MENOS Applications
Real-time Radio Exchange

MENOS is a very flexible and efficient platform for the contribution and distribution of live radio signals over satellite in professional broadcast networks.

Radio content often originates at regional sites. This content is typically digitized and compressed at 48 Kilobit/s per stereo channel. The captured content is then sent (contributed) to a central location, from where the content can be distributed to a number of national or regional broadcast centers. Content contribution is usually a point-to-point unicast transmission while content distribution is generally a point-to-multipoint multicast or broadcast diffusion.

Live Radio contribution or distribution is possible for all network users who own a MENOS Radio terminal (SIT-Radio). These terminals are equipped with a satellite broadband access modem that allows the transmission and the reception of the compressed radio signal to and from the hub of the MENOS network.

Live Radio sessions start with a user making a reservation. This can be performed on a web based interface from any MENOS terminal in the network. During the reservation process, the user defines the Radio session and the bandwidth required for the uplink, and receives a price proposal from the billing system. If the live feed is only intended to specific stations of the networks, the user can also indicate which set of stations are allowed to receive the signal.
At transmission time, the system will automatically configure the MENOS hub and the equipment at the uplink station. The transmission starts when the audio source is turned on.

The radio signal is first transmitted from the uplink station to the MENOS hub. In the hub the content is multiplexed with other MENOS services in a single broadband signal that is distributed from the hub to all stations in the network. Authorized stations can receive the signal by manually joining the session on their own web-based user interface. This action will configure the receive equipment automatically. In case a transmission is shorter or longer than first anticipated (i.e. live interview or live sports), then the session can be extended or reduced.

After the transmission the billing system will generate billing information.

All MENOS stations are equipped with broadband data connectivity and Voice over IP channels, so two-way communication is possible at any time during the Radio transmission. This communication is typically used for technical coordination as well as interactivity with the content generation (interviews).

When radio content needs to be contributed and distributed in real-time, sufficient network bandwidth has to be guaranteed throughout the transmission time and throughout the entire communication chain. Typically, the contribution or distribution of real-time professional quality radio signals encapsulated in IP format requires 80 Kilobit/s. The MENOS system automatically ensures that the capacity is reserved on the contribution and distribution links in order to guarantee the quality of the delivered content.

Key features

- Intra-network Radio sessions.

- Content protection and conditional access

- MPEG4-AAC High Efficiency and MPEG4-AAC Low Complexity profiles

- Each SIT-Radio can support 2 stereo channels or 4 mono channels operating in parallel

- Two-way voice and data coordination channels during the transmission

- Billing of consumed services.

- Local and Central Archiving

Key Benefits

- Efficient usage of the space segment with DVB-S2 and VCM technologies

- Efficient usage of the available bandwidth by the multiplexing of services

- Easy-to-use terminals thanks to the automatic configuration of the equipment

- Easy reservation process for new contribution sessions

- Single-click process to join distribution sessions

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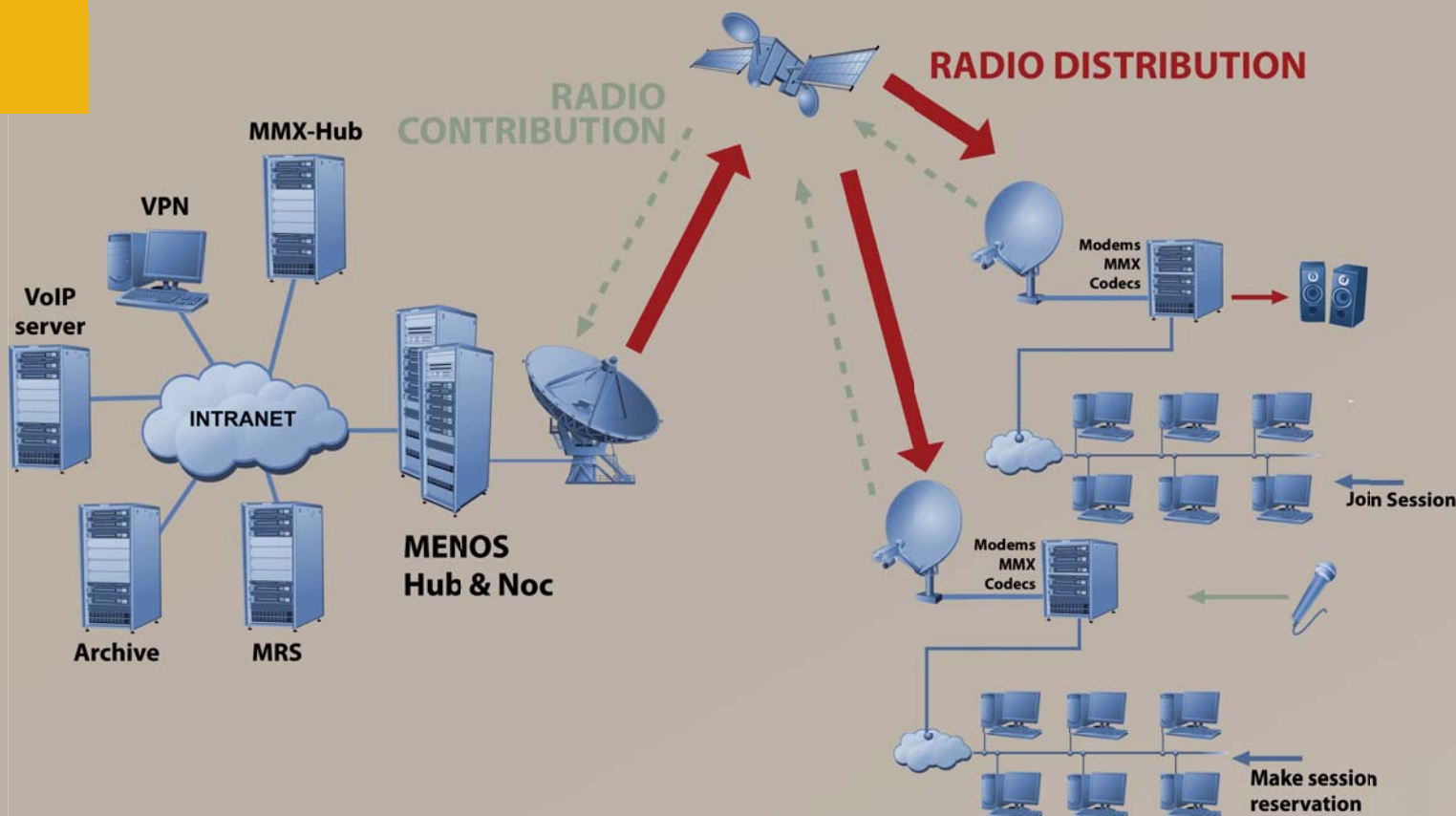
Technical description

Real-time radio exchanges are implemented on the broadband access subsystem of the MENOS network. This subsystem is based on MF-TDMA (Multiple Frequency Time Division Multiple Access) return carriers from the terminals to the hub and an MCPC (Multiple Channel Per Carrier) DVB-S2 forward carrier from the hub to the terminals.

The Live Radio infrastructure consists of a multicast streaming server in the Hub (MMX-Hub) and a multicast streaming client in the terminal (MMX-SIT). The MMX-SIT is associated with audio codecs at the customer site.

Audio Codec

The audio codec is a standalone piece of equipment in the terminal that interfaces to the MMX. The audio encoding is based on MPEG4-AAC HE and LC. The codec is capable of transmitting and receiving 4 mono channels or stereo channels. The encoded radio signal is encapsulated in IP format.

MMX Streaming Server/Client Module

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Interface to Reservation System

The MENOS Reservation System (MRS) is used by the MENOS users in order to book the sessions. This reservation server guarantees that once a session for live Radio has been booked, the bandwidth required for the time of the session is committed. The reservation server therefore avoids any capacity overbooking. Once the session has been booked, the information is sent to the MMX.

Interface to Archive Subsystem

During the reservation process it is possible to indicate which set of receivers is allowed to receive content. The signalling subsystem then indicates to the MMX in the Hub to encrypt the content before multicasting the content to the authorized SITs.

Interface to Multimedia Virtual Network (conditional access) subsystem

During the reservation process it is possible to indicate which set of receivers is allowed to receive content. The signaling subsystem then indicates to the MMX in the Hub to encrypt the content before multicasting the content to the authorized SITs.