

## TRIPLE PLAY SERVICE AND IPTV SERVICES OFFERED WITHIN IT

D. Pajdušáková, B. Adamec

Department of Telecommunications and Multimedia, Faculty of Electrical Engineering,  
University of Žilina, Univerzitná 8215/1, 010 26 Žilina,  
tel.: +421 41 513 22 55, mail: pajdusakova@fel.uniza.sk, mail: adamec@fel.uniza.sk

**Summary** This paper deals with Triple Play multimedia service and figures its architecture. Triple Play offers voice, video and data services together in one customer connection. There is offered IPTV (*Internet Protocol Television*) service within this service, where we can include also Video on Demand service and other different additional services. In the paper is described classification of Video on Demand services.

### 1. INTRODUCTION

Operators of all kinds of electronic communication networks and services try to provide complete digital services for present and also for prospective customers. To achieve this goal, innovation of networks on IP infrastructure is necessary.

Nowadays service marked as Triple Play is very popular in the world. Triple Play is a combination of Internet access, voice communication, and entertainment services such as IP television and video on demand. These services are distributed to user through existing network.

### 2. MULTIMEDIA SERVICE TRIPLE PLAY

Triple Play offers voice, video and data services together in one customer's connection as a single package. They can be divided into three groups:

- Communication Services - analog or digital telephony (ISDN), eventually services based on VoIP, conference talk, videoconference;

- Services of Fast Internet Access (HSI – High Speed Internet);
- TV broadcasting services based on IP (IPTV) and Video on Demand (VoD).

#### 2.1 The Triple Play architecture

Triple Play architecture consists of the following (Fig.1):

- Platform of Services;
- Transport Network;
- Access Network;
- Home Area Network.

##### 2.1.1 Platform of services

Platform of services covers data, audio and video services which are provided within the Triple Play. There are parts for processing, coding and multiplexing TV signals, video servers, VoIP servers and servers which provide services of content (web portals, messages, searching...).

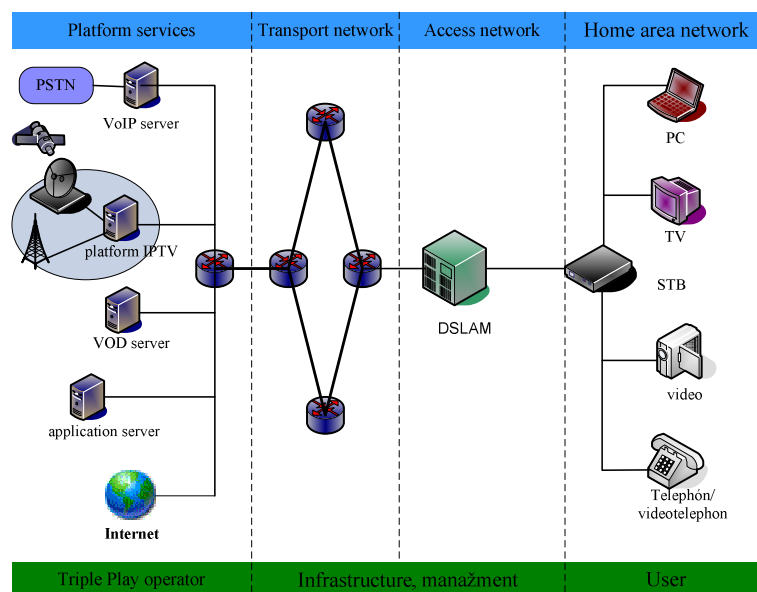


Fig. 1. Triple Play Architecture

### VoIP Server

It operates and provides voice communication through the VoIP. Signalization for control of indication, change and cancel of connection is solved through SIP protocol or H.323. Voice is transmitted in real time on the basis of RTP and UDP/IP protocols. Interfaces towards the classic telephone network PSTN are VoIP gateways or media gateways.

### IPTV Platform

It elaborates audio, video and data suitable for transfer in real time on transport and access network up to the end-user equipment, for example personal computers, or additional end-user equipment - Set top box (STB). IPTV platform covers signal processing which comes from transmitting systems to its digital format suitable for transfer on packet networks IP or ATM.

### VoD Servers

They enable access the video-content and there are a lot of multimedia data stored on them, on which constituency access and they can watch the content on PC or TV screen.

In contrast to IPTV streams are data from video server transmitted via unicast only between video server and STB. Control of video playback can be realized through RTSP (*Real Time Streaming Protocol*) protocol. It supports remote control function, for audio and video streams as play, stop, pause, reverse etc.

### Middleware

It is concerned application software among platforms, which is part of the software for platform of services and it is based on client-server architecture. Client software is placed on STB and video server is located in platform of services. Server covers management of all clients, covers activation and cancel of services, EPG (Electronic program guide) and interface on other applications.

### 2.1.2 Transport Network

Transport network is between platform of services and access network. It uses transport infrastructure of operator e.g. backbone network. The technologies as ATM, IP/Ethernet, are used in transport network.

### 2.1.3 Access Network

Suitable Access networks are following:

- xDSL technologies – ADSL, ADSL2/2+, VDSL, VDSL2;
- Cable Distributor - HFC, CATV, at which standards DOCSIS, PacketCable describe architecture which is suitable for Triple Play services [4];

- Optical Access Network FTTx - founded on passive optical network PON or active optical network AON;
- Wireless Local Loop LMDS (Local Multipoint Distribution Services) or MMDS (Multichannel Multipoint Distribution System).

### 2.1.4 Home area network

Home Area Network (HAN) connects individual electronic systems and equipments at home and safeguards transport and sharing all media within the home area network [1].

## 3. IPTV AND IPTV SERVICES

IPTV (*Internet Protocol Television*) delivers television programming to households via a broadband connection using Internet protocols. It requires a subscription and IPTV set-top box, and offers key advantages over existing TV cable and satellite technologies. IPTV is typically bundled with other services like Video on Demand, voice over IP and Web access, collectively referred to as *Triple Play* [2].

Television with internet protocol IPTV delivers TV program to each user through IP broadband network in real time. IPTV uses mainly standard data networks on the basis of Ethernet, end-user equipments STB or PC, which converts digital signal suitable for television receiver.

In case the transmission channel isn't dimensioned enough to transmit more programs together to the end-user at once even if we have more televisions in a household. Signal can be differently divided and distributed to several visual display units, but source of signal is only one and offers only one program [3].

### 3.1 IPTV services

Except of television IPTV offers also other additional services and broadcasting programs, which range is different within each provider. There are following [3]:

- Video on Demand
- Personal Video Recorder
- Network Personal Video Recorder
- Information Services
- Interactive TV
- Broadband Applications
- Electronic Program Guide
- Video Cassette Recorder

#### 3.1.1 Video on demand

VoD (*Video on Demand*) is video-content delivery in IP broadband networks to each customer on the bases of their requests in the time stated. Video on Demand architecture is showed on figure 2.

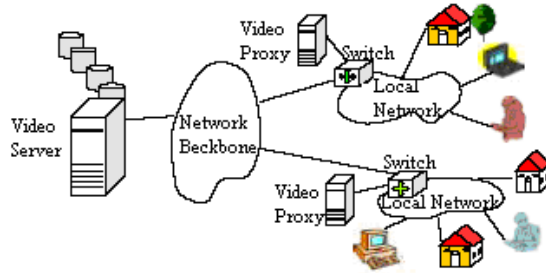


Fig. 2. Video on Demand Architecture

We can divide VoD services according to data transmission and the way of play control in:

#### **True Video on Demand (TVoD)**

User communicates with VoD server through his Set-Top-Box (STB). He chooses video file in the menu and controls his play. Video file is played directly from VoD server and transmits to the user in real time (streaming). TVoD offers many interactive functions for play control, similar to video or DVD-players. Play, Stop, Pause and other functions for choice or restraint of advertisements belongs to the functions.

#### **Near Video on Demand (NVoD)**

As well as by TVoD video file broadcasts in real time directly from VoD server, though on several channels together with several minutes intervals. So users have possibility to skip on various time intervals, what replaces forward and back fast moving functions. This solution, when one title is broadcasted on several channels, is difficult on data transmission, therefore only providers with sufficient network capacity offer it. Video title can be transmitted to several users together.

#### **Push Video on Demand (PUSH-VoD)**

This solution is interesting for providers, who want to start to provide VoD without massive investments to network capacity increase. User can start watching required film or program anytime by NVoD and TVoD solutions, what means also probability of appearance of peaks in network, higher error rate, interrupt possibility or massive extension of download time. Transmit of required video file by PUSH-VoD is realized in time, when it is optimal in term of load of network (e.g. at night) and it is recorded on users STB hard disc. Thanks to that, provider can offers VoD also with lower transfer speeds. Disadvantage is, that the user can't start watching chosen video file immediately.

#### **Quasi Video on Demand (QVoD)**

It is similar to NVoD with difference, that video file playing starts only if at least minimal given number of viewers will have interest about it. Users are grouped according to their interest area by QVoD.

We can divide VoD according to payment in:

#### **Free Video on Demand (FVoD)**

Service is offered free, or within basic package of services together with IPTV or other service and includes only few video titles (older, less successful, family, documentary films or musical video clips.)

#### **Subscription Video on Demand (SVoD)**

Service for some regular charge offers unlimited access to package of more attractive films than FVoD, or to archive of broadcasting programs in limited time (e.g. one month).

#### **Pay-per-view VoD**

User pays only for watching the, which he is really interesting of. Charge will be count on him during title order and he pays it with other regular payments or it counts out from subscriber's credit. User has possibility to watch video title after payment only once or unlimited times during next following hours [2], [5].

## 4. CONCLUSION

In the present time and also in the future it will be more and more interest of customers in Triple Play service. It is therefore, because customers don't want to be only in passive spectator position, but they want feedback to be supplied within which there will be supplied interaction.

#### **Acknowledgement**

The author gratefully acknowledges support from the VEGA project No 1/2043/05 - Systems for the Interactive Cable Television ICATV.

#### **REFERENCES**

- [1] MIKÓCZY, E.: *Triple Play – multimediálna služba novej generácie*, Telekomunikácie 7-8/2005
- [2] K. C. ALMEROOTH AND M.H. AMMAR: *The use of Multicast Delivery to Provide a Scalable and interactive Video-on-Demand Service*, IEEE Journal of Selected Areas in Communications, vol.14(6), Aug 1996, p.p.1110-1122
- [3] KOVÁČIK, M.: *IPTV: televízia s protokolom IP*, Telekomunikácie 9/2006, ISSN 0040-2591
- [4] V. HOTTMAR, L. SCHWARTZ, D. TRSTENSKÝ: *End User Box for Interactive Cable Television*, IEEE Transaction on Consumer Electronics, May 2007, Vol. 53, No. 2, p. 412 – 416, ISSN 0098-3063
- [5] JACK Y. B. LEE: *On a Unified Architecture for Video on Demand Services*, IEEE transaction on multimedia, vol. 4 No.1, MARCH 2002