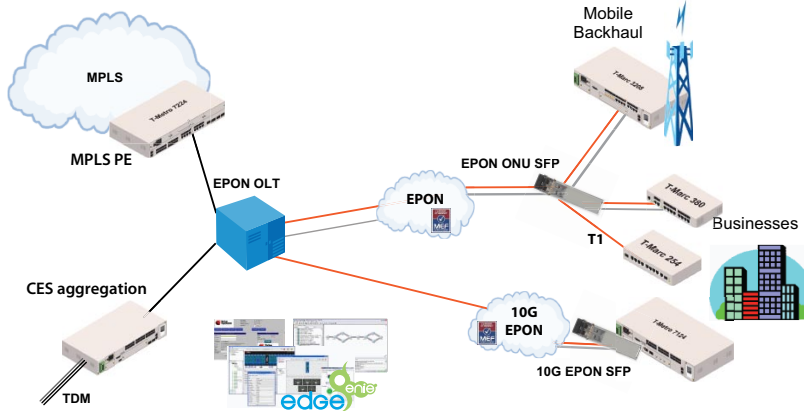


## Extending PON-based Commercial Services over DOCSIS



A new set of products which are basically an ONT in an SFP form factor has been released to the market and have attracted attention from both vendors and providers. These products incorporate the PON gateway into SFP allowing it to be placed into any 1G fiber port on a demarcation product.

Ethernet PON, or EPON, is based on the IEEE802.3 standard for a passive optical network (PON) and has been widely deployed, especially in the Far East. 10G EPON technology is now becoming available and is compatible with 1G-EPON. A 1G-EPON network can be incrementally upgraded to 10G-EPON, adding or replacing SFPs one at a time.

- 1 DPoE tested and compliant as defined by CableLabs and manageable through DOCSIS back office
- 2 Support for 1G - 10G EPON
- 3 Carrier-grade Ethernet edge solutions built to lower costs and provide service-aware and service-assured Ethernet services from demarc to aggregation
- 4 MPLS service implementations for enhanced Ethernet service scalability, traffic engineering, security, and resilience
- 5 Simultaneous OAM on all services and traffic flow — IEEE 802.3ah; IEEE 802.1ag; ITU.T Y-1731; MEF SOAM — to maintain customer SLA and optimize network transport performance
- 6 Low latency with enhanced QoS mechanisms to support traffic engineering on a per customer/per service basis
- 7 Zero-touch provisioning to ease network deployment and training burdens
- 8 Network resiliency across multiple network topologies with sub 50ms protection switching
- 9 Legacy integration / migration to support DS1 and DS3 CES
- 10 Certified to MEF 9 and 14 for standards-based multi-vendor interoperability

### What is DPoE?

DOCSIS Provisioning of EPON (DPoE) is a joint effort of operators, vendors, and suppliers to support EPON technology using existing DOCSIS-based back office systems and processes. Comcast Corporation, Time Warner Cable, and Bright House Networks under the umbrella of CableLabs have announced of the release of DPoE 1.0 specification release and continue to work on future versions.

Since the standard centers around DOCSIS, it targets EPON deployments by MSOs. Using DPoE, MSOs can reduce the time needed to deploy EPON technology by enabling the cable provider to use their existing back office DOCSIS systems, as well as deliver high-speed Ethernet-based services.

### Telco Systems solutions

The EPON SFP combined with Telco Systems' T-Marc product line allows MSO to support service assured Ethernet services on a customer-by-customer basis, further differentiating their offering to businesses, schools, hospitals, utilities, mobile operators and government offices over an EPON network.

The T-Marc product line can provide not only Ethernet OAM capabilities, but also circuit emulation (CES) to enable MSOs to carry TDM circuits (T1/E1, DS3, OC-3/STM-1) over their fiber network, to support applications like PBX backhaul or mobile backhaul that traditionally could only be supported by providers who own copper infrastructure.

Telco Systems' can provide the MSO with a complete edge solution including OLT aggregators, allowing them to benefit from MPLS scalability as well as to aggregate CES traffic and convert it back to TDM.

# Extending PON-based Commercial Services over DOCSIS

## Demarcation for Commercial Services

This versatile family of service demarcation devices provides intelligent and remotely managed, multi-port customer-located equipment (CLE) to deliver managed converged services (voice, video and data) over virtual Ethernet, MPLS/VPLS and IP networks.



T-Marc 254

The T-Marc 254 offers both Ethernet and CES options to deliver legacy TDM over Ethernet enabling service providers to extend their reach and addressable customer base to include both voice and data without sacrificing revenues from existing TDM services. The T-Marc 254H has been optimized for wireless backhaul applications with standards-based synchronization and is temperature-hardened for outdoor installations.



T-Marc 340/380

The T-Marc 300 allows service providers to deliver multiple services on separate customer interfaces, including multiple services over a single customer interface. Because each service is isolated, providers can troubleshoot each individual service without impacting others.

## Demarcation for Wireless Backhaul

The T-Marc 3208SH service demarcation device is a temperature-hardened, Carrier Ethernet demarcation device to enable service providers and wireless operators to backhaul traffic from multiple 2G, 3G and 4G cell sites over Carrier Ethernet. This device supports a wide variety of technologies including Ethernet, pseudowire and TDM emulation using Circuit Emulation Services (CES), MPLS, OAM tools and H-QoS. This combination of features, technologies and manageability allows service providers to extend the service intelligence to the customer edge offering and maintaining advanced SLAs, thus providing them competitive advantage.



T-Marc 3208SH

## 1G- 10G ONT Aggregation



T5C-XG

T5C-XG™ — This 10 Gigabit Ethernet switch is designed to aggregate traffic from the customer premise onto a carrier's IP network. The high-performance switching functions for IP video and traffic aggregation enable a future-proof network as consumer demand increases. The device features enhanced QoS tools to support multiple services for multiple customers. Two 10 Gigabit XFP network ports support either protected services or link aggregation, and an expansion slot supporting two additional 10 Gigabit Ethernet network ports supports ring configurations and scalability.



T-Metro 7224

The T-Metro 7224 was designed for service providers who need the reliability of the traditional SONET/SDH quality of service and the flexibility to deliver quad play over a 10 Gigabit metro Ethernet network. This carrier-class device offers advanced MPLS/HVPLS capabilities, enabling emerging and incumbent service providers to protect their existing investments, while easily migrating to next-generation services. T-Metro 7224 delivers features such as uncompromised security, advanced HQoS and MPLS/ HVPLS.

## EPON SFP



Bi-directional single fiber 1310/1490nm with SC connector. Distance 20km+ (27dB)



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