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A Survey on Modular Approach to Share Secure and Efficient Video Streaming over Cloud

Radha A. Mundhada
Department of Computer Science and Engineering
G.H Raisoni Institute of Engineering and Technology for Women
Nagpur, Maharashtra, India

Ms.Sapna S.Khapre
Assistant Professor, Department of Computer Science and Engineering
G.H Raisoni Institute of Engineering and Technology for Women
Nagpur, Maharashtra, India

Abstract-Over the past years, more traffic is increased due to different forms of video streaming anddownloading by the mobile users in their day to day life.The user request for videos throught the mobiles through their corresponding wireless links, this wireless links capacity failed be corporate with the traffic demand. As diference between traffic demand and link capacity increases, with link conditions, result poor quality service and sending data on this channel result in long buffering time .Hence,a mobile video streamingarchitechture of cloud is proposed, which has two main parts: AMoV (adaptive mobile video streaming) and ESoV(efficient social video sharing). AMoV and ESoV construct a private agent to provide video streaming services efficiently for each mobile user. Whereas,ESoV monitors the social network interactions among mobile users, and their private agents try to prefetch video content in advance.And,to these videos,data integrity and security are provided with help of RC5encryption and decryption algorithm. It is shown that the private agents which are constructed in clouds can effectively provide the adaptive streaming, and perform video sharing (i.e., prefetching) based on the social network analysis with high level security.

***IndexTerms*—**
AMOV,ESOV,RC5,livestreaming,cloudcomputing,adaptive video streaming.

1. INTRODUCTION:

Over the past decade, more traffic is increased due to different forms of video (TV, Internet, File sharing using P2P, Video on Demand –VOD etc.,) streaming and downloading by the mobile users in particular. Video streaming is not an issue in wired networks but wireless networks (mobile users) has been suffering from sharing of videos over limited bandwidth of links. Though 3G and LTE have been introduced to cope up with the bandwidth, the efforts re not successful due to rapid increase of mobile users. While receiving videos via 3G/4G mobile networks, users suffer from long buffering time to load video and interruptions due to limited bandwidth and link fluctuations. Thus, it is important to increase the quality of video streaming in mobiles using networking and computing resources effectively. The quality of mobile video streaming can be improved using two aspects:

Scalability: Video Streaming service must be compatible with multiple mobile devices having various video resolutions, computing powers, wireless links and so on. Capturing multiple bit rates of same video may increase the burden on servers in terms of storage and sharing. To resolve this issue, the Scalable Video Coding (SVC) technique has been introduced. SVC standardizes the encoding of a high-quality video bit stream contains one more subset bitstreams.

Adaptability:Traditional video streaming techniques designed by considering relatively stable traffic links between servers and users perform poorly in mobile environments .Thus the fluctuating wireless link status should be properly dealt with to provide 'tolerable" video streaming services. To address this issue, it has been 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. Cloud computing techniques are used to provide scalable resources to service providers to serve mobile users.

Hence, clouds are used for large scale real time video services. Social Network Services (SNS's) have occupied a major role recently. In SNS's user can share, comment, postthe videos among friends and groups. Users can follow their favorites' depending on their interest in which their followers are likely to watch popular person posts. E.g., Twitter, Facebook.

2. LITERATURE REVEIW:-

XiaofeiWang ,MinChen,, Ted Taekyoung Kwon, Laurenc Yang, and Victor C. M. Leung [1]proposed a new mobile video streaming framework, dubbed AMES-Cloud, which has two main parts: adaptive mobile video streaming (AMoV) and efficient social video sharing (ESoV). AMoV and ESoV construct a private agent to provide video streaming services efficiently for each mobile user. For a given user, AMoV lets her private agent adaptively adjust her streaming flow with a scalable video coding technique based on the feedback of link quality. Likewise, ESoV

monitors the social network interactions among mobile users, and their private agents try to prefetch video content in advance. They implemented a prototype of the AMES-Cloud framework to demonstrate its performance.

C. Narsimha Raju, GanugulaUmadevi, KannanSrinathan and C. V. Jawahar[2] proposed a computationally efficient and secure video encryption algorithm. This makes secure video encryption feasible for real-time applications without any extra dedicated hardware. They achieved computational efficiency by exploiting the frequently occurring patterns in the DCT coefficients of thevideo data. Computational complexity of the encryption is made proportional to the influence of the DCT coefficients on the visual content. On an average, algorithm takesonly 8.32ms of encryption time per frame

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Y. Fu, R. Hu, G. Tian, and Z. Wang[3] investigates the performance of TCP-Friendly Rate Control (TFRC) to control the transmission rate of scalable video streams when used in a mobile network. The streams are encoded using the Scalable Video Coding (SVC) extension of the H.264/AVC standard. Adding or removing the layers is decided based on the TFRC during varying channel conditions of the mobile network. They conducted simulations in various realistic use cases, evaluate and compare the performance with and without TFRC-based adaptation. The results show significant improvements in terms of lower loss rate, delay, required buffer size and less playback interruption.

M.Sona, D.Daniel, S.Vanitha, [4] proposed cloud VC and studied survey on different cloud for efficient video sharing and streaming Cloud environment.The Author's survey shows the functioning of various methods and architecture which used cloud to provide effective solution for providing better service to the users. AMES is cloud architecture built specially to provide video service to the user. The study has came up with a optimal solution, proposing with video cloud, which collects the video from video service providers and providing the reliable service to the user.

3.COMPARISION STUDY:

Table 1.comparision study.

SR NO	AUTHER NAME	PROPOSED WORK	ADVANTAGE & DISADVANTAGE
1	Xiaofei Wang , MinChen,, Ted Taekyoung Kwon, Laurenc Yang, and Victor C. M. Leung	A new mobile video streaming framework, dubbed AMES-Cloud, which has two main parts: adaptive mobile video streaming (AMoV) and efficient social video sharing (ESoV).	• offer "non-terminating" video streaming adaptingtothefluctuationoflinkquality, provide"non-buffering"experienceofvideostreaming. • It has high energy and price cost. • It has toimprove SNS-basedprefetching,and security issues in the AMES-Cloud.
2	C. Narsimha Raju, GanugulaUmadevi, KannanSrinathan and C. V. Jawahar	Computationally efficient and secure video encryption algorithm	• Acomputationally effi- cient,secure video encryption scheme. • It uses RC5 for encryption of the DCT coefficients. very fast, possesses good security and adds less overhead on the codec • To reduce the encrypted video size by modifying the default Huffman tables
3	Y. Fu, R. Hu, G. Tian, and Z. Wang	Investigates the performance of TCP-Friendly Rate Control (TFRC) to control the transmission rate of scalable video streams when used in a mobile network	• Adaptation capability of the SVC codecin conjunction with TFRC givesvideo streaming in mobile network. • It has to improve the adaptation algorithm and over joint adaptation case in future.
4	M.Sona, D.Daniel, S.Vanitha	Cloud VC and studied survey on different cloud for efficient video sharing and streaming Cloud environment	• Video cloud provides adaptive measure for video streaming using Vagent , provides video sharing among mobile users.

From the surveys it implies that for efficient video sharing and streaming Cloud environment AMES cloud is used.Thesurvey shows the working and functioning of various methods and architecture which used cloud to provide effective solution for providing better service to the users.The cloud framework of AMES includes two parts: Adaptive Mobile Video streaming and Efficient Social Video sharing. The framework is as shown in Fig. 1

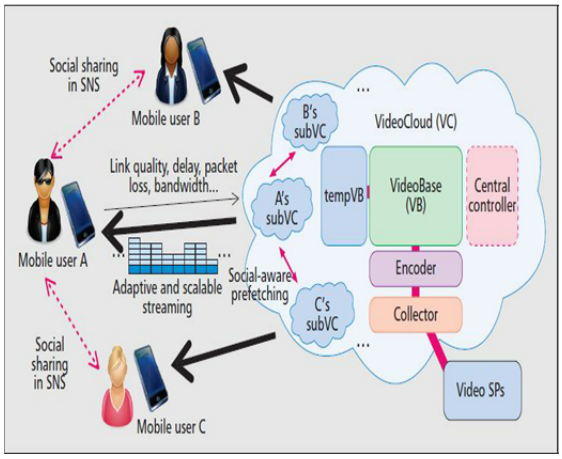

Fig 1 – Architechture of cloud.

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) and Temporal video base (tempVB) is used to cache new candidates for the popular videos, tempVB counts the access frequency of each video. The VC keeps running a collector to seek videos which are already popular in VSPs, and will re-encode the collected 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. During video streaming, mobile users will always report link conditions to their corresponding subVCs, and then the subVCs offer adaptive video streams.

4.PROPOSED SYSTEM:

In proposed system will use the two parts AMOV and EMOS of AMES cloud to perform video streaming and sharing effectively based on cloud computing platform.

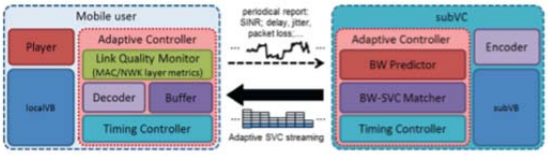

Fig 2: Functional structurure of mobile user and subVc.

AMOV and EMOS use private agents to achieve better quality video without any buffering and interruptions by prefetching the user interested videos.Themobile user andthesubVCwiththe structure as shown in Fig. 2 which give adaptability to mobile video. The link quality monitor at mobile client keeps tracking on metrics including signal strength, packet round-trip-time(RTT),jitter and packet loss with a certain duty cycle. And the client will periodically report to the subV and defined cycleperiod for calculating bandwidth of real video and estimated video with help of bandwidth matching algorithm..

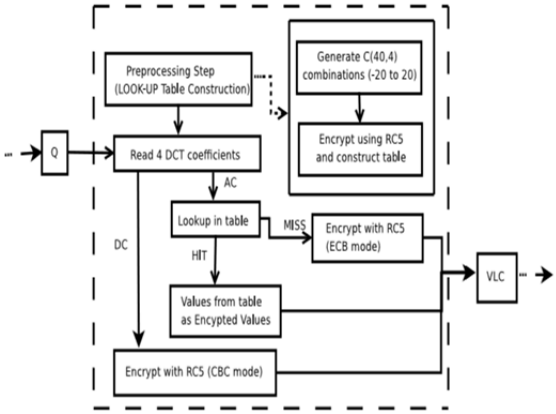

Fig 3: Block diagram of encryption algorithm.

On other hand,security and privacy issues of the transmitted data have become an important during streaming and storing video data over cloud .Here,a computationally efficient and secure video encryption algorithm is used which makes secure video encryption feasible for real-time applications without any extra dedicated hardware. It uses RC5 for encryption of the DCT coefficients. The proposed scheme is very fast, possesses good security and adds less overhead on the codec. It slightly decreases the compression rate of the video, which is negotiable for higher security.

5. CONCLUSION:

In this paper link capacity according to the traffic demand has to be delivered. The techniques used in the cloud do the exact prefetching of the video.The proposed cloud system above to share Secure and Efficient Video Streaming over Cloud which efficiently stores videos in the clouds (VC), and utilizescloud computing to construct private agent (subVC) for eachmobile user to try to offer "non-terminating" video streamingadapting to the fluctuation of link quality based on the ScalableVideo Coding technique and providing the security by RC5 (Rivest Cipher),encryption and decryption algorithm and also providing data integrity to the video data over the cloud.Also this Cloud can further seek toprovide "non-buffering" experience of video streaming by background pushing functions among the VB, subVBs and localVBof mobile users.

The focus is to verify how cloud computing can improve the transmission adaptability and prefetching for mobile users.The cost of encoding workload in thecloud is being ignored while implementing the prototype. As one important future work, large-scale implementation would carried out andwith serious consideration on energyalso try to improve the SNS-based prefetching and price cost.

REFERENCES:

[1] XiaofeiWang,MinChen,TedTaeyoungKwon,Laurence.Yang, Victor C.M.Leung , "AMES –cloud: A framework of adaptive mobile video streaming and efficient social video sharing in the clouds, IEEE transaction on multimedia,Vol 15, no.4, June 13,2013.`

[2]. C. Narsimha Raju, GanugulaUmadevi, KannanSrinathan and C. V. Jawahar,"Fast and Secure Real-Time Video Encryption", IEEE Computer Society,IEEE,2008.

[3] Y. Fu, R. Hu, G. Tian, and Z. Wang, "TCP-friendly rate control for streaming service over 3G network," in Proc. WiCOM, 2006, pp. 1–4

[4] M.Sona, D.Daniel, S.Vanitha, "A survey on Efficient Video sharing And Streaming Cloud Environment Using VC", International Journal of Innovative Research in Computer and Comm Engineering , Vol. 1, Issue 8, October 2013. [5] Z. Huang, C. Mei, L. E. Li, and T. Woo, "CloudStream: Delivering high-quality streaming videos through a cloud-based SVC proxy," in Proc. IEEE INFOCOM Mini-conf., 2011, pp. 201–205.

[6] S. Chetan, G. Kumar, K. Dinesh, K. Mathew, and M. A. Abhimanyu,"Cloud Computing for Mobile World," 2010.

[7] A. Balasubramanian, R. Mahajan, and A. Venkataramani, "Augmenting mobile 3G using WiFi," in *Proc. ACM MobiSys*, 2010, pp.209222.

[8]. T. Taleb and K. Hashimoto, "MS2: A novel multi-source mobile-streaming architecture," IEEE Trans. Broadcasting, vol. 57, no.3, pp. 662–673, Sep. 2011.

[9]. M. Wien, R. Cazoulat, A. Graffunder, A. Hutter, and P. Amon,"Real-time system for adaptive video streaming based on SVC,"IEEE Trans. Circuits Syst. Video Technol., vol. 17, no. 9, pp.1227–1237, Sep. 2007

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

[11]. A. Nafaa, T. Taleb, and L. Murphy, "Forward error correction adaptation strategies for media streaming over wireless networks," IEEE Commun.Mag., vol. 46, no. 1, pp. 72–79, Jan. 2008.

[12]. Y. Zhang, W. Gao, G. Cao, T. L. Porta, B. Krishnamachari, and A. Iyengar, "Social-aware data diffusion in delay tolerant MANET," in HandbookofOptimizationinComplexNetworks:Communicationand Social Networks. Berlin, Germany: Springer, 2010.

[13]. Z. Wang, L. Sun, C. Wu, and S. Yang, "Guiding Internet-scale video servicedeploymentusingmicroblog-basedprediction,"inProc.IEEE INFOCOM Mini-conf., 2012, pp. 2901–2905.

[14]. G.WangandT.E.Ng,"Theimpactofvirtualizationonnetworkperformance of amazon EC2 data center," in Proc. IEEE INFOCOM, 2010, pp. 1163–1171.

[15]. F. Benevenuto, T. Redrigues, V. Almeida, and J. Almeida, "Video in- teractions in online social networks," ACM Trans. Multimedia Cm- puting,Commun.Applic., vol. 5, no4,30-44, 2009.

[16]. Z. Wang, L. Sun, C. Wu, and S. Yang, "Guiding Internet-scale video servicedeploymentusingmicroblog-basedprediction,"inProc.IEEE INFOCOM Mini-conf., 2012, pp. 2901–2905.