# An Efficient infrastructure, Facilitate to reduce buffering time and live video streaming in the Cloud Environment for Mobile Networks

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***Abstract*-The video traffic over mobile networks have been increasing enormously but the wireless link capacity cannot keep up with traffic. This gap results in poor service quality of video streaming over mobile networks. Leveraging cloud computing technology into mobile networks, In this paper we propose the new video streaming framework which has the two main part EMVS(Efficient Mobile Video Streaming) and EMVS(Efficient Mobile Video Sharing) . This enables video streaming and sharing in Cloud Environment for Mobile devices. In EMVS, there is a combination of adaptability and scalability features. So that it provides efficient utilization of bandwidth. Likewise EMVS provides efficient social video sharing by use of same combination of features. So that user experiences continuous flow of video streaming by decrease of buffering. In this paper we can able to apply a new framework model to illustrate significant development in terms of lesser loss rate, decrease delay and buffering time.**

**Keywords: Scalable video coding, Adaptive video streaming, Mobile networks, social sharing, Cloud computing.**

## I. INTRODUCTION

Recently, most of mobile network operators are facing a serious challenge due to mobile data (especially video traffic) explosion. While video streaming services become more crucial for mobile users, their traffic may often exceed the bandwidth capacity of cellular networks. The wireless connection service not basically holds up with the rising traffic demand. While receiving the video streaming traffic through 3G or 4G mobile wireless networks, mobile users conventionally getting the lengthy buffering period and perturbances due to the less bandwidth and link condition damages caused by multi-path fading and utilizer mobility. Thus, it is paramount to enhance the accommodation quality of mobile video streaming while utilizing the networking and computing resources efficiently. Recently there have been many discussions on how to enhance the accommodation quality of mobile video streaming on two aspects:

Scalability: In a Mobile network video streaming accommodations should fortify a wide range of mobile contrivances; they may have different video resolutions, different manipulating potencies, different wireless links (like 3G, 4G and LTE) etc. Also, the present link capacity of a mobile device may vary over time and space depending on its signal vigor and bandwidth. To address this issue, the Scalable Video Coding (SVC) methodology of the H.264 AVC video compression standard describes a base layer (BL) with multiple enhance layers (EL).These sub streams can be encoded by exploiting three scalability features: (i) spatial scalability by reducing image resolution (screen pixels), (ii) temporal scalability by minimizing the frame rate, and (iii) quality scalability by reducing the image compression. By means of the Scalable Video Coding, a video can be decoded/ played at the less quality if only the BL is distributed. Anyhow, the more EL can be distributed, the superior quality of the video is streamed.

Adaptability: The video streaming techniques structured by considering relatively stable traffic links between servers and Client (users), perform poorly in mobile contrivances on environments. Thus the quandaries on wireless link status should be felicitously dealt with to distribute the „tolerable" video streaming accommodations. To address this quandary, we have to adjust the video bit rate acclimating to the currently time-varying available link bandwidth of each mobile device utilizer. Such adaptive streaming methodology can efficaciously reduce packet losses and bandwidth wastes. Scalable video coding and adaptive streaming methodology can be amalgamated to accomplish efficaciously the more preponderant possible quality of video streaming accommodations. That is, we can regulate the number of SVC layers depending on the current link status dynamically.

## II. PROBLEM STATEMENT

### A. Existing System

The SVC extension of H.264/AVC is suitable for video conferencing as well as for mobile to high-definition broadcast and professional editing applications. Storing the different versions (with different bit rates) of the same video content may incur high overhead in terms of storage and communication. To overcome from this problem, the Scalable Video Coding (SVC) technique of the H.264 compression of video standard defines a base layer (BL) with multiple enhance layers (ELs). These sub-streams can be encoded by exploiting three scalability features: (i) spatial scalability by layering image resolution (pixels of screen), (ii) temporal scalability by layering the frame rate, and (iii) quality scalability by layering the compression of image. By this scalable video coding, a video can be played at the lowest quality if only the BL is transmitted. However, the more ELs can be transmitted. By this best quality of the video stream is accomplished. In the existing system when user types a URL in mobile browsers, it lets user to navigate to the respective page and if that page has an embedded video in the URL it starts streaming using the mobile network whether (WI-FI, GPRS) and based on the strength of the signal it keep on streaming as well as playing. If the resolution is HD or high it will take time to stream and play in that case user gets paused till it stream and play. In the mentioned situation it has time delay to watch the video which user has requested. This technology has several advantages and disadvantages. Some of the disadvantages are it always uses the maximum link capacity for video streaming and it cannot control the resolution. In case of weak signal user gets paused on the screen till video streams so cannot maintain constancy also in the video streaming

### B. Proposed System

In this system an adaptive video streaming and efficient social video sharing framework for mobile users by keeping above objectives in mind, dubbed AMES-Cloud. AMES-Cloud creates a private agent for each of the mobile user in cloud environments, which is used by its two main parts: AMoV(adaptive mobile video streaming), and ESoV (efficient social video sharing). AMoV offers the best possible video streaming experiences by adaptively controlling the streaming bit rate depending on the fluctuation in the bandwidth. AMoV adjusts the bit rate for each mobile user leveraging the scalable video coding technique. The private agent of a mobile user keeps track of the feedback information on the status of link. Private agents of users are dynamically initiated and optimized in the cloud platform. Also the real-time scalable video coding is done on the cloud computing side efficiently. From the analysis of the SNS activities of mobile users, ESoV look for to provide a user with on the spot playing of video clips efficiently by the way of HTTP live streaming. The advantages of this proposed system takes care of maximum utilization of bandwidth. User never gets paused while watching video due to pre-fetching mechanism so streaming constancy is always maintained and also user can watch multiple videos together and framework will take care of resolution conversion.

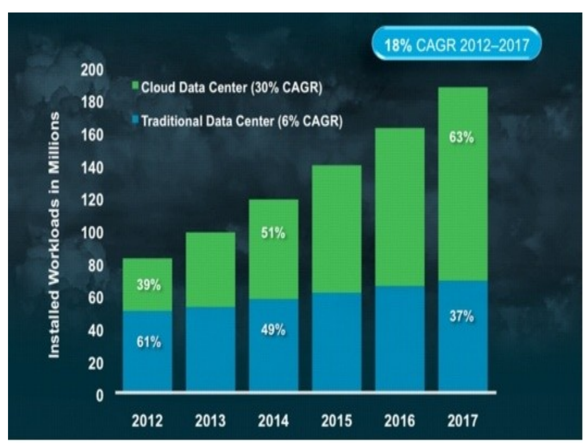
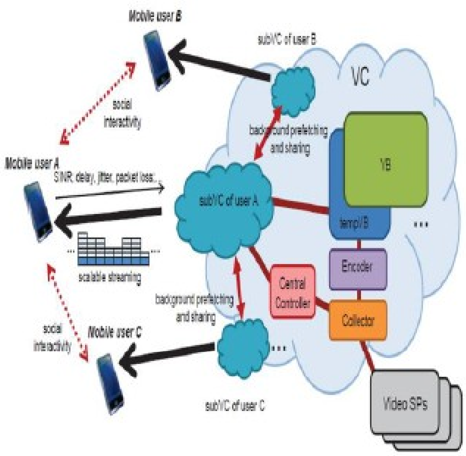



***Figure 1: Cloud framework usage growth periodically***

## III CLOUD FRAMEWORK

The cloud framework includes two parts: Adaptive Mobile Video streaming and Efficient Social Video sharing. The framework is as shown in Fig. 1




The whole video storing and streaming system in the cloud is called the Video Cloud (VC). In the VC, there is a large scale video base (VB), which stores the most of the popular video clips for the video Service Providers (VSPs). A temporal video base (tempVB) is used to store new candidates for the trendy videos, whereas tempVB calculates the access frequency of each video. The VC keeps running a collector to look for videos which are already popular in VSPs, and it will re-encode the gathered videos into SVC format and store into tempVB first. By this 2-tier storage, the Cloud can keep serving most of popular videos eternally. The management work will be handled by the controller in the VC. Specialized for each mobile user, a sub-video cloud (subVC) is created dynamically if there is any video streaming demand from the user. The sub-VC has a sub video base (subVB), which stores the recently fetched video segments.

The video distributions among the subVCs and the VC in most cases are authentically not "copy", but just "link" operations on the same file sempiternally within the cloud data center. There is additionally encoding function in subVC and if the mobile utilizer demands an incipient video, which is not in the subVB or the VB in VC, the subVC will obtain, encode and transfer the video. For the duration of video streaming, mobile users will always report link conditions to their corresponding subVCs, and then the subVCs offer adaptive video streams. Note that each mobile contrivance withal has an ephemeral caching storage, which is called local video base (localVB), and is utilized for buffering and pre-fetching.

## IV. COMPARATIVE STUDY ON VIDEO SHARING AND STREAMING METHODS

There are number of studies illustrating the video sharing and rendering in wireless devices and mobiles has been carried over the last decade. We Proposed idea of negotiation the bandwidth with service provider dynamically so to provide the QoS to the customer. The service conformity can also be dynamically as the negotiation of the service bandwidth changes dynamically. We have proposed novel method for dynamically managing the wireless network by observing the usage logs of the smart phone users and usage patterns of the customer under a particular service provider. This helps to recognize and allocates trustworthy resource for the customer as per their requested service.

We used TFRC – TCP friendly rate control for adaptively streaming videos over the wireless and mobile network. Which offers the analysis of data transfer over the devices in the network and load of the service is dynamically balanced as per the video service requests from the user. We constructed Future Internet Performance Architecture (FIPA), which provides new scheme for providing service over the internet to the customer based on their request. The architecture provide constant based for application oriented service through out the internet. The AMES cloud was built specifically to provide service of video sharing and streaming over the cloud. The user of the video service in cloud would be mobile users normally. The data rate and the QOS should not be affected in any way such as data disruption or low bandwidth etc. AMES offers protocol to be serviced to client and service provided to monitor and give the reliable service.

## V. STREAMING FLOW BY AMOV AND ESOV

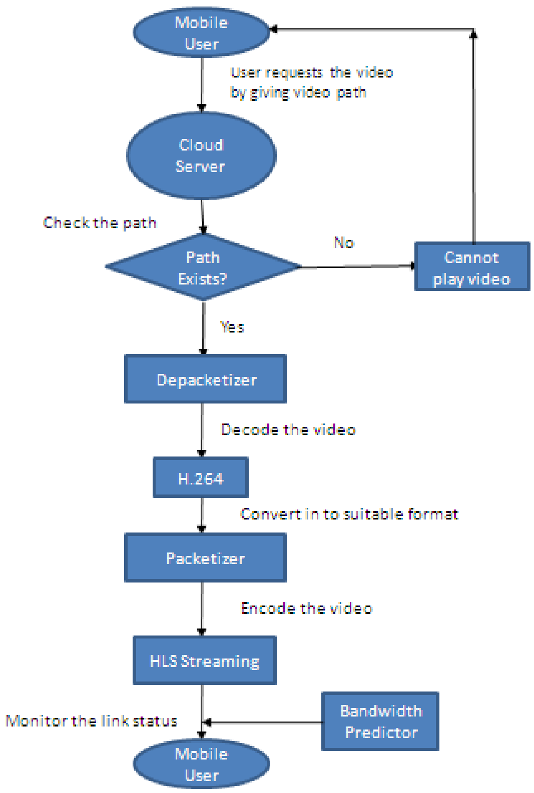



Figure 4. Working flow of video streaming

The two parts, adaptive mobile video streaming and Efficient social video sharing, in AMES-Cloud framework have tight connections and will together service the video sharing and streaming, they both stand on the cloud computing platform. First the mobile user requests the video which is presented in AMES-Cloud by sending video path in user's player. Cloud server checks the requested video path from the mobile user, it is existed or not, if it is not existed then it reports to user that cannot play video otherwise it decodes the video from AMES Cloud and encodes the video in to suitable format which is required at the user side using scalable video coding technique. By using HLS streaming it delivers the video packets in different bit rates to user by monitoring link status.

## VI. SCREEN SHOTS

**Fig.5 Sharing of video using Direct Recommendation, Public Sharing or Subscription**

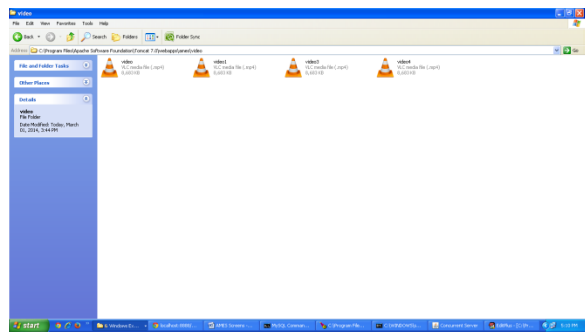


**Fig .6 Uploaded Videos are stored at cloud side**

**Fig .7 Server Side**

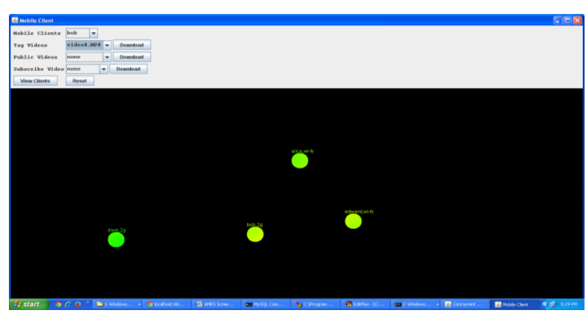


**Fig 8. Mobile Users with different networks (2g,3g or Wi-Fi)**

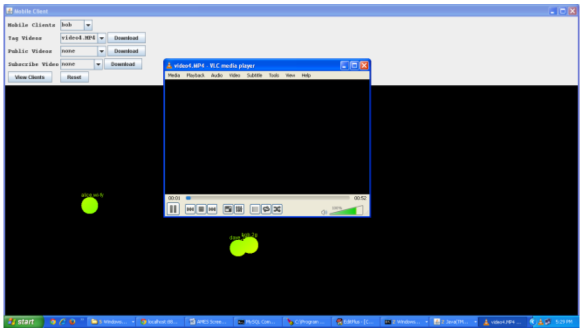


**Fig .9 after downloading the video with out buffering**

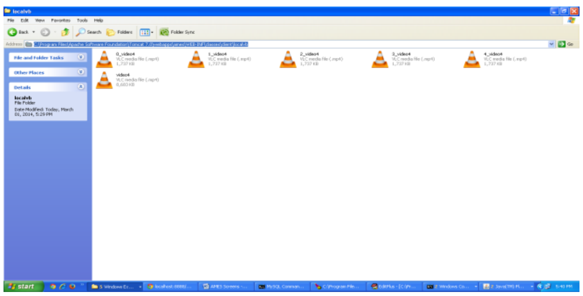


**Fig. 10 Local VB created for each mobile client**

## VII. CONCLUSION AND FUTURE WORK

Our proposal of the user behavior prediction based mobile video streaming and social video sharing which cost-effectively stores and gets back videos from the cloud to create private agent for lively mobile user try to watch "non-terminating" mobile video streaming by regulate based on the mobile user behavior. This computing system brings essential enhancement to the mobile adaptability and scalability. Concerning the potential work, we will carry out large-scale operation on energy and price cost on the basis of mobile users. Also we try to make bigger our framework with more concerns of safety measures and privacy. The focus of this paper is to authenticate how cloud computing can get better the transmission adaptability and prefetching mobile users. In addition, we will also try to improve the SNS-based pre-fetching, and security issues in the AMES-Cloud.

## VII.REFERENCES

[1] V. Sarangan, J. C. Chen, ―Comparative study of protocols for dynamic service negotiation in the next-generation Internet,‖ IEEE Commun. Mag., vol. 44, no. 3, pp. 151–159, Mar. 2006.

[2] L.Magalhaes, R.Kravets, ―MMTP—Multimedia multiplexing transport protocol,‖ in Proc. 1st ACM Workshop Data Communications in Latin America and the Caribbean, Apr. 2001.

[3] S. Fu, M. Atiquzzaman, ―SCTP: State of the art in research, products, and technical challenges,‖ IEEE Commun. Mag., vol. 42, no. 4, pp. 64–76, Apr. 2004.

[4] P. McDonagh, C. Vallati, A. Pande, and P. Mohapatra, "Quality-oriented scalable video delivery using H. 264 SVC on an LTE network," in Proc. WPMC, 2011.

[5] F. Wang, J. Liu, and M. Chen, "CALMS: Cloud-assisted live media streaming for globalized demands with time/region diversities," in Proc. IEEE INFOCOM, 2012, pp. 199–207.

[6] A. Zambelli, "IIS smooth streaming technical overview," Microsoft Corp., 2009.

[7] V. Singh and I. D. D. Curcio, "Rate adaptation for conversational 3G video," in Proc. IEEE INFOCOM Workshop, 2009, pp. 205–211.

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