Both 802.3af (15.4 W per port) and 802.3at (25.5 W per port) standards are supported.

MAXIMIZING ETHERNET SERVICE REVENUES WITH HARD QUALITY OF SERVICE AND A RANGE OF HIGH AVAILABILITY FEATURES

The 7090-2 CEM is an MEF CE 2.0 certified platform with support for Ethernet connectivity services including E-Line, E-LAN, E-Tree, and E-Access. Quality of service mechanisms include Layer 2 and Layer 3 classification, policing, and shaping. Eight service levels with strict priority and deficit weighted round robin scheduling algorithms are supported. Hierarchical QoS is supported for pseudowires and LSPs. Unintentional overbooking is prevented by Connection Admission Control (CAC) in the network management system enabling hard QoS. In addition to the MPLS-TP protection mechanisms described previously, 802.1AX Link Aggregation on both client (UNI) and network (NNI) interfaces is supported. Furthermore, all three 7090-2 CEM platforms support redundant DC power feeds, while the 7090-2/B CEM and 7090-2/C CEM are also fanless, which avoids the risk of fan failures.

FUTURE-PROOFING MOBILE BACKHAUL WITH COMPREHENSIVE SYNCHRONIZATION SUPPORT

With comprehensive support for both frequency and phase synchronization, the 7090-2 CEM and 7090-2/C CEM provide ideal solutions for mobile backhaul, including LTE-TDD and LTE-Advanced functions such as Coordinated Multipoint (CoMP), Enhanced Inter-cell Interference Coordination (eICIC), and Multiple-input Multiple-output (MIMO). These platforms support both frequency and phase synchronization over packet. Options for frequency synchronization include Synchronous Ethernet, 1588v2 frequency profile, and a hybrid option that combines Synchronous Ethernet and 1588v2. Additional 1588v2 phase/frequency synchronization options include boundary clock, transparent clock, and ordinary clock. The 7090-2/C CEM also provides an external clock interface with support for 2 MHz and 2 Mbps (G.703).

REDUCING OPEX WITH POWERFUL END-TO-END PACKET MANAGEMENT

The Coriant Transcend™ Transport Network Management System (TNMS) provides comprehensive end-to-end network management for the 7090 M/CEM Series and the other platforms within the Coriant packet optical transport portfolio, including the 7100 Series and mTera UTP. Key features include network inventory, capacity management, advanced troubleshooting, performance monitoring, service provisioning and supervision, and service and subscriber management. Open APIs enable end-to-end orchestration including a REST API (Presto) enabling support for the MEF's Lifecycle Service Orchestration (LSO). A local craft station option, the Coriant® 7090 LCT NE Management System, is also available.

TECHNICAL SPECIFICATIONS

Dimensions	7090-2 CEM	7090-2/B CEM	7090-2/C CEM
Height	44.5 mm (1RU)	44.5 mm (1RU)	44.5 mm (1RU)
Width	266 mm	353 mm	440 mm
Depth	209 mm	176 mm	164 mm
Switching Capacity	14 Gbps	14 Gbps	8 Gbps
Fixed Interfaces			
100M/1000M SFP	10	6	4
100M/1000M RJ45	4	8 (with optional PoE)	4
STM-1 SFP	2	-	-
E1 (75/120 Ohm)	-	-	4
Maximum SMART CES SFPs			
STM-4/OC-12	5	6	4
STM-1/OC-3	5	6	4
DS3	5	6	4
E1 (120 Ohm)	10	6	4
T1 (100 Ohm)	10	6	4
Maximum Interaces			
GE (SFP)	10	6	4
GE (RJ45)	14	14	8
GE PoE	-	8	-
100M (SFP)	10	6	4
100M (RJ45)	14	14	8
STM-4	5	6	4
OC-12	5	6	4
STM-1	7	6	4
OC-3	5	6	4
DS3	5	6	4
E1	10	6	8
T1	10	6	4
Power			
DC Power, Dual Feeds	✓	✓	✓
AC Power	External AC Adapter	External AC Adapter	✓
Maximum Consumption	40 W	<30 W (without PoE)	<25 W
Environmental	Environmental	Environmental	Environmental
Operating Temperature	-5°C to +65°C	-5°C to +65°C	DC: -5°C to +65°C AC: -5°C to +50°C
Humidity	5%-90%	5%-90%	5%-90%

TECHNICAL SPECIFICATIONS

MPLS-TP

- Static LSPs
- Static Single Segment (SS) pseudowires
- Static Multi-Segment (MS) pseudowires
- VPLS/H-VPLS

OAM

- MPLS-TP OAM (G.8113.1/G.8113.2)
- ITU-T Y.1731 End-to-end Performance Monitoring and AIS
- 802.3 Link OAM
- 802.1 CFM OAM
- Hardware-based delay and loopback measurement with nanosecond resolution

Network Protection

- LSP 1:1 linear protection
- LSP SNC protection
- LSP ring protection
- Single Segment (SS) pseudowire 1:1 protection
- Multi-Segment (MS) pseudowire 1:1 protection
- Dual Homing/Dual Star
- 802.1AX Link Aggregation (UNI/NNI) with LACP
- MSP 1+1/1:1 (STM-1, 7090-2 CEM)
- RSTP (IEEE 802.1Q)
- Link Pass-Through (LPT)

Quality of Service and Traffic

Management

- L2 Classification: VLAN, PRI, MAC address, TPID
- L3 Classification: IP address, DSCP, port number, TOS
- Connection Admission Control (CAC)
- Policing (CIR, CBS, EIR, and EBS; Color-Blind Mode and Color-Aware Mode)
- Shaping
- Congestion Avoidance: WRED
- 8 Service Classes
- Scheduling: SP, DWRR, SP+DWRR

Timing and Synchronization (7090-2 CEM and 7090-2/C CEM)

- Synchronous Ethernet (G.8261, G.8262)
- IEEE 1588v2:
 - Boundary Clock, Transparent Clock, Ordinary Clock (G.8275.1/2)
 - Frequency Profile (G.8265.1)
- External Clock Interface: G.703 2 MHz and 2 Mbps (7090-2/C CEM only)

Ethernet Functions

- VLAN (IEEE 802.1Q)
- Q-in-Q (IEEE 802.1ad)
- 9600 bytes jumbo frame
- VLAN manipulation: stack/switch/strip
- Flow control (IEEE 802.3x)
- IGMP snooping (V1/V2/V3)

TDM CES Interfaces

- 2xSTM-1 (7090-2 CEM)
- 4xE1 (7090-2/C CEM)
- Smart SFPs (see previous table)
- RFC 4553 Structure-Agnostic TDM over Packet (SAToP)
- Transparent SONET/SDH over Packet (TSoP)

Power over Ethernet (PoE)

- 8 ports (7090-2/B CEM)
- 802.3af (15.4 W)
- 802.3at (25.5 W)

Management

- Coriant Transcend™ Transport Network Management System (TNMS)
- Coriant® 7090 LCT NE Management System
- In-band Management VLAN
- Out-band Management Interfaces (100M Ethernet, RJ45)
- OSPF Layer 3 DCN
- Zero Touch Provisioning (ZTP)
- SFTP
- SSHv2

Certifications

- MEF CE 2.0 Certified: E-Line, E-LAN, E-Tree, E-Access (7090-2 CEM)
- ETSI 300 019
- ETSI EN 300 386 V1.6.1/EN 55022(2010)
- EN 60950-1: 2006+A11: 2009+A1:2010+A12:2011

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