General Availability

Megaplex-4

MS-CESP

Data/Voice Cross-Connect Processing Engine

- Point to multipoint data/voice services
- Data encapsulation protocols V.110, R111, oversampling
- Voice service conversion (PCM, ADPCM, G.729A, RTP)
- Service level protection
- Gateway from TDM to IP both for data (UDP/TCP) and voice (RTP)
- Signaling plane for data and voice protocols

MS-CESP is a powerful processing engine, for data/voice, providing sub-TS (DS0) cross-connect for compressed voice and low-speed data.

High scale terminal server functionality for Megaplex-4100 and Megaplex-4104 uses highly efficient multicore processor and advanced algorithms. Advantages of software processing compared to hardware (implemented in VS/VC Megaplex modules) include:

- More feature-rich. In addition to voice/data cross-connecting, compressing, converting and conferencing are also available.
- Flexibility in new feature introduction
- Processing capabilities of up to 32-E1s-equivalent voice channels, depending on the service required.

A built-in synchronization mechanism allows end-to-end services over non-structured networks such as n x 64 kbps satellite links. The bandwidth used for synchronization is 8 kbps (1 bit).

For applications involving Nokia Dynanet devices using National bits in TS0 for inband management, the MS-CESP module cross-connects these bits.

MARKET SEGMENTS AND APPLICATIONS

Various applications can benefit from Megaplex-4 with MS-CESP module:

- Centralized data processing for distributed networks over PSN/TDM (not natively supported by Megaplex-4)
- Perfect solution for low-bandwidth lines, such as satellite links

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

ARCHITECTURE

The module occupies two module slots in the Megaplex-4 chassis. It functions as a server: all the communication between the NNI and UNI ports is performed via the Megaplex-4 CL module.

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.

MS-CESP uses voice channel activity data obtained from the CAS pattern or calculated by the VAD (Voice Activity Detection) algorithm over the received voice channel, to remove some voice channels from the final bundle.

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

Several voice and data channel can share same bundle.

DATA SERVICES

The module features independent internal channels carrying sync/async low-speed data. Each of the internal channels can operate at programmable data rates of up to 64 kbps for synchronous interfaces, and up to 38.4 kbps for asynchronous interfaces.

Rate adaptation of serial async services is implemented by V.110/R.111 protocols or oversampling.

The module cross-connects services at bit level, and multiplexes voice and data on the same link.

RAD

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MS-CESP
Data/Voice Cross-Connect Processing Engine

PSEUDOWIRE

The PW engine employing SAToP and CESoPSN encapsulation methods provides connectivity of the MS-CESP module with physical interfaces of local and remote devices.

IP GATEWAY (TERMINAL SERVER)

A unique feature of the MS-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 may include multiple bytes. All of these bytes are sent to slave devices and MS-CESP synthetizes an n x 64 kbps signal that includes an oversampled async stream of received bytes.

RESILIENCY

MS-CESP 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 module employs optional protection schemes between services created inside the module software.

MANAGEMENT AND SECURITY

The MS-CESP module can be managed directly via CLI or via web graphical application for Windows. The module 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. Terminal Server in Central Site with MS-CESP module
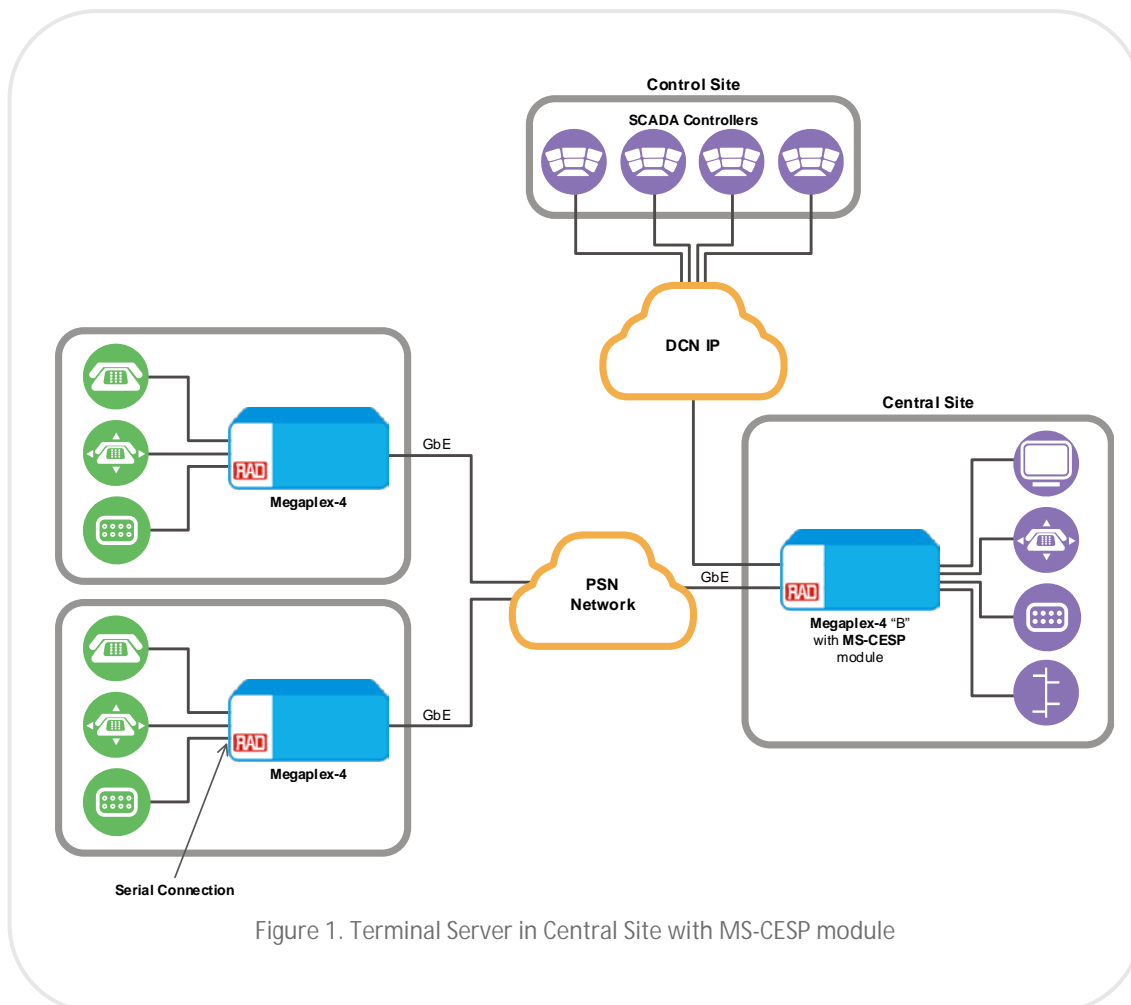
MS-CESP
Data/Voice Cross-Connect Processing Engine

Specifications

CAPACITY

Services	
	Voice/data point-to-multipoint or conference with up to 16 end points per service
	Up to 32 TDM virtual interfaces/entities supporting SAToP, CESoPSN and TDMoIP protocols
	Up to 4 TDM interface domains (groups of TDM interfaces) with independent processing and configuration
	Up to 10 service VLANs, plus management VLAN

SERIAL INTERFACE

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

VOICE INTERFACE

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)		

USB PORT

Factory use only
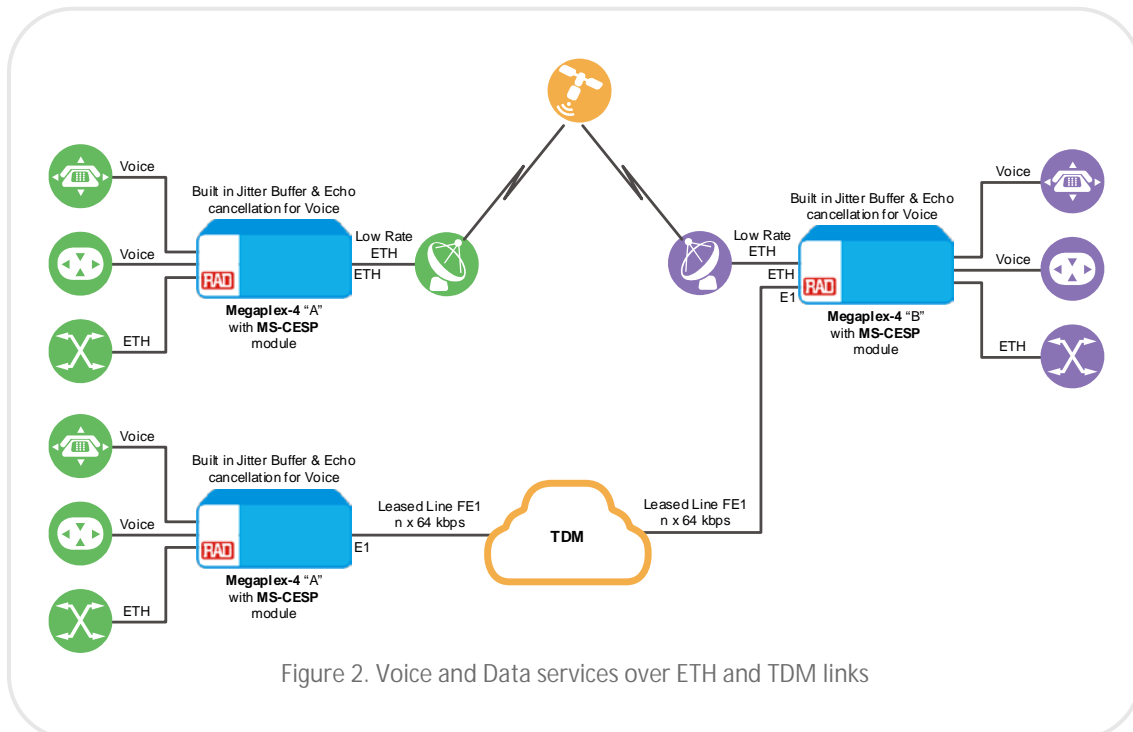
Figure 2. Voice and Data services over ETH and TDM links

RESILIENCY

1+1 active-active module-level redundancy	below 50 msec protection
1+1 service level redundancy	below 50 msec protection

DIAGNOSTICS

LED Indicators	RDY (green): The module is up and running
	LINK (green) – for GbE port:
	• On: the port is connected to an active Ethernet hub or switch
	• Off: Ethernet link is not detected
	ACT (yellow) – for GbE port:
	• On or Blinking (in accordance with the traffic): ETH frames are received or transmitted
	• Off: ETH frames are not received and transmitted

GENERAL

Processor	Rangeley2C (Intel Rangeley ATOM, 2-core processor)
	Xeon D 8-core processor

Environment

Operating Temperature	0°C to 55°C (32°F to 131°F)
Storage Temperature	-20°C to 70°C (-4°F to 158°F)
Humidity	Humidity: up to 95%, non-condensing

Power

Power Consumption	35W max (at CPU operating frequency of 1.7GHz)

Ordering

MP-4100M-MS/CESP/R2C

Megaplex-4 multiservice module, CES processor, 2C Rangeley (Intel Rangeley ATOM, 2-core processor)

MP-4100M-MS/CESP/X8C

Megaplex-4 multiservice module, CES processor, Xeon D 8-core processor

MP-CESP-LIC

License allowing processing of 8E1/T1 traffic capacity

Each module comes pre-loaded with a single instance of the MP-CESP-LIC license.

X8C modules allow adding additional licenses to process more than 8 E1/T1 traffic capacity. The number of additional licenses depends on the module application. Please consult your Sales representative on this subject.

The module must be ordered together with a RADcare package.

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