

# 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
- One or two embedded LTE modems
- Two SIM cards for maximum link resiliency
- GPS for location reporting
- Wi-Fi access point
- Zone-based stateful firewall
- Edge computing by hosting 3rd party container software for customized applications
- Zero Touch provisioning
- Support of RAD's SD-CloudAccess solution

### Transition to Cloud Services

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.

### 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 customer segments in a single device, while reducing capital costs and simplifying logistics and operations.

### MARKET SEGMENTS AND APPLICATIONS

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.

### 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 end-point 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 end-point 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.

### 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 with option for one LTE modem with two SIM cards, or two embedded LTE modems, for maximum resiliency. Optional support of GPS for location reporting is also available. The ETX-1p HW is ready for future support of 5G modems.

### DISAGGREGATED OPERATING SYSTEM

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

pCPE-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 3<sup>rd</sup> party containers, which extend its original functionality to a new level.

Containers can easily be installed and managed via ETX-1p's Web interface, or RADview NMS.



# ETX-1p

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### SD-CloudAccess

SD-CloudAccess enables access-agnostic application-aware traffic distribution across multiple access links, featuring bonding, failover, application based steering, and top up. This technology allows traffic to burst into a second cellular connection when the primary link bandwidth is not sufficient to meet the SLA.

RAD's SD-CloudAccess solution can be purchased as an add-on service. For more information, refer to the SD-CloudAccess documentation.

### MANAGEMENT AND SECURITY

#### Management

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

#### Embedded Advanced Security

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

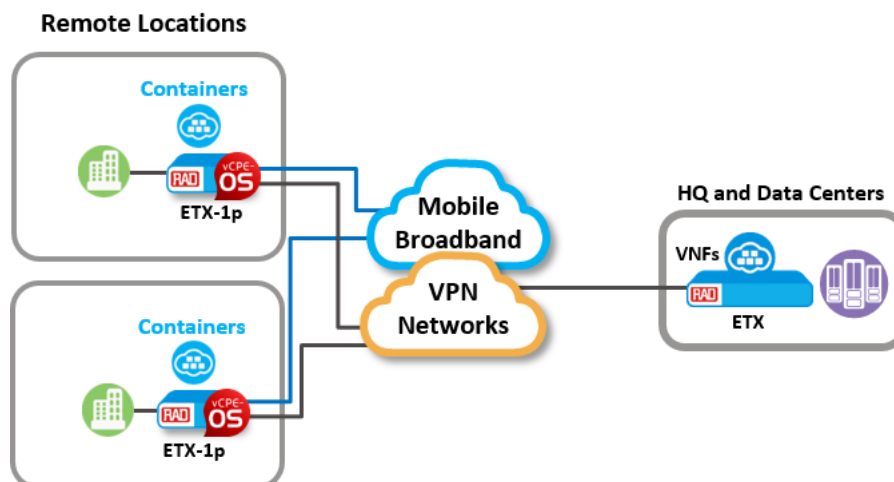
The NGFW functionality, including zone-based stateful firewall, DPI for application recognition, IDS/IPS and DDOS prevention, do not require additional licenses. It is possible to specify URLs, Web content filtering, and much more.

### DESIGNED FOR ZERO TOUCH AND EASY OPERATION

ETX-1p is designed to simplify operations, while providing service providers with 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.

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.



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

## Hardware Specifications

### INTERFACES

WAN	1 GbE SFP and 1 GbE UTP (RJ-45) ports 2 GbE SFP*
LAN	4 GbE UTP (RJ-45)
LTE	LTE modem with dual SIM
Wi-Fi	802.11b/g/n/ac dual band
2 RJ-45 serial ports	2 RS-232 or 1 RS-232 and 1 RS-485
GNSS	GPS – American (default) Galileo – European

### MODEMS

Dual SIM Cellular Modem	LTE bands – see Table 1 EVDO networks (technology backward compatible)
Firmware Upgrade	FOTA (Firmware upgrade Over the Air)
Configurable Cellular Authentication	PAP, CHAP
SIM Card	Mini SIM, 25 mm x 15 mm (0.98 in x 0.59 in) Form factor: 2FF
WiFi Module	IEEE 802.11ac/a/b/g/n Dual band 2.4 GHz or 5 GHz (software selectable) Up to 8 users

Table 1. Integrated LTE 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

## MANAGEMENT AND DIAGNOSTICS

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

## COMPLIANCE

Standards	CE EMC Class A
Modem	Verizon Wireless* PTCRB certification*

## 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 or HTTP CLI with password-protected access Configure parameters via SMS*
Protocols	NETCONF server (v1.0/v1.1)/ YANG SNMP v2/v3 Telnet, SSH v2, HTTPS server, TFTP/SFTP
Users	User roles and privileges
Monitoring and Diagnostics	Syslog Traceroute, ping Alarm and event logs
DHCP Server	IPv4, IP subnet pools support 256 addresses

### IP ADDRESSING AND ROUTING

Addressing	IPv4 and IPv6
Routing Protocols	OSPF v2, BGP v4 VRRP* IP-BFD for fast route propagation*
Routing Technologies	Static Policy-based* VRF (10), RIF (32)
NAT	Static/dynamic NAPT/NAT
DHCP	Client, server, relay IP helper addresses
DNS	Server Dynamic DNS*

### TIMING

Date and Time	Local time setting
Protocol	SNTPv4

### IP QUALITY OF SERVICE

Classification and Priority	IP-based (DiffServ) Marking, remarking
Queuing	Class-based, SPQ, WFQ
Traffic Processing	Shaping
Egress Queues	4 queues per port
Classification	Port-based, 802.1p, DSCP
Scheduling	Strict Priority / WRR

### SECURITY

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

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

### IP VPNS

<b>Protocols</b>	Policy- and route-based IPsec, GRE GREoIPsec IKEv1 (main and aggressive mode), IKEv2, SHA2 L3 mGRE DMVPN* L3 IPsec VPN PPPoE supporting Broadband or LTE access*
<b>IKE Algorithms</b>	AES CBC 128 and 256, SHA-1, SHA-2 256 and 512
<b>IKE Hashing Algorithms</b>	SHA1-96-HMAC, SHA2-256-128-HMAC, SHA2-512-256-HMAC
<b>ESP Algorithms</b>	AES CBC 128 and 256, AES GCM 128 and 256, AES GMAC 128 and 256, null encryption, SHA-1, SHA-2 256 and 512
<b>DH Groups</b>	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)
<b>Technologies</b>	NAT traversal Interoperability with SCEP server 2012 and higher

### ADVANCED TECHNOLOGIES

<b>SD-CloudAccess</b>	Embedded agent in pCPE-OS, enabled by CLI (requires CGW servers)
<b>Containers</b>	LXC/LXD

### ZONE-BASED FIREWALL

<b>Type</b>	Stateless (ACL-like) Stateful (monitor connection state; e.g. only allow to start a connection from inside the organization)
<b>IPv4 and IPv6 NAT</b>	SNAT, DNAT REDIRECT Masquerading (PAT)
<b>Security Measures</b>	DDOS protection: SYN and RST flood prevention
<b>Configuration</b>	via Web GUI
<b>Rules</b>	Interfaces are assigned to zones, for which a set of rules is configured IPv4 and IPv6 Can be limited to specific days, dates and times Number of connections per rule can be limited Rule hits reported to local LINUX Syslog Geo IP: Block or allow traffic based on source or destination country (requires Internet connection) DPI: Layer 7 rules (e.g. block Skype) Blacklisting of URL or IP, based on categories (e.g. ads, gambling) Blacklisting of phrases, based on categories

<b>Web content filtering</b> (requires internet connection, for periodic list updates)	Limiting downloadable files by extension DNS Proxy: black list filtering, downloadable periodically from the Internet
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### INTEGRATED ROUTING AND BRIDGING (IRB)\*

<b>Operation Mode</b>	VLAN aware VLAN un-aware Static or Dynamic MAC addresses
<b>QoS</b>	VLAN tagging and un-tagging 802.1p priority tagging ToS/CoS and CoS/ToS mapping
<b>Max number of bridges</b>	4
<b>Max number of bridge ports</b>	32
<b>Max MAC addresses per bridge</b>	512

### WI-FI

<b>Radio mode</b>	802.11a/b/g/n/ac
<b>Security</b>	WPA2-AES MAC filter*
<b>Users</b>	8 concurrent
<b>SSID</b>	6
<b>Bands</b>	2.5Ghz and 5Ghz

### CELLULAR AND GPS

<b>LTE</b>	Single SIM Dual SIM* Dual LTE modems*
<b>Operation Modes</b>	PPP*, Eth/DHCP
<b>GPS</b>	Location reporting*

### OAM

<b>SLA Monitoring</b>	TWAMP Light over IPv4 and IPv6* ICMP echo, UDP echo and RADM*
<b>ZTP</b>	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.

## Ordering

### Legend

ETX-1p/@/#/\$/Lx1/Lx2/&

@	Power Supply	
	ACEX	external AC power adaptor
#	WAN Ports	
	1SFP1UTP	1 x 1000FX, 4 x 10/100/1000BASE-T ports
\$	LAN Ports	
	4UTP	4 x RJ-45 GbE UTP
Lx	Cellular Ports	
	L1	LTE modem for Europe
	L3	LTE modem for Oceania and Latin America
	L4	LTE modem for North America, Verizon wireless + AT&T
%	GNSS*	
	G	Integrated GPS
&	WiFi Interface	
	WF	Wireless LAN

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## RECOMMENDED CONFIGURATIONS

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/L4

ETX-1P/ACEX/1SFP1UTP/4UTP/L4/WF

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

## SPECIAL CONFIGURATIONS

Please contact your local RAD partner for additional configuration options.

## SUPPLIED ACCESSORIES

AC power cord for ACEX

2 WiFi antennas (when WiFi is ordered)

Two LTE antennas (when LTE is ordered)

## 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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