Scientific Journal of Impact Factor (SJIF): 5.71

e-ISSN (O): 2348-4470
p-ISSN (P): 2348-6406

International Journal of Advance Engineering and Research Development

Volume 5, Issue 03, March -2018

SURVEY ON CHANNEL SWITCHING TIME IN IPTV

[1]Shivakarthika.V, [2]Dr Shambhavi B R

[1]*PG student Department of Information Science And Engineering, BMSCE*
[2]*Associate Professor, Department of Information Science And Engineering, BMSCE*

Abstract— *The Internet protocol television (IPTV) is one of the most promising application in next generation networks.IPTV mainly offers live television , Time-shifted media , Video on demand services.It can be viewed in normal television using Set-top box and in mobile devices by using Wi-MAX base station.The proposed method uses the Hot-view channel and Personal favorite channel preloading to reduce the delay in channel switching.*

Index Terms- *IPTV, Channel zapping time, video-on-demand,Triple play*

I. INTRODUCTION

With the development of network services, transferring materials have evolved from data to multimedia. The Internet protocol television (IPTV) service is derived from Triple-play,Which consists of data, audio, and video.IPTV offers service over IP networks, and offers viewers interactive multimedia services such as program voting and advertisements. IPTV supports unicast,multicast, broadcast multimedia, games, VOIP, etc.[1].

In the wired IPTV service, the service terminals consist of a set-top box and television in the home. But for mobile IPTV service, the terminals are wireless networks, such as 3G, Wi-Fi, or WiMAX. Compared to mobile, wired IPTV services has sufficient bandwidth. For mobile IPTV there is the issue of insufficient bandwidth, forcing system operators to broadcast partial channels.[2]

A. IPTV Architecture

Functional Components of the IPTV Architecture Content Sources:- It receives video content from the sources.It encodes the data and stores it in an acquisition database. *Service Nodes:-* The content received here will be in various formats ,It will reformated and encapsulated for transmission with that appropriate Quality of Services(QOS) indicates to the wide area network(WAN) for delivery to the customers. It is also communicate to the Customer Premises Equipment (CPE) for the service management. *Wide Area Distribution Networks:-* it provides the distribution services ,quality of services, and other capabilities, such as multicast and other timely distribution of IPTV data streams from the Service Nodes to the Customer Premises.

*Customer Premises Equipment (CPE):-*This device located at the customer premise provides that the Broadband Network Termination(B-NT) that the functionality at the minimum.

IPTV Client :- The IPTV Client is the functional unit, basically it performs the functional processing ,which includes setting up the connection and Quality of Services.[3]

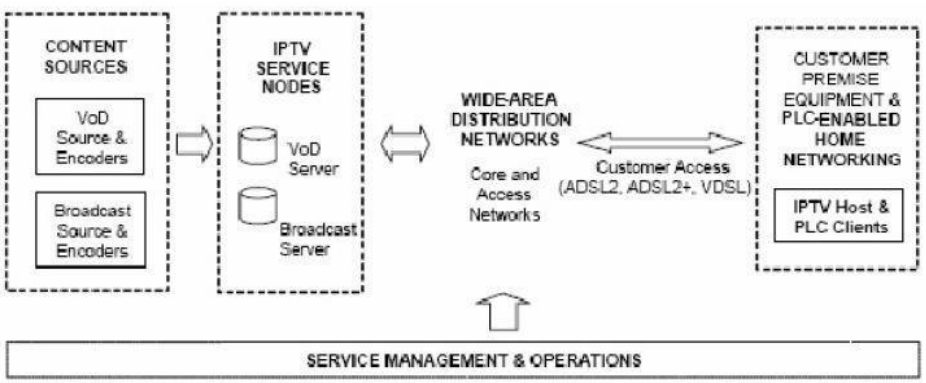

Fig 1. IPTV Architecture

B. Mobile IPTV Architecture

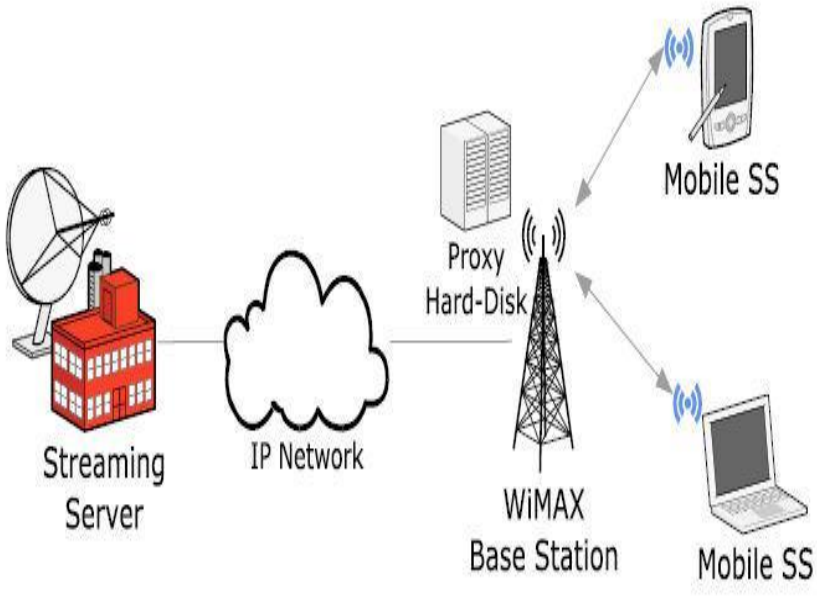

Fig 2.Mobile IPTV Architecture

As shown in Fig 2 , the system architecture consists of four roles: streaming server, WiMAX base station,

proxy hard-disk, and mobile SS. The functions of these roles are described below.

1. *Streaming server:* It recieves the data from producer and Sends encoded media streaming to base-station or mobile SS.

2. *WiMAX base station:* Schedules bandwidth and allocates channels for channel or video which the user requests.

3. *Proxy hard-disk:* Stores all streaming media sent from streaming server. While it can offer video on demand and real-time IPTV service at the same time.When user requests for channel, base station can get content from nearby proxy hard-disk to reduce IPTV channel switching time.

4. *Mobile SS:* Sends request for channel selected by the user and switches multicast group between channels to fetch streaming.

II. CHANNEL SWITCHING IN IPTV

Consider this scenario, a user is watching channel #1 and after a while he changes to some channel #2. Between pressing the switching button on the remote controller and the time it takes for the monitor to display the channel #2, the following events occur[4-6]:

(1) Streaming encoding and decoding
(2) Channel zapping time
(3) Channel switching algorithm
(4) Quality of experience (QoE)

A. *Channel zapping time*

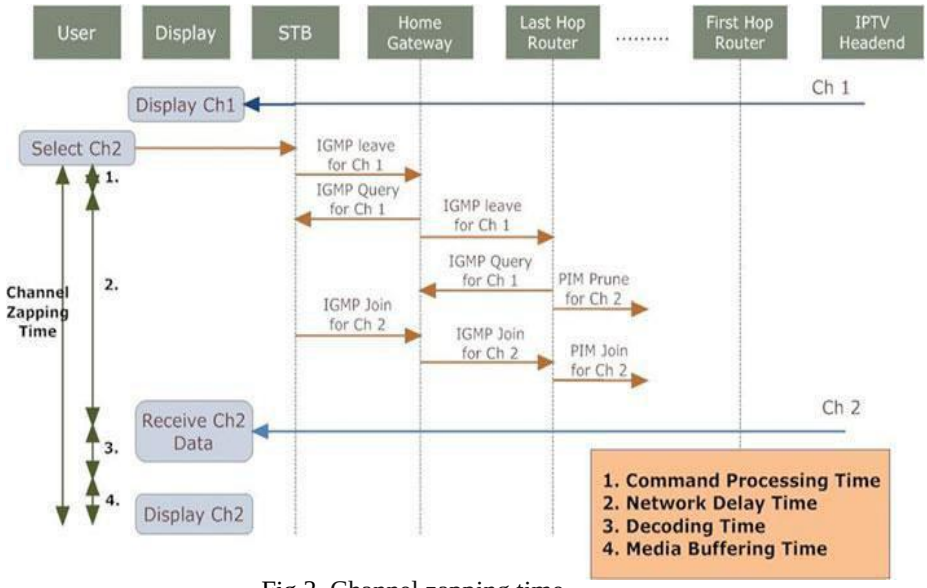

Fig 3. Channel zapping time

Channel zapping time consists of four major time durations as shown in Fig 3 :

1 Command processing time
2 Network delay time
3 Decoding time
4 Media buffering time

The decoding time and media buffering time cannot directly improve the channel zapping time.For reducing IPTV channel zapping time, the main ideas are IPTV channel zapping pre-load and fast streaming encoding/decoding. Preload channels adjacent to the servicing channel. For example, when viewer requests channel n, channels n – 2, n – 1, n + 1, n + 2 will be preloaded at the same time.While viewer does up/down operations of changing IPTV channels, the predicted channels will be caught and transferred to the viewer immediately. However, if viewers switch channels randomly, the average channel zapping time will increase.The solution is to set highest priority to reduce packet-scheduling delay and furthermore reduce channel-zapping time. Because of base station periodically allocates fixed bandwidth for USG data flow. In the duration of allocating USG bandwidth if there is no change in channel, the utility rate of bandwidth will decrease. Video decoding delay can be efficiently decreased by adding extra I-frames to normal video frames.The concurrent consideration of both broadcasting channel distribution state and video encoding structure as control variables to effectively guarantee channel zapping time.The researchers have the same pre-assumptions that all channels are sequentially arranged, and viewers can only do up/down channel-changing operations.However, these assumptions do not realistically model viewers' channel surfing behaviors. In general, viewers have preferences, such as hot-view channels and favorite channels, and the operations of channel changing are not only up/down operations, but also jump channels.

B. Hot-view channel list and Personality-favorite channel list

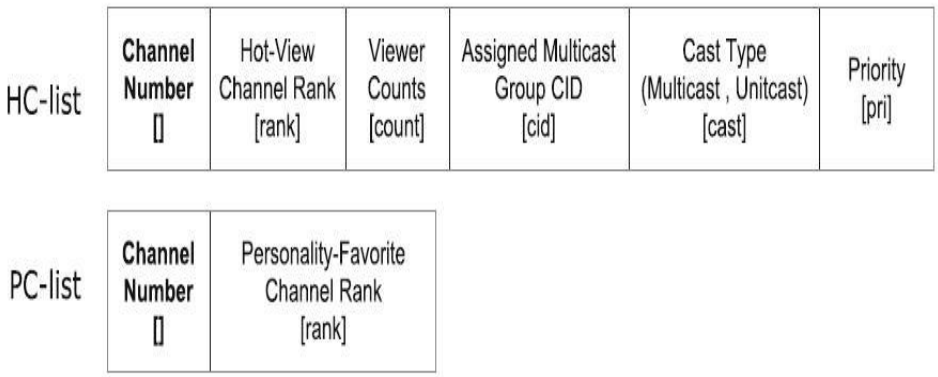

Fig 4. Hot-view channel list and Personality-favorite channel list

Fig 4. shows the primary parameters for the proposed system, hot-view channel list (HC-list), and personality-favorite channel list (PC-list). HC-list contains all the channels and is sorted by viewer counts.The viewer selects their own PC-list, and sends the list to the base station for preload .HC-list is maintained by the base station, and the base station resorts the list by accumulating count of viewers.In addition, in every time unit (perhaps 30 or 60 min), HC-list records rankings for every channel. According to the ranking on the HC-list, we can preload hot-view channels to proxy hard disk in advance. So far, with the preloading in proxy hard-disk according to HC-list and PC-list, we can reduce IPTV channel zapping time and keep bandwidth allocation effectively.

C. Programming guide with ranking

In IPTV, the design of the program guide is very important. For example If we take the Program guide for 1-day duration. If we set time duration as the rows, and channel lists as the columns, we get a full table as ranking list over 1 day, as shown in figure above. The ranking means that at specific time duration, the list ranks for all channels.For example, if the system time is 10:15 now, the ranking for channel 3 is 4th, and channel 4 is 9th.As a result, the system ranking is changing with respect to time.

time \ channel	1 TVBS-N	2 CNN	3 SETN	4 Discovery	.....	98 HBO	99 AXN	100 CINEMAX
08:00 ~ 09:00	23	25	1	4	.....	44	22	6
09:00 ~ 10:00	21	2	23	71	.....	24	1	29
10:00 ~ 11:00	19	1	4	9	.....	19	29	33
~	~	~	~	~	~	~	~	~
21:00 ~ 22:00	22	33	14	29	.....	4	1	39
22:00 ~ 23:00	3	4	29	20	.....	55	42	87
23:00 ~ 24:00	3	4	99	23	.....	55	66	24

Fig 5. Channel ranking

III. QUALITY OF EXPERIENCE (QOE)

A. Accurate channel preloading rate

IPTV channel switch time is impacted by the Accurate channel preloading rate. The proposed method is compared with adjacent channel preload method [9].

Fig 6. shows that proposed channel preload method is better than the adjacent channel preload method. As number of viewers increases, channel preload method becomes more accurate Because of more user activity can increase predict accurate rate.

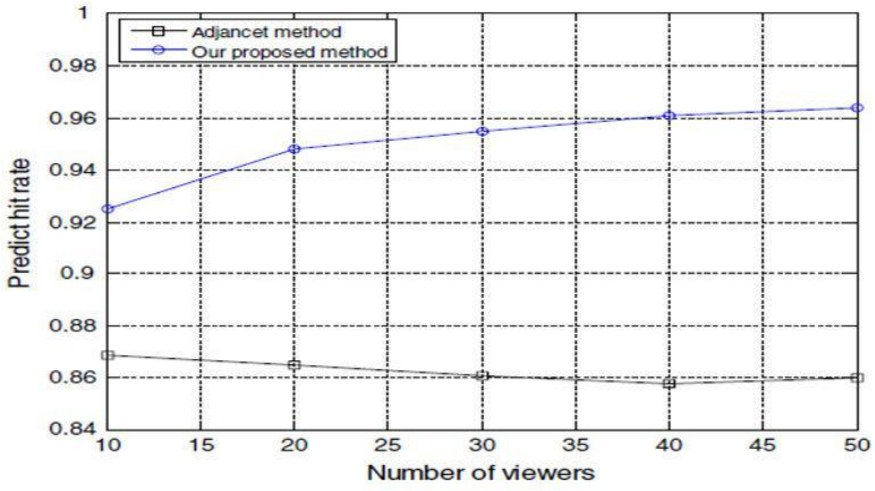

Fig 6. Channel preloading rate

A. Channel switch delay time

Channel switch delay time is among the most important factors of QoE. Therefore, it is important to reduce the delay time. Channel switch time has a direct impact on channel preload predict rate. Better channel preload predict rate will reduce the channel switch delay time. Fig 7. shows that we Have shorter delay time in proposed method

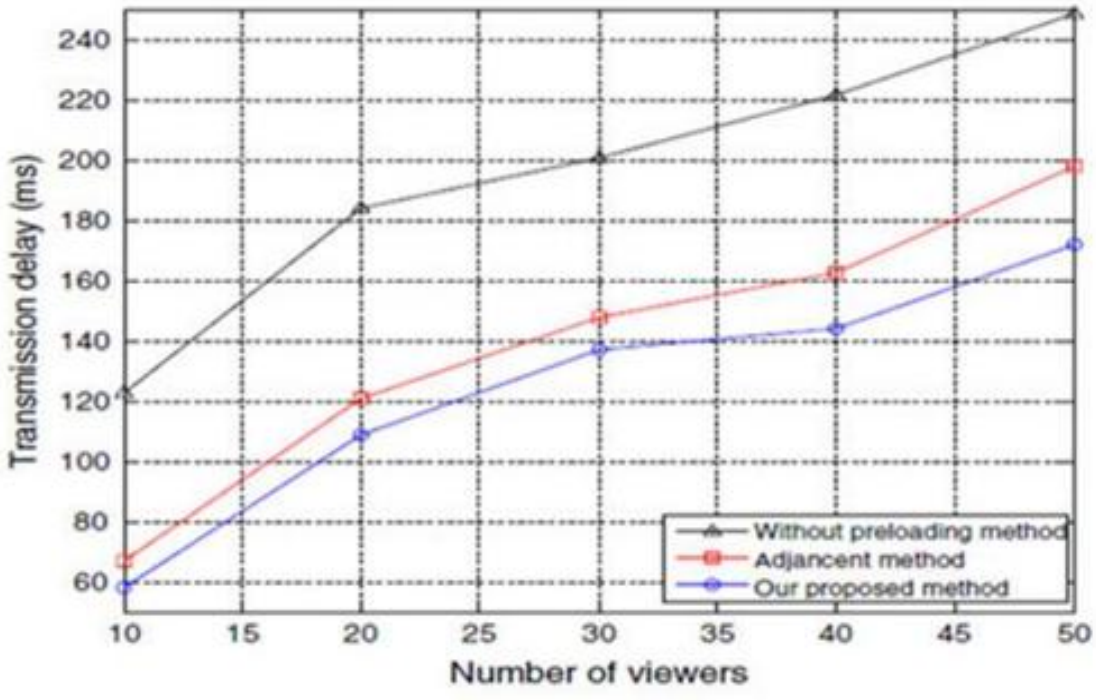

Fig 7. Channel switch delay time

C. Jitter

Jitter is another important factor of QoE. If networks speed is low, then users will experience a worse video fragment. Because of that packets losses and heavy delay will occur. Fig 8. shows that proposed method gives better results.

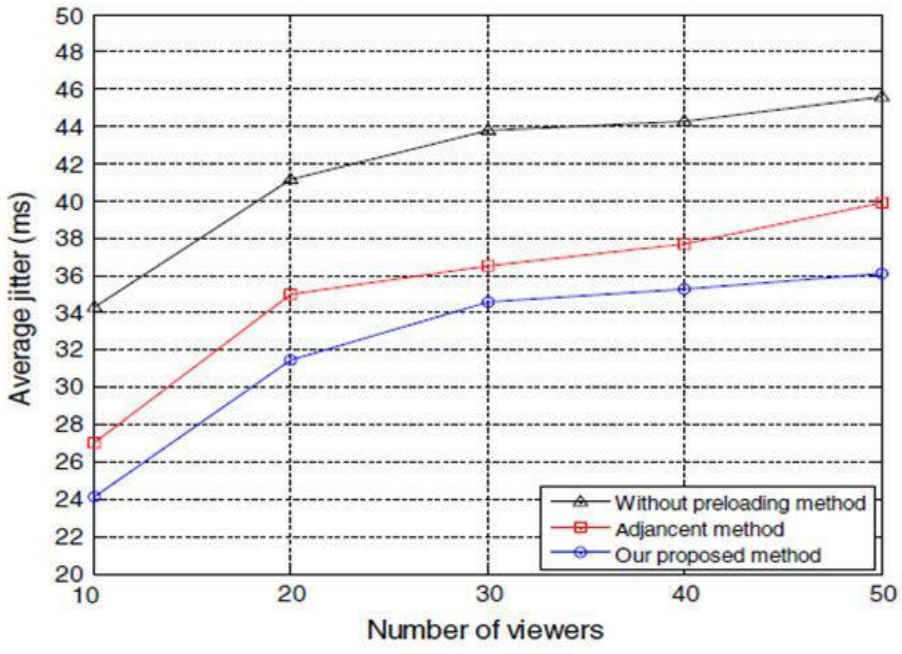

Fig 8. Jitter

IV. CONCLUSIONS

This paper describes the architecture of IPTV using Set top box and in mobile devices by using Wi-MAX base station.The proposed method uses the Hot-view channel and Personal favorite channel preloading to reduce the delay in channel switching. The preloading of channel consumes Bandwidth,So the speed of the internet is the major factor.In case the viewer presses some random channel,which does not belongs to both Hot-view channel and Personal favorite channel then this system fails to improve the channel switching time.

.REFERENCES

[1] *B. O. Obele, S. H. Han, J. K. Choi, and M. Kang, "On building a successful IPTV business model based on personalized IPTV content & services," 2009 9th International Symposium on Communications and Information Technology, 2009.*

[2] *Y. Xiao, X. Du, J. Zhang, F. Hu, and S. Guizani, "Internet Protocol Television (IPTV): The Killer Application for the Next-Generation Internet," IEEE Communications Magazine, vol. 45, no. 11, pp. 126–134,2007.*

[3] *H. Joo, C. Yoon, T.-W. Um, and H. Song, "A novel fountain code-based mobile IPTV multicast system architecture over WiMAX network," J. Vis. Commun. Image R., vol. 23, no. 1, pp. 161-172, Jan. 2012.*

[4] *J. She, F. Hou, P. H. Ho, and L. L. Xie, "IPTV over WiMAX: Key success factors, challenges, and solutions," IEEE Commun. Mag., vol. 45, no. 8, pp.87-93, Aug. 2007.*

[5] *S. Park, S.-H. Jeong, and C. Hwang, "Mobile IPTV expanding the value of IPTV," in Proc. IEEE ICN 2008, Apr. 13-18, 2008, pp. 296-301.*

[6] *Sheng-Tzong Cheng, Chih-Lun Chou, Gwo-Jiun Horng* and Tun-Yu Chang,"Fast IPTV channel switching using hot-view and personalized channel preload over IEEE 802.16e"*

[7] *Matej Kren, Andrej Kos, Senior Member, IEEE, Yuan Zhang, Senior Member, IEEE, Anton Kos,Member, IEEE, and Urban Sedlar, Member, IEEE," Public Interest Analysis Based on Implicit Feedback of IPTV Users"*

[8] *M. Sadiku and S. Nelatury, "IPTV: An alternative to traditional cable and satellite television," IEEE Potentials, vol. 30, no. 4, pp. 44–46, 2011.*

[9] *Pooja Kumari, Puneet Rani, "A Comprehensive Survey on Internet Protocol Television (IPTV)", International Journal Of Engineering And Computer Science ISSN:2319-7242 Volume 4 Issue 6 June 2015, Page No. 12391-12394*

[10] *C Chunglae, H Intak, J Yongil, L Hyeongho, Improvement of channel zapping time in IPTV services using the adjacent groups join-leave method.The 6th International Conference on Advanced Communication Technology2, 971–975 (2004)*

