Telco Systems

A BATM Company

Metro Ethernet Weatherproof Demarcation
- any service, any place, any time

A WHITE PAPER FROM TELCO SYSTEMS

The need:

In today's world where internet controls almost everything, we can't be limited anymore by physical infrastructures or even housing. Telecommunications Service providers are looking for alternative solutions where traditional installations in a building are not possible because the customer or carrier does not offer 24 hour access. In cases where you may need to install on the outside of a building or on a pole, this creates an issue with security and changes in the environment such as high winds, rain, and fluctuations in temperatures. Even with these challenges, the telecommunications service providers still must deliver Ethernet services to commercial customers, backhaul data from wireless carriers and provide cities with internet services for surveillance, monitoring and controlling traffic, and communications between departments within the city government ie; (city hall, school departments, fire, police, and emergency management).

What are the challenges?

- Public WiFi requires outdoor installation of aggregation switches and in some cases power feeding over ETH (POE) for the WiFi routers. Other devices such as IP cameras for security also require POE
- Requirement for unfettered access to the equipment is needed 7 days a week, 24 hours a day, 365 days a year but the building closes in the evenings and on weekends
- Requirement for hardened device that can withstand harsh environments
- Each end-user has a different requirement for bandwidth such as less then 100Meg up to a Gig and 10Gig
- Many end-users still have T-1's that will need to be converted to Ethernet or MPLS for transport
- There could be requirements for either Carrier Ethernet, MPLS, or Layer3 transport
- Specific installations require a battery back-up system
- In some cases there is a need to connect multiple buildings in a ring

The solution to these challenges is the T-Marc WD Weatherized Demarcation device complete NID System

This Carrier Ethernet MEF 2.0, MPLS and Layer 3 VPN device ships "out of the box", ready for installation as a single managed entity. There is no need to coordinate with building managers, wholesale carriers and there is no need to pour a slab for traditional weatherized pedestals, etc. It can be installed on existing poles/buildings.

The **T-Marc WD** supports bandwidths of 100 Meg, Gig, 10Gig and T-1's while offering support for a wide variety of service application scenarios and network topologies. It can be used for a small pop, aggregation point or for backhauling wireless access points. The weatherproof T-Marc WD enclosure solution eliminates associated costs of cabinets, enclosures, and site preparation increasing your ROI and lowering you TCO (total cost of ownership).

Telco Systems – T-Marc WD Solution
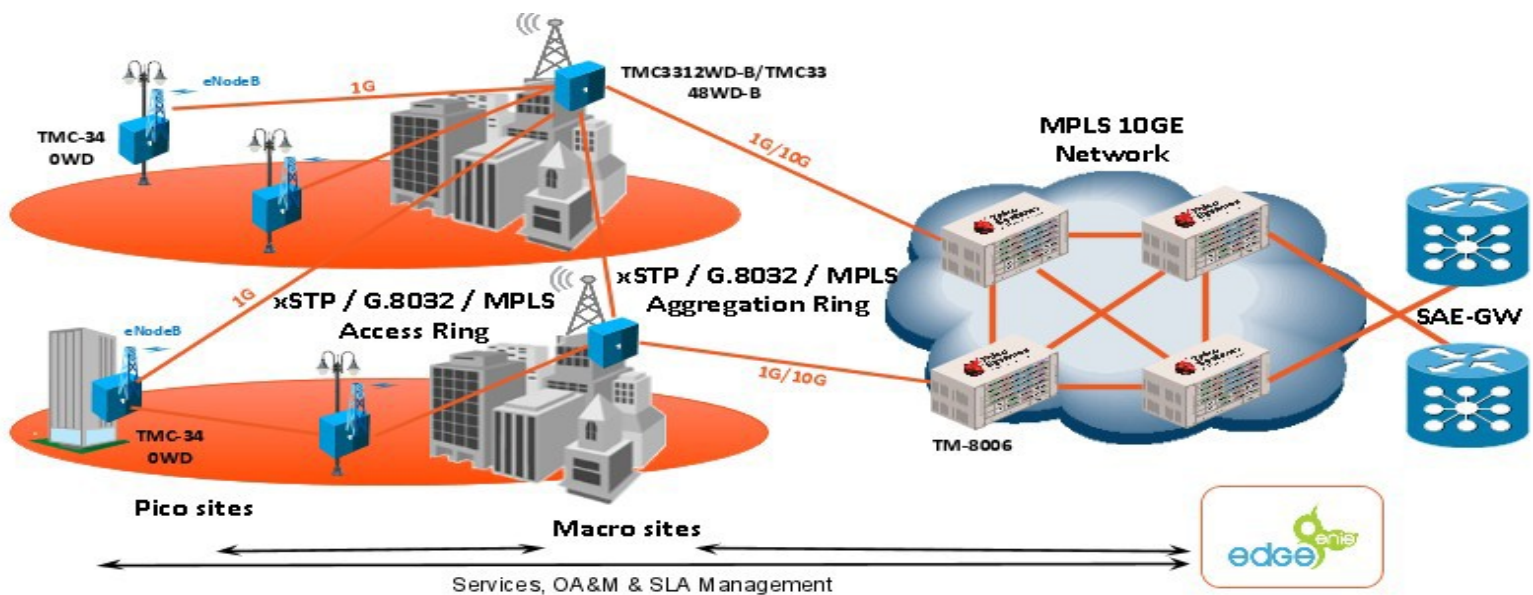
- Device port densities up to 12GE (optional 8xT1 for CES / 4x10GE)
- Hub and spoke, ring, and mesh topology support
- Layer 2 or MPLS transport to the access

The **T-Marc WD** can be used for any of the following opportunities:

- **Picocell** - a small cellular base station typically covering a small area, such as in-building (offices, shopping malls, train stations, stock exchanges, etc.), or more recently in-aircraft.

- **MicroCell** - acts like a mini cellular tower, boosting cellular performance in your home or small business.

- **Macrocell** -is a **cell** in a mobile phone network that provides radio coverage served by a high power cellular base station (tower). Generally, macrocells provide coverage larger than microcell.

  - ❖ **Note: In the above cases The T-Marc WD is not the base station radio but the "all in one box" Carrier Ethernet Service fiber delivery device.**

- **Smart City -** a **smart city** is an urban development vision to integrate multiple information and communication technology **(ICT)** and Internet of Things **(IOT)** solutions in a secure fashion to manage a **city's** assets – the **city's** assets include, but are not limited to, local departments information systems, schools, libraries, and traffic control. Our cities want to provide their citizens full Wi-Fi coverage throughout the city mostly outdoor regardless of climate or existing infrastructure.

- **MTU(Multi-tenant Unit)/MDU (Multi-Dwelling Unit)** – Weatherized demarcation device or aggregation node for shopping centers, commercial buildings, industrial centers with multiple commercial tenants, multi-use buildings with commercial tenants on the first floors and residential customers on the upper floors, Campus environments with a mix of classrooms, labs and residences.

- **Utilities** – Installed outside of substations as an Ethernet/MPLS switch to connect Carrier Ethernet or MPLS network while maintaining legacy TDM and SCADA equipment for communications and as a connection to IP video surveillance type equipment if needed.

The T-Marc WD enclosure is another version of the Telco Systems' demarcation family, specifically the hardened versions of the **T-Marc 3348S/SH**, **T-Marc 3312SC/SCH** and, **T-Marc 340** devices. This series of devices allows service providers to deliver multiple services on separate customer interfaces, including multiple services over a single customer interface. Since each service is isolated, providers can not only troubleshoot each individual service without impacting the others, but also have the ability to provide service extension, and remote management.

Physical Features

- Hardened Enclosure is designed for outdoor applications. IP Protection class IP65

- H-Frame (wall mount), Pole mount

- Dimensions: 9.8"(D) x 15.7"(W) x 15.7"(H), 250mm(D) x 400mm(W) 400mm(H)

- Operating temperature: -40 to +149F (- 40 to +65C)

- Enclosure input AC (85~264V @ 47~63Mhz) input, or DC input (18-75V)

- Special RJ-45 knock out for console and management

- > 4 hours battery backup + battery charger

- UPS for full power down backup

- Fiber splice tray – optional

- Surge protection for copper ports and power Input

- Optional POE injector (2 Port POE injector 25-60W output)*

- Optional CWDM OADM filters (2"x4"x1.5")

- All components are field replaceable and upgradeable

- Separate access to service networks users and deployments users

- Door alarm intrusion - If the door of the enclosure is opened, the door intrusion detection

    device triggers an alarm to Log, and SNMP traps

Product Highlights

- MPLS: VPWS, VPLS, HVPLS, Dynamic routing and signaling utilizing OSPF, IS-IS, RSVP-TE and T-LDP

- IP: VRF, Static Routing, OSPF, BGP, BFD, DHCP, VRRF

- All MEF services, IEEE 802.1Q bridging, IEEE 802.1ad Q-in-Q (TLS)

- Hardware-based ITU-T Y.1564 and RFC 2544 test head and service performance analyzer, In-service testing capabilities, TWAMP, ITU-T Y.1731 PM, SM and SLM support, Per-port/EVC/VLAN/COS, hardware-based flexible MAC-based loopbacks; Hardware-based per-EVC IOMetrix or LSL loopback mechanisms Per port/EVC/flow single/dual rate limiting and shaping, Hierarchical QoS with Multi-level SP, WRR and hybrid frames scheduling, CoS marking and mapping per EVC

- CES for delivery of TDM over IP services

- Zero-touch provisioning for simple and fast deployment

- Redundant uplink with sub 50ms recovery time using G.8031/G.8032, xSTP, Fast Ring, Resilient Link LAG (static/IEEE 802.3ad LACP)

- Multi-layer control, monitoring, line testing and loopback allowing fail-safe operation using hardware-based OAM for enhanced service management, including hardware based IEEE 802.3ah EFM, IEEE 802.1ag CFM OAM over VPLS, SDN: NETCONF/YANG and OpenFlow 1.3 support

- Multicast Management - IGMP snooping v1/v2, IGMP proxy; MVR (Multicast VLAN registration) support

- Security ACLs, RADIUS, SSHv2, SNMPv3, SFTP, port security, broadcast storm prevention, secured access Port security, broadcast storm prevention, secured access, IS-IS authentication

- Management Console, Telnet, SSHv2, Radius, TACACS+, SNMP v1/2/3, xFTP, NTP, DNS resolver, DHCP client

- SyncE, IEEE-1588v2 PTP Transparent Clock, Hardware ready for IEEE-1588v2 Boundary Clock

Multiple Aggregation Options

T-Metro 200 is a feature-rich multiservice access device designed to increase service provider revenues and deliver a complete portfolio of voice, data and video services. The T-Metro family of products supports a wide variety of technologies including Ethernet, circuit emulation services (CES), MPLS, OAM (operations, administration and maintenance) tools and hierarchical quality of services (HQoS).

T-Metro 7124 pre-aggregation and demarcation device is a member of Telco Systems' field-proven T-Metro family of Carrier Ethernet switches. The T-Metro 7124S supports both Carrier Ethernet and MPLS transport technologies with a diverse set of OAM (operations, administration and maintenance) tools and extensive QoS and resiliency capabilities.

T-Metro 8001 is a next generation high density service aggregation platform that provides Carrier Ethernet over both MPLS and Ethernet transport technologies, and is integrated with massive service scalability, carrier class resiliency, and an industry-leading feature set that supports Hierarchical QoS (HQoS), operations administration and management (OAM) capabilities. This best-in class service switch allows carriers to offer cloud-based, business Ethernet and mobile backhaul services to the edge. With 200GE capacity in a compact 1RU chassis, the T-Metro 8001 provides industry-leading throughput, port density, management and resiliency.

T-Metro 8006 is a next generation Ethernet high density service aggregation platform that provides massive service scalability, carrier-class resiliency, and an industry-leading feature set that supports Hierarchical Quality of Service (HQoS), operation, administration and maintenance (OAM) tools, and L2VPN capabilities. This best-in class service aggregation platform and cloud gateway allows carriers to offer cloud-based services, business Ethernet and mobile backhaul to the edge. With a scale of 1T of bandwidth in a compact 6RU chassis, the T-Metro 8006 provides best-in-class throughput, densities, monitoring and resiliency. Enabling a wide variety of services and an easy migration to a converged service environment, the T-Metro 8006 is the platform of choice to enable wide-scale Carrier Ethernet adoption, implementation, and transformation.

Complete the solution with Telco Systems' Service Management System

EdgeGenie Orchestrator™ CE 2.0 & SDN/NFV Management System offers a modular and complete solution for the full life cycle of network deployment, from planning to managing, monitoring and maintaining Ethernet services. With a modular approach, EdgeGenie Orchestrator enables service providers to future-proof their networks as they transition from CE 2.0 to SDN and distributed NFV technologies. EdgeGenie Orchestrator's modules include a Carrier Ethernet/MPLS end-to-end service management system with an SDN controller (TelcoController) module that manages OpenFlow switches, and an NFV Orchestrator (TelcoOrchestrator) module that directs distributed NFV deployments, including TelcoApps VM initiation, configuration and maintenance, service attachment and chaining, and VNF resiliency

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