

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
- Quality of Service mechanism 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

ETX-1 is an entry level Ethernet demarcation switch, part of RAD's Service Assured Access (SAA) solution, provides 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 the operator to provide Carrier Ethernet services from the network hand-off point (see Figure 1).

ETHERNET

ETX-1 introduces a six-port, full line rate wire-speed VLAN-aware GbE switch with 9-kB Jumbo frame size 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. Fault monitoring and end-to-end performance measurement including delay, delay variation, frame loss and availability.

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.

RESILIENCY

Protection

ETX-1 provides the following network interface protection modes:

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



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- Ethernet ring protection switching per ITU-T G.8032 v2 allowing the device to act as a node in an Ethernet ring and achieve 50 msec protection restore time in case of link failure.
- Rapid Spanning Tree Protocol (RSTP) per IEEE 802.1w allowing the device to activate a redundant path in case of failure on the traffic route as well as preventing Ethernet loops.

Fault Propagation

The unit provides 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.

Applications

TIMING AND SYNCHRONIZATION

Synchronous Ethernet (Sync-E) clock recovered via the network port can be used as a timing reference by the devices connected to the user ports of the unit. Sync-E option requires a 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 using Telnet or RADview, RAD's SNMP-based 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 are provided by ETX-1 to 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.

L2CP HANDLING

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 L2CP frames.

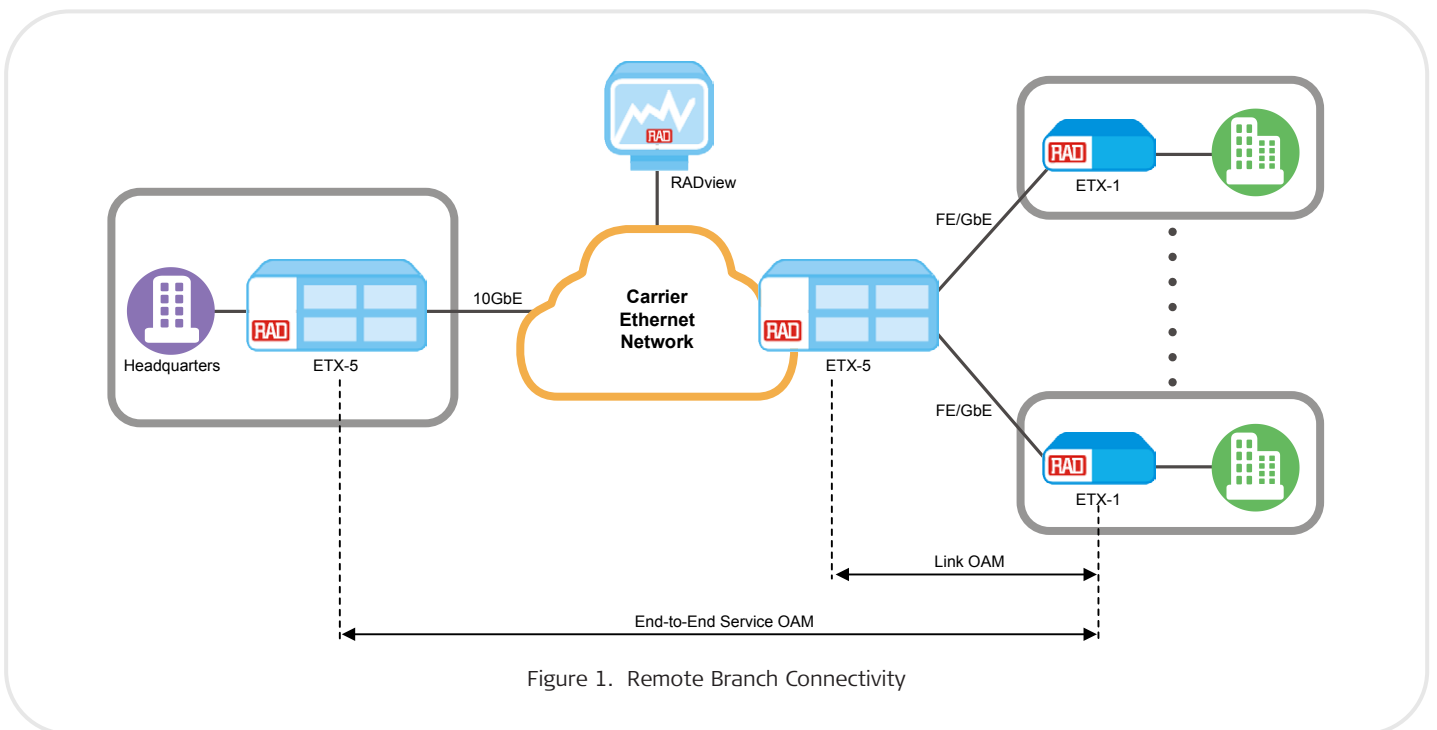


Figure 1. Remote Branch Connectivity

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

Out-of-Band Ethernet

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

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

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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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