Cisco Carrier Packet Transport (CPT) 50 Series

The Cisco® Carrier Packet Transport (CPT) Product Family with CPT600, CPT200 and CPT50 Series sets the industry benchmark as a compact carrier-class converged access and aggregation platform for Unified Packet Transport architectures. Cisco CPT product family represents an exciting new paradigm in the world of Packet Transport with exceptional pay as you grow scalability, carrier-class reliability, incredible flexibility, and TDM like ease of packet service provisioning, OAM and protection capability.

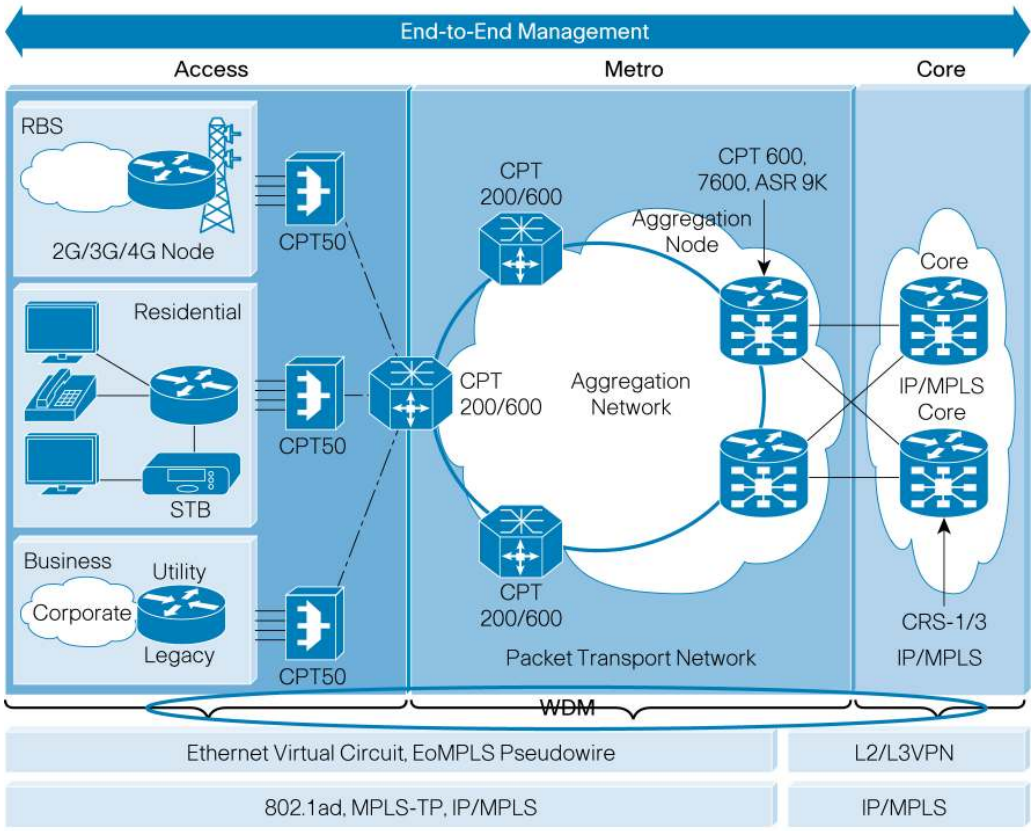
Product Overview

The Cisco CPT 50 introduces architectural innovations to the CPT product family for building access and aggregation Packet Transport networks and redefines the network economics and management to provide exceptional CapEx and OpEx advantages. The Cisco® CPT 50 is a compact and operationally simple, yet highly scalable and flexible platform optimized for delivering TDM like Ethernet Private lines as well as multipoint capabilities for Business, Residential, Mobile Backhaul, Data Center, and Video Services. Its unique satellite architecture is designed to scale, simplify and enhance the operational and deployment aspects of service-delivery networks. The Cisco CPT 50 Series behave as remote line cards for CPT 600 and/or CPT 200, together forming a distributed modular system. This architecture enables physical topologies with the flexibility and benefits of collocated and remote deployments.

Some highlights of this next-generation platform are:

- The Cisco CPT 50 Series acts as a satellite in a distributed modular architecture and terminates various services. The satellites are purpose built to achieve multiple goals to basically reduce both CapEx and OpEx costs:
  - Do more with the same by increasing density of service interfaces per chassis by a factor of 3x to 10x
  - Deployment flexibility as satellites can be collocated with the main chassis or located in a remote location up to 80km away
  - Simplified operations: One single point of management and policy enforcement using upstream CPT 600 and CPT 200
  - Significantly reduced space and power needs with industry leading port density
- The Cisco CPT 50 supports unprecedented port density in 1 RU space with 44 SFP based ports (10/100/1000 Mbps) and 4 SFP+ based 10GE ports. CPT 50 introduces a license based pay as you grow model for Ethernet ports allowing customers to optimize current CapEx, while having capacity to grow in the future without a fork lift upgrade. Added with ITEMP temperature rating, the platform can be not only deployed in temperature controlled central offices but also in harsher locations like outside plants.

- In a metro area, service providers fan out many Ethernet ports for service delivery but the management of such a distributed solution is complex. The Cisco CPT50 Series solves this problem by centralizing the management of a distributed system. The Cisco CPT 50 is managed as a virtual line card of CPT 200 or CPT 600. The management operations for CPT 50 such as provisioning, software download, platform discovery and database backup are performed at CPT200 or CPT 600. The virtual CPT50 can be collocated with UST200 or CPT600 using cheap 10G copper SFP+ pluggables or can be remotely located using long reach 10G SFP+ pluggables. The satellite architecture can be extended to solve many kinds of access needs like Ethernet, TDM or others with a common backhaul architecture in effect saving need for different architectures for each kind of access.



- Hardware supported with timing outputs for BITS and TOD/PPS standards-based line-interface functions for delivering transport-class network timing, enables support of network-synchronized services and applications such as mobile backhaul and time-division multiplexing (TDM) migration.

Table 1. Features and Benefits

Description	Specification		
Interface Support			
44 SFP Based Ports (100/1000 Mbps) + 4 SFP+ based 10 GE ports	Satellite panel provides 100/1000 SFP based ports		
100/1000 Mbps SFP Types	SFP interfaces provide mix/match interface types. For a complete list of supported interfaces, please see the Cisco CPT pluggable configuration guide.		
10GE SFP+ Types	SFP+ interfaces provide mix/match interface types. For a complete list of supported interfaces, please see the Cisco CPT pluggable configuration guide.		
Scalable and Integrated Multiservice Support			
Layer 2 Transport	Carrier Ethernet, MPLS-Transport Profile (TP) and IP/MPLS-(TE)		
Layer 2 and Layer 2+ services	• Carrier Ethernet – EPL, EVPL, ELAN, EVPLAN • MPLS-TP – P2P Circuits (VPWS), Multipoint (VPLS), Hierarchy Multipoint (H-VPLS), Ring VPLS (Optimized for Video Broadcast applications) • IP/MPLS(TE) – P2P Circuits (VPWS), Multipoint (VPLS), Hierarchy Multipoint (H-VPLS), Ring VPLS (Optimized for Video Broadcast applications)		
Service Scale			
MAC Address	128K mac addresses		
Point to Point Ethernet Virtual Circuit (EVC)	4K		
VPWS	3.5K		
PW Redundancy	2.5K		
Point to Multi-Point Ethernet Virtual Circuit (EVC)	4K with 8K members		
VPLS	1K		
MPLS-Transport Profile (TP) Tunnels	4k		
MPLS-TP LSP Un-Protected	2K		
MPLS-TP LSP Protected	1K		
REP	32 Segments		
Multicast Groups	2K		
Policers	8K Policers 2-rate 3-color (2R3C)		
Egress queues	64K Queues (3-level H-QoS)		
Ethernet OAM			
CFM	**Interval**	**Remote MEPs**	**Local MEPs**
	100 ms	100	100
	1 sec	1000	1000
	10 sec	8000	8000
	1 min	16000	16000
	10 min	16000	16000
EFM	Per Interface		
ITU Y.1731 (FM)	Same as CFM		
ITU Y.1731 (DM)	**Type**	**Interval**	**# of Sessions**
	Line Card (per CPT 50)	1 sec	100
	System	1 sec	1000

Description	Specification
High Availability	
High Availability features	Stateful Switchover (SSO) In Service Software Upgrade (ISSU) MPLS-TP 1:1 path protection Link Aggregation (LAG) Resilient Ethernet Protocol (REP)
Multicast	
Multicast features	IGMP snooping v1, v2, & v3 Multicast VLAN registration (MVR)
BITS out	Sync-E or IEEE 1588V2
TOD/PPS	IEEE 1588V2

Product Specifications

Table 2. Product Specifications

Description	Specification
Product Functionality, Benefits and Specifications	
Software Support	• Cisco Transport Controller: End-to-End Network Point and Click Provisioning, Maintenance, & Alarm Correlation. • Integrated Robust Command Line Interface (CLI)
MPLS-Transport Profile (TP)	• IETF Standard Based MPLS-Transport Profile: ◦ RFC 5317 ◦ RFC 5654 ◦ RFC 5921 ◦ RFC 5880 ◦ RFC 5960 ◦ RFC 5586 ◦ RFC 5951 ◦ RFC 5950
Flexible Ethernet services	• Ethernet Virtual Connections (EVCs): Ethernet services are supported using individual EVCs to carry traffic belonging to a specific service type or end user through the network. EVC-based services can be used in conjunction with MPLS-based L2VPNs and native Ethernet switching deployments. • Flexible VLAN classification: VLAN classification into Ethernet flow points (EFPs) includes single-tagged VLANs, double-tagged VLANs (QinQ and 802.1ad), contiguous VLAN ranges, and noncontiguous VLAN lists. • IEEE Bridging: The line cards support native bridging based on IEEE 802.1Q, IEEE 802.1ad, and QinQ VLAN encapsulation mechanisms. • Resilient Ethernet protocol (REP): The REP provides a resilient, fast-convergence mechanism for aggregating and connecting to Ethernet-based access rings.
L2VPN services	• MPLS-TP Circuit with Ethernet over MPLS-TP (EoMPLS-TP): EoMPLS-TP transports Ethernet frames across an MPLS-TP LSPs using pseudowires. Individual EFPs or traffic from an entire port can be transported over an MPLS-TP network using pseudowires to an egress interface or sub-interface. • Virtual Private LAN Services (VPLS): These services are included in a class of VPN that supports the connection of multiple sites in a single bridged domain over a MPLS-TP network. VPLS presents an Ethernet interface to customers, simplifying the LAN and WAN boundary for service providers and customers, and enabling rapid and flexible service provisioning, because the service bandwidth is not tied to the physical interface. All services in a VPLS appear to be on the same LAN, regardless of location. • Pseudowire redundancy: Pseudowire redundancy supports the definition of a backup pseudowire to protect a primary pseudowire in case of failure. • Multi-segment pseudowire stitching: Multi-segment pseudowire stitching is a method for interworking two pseudowires together to form a cross-connect relationship.
SPAN	• Span is a technique of replicating the ingress or egress frames in a specific port to a specified list of destination ports. It is a monitoring feature used to monitor the traffic that is coming out of a port or an EFP. The monitored traffic can be used to debug the network and can also be used by law enforcement agencies.

Description	Specification
High Availability	• MPLS-TP: 1:1 MPLS TP LSP delivers protection switching for networks with sub-50ms APS switching for link, node, path failures. • Bidirectional Forwarding Detection (BFD): BFD is a detection protocol that is designed to provide fast forwarding path-failure detection times for all media types, encapsulations, topologies, and routing protocols • 802.3ad Link Aggregation Bundles: The line cards support a bundle of multiple links to provide added resiliency and the ability to load balance traffic over multiple member links.
Multicast	• IGMP v2 and v3 snooping: This Layer 2 mechanism efficiently tracks multicast membership on an L2VPN network. Individual IGMP joins are snooped at the VLAN level or pseudowire level. In residential broadband deployments, this scenario enables the network to send only channels that are being watched to downstream users. • Multicast VLAN Registration (MVR): MVR optimizes the control plane (IGMP) load between the router and switch. MVR feature enables switch to aggregate different JOINs received on different VLANs (from the receivers) into one JOIN (on a single VLAN, which could be the same as or different from the VLANs of the receiving ports) towards the router. The switch then distributes (replicate) the received content into the relevant ports.
Ethernet OA&M	• Connectivity Fault Management (CFM) Ethernet layer OAM protocol provides end-to-end provider edge (PE to PE) and/or customer edge to customer edge (CE to CE) fault management. CFM includes proactive connectivity monitoring, fault verification, and fault isolation for large Ethernet metropolitan-area networks (MANs) and WANs. CFM is defined by IEEE 802.1ag standard. • Ethernet Link OAM is a protocol for installing, monitoring, and troubleshooting Ethernet metropolitan-area networks (MANs) and Ethernet WANs. It relies on an optional sublayer in the data link layer of the Open Systems Interconnection (OSI) model. Ethernet Link OAM is defined by IEEE 802.3ah standard. • Remote Ethernet Port Shutdown. The Remote Ethernet Port Shutdown replicates a local link failure over an EoMPLS pseudowire to a remote link shutdown the remote Ethernet port down. Bot UNI interfaces connected to the EoMPLS pseudowire will shutdown in the event of a pseudowire failure. • ITU Y.1731 Fault Management and Delay Management. The ITU-T Y.1731 feature provides OAM functions for fault management and performance monitoring functionality for service providers in a large network. ITY Y.1731 includes Ethernet Alarm Indication Signal (ETH-AIS), Ethernet Remote Defect Indication (ETH-RDI), Ethernet Locked Signal (ETH-LCK) functionality for fault detection and isolation. ITU Y.1731 Delay Management (DM) provides a standard Ethernet PM function that includes measurement of Ethernet frame delay and frame delay variation.
MPLS OA&M	• IP/MPLS OA&M: LSP Ping & LSP Trace Route • Pseudo-Wire: Virtual Circuit Connectivity Verification (VCCV), Ping, Traceroute, Static Status Message to LDP Status Message Translation • MPLS-TP OA&M: GACH/GAL & MPLS-TP LSP BFD OAM
Manageability	Cisco Prime Suite is the industry's most advanced optical transport domain manager. It delivers the full power of the Cisco Carrier Packet Transport products to a customers operation personnel and back office systems alike. • A carrier-class Element Management System (EMS), Cisco Transport Manager: Lowers network operations, administration, maintenance, and provisioning costs • Provides fault, configuration, performance, and user access security management capabilities • Features a comprehensive client/server-based platform that scales to manage the equivalent of 3000 CPT50, CPT200, CPT600 network elements and up to 100 simultaneous user sessions • Offers network provisioning, surveillance, and performance monitoring features that help customers rapidly deploy and maintain revenue-generating services that are built on Cisco Optical Networking and Voice Gateway Systems The intelligent Cisco Prime Suite High Availability Agent is designed to automatically detect problems, attempt to restart processes, and fail over to a secondary Sun UNIX server if required. The Cisco Prime Suite High Availability solution: • Significantly reduces the risk of losing data • Optimizes the Cisco Prime Suite platform to provide continuous service in the event of a failure does occur • Helps ensure constant visibility in a customer's network
Security	Cisco Transport Software: Cisco Transport Software provides comprehensive network security features, including access control lists (ACLs); control-plane protection; authentication, authorization, and accounting (AAA) and RADIUS; Secure Shell (SSH) Protocol; SNMPv3; and Hypertext Transfer Protocol Secure (HTTPS); Security: Many critical security features are supported: • 802.1ad Layer 2 Control Protocol (L2CP) and bridge-protocol-data-unit (BPDU) filtering • MAC limiting per EFP or bridge domain • Unicast, multicast, and broadcast storm-control blocking on any interface or port • Unknown Unicast Flood Blocking (UUFB)

Description	Specification	
Environmental and Compliance Standardization		
Physical dimensions (H x W x D); Weight	AC	1.560 x 17.417 x 9.095 in. (39.624 x 442.392 x 231.013 mm) 8.951 lbs. (4.06 Kg)
	DC ANSI	1.560 x 17.417 x 9.095 in. (39.624 x 442.392 x 231.013 mm) 8.951 lbs. (4.06 Kg)
	DC ETSI	1.560 x 17.417 x 9.095 in. (39.624 x 442.392 x 231.013 mm) 8.951 lbs. (4.06 Kg)
	FAN Tray	8.252 x 1.661 x 1.516 in. (209.6 x 42.2 x 38.5 mm) 1.323 lbs. (600 grams)
Power	Max Power 210 Watts Nominal Power 159 Watts	
Network Equipment Building Standards (NEBS)	GR-1089 Issue 5, GR-63 Issue 3	
Operating temperature (nominal)	–40℉ to 149℉ (–40℃ to +65℃)	
Operating humidity (nominal) (relative humidity)	5–85% noncondensing, operation is guaranteed up to 95% noncondensing	
Storage temperature	–40℉ to 158℉ (–40℃ to +70℃)	
Storage (relative humidity)	93% noncondensing	
Operating altitude	13,123.36 feet (4000 meters)	

Warranty Information

Find warranty information on Cisco.com at the Product Warranties page.

Ordering Information

To place an order, visit the Cisco Ordering Home Page. To download software, visit the Cisco Software Center.

Table 3. Ordering Information

Product Name	Part Number
Carrier Packet Transport 50 with 44xGE –48v Power ANSI	CPT-50-44GE-48A=
Carrier Packet Transport 50 with 44xGE –48v Power ETSI	CPT-50-44GE-48E=
Carrier Packet Transport 50 with 44xGE –24v Power ANSI	CPT-50-44GE-24A=
Carrier Packet Transport 50 with 44xGE AC Power	CPT-50-44GE-AC=
CPT 50 with 11 ports license HW –48v Power ANSI	CPT-50-48A-LIC=
CPT-50 with 11 ports license HW –48v Power ETSI	CPT-50-48E-LIC=
CPT-50 with 11 ports license HW –24v Power ANSI	CPT-50-24A-LIC=
CPT-50 with 11 ports license HW AC Power	CPT-50-AC-LIC=
CPT-50 11-Port GE License	CPT-LIC-11GE=
Carrier Packet Transport 50 11-Port GE License (eDelivery)	L-CPT-LIC-11GE-E=
Carrier Packet Transport 50 Fan Tray with Filter	CPT-50-FTA=
Carrier Packet Transport 50 Fan Tray Filter	CPT-50-FTF=

Cisco Services

Cisco Services make networks, applications, and the people who use them work better together.

Today, the network is a strategic platform in a world that demands better integration between people, information, and ideas. The network works better when services, together with products, create solutions aligned with business needs and opportunities.

The unique Cisco Lifecycle approach to services defines the requisite activities at each phase of the network lifecycle to help ensure service excellence. With a collaborative delivery methodology that joins the forces of Cisco, our skilled network of partners, and our customers, we achieve the best results.

For More Information

For more information about the Cisco Carrier Packet Transport, visit www.cisco.com/en/US/products/hw/optical/ps1996/index.html for the product home page or contact your local account representative or Enter Cisco alias.

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