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PREFEASIBILITY STUDY FOR THE DEVELOPMENT OF IPTV SERVICE ON THE NETWORK INFRASTRUCTURE OF FIXED NETWORK OPERATORS

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Abstract

Lots of fixed network operators have tried their best to invest and made sound decisions for the development of construction of IPTV network infrastructure. This paper is base on the test development of IPTV service on the fixed network infrastructure of VNPT (Viet Nam Posts and Telecoms) Group by means of specific products of Cisco, ZTE, and Teleo. Part 1 Introduction of challenges, opportunities as well as technological trends of providers of domestic fixed services. Part 2 present Overview solutions for the development of IPTV service of equipment providers, models of network providing IPTV service of VNPT Group. Part 3 present Tests of IPTV service on ADSL line and FTTH line in accordance with specific conditions of VNPT-Tien giang. Part 4 Conclusions of the ability for the development of IPTV service and technological aspects of the IPTV service in future.

Keywords : IPTV, ADSL 2+, FTTH, VNPT

1. Introduction

In the trend of development of technology and needs of using telecommunication services – Information Technology higher and higher of customers, while fixed telephone services become lesser and lesser and not to attract customers any more.

Although VNPT Group develops fast, but it has to cope with the renouncement of network at fixed services with a big numbers of customers.

Providers of fixed services have lots of the following challenges and opportunities:

- It is infringed the level field by providers of mobile services, providers of development of cable television.
- With the development of video compressing technology, compressing standard, devices with high performance, big contact gate, and up-and-coming services of contents and multimedia.
- In order to be in being and compete with other providers of services while market shares are divided more with every passing day.
- Thence, it is aimed to the development of new services, IPTV services on network infrastructure of providers of fixed services are pressing.

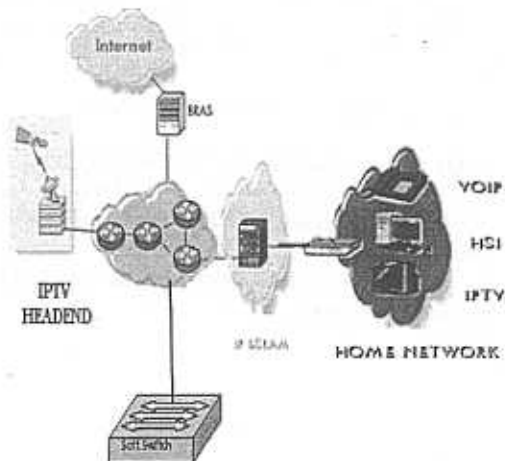


Fig 1. A model of providence IPTV service

Providers of Vietnam network really start to develop measure of NGN network in which VNPT Group has taken the lead. They finished the lower layer of the state core NGN network and is developing to install inter-provincial are all over the country (MAN-E)

One of the dearest things is broadband access infrastructure. It explains why exploiters still try to maintain subscribers of current cables. Base on it, exploiters will invest effectively on cost price for xDSL technique, and it can be taken full advantage of bandwidth accessing thru copper cables for the development of wide bandwidths such as Internet, IPTV, VoD, IP telephones, video mobiles. It is necessary to pay attention to limits of xDSL technology when using subscribers of current cables and the selection of appropriate compressing standards.

Contents	ADSL	ADSL2	ADSL2+	VDSL
Downstream rate	8 Mbps	12 Mbps	24 Mbps	52 Mbps
Upstream rate	640 Kbps	1 Mbps	2 Mbps	6 Mbps
Distance	18.000 ft	12.000 ft	9.000 ft	1.000 ft
Standard	G 922.1 G 922.2	G 922.3 G 922.4	G 922.5	H.610- H.619

Table 1. Technological particularities of common xDSL Technology

Compressing standards	Standard Definition	High Definition	Applications
MPEG-1	1,5 Mbps	-	MP3, Video on Internet
MPEG-2	4-5 Mbps	18-20 Mbps	DVD, Digital TV
MPEG-4 part 10(H.264/AVC)	2-4 Mbps	08-10 Mbps	Multi Video

Table 2. Common compressing standards.

2. Overview solutions for the development of IPTV service of equipment providers, models of network providing IPTV service of VNPT Group

a. Solution for the development of IPTV service of Alcatel

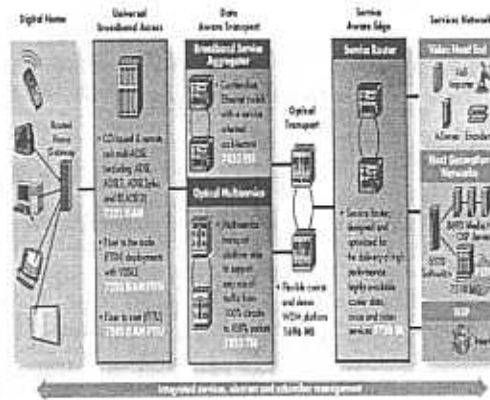


Fig 2: Enabling products for the development of IPTV service

With its Intelligent Services Access Manager (ISAM) family, optical transport platforms (Optical Multi-Service Nodes, 1850 Transport Service Switch and MetroSpan), 7450 Ethernet Service Switch (BSA function), and at the service edge, operators need a Broadband Service Router (7750 BSR) designed and optimized for the delivery of high-performance data, voice and video services. Alcatel can deploy an end-to-end solution that offers the flexibility and cost-effectiveness operators want, while delivering services with superior quality and reliability.

b. Solution for the development of IPTV service of ZTE

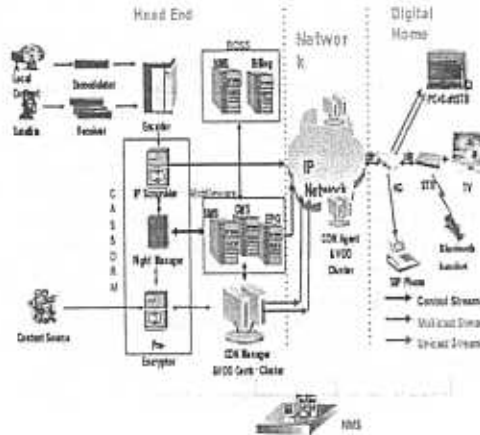


Fig 3. Generic solution for the development of IPTV service

An end-to end solution of ZTE includes:

- > Head-end system with satellites for receiving TV sign from satellite; optical cable use to transport sign and receive video source from Content Providers; Video Demodulator system, Encoder system encodes video sign

- using compressing standard H.264 change to IP signs thru IP Scramber.
- Middleware manage general IPTV system, to guarantee dialog between components of IPTV system.
- CAS&DRM (Conditional Access System and Digital Right Management) encode and secure video signs.
- VoD are Video on Demand Servers, to store encoded video contents and thru EPG (Electronic Program Guide) to help user's chanel selection.

c. Models of network providing IPTV service of VNPT Group

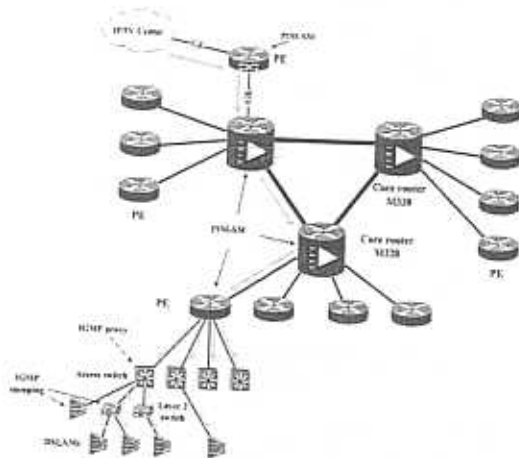


Fig 4. Models of network providing IPTV service of VNPT Group

National IPTV Center connect with core network thru PE (Provider Edge) router. Core network of VNPT Group consists of three core router (M320 of Juniper Networks) connecting together by nGE gates, connect to PE routers and BRAS (Broadband Remote Access Server, ERX-1410 Juniper Router support switch up to 10Gbps) by nGE gates. MAN-E network consists of core switches layer 3 and access switches layer 2, they connect to customers through FTTH network or connect to IP DSLAM to customers through copper cables.

3. Test of IPTV services

a. Test process

The test will be carried out with the following targets:

- It is checked up technical measures of the system in principle;
- It is checked up and evaluated the ability of network system;
- It is evaluated quality of QoE (Quality of Experience) of IPTV service in specific environment

IPTV system test includes the following equipment:

- 7609 Router of Cisco
- MA5600 IP DSLAM of Huawei

- 7606 Switch of Cisco / T5C Switch of Telco
- VOD/Live TV Server
- MiddleWare/DHCP Server
- STB-Set top box: ZTE
- ✓ ZXV10 B700 for HDTV (High Definition Television)
- ✓ ZXV10 B600 for SDTV (Standard Definition Television)

Support tools:

- Bandwidth Measure Software: Iperf
- Download software: Flashget
- Watching IPTV on PC software: VLC

Head-end network equipment of customers:

- ADSL2+ Modem: 2540T D-Link, 4400 Planet
- Media Converter: Optone of Shenzhen Technology Company

The test will be carried out with the following steps:

- To configure the system according to technical projects
- To put on-line PC into Modem/Media Converter of customers, to configure IP address in band 10.0.0.x/24, to carry out ping commandline to test with system of IPTV Server.
- To put on-line PC into Modem/ Media Converter of customers, to configure live IP, to check up PC received distribution address by IPTV system.
- To use Iperf software, to carry out to measure bandwidth/delay/jitter of the connecting line between STB and IPTV systems with an output similar to IPTV (UDP protocol, packet size, bandwidth, v.v..). In the process of measurement, evaluation of the influence of QoS in the quality of coming cables.
- To put on-line PC into Modem/Router of customers, to configure IP address in band 192.168.1.x/24, to carry out internet connection.
- To put on-line receiving head IPTV (STB) into Modem/ Media Converter of customers, to check up STB boot to succeed.
- To check up the quality of services of Live TV and VOD.
- To download on PC (Internet connection) while watching Live TV and VOD, to check up the quality of service of Live TV and VOD.

b. Test configuration of IPTV service for subscribers of copper cables to use ADSL2+ service:

Description of test system:

The test of IPTV service will be carried out on conditions of specific network (Fig. 5). Subscribers of IPTV use STB connecting to modem ADSL2+ using RJ45 interface. The IPTV system will connect to equipment of IP DSLAM with connection of Layer 2 base on MAN-E (Metro Area Network- Ethernet) network.

quality such HDTV and the rate of use of TV in a household is high, then the only rational mode is to select technology of optical cables for services of wide bandwidth for managers of fixed network.

At present, managers of fixed network of Vietnam (VNPT Group) will take full advantage of bandwidth of copper cables to develop the provision of IPTV service in order to reduce costs of provision of services when the IPTV market in Vietnam is still new, at the same time, it is also leaped to invest lower layers of network of core NGN and network of MAN-E in-province to provide Triple services base on optical technology (as FTTH) to speed up the competition of services of wide bandwidth.

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