General Availability

CESP

Data/Voice Cross-Connect Processing Engine

- Point-to-multipoint data/voice services
- Data encapsulation protocols V.110, R111, Oversampling,
- Terminal server functionality for serial data transport over IP/TCP/UDP, SSH
- Voice service conversion (PCM, ADPCM, G729A, RTP)
- Service level protection
- Gateway from TDM to IP for both data (UDP/TCP) and voice (RTP)
- Highly efficient multicore processes and algorithms.
- Signaling plane including data and voice protocols
- DS0 and sub-DS0 cross-connect
- Powerful PW Interworking
- High scale terminal server and PW interworking
- Serial protocol conversion
- Ethernet bridging and routing.
- Highly efficient multicore/multithread latency optimized processes and algorithms.

Some advantages of software processing compared to hardware are:

- Higher number of implemented features.
- Flexibility in new feature introduction
- The CESP module provides processing capabilities of up to 32 E1s-equivalent voice channels, depending on the service required (depends on hosting HW platform).

MARKET SEGMENTS AND APPLICATIONS

Various users can benefit from CESP Virtual Machine installed on X.86 HW (ETX-2v/X.86, ETX-1p, SF-1p or any other vendor's White Box X.86 or ARM based):

- Users hosting centralized data processing servers for PSN/TDM interworking (not natively supported by TDM or PSN equipment)
- Users with low-bandwidth lines, such as satellite links
- Users with requirements to bridge between technologies

Its ability to handle a broad range of services by software makes the solution ideal for customers with broad and changing requirements.

VOICE COMPRESSION

Each voice channel can be re-coded into a smaller bandwidth channel, using ADPCM 32K, ADPCM 16K or G729A 8K. With G.729A the compression ratio compared with PCM is 8:1, meaning that just one bit is needed per voice channel. Signaling CAS bit are also compressed, the bundle using just one or two bits instead of a full timeslot.

Voice channel activity can be used to remove some voice channels from the final bundle. This activity can be obtained from CAS pattern or calculated using VAD (Voice Activity Detection) algorithm over the received voice channel.

A transmitted bundle has a fixed bandwidth (nxDS0) over TDM ports while the payload is dynamically managed between active and non-active channels.

Several voice and data channels can share the same bundle.

DATA SERVICES

The following services are offered:

- Rate adaptation of serial sync and async services to Nx16K by implementing V.110 protocol
- Cross-connect between services at bit level
- Multiplexing of voice and data on same link

BUILT-IN SYNCHRONIZATION MECHANISM

The CESP VM includes a built-in synchronization mechanism allowing end-to-end synchronization over non-structured networks by using 16K (2 bits) – for example, connectivity over Nx64K Satellite links.

PSEUDOWIRE ENGINE

The PW engine includes SATOP and CESoPSN encapsulation methods to allow connectivity of the CESP software with RAD's and 3rd part devices.

RAD
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CESP
Data/Voice Cross-Connect Processing Engine

GATEWAY TO IP (TERMINAL SERVER)

A unique feature of CESP DATA Application is the Gateway to IP Endpoint. The server directly creates an IP-Endpoint at a UDP or TCP Port. A packet received at this Endpoint is encapsulated with CESoPSN compatible with standard CESoPSN products such as Megaplex-4 VS modules.

ETHERNET OVER TDM

CESP is capable to encapsulate Ethernet packets over TDM. The following modes are supported:

- ETH over HDLC (Compatible with same functionality of the M-8E1/T1 or FCD-E1)

- ETH termination and transport of IP over PPP/HDLC including Authentication. Verified Compatibility against: Cisco, Juniper, Huawei, and FCD-IP

RESILIENCY

CESP Virtual Machine is designed to work in protecting pairs of two modules, with 1+1 active-active redundancy for TDM processing, and Virtual IP addresses for any external service at both modules for management.

In addition the VM brings optional protection schemes between services created inside the module software.

MANAGEMENT AND SECURITY

The CESP virtual machine can be managed directly via CLI or via Web Graphical Application for Windows. The engine supports SNMP Traps, SYSLOG, and SNTP.

MONITORING AND DIAGNOSTICS

Comprehensive diagnostic capabilities include:
- Local and remote loopbacks
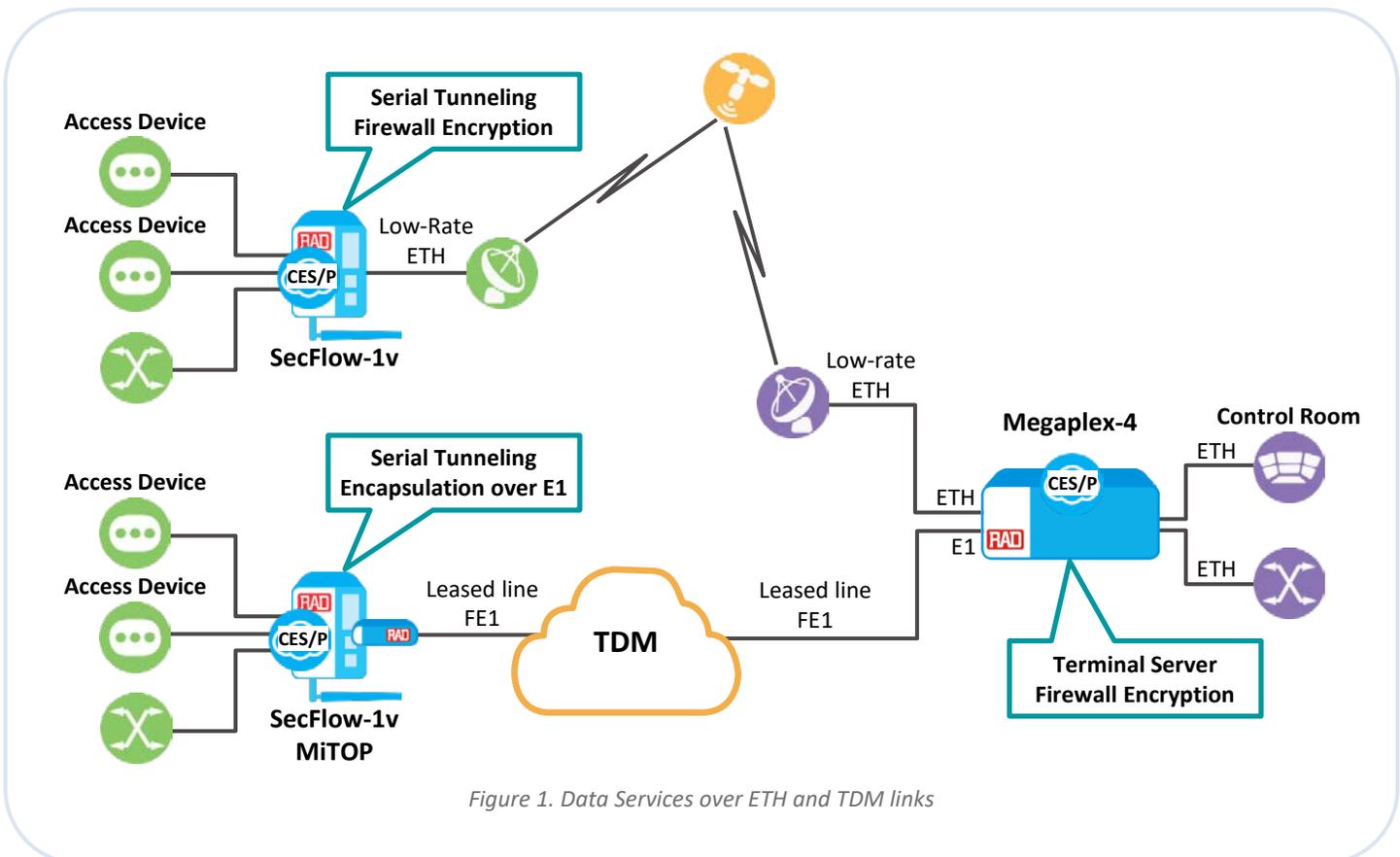- Real-time alarms to alert the user on fault conditions

Figure 1. Data Services over ETH and TDM links

CESP
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Specifications

VOICE

Voice Codecs	G729A (8K)		
	ADPCM (16,32K)		
	PCM-G.711		

Number of Voice Channels	Codec	R2C	X8C
	PCM	64	240
	ADPCM32	46	160
	ADPCM16	42	160
	G729A	16	64

Voice Compression	VAD
	Silence suppression
	Comfort noise generation
Echo Cancelation	Up to 50 ms (G729A codec only)
Channel Activity	CAS Pattern
	VAD (Voice Activity Detection)

SERIAL DATA

Protocols	Transparent
	R111
	V110
	Oversampled
Channel Activity	DAD (Data Activity Detection): based on RTS/DTR (only for V110)

SERVICES

Voice/Data	Point-To-Multipoint or Conference with up to 32 end points per service
	Up to 32 TDM Virtual Interfaces/entities supporting SAToP, CESoPSN protocols.
Ethernet over TDM	ETH over HDLC
	IP over PPP/HDLC including Authentication
Voice Compression	G729A, G711, ADPCM (16,32K)

RESILIENCY

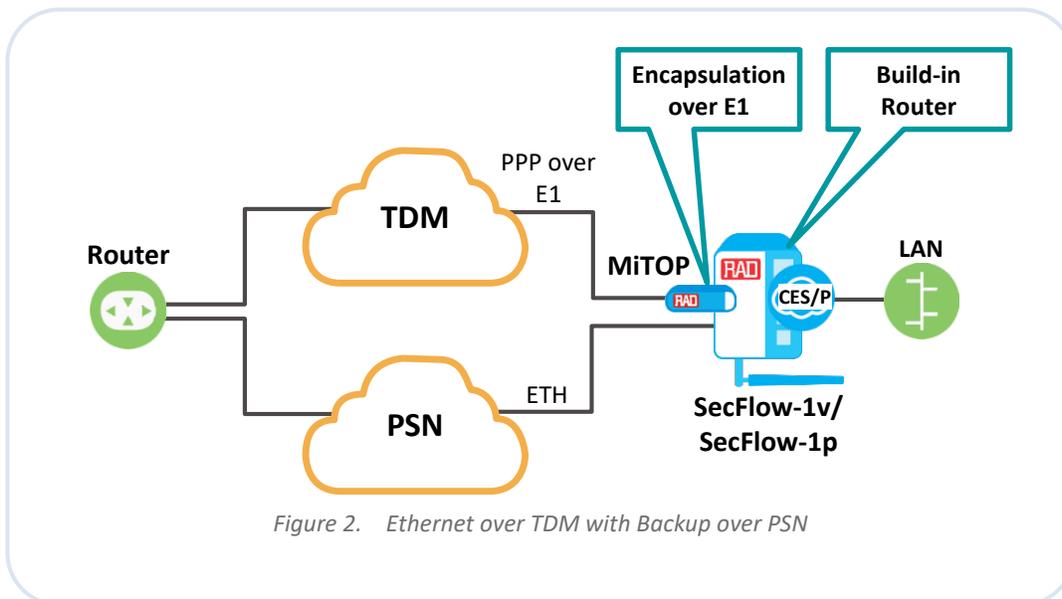| 1+1 active-active entire VM redundancy	below 50 msec protection
1+1 service level redundancy	below 50 msec protection

Figure 2.   Ethernet over TDM with Backup over PSN

Ordering

CESP

CESProcessor Virtual Machine

MP-CESP-LIC

License for installing CESP on X.86 (for example, ETX-2v)

Note: *Megaplex-4 MS-CESP module includes MP-CESP-LIC.*

UB-UCESP-1-LIC

License for installing CESP on ARM processors (for example, SecFlow-1p, ETX-1p)

The package must be ordered together with a RADcare Package.

For annual service coverage and professional services, please contact your local RAD Partner.

SPECIAL CONFIGURATIONS

Please contact your local RAD partner for additional configuration options.

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