Efficient and Adaptive Video Sharing in the Clouds

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Abstract: **Wireless communication changes the world an extent. Communication over the social networks has been increased as the mobile usage getting more. Hence respective technologies and software's also can be modulated. But incapability in integrating all these issues, finally poor service in the name of less performance. The better solutions for the mentioned issues are cloud technology. In this paper we attempted to develop a new mobile streaming framework called adaptive mobile video streaming increases the efficiency of social video sharing and also monitoring activities of users.**

Key words: **Cloud, mobile networks, Scalable Video Coding, Adaptive Video Streaming.**

1. INTRODUCTION

As the usage of video data over the years has increased, the management of resources supporting the video data service has to be monitored and extended for providing a reliable service. The trend in the technology changes as per the needs of the users. Users are comfortable with the mobile and portable devices than stationary hosts. The problem with providing service to the mobile device, user is unavailability to service reaching the user in constant range. Since the location of the user changes every second of the time, the bandwidth of their network also changes constantly due to various reason and main reason would be change in location. Providing quality oriented service to the mobile users are far difficult than to wired users. The mobile devices which works under mobile network follows and entirely different path in providing service to its users. The main issues faced during the study of video streaming and sharing achieved in mobile users under cloud environment are high traffic rate, long buffering time, and disruption due to limited bandwidth. The study shows the usage of video or any kind of multimedia has increased over the period of years, many issues had occurred and resolved through various techniques during the traditional change happened between emerging technologies.

2. LITERARTURE SURVEY

Over the past decade, increasingly more traffic is accounted by video streaming and downloading. In particular, video streaming services over mobile networks have become prevalent over the past few years. While the video streaming is not so challenging in wired networks, mobile networks have been suffering from video traffic transmissions over scarce bandwidth of wireless links. Despite network operators' desperate efforts to enhance the wireless link bandwidth (e.g., 3G and LTE), soaring video traffic demands from mobile users are rapidly overwhelming the wireless link capacity. While receiving video streaming traffic via 3G/4G mobile networks, mobile users often suffer from long buffering time and intermittent disruptions due to the limited bandwidth and link condition fluctuation caused by multi-path fading and user mobility. It is crucial to improve the service quality of mobile video streaming while using the networking and computing resources efficiently.

The recent research shows that , various services are provided by the service provider to the customer , the question is whether the services that are provided is of any good? Whether the customers expected quality of services is met? Since there are number of service providers are available in the market. Each of them race to satisfy the customer's expectation so as to keep the business [14, 1]. In order to achieve that, issues that are mentioned above, which describes the factors which degrades the quality of services provided while streaming video and sharing video content over the network has to be considered and optimal solution has to be provided so as the quality of the services are maintained at all times, even when a user uses mobile devices. There are number of studies show the video sharing and rendering in wireless devices and mobiles has been carried over the last decade. Juan Carlos Fernandez et al has proposed idea of negotiation the bandwidth with service provider dynamically so to provide the QoS to the customer.

The service agreement can also be dynamically as the negotiation of the service bandwidth changes dynamically. Joon-Myung Kang et al and Sin-seok Seo et al 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 understand and

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allocates reliable resource for the customer as per their requested service. Guenther Liebl et al used TFRC – TCP friendly rate control for adaptively streaming videos over the wireless and mobile network. Which provides 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. Prasad Calyam et al have 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 stable based for application oriented service over 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 most of the time. be affected in any way such as data disruption or low bandwidth etc. AMES provides protocol to be serviced to client and service provided to monitor and give the reliable service.

3. RELATED WORK

To improve the service quality of mobile video streaming on two aspects: Scalability: Mobile video streaming services should support a wide spectrum of mobile devices; they have different video resolutions, different computing powers, different wireless links (like 3G and LTE) and so on. Adaptability: To address this issue, we have to adjust the video bit rate adapting to the currently time-varying available link bandwidth of each mobile user. Such adaptive streaming techniques can effectively reduce packet losses and bandwidth waste. We propose an adaptive mobile video streaming and sharing framework, called AMES-Cloud, which efficiently stores videos in the clouds (VC), and utilizes cloud computing to construct private agent (subVC) for each mobile user to try to offer "non-terminating" video streaming adapting to the fluctuation of link quality based on the Scalable Video Coding technique. Also AMES-Cloud can further seek to provide "non buffering" experience of video streaming by background pushing functions among the VB, sub VBs and local VB of mobile users. We evaluated the AMES-Cloud by prototype implementation and shows that the cloud computing technique brings significant improvement on the adaptively of the mobile streaming. We ignored the cost of encoding workload in the cloud while implementing the prototype. More and more people pay attention to cloud computing. Cloud computing is efficient and scalable but maintaining the stability of processing so many jobs in the cloud computing environment is a very complex problem in adaptive video streaming with social network. Since scalability and adaptability is not predictable and the base layer in the cloud differs, for efficient video streaming, workload control is crucial to improve system performance and maintain Stability. Adaptive Mobile Video Streaming depending on whether the system dynamics are important can be either static or dynamic. Static schemes do not use the system information and are less complex while dynamic schemes will bring additional costs for the system but can change as the system status changes.

4. FRAME WORK

As shown in Figure 1, the whole video storing and streaming system in the cloud is called the AMES Cloud. In the AMES Cloud adaptive video streaming and scalable video coding techniques are used. First in adaptive video streaming HLS [HTTP live streaming] protocol is used. Based on the request of particular video from the user it converts video in to different bit rates by dividing video streams. Each bit rate of video streams is saved in .TS files extension. All of the .TS files are saved in M3V8 format. M3V8 is the text file containing all the .TS files extensions. It can deliver the video packets to user based on the bandwidth status. It adjusts the bit rate when there is fluctuation or any disruptions in the link. If there is vary in link status it delivers particular bitrates to user so that packet loss is avoided and video quality is not changed. One more added advantage is that it uses TCP, it can get back the video packet by requesting to server which packet is lost while transferring to user. So that loss of packet is fully avoided thus user can get best quality of video streaming.

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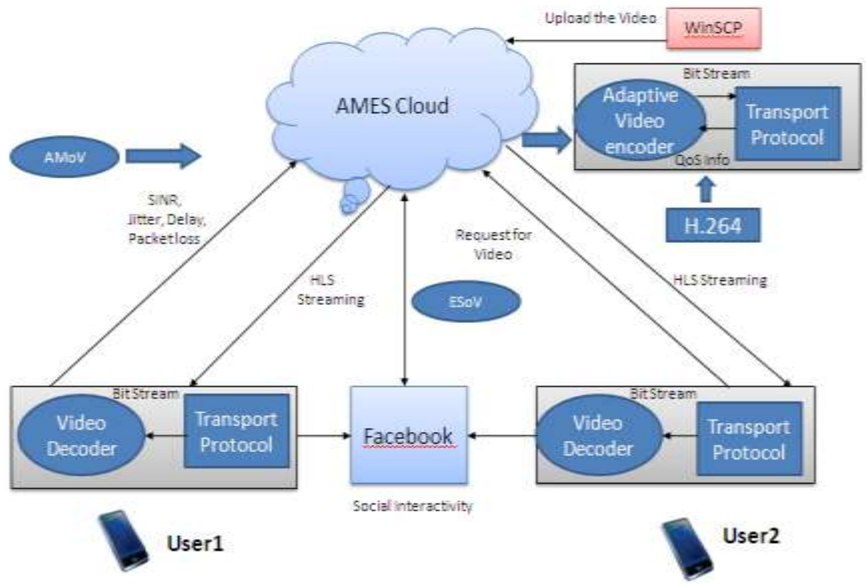

Figure 1.Cloud framework.

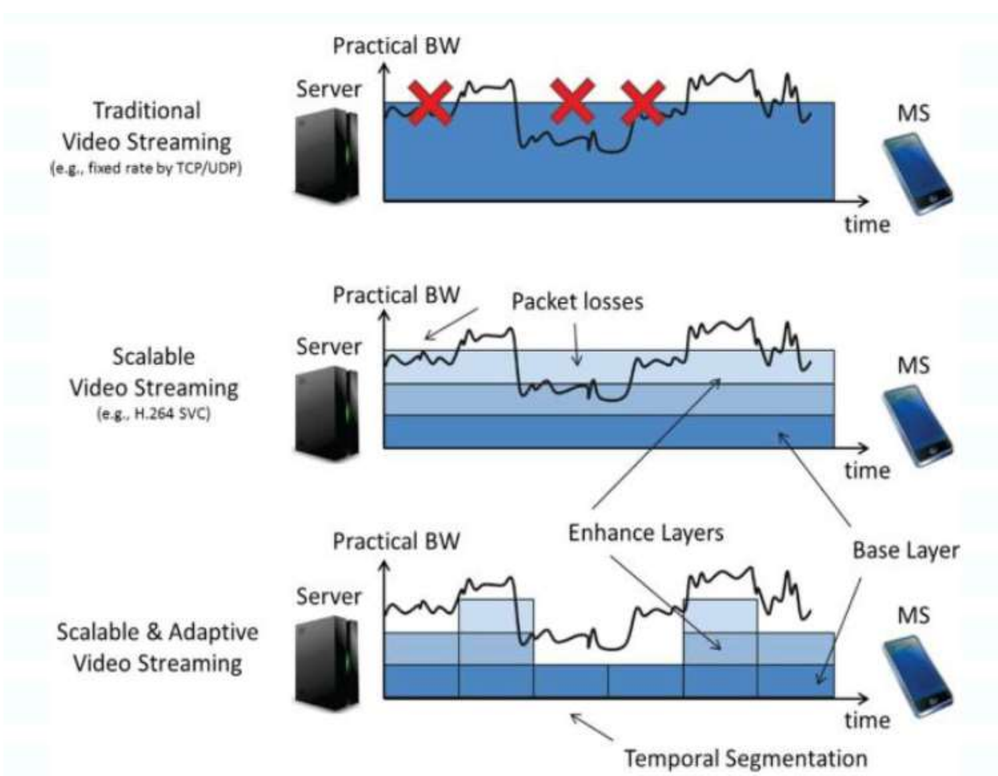

Figure 2. A comparison of the streaming methods

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The advantages of this proposed system takes care of maximum utilization of bandwidth. User never gets paused while watching video due to prefetching mechanism so streaming constancy is always maintained and also user can watch multiple videos together and framework will take care of resolution conversion. Another technique is scalable video coding, for each user their screen sizes are different in their mobiles. Based on the users screen size video is decoded from AMES cloud and it encodes the video and transfers to mobile user. It uses session description protocol [SDP] first it checks the bandwidth status of user mobile, how much frames he can receives per second. Based on the link status cloud server deliver the encoded video streams to mobile user. Though first time buffers will happen because SDP checks link status but later without buffering it transfers the video packets to user so that user experiences continuous flow of video streaming. Here users can share the video present in AMES cloud to his or her friends by public posting of video path to cloud in their timelines or he or she can just send a video path of the cloud server to his or her friends in the form of message. Another concept we adapted here is live streaming, Users can record the video in one mobile lively and his or her friends can watch the video in other mobile by sending live recording video path using cloud. V.

In Scalable video coding, a combination of the three layer scalability is called the Base Layer (BL) while the enhanced combinations are called Enhancement Layers (ELs). To this regard, if base layer is guaranteed to be delivered, while more enhancement layers can be also obtained when the link status cannot change, thus a better video quality can be expected.

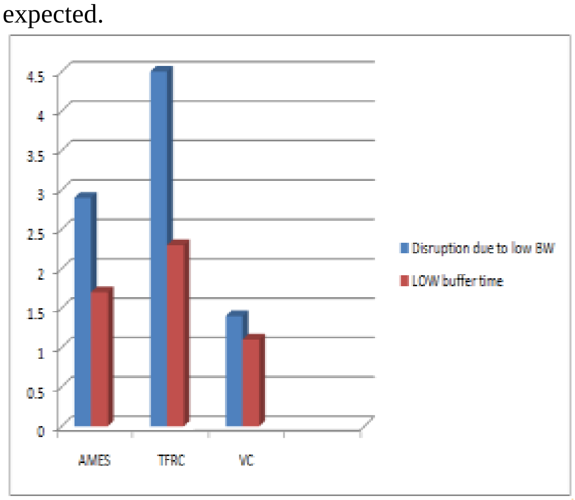

Figure 3. Comparison of performance

5. CONCLUSION

Scalable video coding and adaptive streaming techniques can be jointly combined to accomplish effectively the best possible quality of video streaming services. This can dynamically adjust the number of SVC layers depending on the current link status. This Proposed System will reduce the traffic and it will provide the maximum utilization of the bandwidth capacity thus User can seamlessly enjoy the video streaming over weak or strong signal of (WI-FI/GPRS) without buffering. Users can also efficiently share or view the video in social networks without any disruptions or any long buffering delay. The focus of this paper is to verify how cloud computing can improve the transmission adaptability and perfecting for mobile users. We ignored the cost of encoding workload in the cloud while implementing the prototype. As one important future work, we will carry out large-scale implementation and with serious consideration on energy and price cost. In the future, we will also try to improve the SNS-based prefetching, and security issues in the AMES-Cloud.

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