

Chapter 2

Satlife: A Big Step into the Enhancement of the Regenerative Satellite Generation

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Abstract This paper offers an overview in the new developments carried out and services offered thanks to SATLIFE project [1]. Based on the AmerHis system [2], SATLIFE [3] has been working in the improvement of the new AmerHis capabilities, looking for a decrease in costs and the provision of new services not yet offered over a regenerative DVB-RCS platform. Satlife concept is introduced, and an analysis of Amerhis/Ibis service enhancements is carried out, together with a deep overview of the new services and functionalities developed. In the phase of real trials, Satlife is testing all the features developed over these two last years.

Satlife Concept

‘Satellite Access Technologies: Leading Improvements for Europe’, Satlife, has been the first project to bring technological innovations and solutions in the DVB-RCS regenerative systems through the AmerHis improvement. Today, after two years, most of the objectives have been reached: SATLIFE has become a key project in the innovation area for positioning and adoption of DVB-RCS regenerative systems, promoting the development of the Information Society.

Hispasat, together with the group of leading companies participants in the project (Thales Alenia Space España, Telefónica I + D, Thales Alenia Space Francia, Nera, EMS, Shiron, Indra Espacio, Thales, University of Surrey, Universidad Politécnica de Madrid and Telefónica Pesquisas e Desenvolvimento), face the challenge of real trials. Therefore, all the prototypes and developments design for each company have been integrated and tested in the laboratory.

Amerhis/Ibis Service Enhancements

Digital TV

One of the main uses of satellite networks today is the provision of Digital TV services. Audio, video and data are broadcasted to final users by satellite in a one-way communication, but two-way communication is needed for interactive applications. Thus, broadcast is ensured in one or several spot beams through on-board switching and duplication. The Video Broadcasting service is improved in Satlife. A specific terminal is introduced to transmit the video from the Service Provider to the Users.

As it is shown in Fig. 2.1, when having several VSPs some signalling information has to be assembled in the NCC (Network Control Center) and redistributed to the receivers.

The Video Service Provider is based on the RCST, having its functionality and in addition being able to transmit MPEG2 video and data.

Thus, it is necessary to add a Video Streaming Unit to the RCST, which must feed the RCST with the MPEG-2 video stream to be broadcasted. The main difference of this Service Provider RCST is that it implements an interface between the streaming unit with the purpose of receiving the video in MPEG-2 format to be broadcasted. This interface consists of video input and a clock output. The clock is required to synchronize the Video Unit with the RCST (Fig. 2.2).

As shown in Fig. 2.3, this SP-RCST removes the IP, UDP and RTP headers to obtain MPEG2 original packets transmitted to the satellite. Thus, all the MPEG2

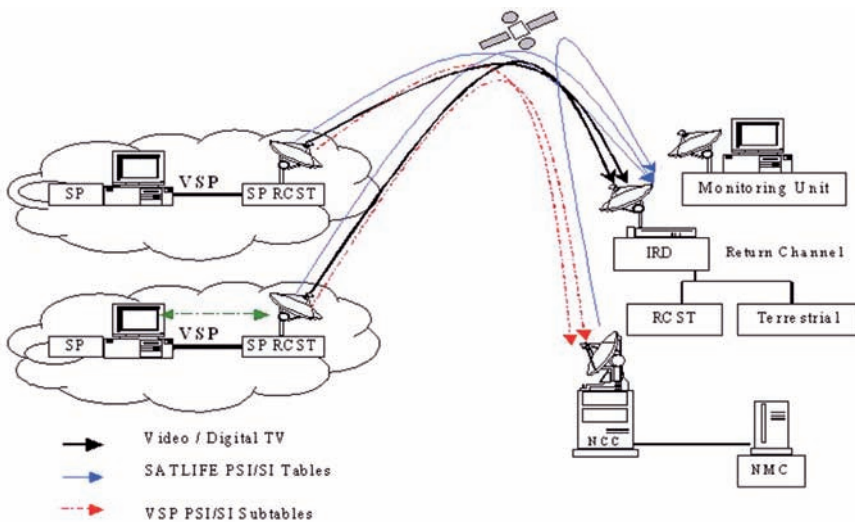


Fig. 2.1 Video broadcast service

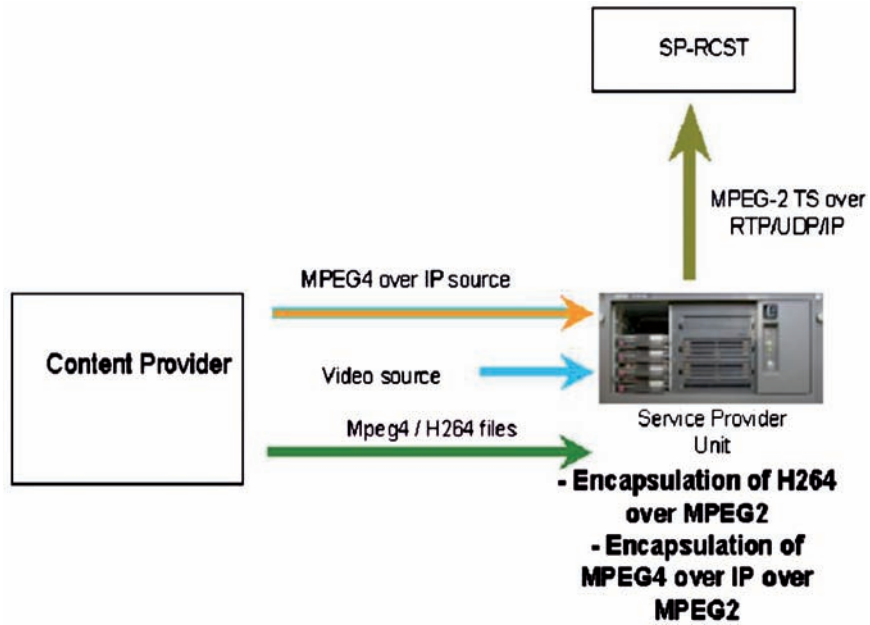


Fig. 2.2 Satlife video service provisioning

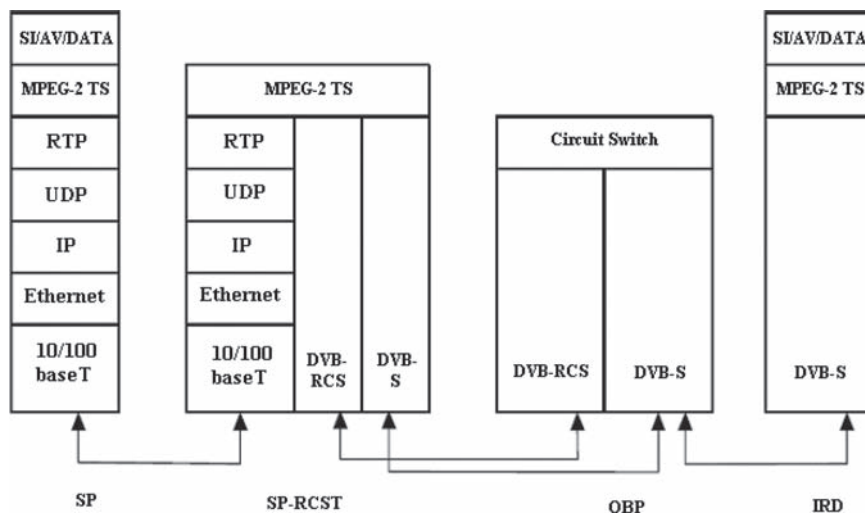


Fig. 2.3 Protocol stack for video broadcasting

contributions from each station are multiplexed on board of the satellite and transmitted in a DVB-S saturated carrier to be received by an IRD, who recovers the MPEG2 signal sent by the Service Provider.

The commercial advantages of this system are very clear, since it removes the need to have a centralized installation in the uplink to give DVB-S services as it is currently happening in the existing digital TV platforms. Now, small service providers may distribute them in different places and have their own uplinks from their premises.

Multiconference

This service allows to establish multimedia communication between two or more users. It provides the same communication capabilities than POTS with new added value services provided by the multimedia technology. Thanks to the mesh regenerative scheme, QoS can be improved, taking advantage of a single satellite hop. In particular, the system allows the use of multicast connections, session and conference control establishment, security and adaptation of the different audio/video topologies depending on the kind of users.

Multiconference functionalities that have been improved specifically in the project are:

1. SIP introduction and compatibility and new H.323 aspects, allowing a new basic interaction between both protocols, avoiding that H.323 clients can only establish multiconference sessions with other H.323 clients and similar with SIP clients. This task is carried out by the regenerative gateway. Besides, H.323 final users with IP private addresses can be registered with the RSGW Gatekeeper while they are carrying out calls towards H.323 users in the Internet network. Thus, now there is no need to remove from the Gatekeeper register as it was necessary with AmerHis.

Between novelties introduced by Satlife, there is the audio/video communication based on SIP protocol; thus, Satlife regenerative gateway supports the following SIP services using a SIP proxy:

- SIP voice calls with ISDN/PSTN terminals: the Satlife RSGW allows a voice call to be established from a Satlife subscriber with a SIP user agent registered in the RSGW SIP proxy to an ISDN/PSTN terminal. Thus, the RSGW is in charge of translating both traffic and signalling from ISDN protocol to/from SIP protocol. For this internetworking service, calls can be initiated from both ends, ISDN or Satlife, with independence of the RSGW subscriber address type (public or private) (Fig. 2.4).
- SIP voice/video with SIP terminals located at the Internet: a Satlife subscriber SIP user agent is able to establish a communication (voice and video) to an external SIP terminal located at the Internet. Both of them will communicate using SIP protocol through the Access Router located at the RSGW (Fig. 2.5).

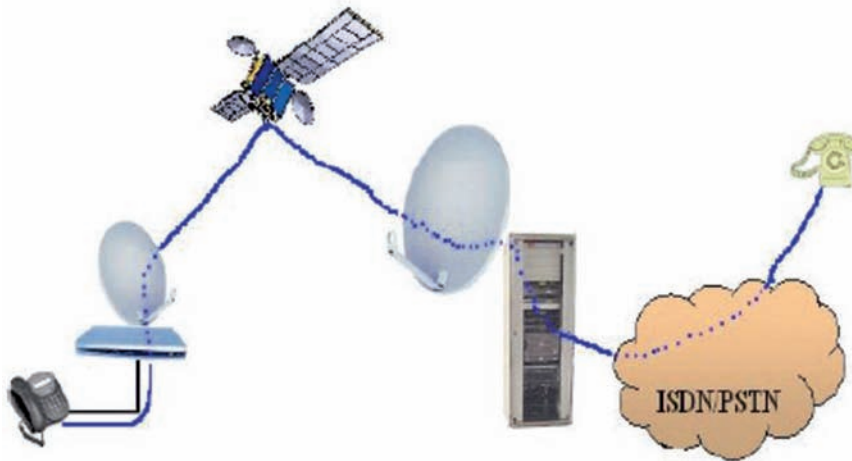


Fig. 2.4 SIP voice call to ISDN/PSTN

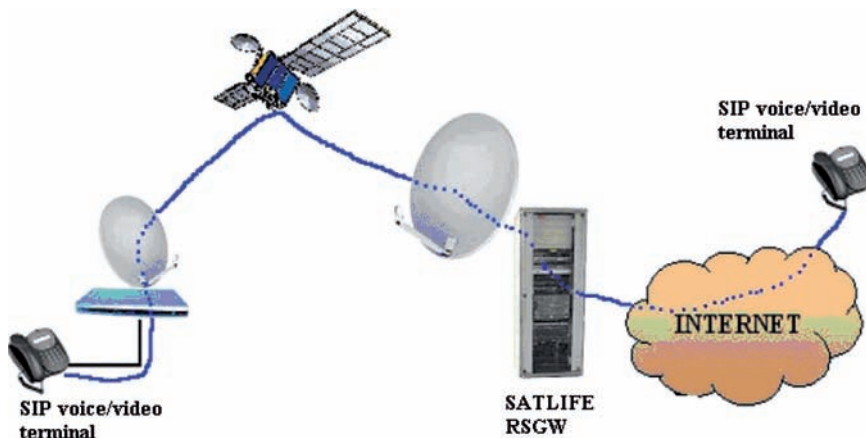


Fig. 2.5 SIP voice/video calls to Internet SIP endpoints

For this service it is necessary to differentiate based on the type of IP address assigned to the subscriber:

- A SatLife UT with a public IP address is able to send and receive SIP voice/video calls being actively registered in the RSGW SIP Proxy. It means that the SIP proxy is in charge of finding the Internet user agent (in case of an outgoing call) or finding the SatLife user agent (in case of an incoming call).

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