A Framework of Video Bit-Stream Scalability and Efficient, Secure Social Video Sharing in the Clouds

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Abstract-- Social interaction among mobile networks increases day by day. Global mobile data traffic grew 81 percent in 2013. While hassle on video traffic over mobile networks results in reduced service excellence of video streaming over cell phone like as lengthy buffering time and blinking disturbance. By introducing cloud computing technology, we propose a new video streaming framework, dubbed VBES-Cloud, which has two main parts: VBS (video bit-stream scalability) and ESoV (efficient, secure social video sharing). VBS and ESoV construct a private agent to provide video streaming services efficiently for each mobile user. For a given user, VBS lets her private agent adaptively adjust her streaming flow with a scalable video coding technique based on the feedback of link quality. Likewise, As well, ESoV observes the social network acquaintances among mobile clients and their personal mediators try to share video pleased in advance and the robustness is achieved through combining proven security measures, namely shared keys based on passwords security methods. It is used to secure social network transmissions. We implement a prototype of the VBES-Cloud framework to demonstrate its performance. It is shown that the confidential agents in the clouds can effectively provide the adaptive streaming, and perform video sharing, security based on the social network analysis.

Keywords—*Mobile Networks, Video Bit-Stream Scalability, SVC, Cloud Computing;*

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I. Introduction

Mobile video sharing is sprouting like crazy across the social media. Network traffic is growing by videos uploading and downloading from the precedent decagon [1]. Video sharing is not so formi-dable in wired networks, but in mobile networks have been anguish from video traffic transmissions because of limited bandwidth of wireless links. Therefore, it is important to improve the fine-tune quality of mobile video streaming in the networking and computing speed effectively [2]–[5]. Based on the studies improve fine-tune quality of mobile video streaming on two approaches:

1. **Scalability**
2. **Adaptability**

Scalability: With the significant progress in video coding technologies [9]-[12] together with the rapid developments of network infrastructures as well as the exponential growth in storage capacity and computing power, an increasing number of video applications employed a variety of transmission and storage systems that have been widely used in our daily life. Among these applications, video signals could be transmitted over wired/wireless channels with variable bandwidth. To deal with this, the Scalable Video Coding (SVC) technique (Annex G extension) of the H.264 AVC video compression standard is used. Scalable video coding involves generating a coded representation (bit-stream) that allows decoding of appropriate subsets to reconstruct complete pictures of resolution or quality commensurate with the proportion of the bit-stream decoded. Scalability types are (i) Spatial scalability involves generating two or more layers with different spatial resolutions from a single video source such that the base layer is coded by itself to provide the basic spatial resolution and the enhancement layer(s) employ the spatial interpolated base layer and carry higher or full spatial resolution of the video source. (ii) Temporal scalability involves partitioning of video frames into layers, in which the base layer is coded to provide the basic frame rate and the enhancement layer(s) is coded with temporal prediction with respect to the base layer. and (iii) quality scalability by layering the image compression. By a strong protection of lower layers, the connection will not be completely interrupted in the presence of transmission error and a base quality with graceful degradation can still be received.

Adaptability: could be displayed on a variety of devices, ranging from mobile phones with small screens to high-end systems with high-definition displays. In traditional video systems, it is always assumed that the bandwidth required by a video client will be guaranteed. An encoder just needs to compress the input video signal at a bit rate that is less than and close to the predefined bit rate, and the decoder reconstructs the video using all the bits received from the channel [9]. However, in latest video transmission over the Internet, it is almost not possible for the encoder to know the available bandwidth in advance. The video should be encoded over a bit rate range instead of a given bit rate. The conventional non-scalable video

coding cannot be used for this type of applications and this gives rise to the need to have a scalable video coding technology.

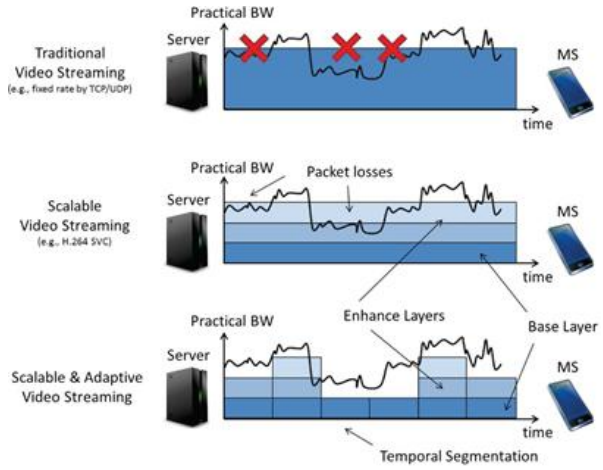

Fig. 1. A comparison of the traditional video sharing, the scalable video streaming of the VBES-Cloud framework.

In VBES, Cloud computing techniques are support to adjustable scalable assets to content providers, and process overloading to mobile users [13]–[16]. Many studies on mobile cloud computing technologies have suggested to develop especial astute agents for servicing mobile users, e.g., Cloudlet and Stratus. This is for, in the cloud, multiple agent threads can be maintained lively and effectively based on the time-varying user requirements.

Based on the observation of the SNS(social network services) activities of mobile users, ESoV pursue to provide a user with prompt playing of video clips by prefetching the video clips in prior from his private agent to the local storage of his device.

II. LITERATURE REVIEW

Early video compression international standards such as ITU-T H.261 and ISO/IEC MPEG-1 did not have any scalability mechanisms. This was due to the specific communication applications at that time, e.g. conversational services, did not require any scalable functionalities. ISO/IEC MPEG-2, which is identical to ITU-T H.262 [10], was the first general-purpose video compression standard that includes a number of tools providing scalability. The later video codec of the ISO/IEC MPEG-4 standard [12] provides even more flexible scalability tools within a more generic framework, especially the SNR scalability with fine granularity scalability (FGS) at the level of video objects providing a continuous scalability in which the enhancement bit-stream can be truncated into any number of bits within each frame.

Mainly two types of video bit-stream scalability techniques, based on incase the adaptivity is restrained by the client or the server. The Microsoft's Smooth Streaming is a live adaptive streaming work which can transform among various bit rate segments encoded with configurable bit rates and video resolutions at servers, while clients actively request videos depend on local observing of link quality. Adobe and Apple also build client-side HTTP adaptive live streaming results operating in the same manner. But the above mentioned solutions maintain multiple copies of the video service with various bit rates, which takes enormous burden of storage on the server.

III. PROPOSED APPROACH

We are introducing a video bit-stream scalability and efficient secure, social video sharing called VBES-Cloud, which effectively stores videos in the clouds (VC), and handles cloud computing to build up private agent (subVC) for every mobile user to try to deliver "non-terminating" video sharing adjusting to the variation of link quality depend on the Scalable Video Coding technique. Likewise VBES-Cloud can more explore to provide "non-buffering" reality of video streaming by background presuming functions among the VB, subVBs and localVB of mobile users. We figure out the VBES-Cloud by model implementation and shows that the cloud computing technique takes significant improvement on the adaptivity of the video streaming.

MODULES OF PROPOSED MODEL:

1. Admin Module
2. User1 Module
3. User2 Module

1. Admin Module: It is sub-divided into three segments, in order that are

a. Videos Uploading: In this Admin can add a new videos. Any user have chance to view videos uploaded by admin.

b. User Database: In this all user details are available who are registered in database. Admin have to chance to manage user details in the database.

c. Checking videos: May be some videos contain insecure data. In this part Admin have chance to accept or reject videos uploaded by the user. Which videos rejected by the admin can't show to anyone.

2. User1 Module: It is sub-divided into four segments, In order that are

a. News Feed: Like facebook news feed, in this also user have chance to see all updates of friends, and his/her messages or videos.

b. Search Friends: In this, user have chance to search any friends by entering his/her details. If search result is

found, user have chance to send friend request/view full details of friend.

c. Share Video: In this, user share videos to his friends with particular key. It is used for providing limited security to data transfer. Friend will get chance to view videos, by entering correct pin send by the user.

d. Update Details: In this user have chance to upload their images, contact details, and all other information. This is used to recognise by user friends.

3. User2 Module: In this module new user signup into social networks by adding their information like full name, contact details, personal details. After registration process completed, then only users will get chance to share or view videos/messages uploaded by his/her friends.

IV. RESULTS

Fig2 is Administrator component, in this administrator add new videos, see user details, accept/reject user videos. Fig3 is Registration component, in this new users create account, exiting user login to their accounts. Fig 4 is User component, in this user share videos, add friends, and view updates. Users can feel "non-buffering" in reality while playing videos. It is achieved by SVC.

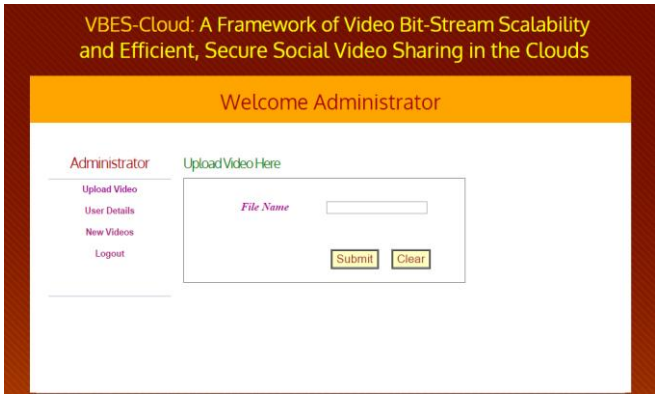

Fig 2: Administrator Window

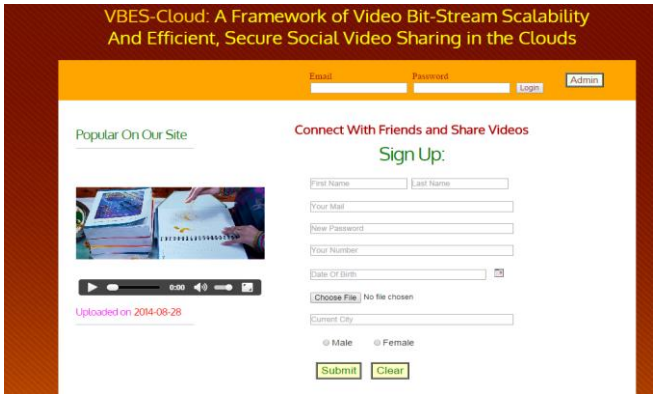

Fig 3: User Registration Window

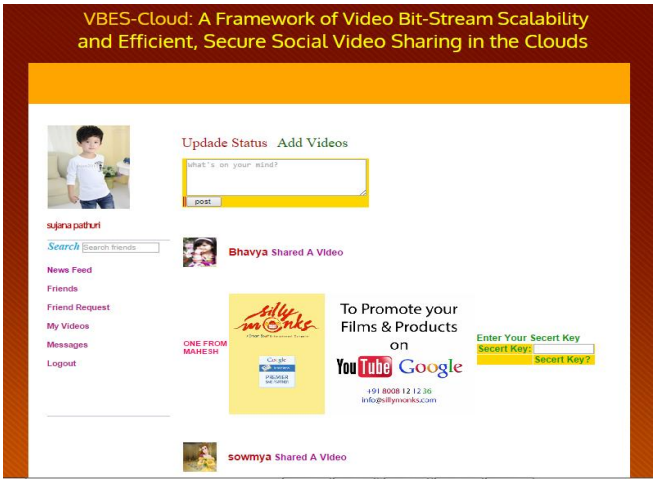

Fig 4: User Window

V. CONCLUSION

In this paper, we express about our application of video bit-stream scalability and efficient, secure social video sharing framework, called VBES-Cloud, which effectively delivers videos in the cloud (VC), and take advantage of cloud computing to build private agent (subVC) for individual mobile user to try to offer "non-terminating" video streaming adjusting to the variation of link quality based on the Scalable Video Coding technique. Also VBES-Cloud can more explore to provide "non-buffering" service of video sharing by background pushing functions among the VB, subVBs and localVB of smart devices users. We evaluated the VBES-Cloud by model implementation and shows that the cloud computing technique takes appreciable improvement on the adaptivity of the mobile streaming.

The concentration of this paper is to check how cloud computing can better the transmission adaptability and prefetching for videos streaming among mobile networks. But we less concentrated on the worth of encoding workload in the cloud while developing the prototype. Important future work continue with this paper is carry out large-scale implementation and with serious look at on energy and price. In next step, we will try to better the SNS-based prefetching, and more security aspects in the VBES-Cloud.

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