

ETX-1p

CPE for VPN and Cloud Access Services



- Branch office service router, optimized for cloud access services via IP-VPN, broadband or LTE networks
- Edge computing by hosting 3rd party container software for customized applications
- Zero Touch provisioning
- One or two embedded cellular modems
- Two SIM cards for maximum link resiliency
- Wi-Fi access point
- GPS for location reporting
- Zone-based stateful firewall

MARKET SEGMENTS AND APPLICATIONS

The digital transformation accelerates the pace of adoption of new services.

Service providers deliver value-added-services from their data center, including networking (i.e., voice, secure Internet access) and IT (i.e., cloud on-ramp) services.

ETX-1p is a branch office CPE enabling business customer transition to the cloud.

By combining powerful networking capabilities with flexible connectivity options, rich management interfaces, and embedded security services, ETX-1p enables service providers to deliver advanced IP-VPN services, as well as value added virtual services from the data center to the customer branch.

Reduced Total Cost of Ownership

The all-in-one form factor includes full featured routing, security, switching, LTE and Wi-Fi, making it easy to connect branches to the Internet and critical applications, without the need for extra hardware or complicated configurations.

The comprehensive, multi-service functionality together with a variety of interfaces, enables ETX-1p to support multiple use-cases and market segments in a single device, while reducing capital costs and simplifying logistics and operations.

Flexible Overlay and Underlay

ETX-1p is the service provider's demarcation point at branch offices, enabling underlay connectivity to IP-VPN and broadband networks, as well as overlay connectivity to the service provider's data center. Branch offices consume their networking

services from the service provider's data center, including IP-VPN connectivity to other branch offices, Internet access and public cloud access.

ETX-1p serves as an endpoint for the underlay and overlay networks in the branch site, offering resilient connectivity over multiple links to IP-VPN and fixed/mobile broadband networks.

It can also serve as an endpoint for overlay connectivity to the service provider's data center to allow value added services running at the data center and deployment of centralized vCPE.

Branch site underlay connectivity is resilient with a backup link, typically connected to a broadband network.

INTEROPERABILITY

ETX-1p is compatible and can interwork with SecFlow-1p and white boxes that run vCPE-OS and any routers that support standard protocols.

VPN SERVICES

The device features a VPN gateway with two operation modes:

- Inter-site connectivity using IPsec tunnels
- Remote user access using SSH

Inter-site VPN-based encrypted link ensures L3 transparent connection of the Ethernet networks sites.

For remote access, the router uses an SSH-encrypted tunnel, with user authentication and specific access authorization.

ROUTING

ETX-1p features static routing, OSPF, BGP and 10 VRFs.

SINGLE/DUAL LTE MODEMS AND GPS

With embedded LTE modems, connectivity is available from day 1 without waiting for a wire-based connection. ETX-1p features flexible configuration for one LTE modem with two SIM cards, or two embedded LTE modems, for maximum resiliency. Support of GPS for location reporting is also available. The ETX-1p HW is ready for future support of 5G modems.



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DISAGGREGATED OPERATING SYSTEM

ETX-1p comes bundled with vCPE-OS, RAD's carrier-grade, 64-bit, Linux-based operating system, designed to run on several HW platforms, including ARM- and X86-based CPEs.

vCPE-OS is a security hardened operating system, optimized to provide maximum performance with small SW footprint.

CONTAINERS – NEXT LEVEL OF FLEXIBILITY

ETX-1p can host containerized edge applications, supporting any 3rd party containers, which extend its original functionality to a new level.

Containers can easily be installed and managed via the Docker CLI.

RESILIENCY

A link redundancy mechanism allows tracking connectivity to specific IP addresses using fault propagation and IP monitoring capabilities.

MANAGEMENT AND SECURITY

Management

ETX-1p can be managed via Web, CLI or by RADview.

To automate the setup of overlay connectivity to the data center, ETX-1p can be integrated with the service provider's SDN controllers or orchestration systems, using NETCONF/YANG modeling.

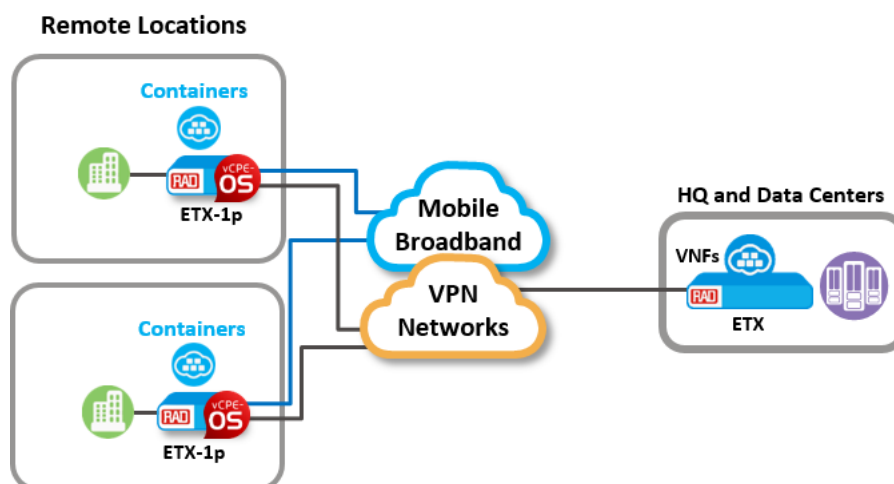
Embedded Advanced Security

To optimize ETX-1p for meeting the evolving security needs of distributed environments, vCPE-OS includes embedded security features and options, such as stateful, zone-based firewall*.

DESIGNED FOR ZERO TOUCH AND EASY OPERATION

ETX-1p is designed to simplify operations, while providing service providers visibility to their branch office demarcation.

ETX-1p incorporates secure Zero-Touch-Provisioning mechanisms for agile and seamless vCPE deployment, reducing truck rolls and minimizing mass deployment operating costs.



ETX-1p Business Services over Fiber and 4G/LTE

Hardware Specifications

INTERFACES

GNSS	GPS – American (default) Galileo – European
LAN	4 GbE UTP (RJ-45)
LTE	LTE modem with dual SIM
WAN	1 GbE SFP and 1 GbE UTP (RJ-45) ports
Wi-Fi	802.11b/g/n/ac dual band

CELLULAR AND GPS

Cellular Authentication	PAP, CHAP
Firmware Upgrade	FOTA (Firmware upgrade Over the Air)
GPS	Location reporting
LTE	Dual LTE modems Dual SIM Single SIM LTE bands – see Table 1
Multi APN	Supported for L450A/L450B
Operation Modes	PPP, IP
SIM Card	Mini SIM, 25 mm x 15 mm (0.98 in x 0.59 in) Form factor: 2 FF
Transmission Modes	Diversity MIMO

Table 1. Integrated Cellular Modems

LTE Ordering Code	Modem Category and Frequency Bands
L1	CAT 4 EMEA/Korea/Thailand LTE FDD: B1/B3/B5/B7/B8/B20 LTE TDD: B38/B40/B41 WCDMA: B1/B5/B8 GSM: B3/B8
L3	CAT 4 Australia/New Zealand/Taiwan/Brazil LTE FDD: B1/B2/B3/B4/B5/B7/B8/B28 LTE TDD: B40 WCDMA: B1/B2/B5/B8 GSM: B2/B3/B5/B8
L4*	CAT 4 North America, Verizon wireless + AT&T LTE LTE FDD: B2/B4/B5/B12/B13/B14/B66/B71 WCDMA: B2/B4/B5
L450A	CAT 4 450 MHz for private LTE networks LTE-FDD: B3/7/20/31/72
L450B	CAT 4 450 MHz for private LTE networks LTE-FDD: B3/20/87

WI-FI

Bands	2.5 GHz and 5 GHz
Radio Mode	802.11a/b/g/n/ac
SSID	6
Security	WPA2-AES
Users	8 concurrent

MANAGEMENT AND DIAGNOSTICS

Control Port	RS-232 interface, RJ-45 connector Note: Control port cable is not included and must be ordered separately (see Optional Accessories)
LEDs	Including alarm indication and cellular RSSI level

GENERAL

Standards	CE EMC Class A
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Environment

Temperature	Operating: -10 to 50°C (32 to 122°F) Storage: -40 to 65°C (-40 to 149°F)
Humidity	5% to 90%, non-condensing

Physical

Enclosure	Plastic Box
Height	44 mm (1.73")
Width	230 mm (9.05")
Depth	175 mm (6.9")
Weight	Net: 0.5 kg (1.1 lb) Max (including device + package + power supply + cable adaptor + 2 LTE antennas + 2 Wi-Fi antennas): 1.04 kg (2.3 lb)

Power

Power Supply	External 90–240 VAC
Power Consumption	< 10W

* This feature will be released in a future version.

Software Specifications

MANAGEMENT

Configuration	Web-based interface using HTTPS CLI with password-protected access
DHCP Server	IPv4, IP subnet pools support 256 addresses
Protocols	NETCONF server (v1.0/v1.1)/ YANG SNMP v2/v3 SSH v2, HTTPS server, TFTP/SFTP
Users	User roles and privileges

SECURITY

Access Lists	Standard and extended
Authenti- cation	Locally, RADIUS, TACACS+ (also for authorization and accounting) Port-based: 802.1X on Ethernet and Wi-Fi
Features	Login lockout
Firewall	Zone-based*, stateful ACL rules
Public Keys	Public Key Infrastructure with X.509 certification for Zero Touch Certificates with SCEP CA server
Session	Monitoring and limiting

ZONE-BASED FIREWALL

Type	Stateless Stateful
IPv4 and IPv6 NAT	SNAT, DNAT REDIRECT NAPT/NAT
Configuration	via Web GUI, SSH and SNMP
Rules	Interfaces are assigned to zones, for which a set of rules is configured IPv4 and IPv6 Can be limited to specific days, date and time* Number of connections per rule can be limited* Limit rules by traffic (by PPS or bandwidth) * Rule hits reported to local LINUX Syslog*
DoS Prevention	Blacklist Defend from IP sweep, Port scan*

IP ADDRESSING AND ROUTING

Addressing	IPv4 and IPv6
DHCP	Client, server, relay IP helper addresses

DNS	Server
NAT	Static/dynamic NAPT/NAT
Routing Protocols	OSPF v2, BGP v4 VRRP IP-BFD for fast route propagation*
Routing Technologies	Static Policy-based VRF (10), Router Interfaces (32)

RESILIENCY AND OPTIMIZATION

Link Redundancy	Tracking connectivity to specific IP addresses using fault propagation and IP monitoring functionalities
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MONITORING AND DIAGNOSTICS

Features	Traceroute, ping Syslog Port mirroring Alarm and event logs
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TIMING

Date and Time	Local time setting
Protocol	SNTPv4

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IP QUALITY OF SERVICE

Classification	Port-based, IP-based, DSCP
Egress Queues	8 queues per port
Queuing	Class-based, SPQ, WFQ
Scheduling	Strict Priority / WRR
Traffic Class	CoS mapping (queues)
Actions	Marking, remarking (DSCP)
Traffic Processing	Shaping

IP VPNS

DH Groups	1 (768-bit modulus) 2 (1024-bit modulus) 5 (1536-bit modulus) 14 (2048-bit modulus) 19 (256-bit elliptic curve) 20 (384-bit elliptic curve)
ESP Algorithms	AES CBC 128 and 256, AES GCM 128 and 256, AES GMAC 128 and 256, null encryption, SHA-1, SHA-2 256 and 512
IKE Algorithms	AES CBC 128 and 256, SHA-1, SHA-2 256 and 512
IKE Hashing Algorithms	SHA1-96-HMAC, SHA2-256-128-HMAC, SHA2-512-256-HMAC
Protocols	Policy- and route-based IPsec, GRE GREoIPsec IKEv1, IKEv2 L3 mGRE DMVPN* L3 IPsec VPN PPPoE supporting Broadband or LTE access
Technologies	NAT traversal Interoperability with SCEP server 2012 and higher

EDGE COMPUTING (CONTAINERS)

Containers	Docker
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INTEGRATED ROUTING AND BRIDGING (IRB)

Max number of bridges	4
Max number of bridge ports	32
Max MAC addresses per bridge	512
Operation Mode	VLAN aware VLAN un-aware Static or Dynamic MAC addresses

OAM

SLA Monitoring	ICMP echo, UDP echo
ZTP	On-net Off-net (over unsecured network) performs secure "call home" using Public Key Infrastructure (X.509)

** This feature will be released in a future version.*

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Ordering

The information below represents examples of supported configurations. For additional configuration options, please contact your local RAD partner.

ETX-1P/ACEX/1SFP1UTP/4UTP/L1

ETX-1P/ACEX/1SFP1UTP/4UTP/L1/WF

ETX-1P/ACEX/1SFP1UTP/4UTP/L3

ETX-1P/ACEX/1SFP1UTP/4UTP/L3/WF

ETX-1P/ACEX/1SFP1UTP/4UTP/WF

ORDERING OPTIONS

Some options are not supported by all models. Some option combinations are invalid or may require a minimum order. To determine the BOM for your application, please contact your local RAD partner.

Cellular	L1	LTE modem for Europe
Ports	L3	LTE modem for Oceania and Latin America
	L4*	LTE modem for North America, Verizon wireless + AT&T
	L450A	LTE modem 450MHz for private LTE networks, LTE-FDD: B3/7/20/31/72
	L450B	LTE modem 450MHz for private LTE networks, LTE-FDD: B3/20/87

Notes:

- In options with dual modems, both modems are of the same type (L1, L3, L4, L450A or L450B).
- The cellular modem is supplied with two matching antennas (see Supplied Accessories).

Ethernet LAN Ports	4UTP	4 x RJ-45 GbE UTP
Ethernet WAN Ports	1SFP1UTP	1 x 1000FX, 4 x 10/100/1000BASE-T ports
GNSS	G	Integrated GPS

Note: The GPS modem is supplied with one antenna (see Supplied Accessories).

Power Supply	ACEX	External AC power adaptor
RAM	Default	1G RAM
	2R	2G RAM
WiFi Interface	WF	Wireless LAN

Note: The WiFi modem is supplied with two matching antennas (see Supplied Accessories).

SUPPLIED ACCESSORIES

AC power cord for ACEX

SF-ANT-GPS-PAS-3DBI-MAG/3M

GPS passive antenna, 3m, for options with integrated GPS

SF-ANT-LTE699-4DBI-SMA

LTE antenna, 4dBi, for options with LTE modems

SF-ANT-WIFI-DUALBAND-3DBI-SMA

WiFi dual band antenna, 3 dBi, for options with WiFi modem

OPTIONAL ACCESSORIES

CBL-RJ45/D9/F/6FT

Control port cable with male RJ-45 and female DB-9 connector

SF-ANT4G-2M

Outdoor antenna for 4G cellular modem, 2m connecting cable, 3 dBi, 699-960 MHz/1710-2170 MHz/2500-2690 MHz

SF-ANT4G-5M

Outdoor antenna for 4G cellular modem, 5m connecting cable, 3 dBi, 699-960 MHz/1710-2170 MHz/2500-2690 MHz

RM-33-2

Hardware kit for mounting ETX-1p device in a 19-inch rack

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