MULTI-TRANSPONDER

TRANSPARENT ACCESS TO MULTICAST IP SERVICES

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Due to the huge bandwidth offered by Internet via Satellite and the possibility to reach millions of users simultaneously, IP/DVB technology offers potential for many new services.

Accessing these services shall be based on user-friendly applications. This paper describes a new feature called "Multi-transponder" added to the Data Control Application of DVB-S Multimedia Receiver Adapters used in conjunction with multicast-based applications.

INTRODUCTION

To break the big fence of bandwidth constraint, one of the most popular means is to use Digital Video Broadcasting Technology (DVB) via Satellite (DVB-S) and Cable (DVB-C) to carry data. As TV is now transmitted digitally using this standard, a multiplex contains several program channels that can be broadcast from a satellite at a gross rate of about 38 Mbit/s, dependent on the modulation scheme used. Within the DVB multiplex, it is now common practice to replace some or all of the MPEG-coded video streams with IP datagrams using multiprotocol encapsulation (MPE). This enables a mix of TV and Internet services to be delivered directly to users reached by SES ASTRA satellite's footprint.

The Program Service Information (PSI) data provides information to enable automatic configuration of the receiver to demultiplex and decode the various streams of programs within a multiplex. Additional Service Information (SI) was defined also to provide information on services and events carried by different multiplexes, and even on other networks.

In order to fill the gap in the broadband world, a standard mechanism has been defined for signalling IP services deployed within DVB networks. It enables the implementation of DVB-S Multimedia Receiver Adapters (or satellite modems) that are completely self-tuning when accessing IP streams on one or more satellite transponders.

The benefits offered by this new feature are the following:

- Optimum bandwidth for end-users,

- Easy installation and user-friendliness,

- Introduction of multimedia "bouquets".

OPTIMUM BANDWIDTH

Some services request more bandwidth than others. With the "Multi-transponder" feature the end-user is automatically tuned to the service offering the optimum bandwidth.

Satellite Internet users will never be blocked on the SES ASTRA highway. They will be automatically tuned to the right satellite transponder bringing them a high level of Quality of Service and assuring a very efficient load balancing per user session.
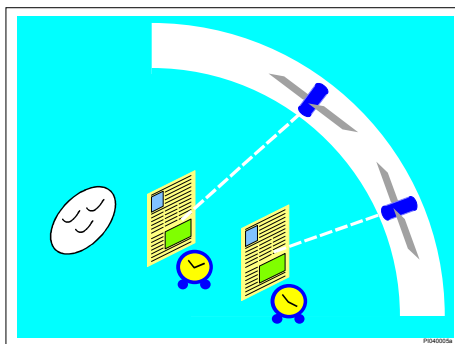

Figure 1: End-User Migration from One Satellite Transponder to Another.

EASY INSTALLATION AND USER-FRIENDLINESS

The installation process is now reduced to the satellite dish installation, the satellite modem connection and the associated software set-up.

No additional knowledge is required. The access to a service is now as simple as *"click and enjoy"*.

Typically a web page can contain links to multimedia content located on different transponders. Selecting this link will launch the associated application that will be automatically "filled" with the corresponding multimedia content.

This feature opens the door to enhanced web page design. The end-user will access smoothly to pages including bandwidth-greedy content.

As soon as a new commercial service is on-air, the content access is easily made available to the end-user.

Figure 2: Web Pages with Links to Multimedia Content Located on Different Transponder

MULTIMEDIA BOUQUETS

At the launch of the satellite reception software or at the end of a session, you can choose between different "bouquets" or commercial offers.

Each offer can be disjoint from the others or can partially include some services. Thus, the number of simulcasts can be drastically reduced. These "bouquets" which can include all types of multimedia content, are chosen via a "platform name".

The content of a "bouquet" can be distributed over different transponders located on different satellite orbital positions.

Figure 3: Different Multimedia Bouquets

EXAMPLES

The figures below illustrate different behaviours that are expected from the "Multi-transponder" feature.

A Satellite Internet user decides to watch a multimedia content proposed on a web page and double clicks on the corresponding link. A MediaPlayer is launched for delivering this content. A transponder change occurs and the MediaPlayer is then able to decode the multimedia content.

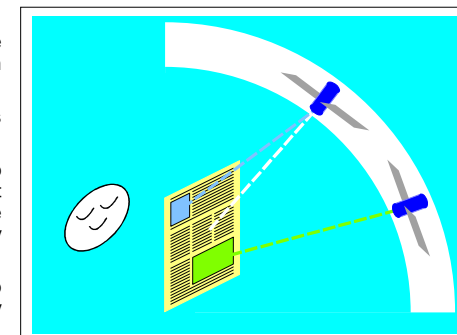During this sequence, no manual tuning actions have
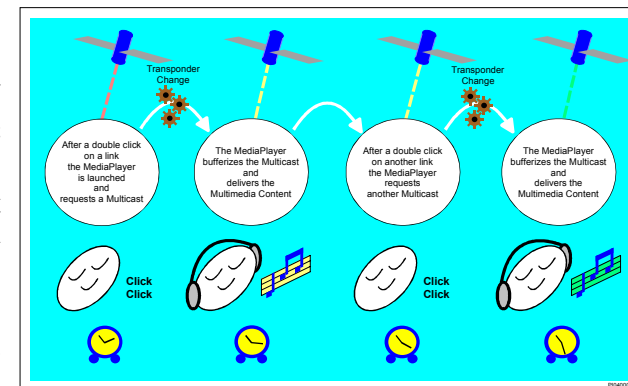

Figure 4: Transponder Change Sequence

been requested from the end-user.

Another behaviour is shown in Figure 5.

A Satellite Internet user decides to receive a multimedia content proposed on a web page and double clicks on the corresponding link. A MediaPlayer is launched for delivering this content. A transponder change occurs. If the MediaPlayer is not able to play the multimedia content, a Codec is requested and a new transponder change occurs. The codec is then downloaded via satellite and installed. The MediaPlayer is ready to decode the multimedia content and thus initiates a third transponder change in order to deliver the multimedia content.
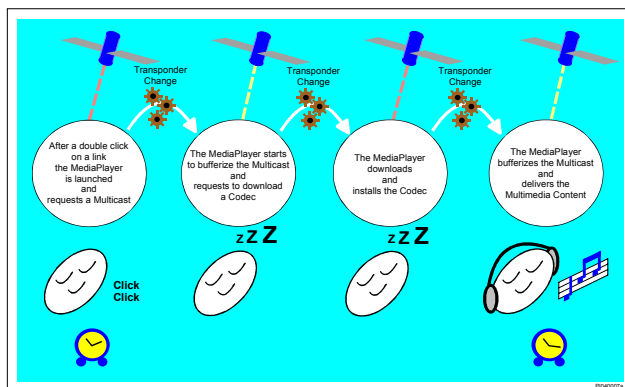

Figure 5: Transponder Change Sequence

HOW DOES IT WORK?

An IP/MAC Notification Table (INT) is transmitted via satellite. This table contains the IP/MAC information of the different multimedia streams and their associated DVB parameters for the service localisation.

The satellite modem locates the INT tables at the beginning of each session. As an INT table is associated to each multimedia "bouquet", the end-user is asked during this process to choose a "bouquet" or "platform name". The satellite modem then stores the corresponding INT table content.

As soon as a multicast ready application is requesting an INT registered service, the satellite modem reads the corresponding input of the INT table and sets the tuner and the filters accordingly for the reception of the service.

IMPLEMENTATION

This automatic configuration mechanism allowing transparent access to multicast IP services has been successfully implemented and tested with the following devices from TechnoTrend AG:

- The TT-PCline Premium S PCI card,

- The TT-PCline Budget S PCI card,

- The TT-PCline USB S external satellite modem,

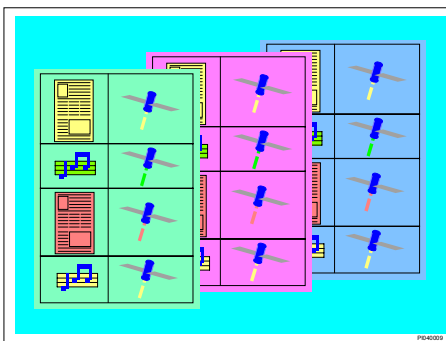The new TechnoTrend TT-PCline USB2 S external satellite modem is also supporting this new feature.

Figure 6: Different IP/MAC Notification Tables

CONFIGURATION AND USE

After the satellite modem hardware and software installation and only in case of a multiple orbital position reception that does not follow our recommended signal distribution topology, the end-user will have to configure the signal distribution topology of his satellite modem. (This part can also be automated if requested).

In most of the cases the end-user will have nothing to configure.

Figure 7 shows the different messages and dialog boxes occurring after the launch of the satellite reception software.

CONCLUSION

This transparent access to multicast IP services shall create new opportunities for multimedia service providers who want to extend their offer in the broadband satellite world with the introduction of multimedia "bouquets".

The usage of this enhancement is totally transparent for the end-user making configuring the satellite modem for a specific service an unpleasant memory.

Additionally, the design of enhanced web pages shall also be stimulated.

REFERENCES

[1]   ETSI EN 301 192 V1.3.1 (2003-05)
        European Standard (Telecommunications series)
        Digital Video Broadcasting (DVB);
        DVB specification for data broadcasting

[2]   SES ASTRA/SMK/PDM/JO040017j
        Multi-transponder – Implementation Guideline for
        IP Multicast Services

[3]   SES ASTRA/SMK/PDM/JO040010a
        Multi-transponder – IP/MAC Notification BAT and
        INT Table Content
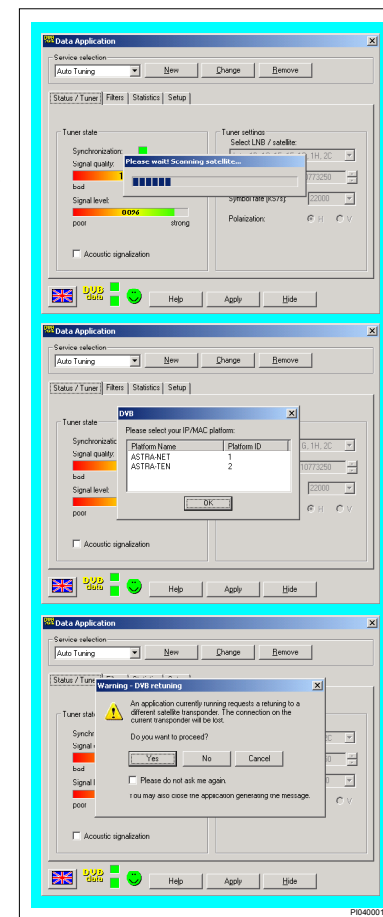
[4]   SES ASTRA/SMK/PDM/JO040008i
        Multi-transponder – Acceptance Test Procedure

Figure 7: Data Control Application