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Data Sheet

ETX-1

Ethernet Demarcation Switch

- Cost-optimized switch with carrier Ethernet demarcation capabilities
- Linear and ring topology resiliency using ERP G.8032v2 and static LAG per 802.3-2005 with load balancing
- MEF-certified Carrier Ethernet 1.0 services with QoS for user and service classification, rate limitation and prioritization
- OAM toolset based on IEEE 802.3-2005, IEEE 802.1ag and Y.1731 for network monitoring and fault detection
- Configurable fault propagation mechanism in the network-to-user or user-to-network direction

CE 1.0 MEF CERTIFIED

ETX-1 is an entry level Ethernet demarcation switch, part of RAD's Service Assured Access (SAA) solution, and providing Ethernet connectivity services for business applications. Combining switch functionality with basic Ethernet demarcation capabilities, ETX-1 enables quick, cost-effective service deployment to meet enterprise demand for Ethernet Private Line connectivity and LAN-to-LAN interworking.

ETX-1 features Ethernet QoS, OAM and diagnostics to lower OpEx associated with service provisioning and monitoring. In addition, built-in switch functionalities allow local service provisioning within the organization, without the need to traverse the operator's network.

MARKET SEGMENTS AND APPLICATIONS

ETX-1 is a demarcation point for service providers enabling control and monitoring of the network starting at the customer site.

Supporting standard based Operations, Administration and Maintenance (OAM) and QoS mechanisms, it enables operators to provide Carrier Ethernet services from the network hand-off point (see Figure 1).

NETWORK TOPOLOGIES AND SERVICES

ETX-1 delivers E-Line and E-LAN MEF CE 1.0 certified services.

ETHERNET

ETX-1 introduces a six-port, full line rate wire-speed VLAN-aware GbE switch with 9-kB jumbo frame support.

QoS

ETX-1 supports six Classes of Service per network port and four Classes of Service per user port with configurable strict priority and/or Weighted Round Robin priority mechanisms. Traffic is shaped at the port egress or per network queue.

Classification

Traffic is mapped to Ethernet flows (EVCs) using the following per-port classification criteria:

- Port-based (all-to-one bundling)
- P-bit (802.1p)
- VLAN ID
- IPv4 ToS/DSCP
- Source/destination IP address.

The following per-flow actions are supported:

- Rate limiting with 64-kbps granularity
- 802.1ps/P-bit remarking
- VLAN stacking.

Ethernet OAM

Single segment (link) OAM according to IEEE 802.3-2005 (formerly 802.3ah) provides fault indication, including remote loopback.

End-to-end OAM based on IEEE 802.1ag enables Ethernet service providers to monitor their services proactively and ensure service availability.

End-to-end service and performance monitoring based on ITU-T Y.1731 assures fault monitoring and end-to-end performance measurement including delay, delay variation, frame loss and availability.

L2CP

The device can be configured to pass through Layer-2 control frames (including other vendors' L2CP frames) across the network, to peer supported protocols, or to discard the frames.

RAD

RESILIENCY

Protection

Link aggregation (LAG) based on 802.3-2005 with load balancing algorithm and configurable hashing mechanism ensures Ethernet interface protection.

Ethernet ring protection switching per ITU-T G.8032 v2 allows the device to act as a node in an Ethernet ring, achieving 50 msec restoration time in case of link failure.

Rapid Spanning Tree Protocol (RSTP) per IEEE 802.1w allows the device to activate a redundant path in case of failure on the traffic route, as well as prevent Ethernet loops.

Dying Gasp

ETX-1 reports power failures to defined network management stations by sending an IEEE 802.3-2005 message or SNMP trap, for quick discovery and recovery from outage events.

Fault Propagation

The unit features a user-configurable fault propagation mechanism in the network-to-user or user-to-network direction.

When a link failure is detected or OAM failure received, ETX-1 shuts down the affected user port or forwards the OAM failure message towards the network. The fault propagation mechanism enables routers and switches connected to both ends of the link to reroute the traffic to the redundancy path.

TIMING AND SYNCHRONIZATION

The Synchronous Ethernet (Sync-E) clock recovered via the network port can be used as a timing reference by the devices connected to the ETX-1 user ports. The Sync-E option requires dedicated hardware.

MANAGEMENT AND SECURITY

Management

The unit can be managed using the following ports and applications:

- Local out-of-band management access via a dedicated serial management port (mini-USB).
- Remote inband management via the network ports, or out-of-band via dedicated Ethernet port, using Telnet or RADview, RAD's SNMP-based network management system.

Command Line Interface

Databases and scripts of commonly used commands can be easily created and applied to multiple units using command line interface.

Security

The following security protocols ensure client server communication privacy and correct user authentication:

- SNMPv3
- RADIUS (client authentication)
- TACACS+ (client authentication and accounting)
- SSH for secure shell communication session
- SFTP for secure file transfer.

Applications

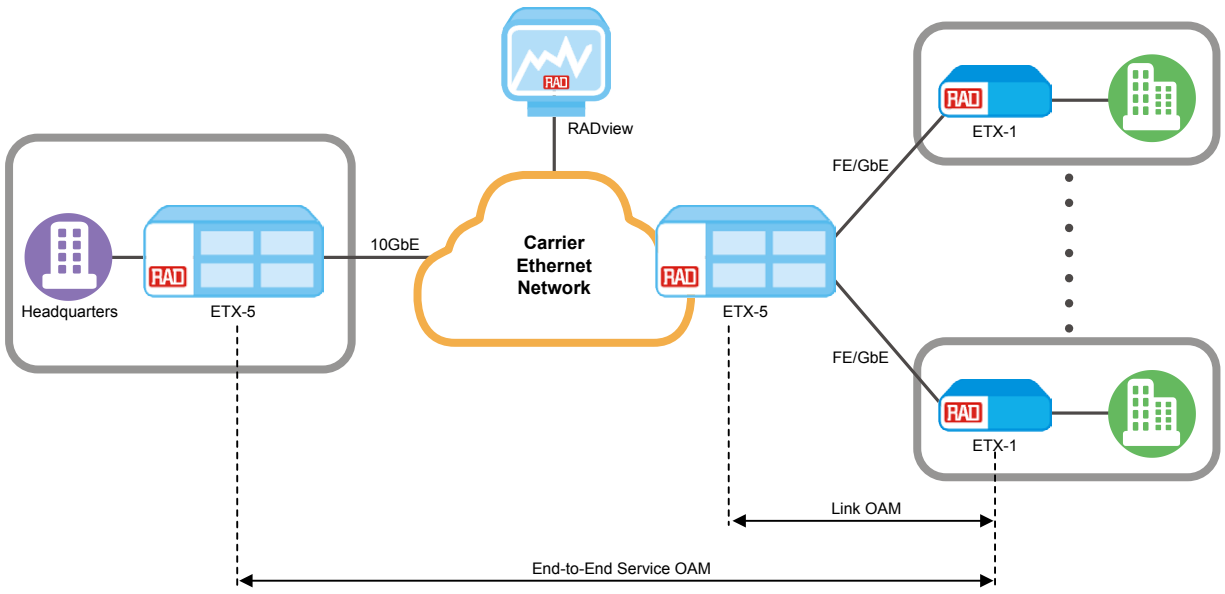

Figure 1. Remote Branch Connectivity

Specifications

ETHERNET NETWORK INTERFACE

Number of Ports
2

Type
Fiber optic:
- Fast Ethernet (100BaseFx, 100BaseLX10, 100BaseBx10), SFP-based
- Gigabit Ethernet (1000BaseSx, 1000BaseLX10, 1000BaseBx10), SFP-based

Copper: 10/100/1000BaseT

Connector
SFP slot or RJ-45

ETX-1 can be ordered with low-cost MiRICi SFPs for packet over PDH and SDH applications.

SFP Transceivers
For full details, see the SFP Transceivers data sheet at www.rad.com

***Note**: It is strongly recommended to order this device with **original** RAD SFPs **installed**. This will ensure that prior to shipping, RAD has performed comprehensive functional quality tests on the entire assembled unit, including the SFP devices. RAD cannot guarantee full compliance to product specifications for units using non-RAD SFPs.*

USER INTERFACE

Number of Ports
4

Type
10/100/1000BaseT UTP port

Connector
RJ-45

INTERNAL BRIDGE

Compliance
IEEE 802.3, 802.3u, 802.1D, 802.1Q, 802.1p, IEEE 802.1w

MAC Address Table Size
Up to 2K learned addresses
64 static addresses

Max Frame Size
9 kB

Operation Mode
VLAN-aware with traffic classification to flows
Filtering and forwarding

Transparent or filtered

Scheduling:
Strict priority
WRR
Strict priority+WRR

MANAGEMENT

Ethernet Management Port
Type: 10/100BaseT

Connector: RJ-45

Control Port

Interface: V.24/RS232, 8 data bits, 1 stop bit, no parity, no flow control

Connector: Mini-USB

Baud rate: 9600 (default), 19200, 38400, 57600 or 115200 bps

Routing for Management
Dual-stack IPv4 and IPv6

GENERAL

Compliance
IEEE 802.3, 802.1d, 802.1q, 802.1p, 802.1ax, 802.1ad, 802.3-2005, 802.1ag, 802.3ah,Y.1731, G.8032v2

Indicators
PWR (green): Power status

ALARM/TEST (red): Alarm/test status

LNK (green): Ethernet link status

ACT (yellow): Ethernet activity status

Physical
Metal enclosure:
Height: 43.7 mm
Width: 215 mm (8.5 in)
Depth: 300 mm (6.7 in)
Weight: 0.7 kg (1.5 lb)

Plastic enclosure:
Height: 43.7 mm (1.7 in)
Width: 217 mm (8.5 in)
Depth: 170 mm (6.7 in)
Weight: 0.5 kg (1.1 lb)

Environment
Temperature:
- ETX-1: 0 to 50°C (32 to 122°F)
- ETX-1/H: -20 to 65°C (-4 to 149°F)

Humidity: Up to 90%, non-condensing

Power
External AC power supply:
- Input: 100–240 VAC ±10%; 50/60 Hz ±3Hz
- Output voltage range: 12 VDC ±10%
- Max output current: 1A
- Line regulation less than 3%

Internal AC power supply:
- Input: 100–230 VAC ±10%, 47–63 Hz

Internal DC power supply:
- Input: 48 VDC, nominal (36–60 VDC)

Maximum Power Consumption
5.5W

ETX-1

Ethernet Demarcation Switch

Ordering

RECOMMENDED CONFIGURATIONS

ETX-1/AC/2SFP/4UTP
Ethernet demarcation switch, 100-240 VAC, 2 empty SFP slots, 4 FE UTP ports 10/100/1000BaseT

ETX-1/DC/2SFP/4UTP
Ethernet demarcation switch, DC, 2 empty SFP slots, 4 FE UTP ports 10/100/1000BaseT

ETX-1/ACEX/2SFP/4UTP
Ethernet demarcation switch, external AC power supply, 2 empty SFP slots, 4 FE UTP ports 10/100/1000BaseT

ETX-1/ACEX/2UTP/4UTP
Ethernet demarcation switch, external AC power supply, 2 UTP Ethernet ports, 4 FE UTP ports 10/100/1000BaseT

ETX-1/AC/2SFP/4UTP/H

Ethernet demarcation switch, 100–240 VAC, 2 empty SFP slots, 4 FE UTP ports 10/100/1000BaseT with hardened enclosure

SPECIAL CONFIGURATIONS

Please contact your local RAD partner for additional configuration options

SUPPLIED ACCESSORIES

AC power cord (when internal AC power supply option is ordered)

CBL-MUSB-DB9F
Mini-USB control port cable

OPTIONAL ACCESSORIES

RM-33-2
Hardware kit for mounting one or two ETX-1 units with plastic enclosure in a 19-inch rack

RM-35/@
Hardware kit for mounting one or two ETX-1 units with metal enclosure into a 19-inch rack

Legend

@ Rack mounting kit (Default=both kits):
- **P1** Kit for mounting one unit
- **P2** Kit for mounting two units

WM-35-TYPE4
Hardware kit for mounting one ETX-1/H unit with metal enclosure on a wall

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