

Cisco uBR10012 OC-48 Dynamic Packet Transport Interface Module Set

The Cisco uBR10012 OC-48 Dynamic Packet Transport (DPT) Interface Module set is a high-performance, fault-tolerant interface set that provides unmatched connectivity options from the Cisco uBR10012 Universal Broadband Router to the IP core network. The Cisco uBR10012 OC48-DPT module set provides a powerful combination of service, scalability, and flexibility with the industry's broadest set of Layer 3 features.

This interface module set enables multiple system operators (MSOs) to substantially increase the data load over their optical transport infrastructure while lowering ongoing operational costs. The DPT feature set supports automatic network resiliency with fast cutover times that translate to a significant increase in overall network availability.

High-Speed Optical Interface

The Cisco OC-48 DPT interface module set for the Cisco uBR10012 is a high-capacity, high-performance interface that provides MSOs with an opportunity to use their existing fiber plant to realize a significant increase in bandwidth, coupled with industry-leading network resiliency and fault tolerance.

The innovative Cisco DPT solution is a Resilient Packet Ring (RPR) technology that combines the intelligence and scalability of IP routing with the bandwidth efficiencies of optical rings. Cisco DPT/RPR

delivers simplified network operations, scalable IP services, and highly reliable IP-aware optical transport that translates to significant improvement in the ongoing cost of running today's high-speed networks.

The OC-48 DPT interface modules for the Cisco uBR10012 use an extensive and scalable set of Layer 3 features needed to deliver mission-critical commercial applications and delay-sensitive real-time applications such as voice and video over the cable IP infrastructure.

For example, operators have the ability to offer virtual private network (VPN) services via a comprehensive set of Multiprotocol Label Switching (MPLS) capabilities. Similarly, the OC-48 DPT product option complements the set of Cisco uBR10012 features needed to support the PacketCable standard.

The Cisco OC-48 DPT interface module set (see Figure 1) supports bandwidth up to 2.488 Gbps and uses Synchronous Optical Network (SONET)/Synchronous Digital Hierarchy (SDH) framing with

Figure 1
 Cisco uBR10012 OC-48
 DPT Interface Module
 Set for Increased
 Bandwidth, Resilience,
 and Service Flexibility



concatenated payloads over two counter-rotating rings. The two modules each terminate half of the OC-48 DPT ring. The two-module set may be placed in any two adjacent uplink slots in the Cisco uBR10012 chassis. Both modules are hot-swappable.

OC-48 DPT optics options support distances up to 2 km for short-reach optics, and up to 80 km for long-reach optics.

The Cisco uBR10012 OC-48 DPT implementation is fully compatible with implementations on platforms such as the Cisco 12000 Series, Cisco 7600 Series, and Cisco 10720 Series Internet routers.

Key Benefits

- Eliminates the complexity and cost associated with intermediate Layer 2 switching solutions.
- Delivers scalable Internet service and reliable IP-aware optical transport over the cable infrastructure.
- Protects the value of the existing fiber plant and optimizes the metro optical ring for IP traffic.
- Provides expanded high-performance bandwidth options to handle high concentrations of cable subscribers.
- Maximizes ring robustness and operational efficiency.
- Delivers “plug-and-play” capabilities that minimize configuration requirements, optimize routing decisions, and aid in network monitoring and management.

Key Features

Chassis

- Dual card OC-48 DPT interface with SC connector
- Interface supports single-mode fiber up to 80 km
- Network Equipment Building Standards (NEBS) Level 3 compliant

Dynamic Packet Transport

- Uses Cisco ring access controller (RAC) application-specific integrated circuit (ASIC) as a Media Access Control (MAC) layer controller for implementing the DPT protocol
- Set of two DPT interface modules send pass-through ring traffic using internal backplane through horizontal Special Reuse Protocol links
- Provides service resiliency through ring wrap on adjacent node fiber or node failure for self-healing in less than 50 ms.

- “Inner and outer ring” support to maximize bandwidth for data using the shortest path to the destination
- Spatial Reuse Protocol (SRP) packets are mapped to System Processing Engine (SPE)
- Uses SONET/SDH framing with concatenated payloads
- Expanded management and monitoring options via DPT Management Information Base (MIB)

SONET Layer

- Standards-compliant SONET interface, including GR253, ITU G.707, and G.957 compliance
- Alarm processing
- Performance monitoring
- Error counts for B1, B2, B3
- Threshold crossing alerts (TCA) for B1, B2, and B3 with settable threshold
- +/- 20 ppm clock accuracy

Specifications

Software Compatibility

- Cisco IOS® Software release 12.2(11) BC2 or higher

Reliability and Availability

- Mean time between failure (MTBF): 215,000 hours
- Hot swappable, requires adjacent slots

Physical

- Occupies two uplink slots
- SC duplex connector
- Interface: single mode for short reach, multimode for long reach
- Weight: 4.75 lb (2.16 kg)
- Dimensions: 16.0 x 1.12 x 9.87 in (40.64 x 2.83 x 25.32 cm) (H x W x D)

Environmental

- Storage temperature: -38 to 150° F (-40 to 70° C)
- Operating temperature: nominal = 41 to 104° F (5 to 40° C)
- Operating temperature: short term = 23 to 131° F (-5 to 55° C)
- Storage relative humidity: 5 to 95% relative humidity
- Operating relative humidity: nominal 5 to 85% relative humidity

- Operating relative humidity: short term 5 to 90% relative humidity
- Operating altitude: -60 to 4000 m

Regulatory Compliance

- UL 1950, Third Edition (Safety of Information Technology Equipment, Including Electrical Business Equipment), with no D3 deviations
- CSA 22.2 No. 950-95 Third Edition (Safety of Information Technology Equipment, Including Electrical Business Equipment)
- EN 60950 (Safety of Information Technology Equipment, Including Electrical Business Equipment) incorporating Amendments 1, 2, 3, and 4 with all National Deviations
- IEC950 incorporating Amendments 1, 2, 3, and 4 with all National Deviations
- ACA TS001 1997 Test Report and Statement of Compliance AS/NZ3260 incorporating Amendments 1, 2, 3, and 4

Electronic Emissions Certification

- FCC Part 15 Class B
- EN55022: 1998 Class B
- CISPR 22: 1997 Class B
- CFR 47 Part 15 Class A
- ICES - 003, Issue2, Class B, April 1995
- VCCI V-3/97.04 Class II
- AS/NZS 3548: 1992, Class B
- CNS - 13438 Class B - BSMI (BCIQ) Taiwan

Immunity

- EN61000-4-2 ESD immunity
- EN61000-4-3 Radiated RF field immunity
- EN61000-4-4 Immunity to electrical fast transients
- EN61000-4-5 Surge immunity
- EN61000-4-6 RF-conducted immunity
- EN61000-4-11 Dips and sags (AC input)
- EN61000-3-2 Power line harmonics (AC input)

Network Equipment Building Systems

- NEBS: criteria levels (Level 3 compliant)
- NEBS: physical protection
- NEBS: EMC and safety
- GR-1089-Core
- GR-63-Core
- SR-3580

European Telecommunications Standards Institute

- ETSI 300 386-1-Levels for equipment with a “high priority of service” that is installed in “locations other than Telecommunications centers”
- ETSI 300 386-2:1997-Levels for equipment with a “high priority of service” that is installed in “locations other than Telecommunications centers”
- ETSI 300 132-2: December 1994-Power supply interfaces at the input to telecommunications equipment Sections 4.8 and 4.9

Visual Status Indicators (LEDs)

- Enabled (green, 1 per card)
- POS (green, 1 per card)
- SRP (green, 1 per card)
- Sync (green, 1 per card)
- CD - Carrier (green, 1 card)
- Receive (Rx) - packet received (green, 1 per card)
- Transmit (Tx) - Packet transmitter (green, 1 per card)
- Fail (yellow, 1 per card)
- WRAP (yellow, 1 per card)
- PASS THRU (yellow, 1 per card)

Encapsulation

- IETF RFC 1661, PP
- IETF RFC 1662,

Network Management

- Simple Network Management Protocol (SNMP)
- MIB II
- DPT MIB

Power Budget

- Component: OC-48 DPT interface module
- Unit power: 28W

Optics

- Short reach 1310 nanometer (nm) optics or long reach 1550 nm optics

Optical Power Budget

- Transmit power: short reach = -10 to -3 dBm, long reach = -3 to -2 dBm
- Receive power: short reach = -18 to -3 dBm, long reach = -28 to -9 dBm
- Typical maximum distance: short reach = 1.25 miles (2 km), long reach = 49.6 miles (80 km)

Ordering Information

Part Number	Description
UBR10-SRP-OC48SMS	Two interface modules, each with a single port OC-48 DPT, single mode, short reach
UBR10-SRP-OC48SML	Two interface modules, each with a single port OC-48 DPT, single mode, long reach



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