A Survey on Adaptive Mobile Media Streaming and Efficient Social Media Sharing in the Cloud

Manasa K. N.
MTech. (Scholar), Department of CS&E,
VTU-RC,
Mysore, India

Shashirekha H.
Assistant Professor, Department of CS&E,
VTU-RC,
Mysore, India

***Abstract*--In spite of the growing networking capabilities and the sophisticated techniques used by today's media coding and streaming systems, media streaming over wireless networks remains a challenging task. The traffic patterns of compressed media streams typically change over time due to content variations and dynamic user behavior, and the received media quality may degrade due to error propagation in the compressed bit stream. Moreover, media streaming applications typically have high data rates and stringent latency requirements, with the limited bandwidth resources in a wireless network. This paper presents the media streaming and sharing mechanism that deals with non disruptive user experiences.**

Keywords- Cloud computing, Media Streaming, Social Media Sharing

I. INTRODUCTION

Presently increasing traffic is counted by media streaming and downloading. In particular, media streaming services have become dominant over the mobile networks. However the media streaming is not much critical in wired networks, mobile networks suffers from media traffic transmissions over limited bandwidth of wireless links. The efforts to enhance the wireless link bandwidth (e.g., 3G and LTE), soaring media traffic demands from mobile users are increasing rapidly for the current needs. The reception of media streaming traffic via different mobile networks often causes mobile users to suffer from long buffering time and intermittent disruptions due to the lower bandwidth and link fluctuation which is caused by user mobility and multi-path fading. Thus, it is crucial to improve the service quality of mobile media streaming, while using the networking and computing resources efficiently.

Cloud computing is the lease of the resources through which the users can use the resources depending upon the requirement and pay based on the usage. Trough cloud computing the user can decrease the cost and can use the resource at any time. Media cloud is based on platform as a service. Platform as a service (PaaS) is a category of cloud computing services that provides a computing platform and a solution stack as a service. Along with software as a service (SaaS) and infrastructure as a service (IaaS), it is a service model of cloud computing. In this model, the consumer creates the software using tools and/or libraries from the provider. The consumer also controls software deployment and configuration settings. PaaS offerings facilitate the deployment of applications without the cost and complexity of buying and managing the underlying hardware and software and provisioning hosting capabilities.

An end user connects to cloud through his browser. On the other hand, an opposite user at another end can directly connect to cloud manager through a command line interface. There are three types of resources provided by cloud: a set of virtual machine (VM) images, a group of computer servers to run VM images, and a storage pool to store persistent user media data. The user requests and the cloud manager will validate the user and monitors the users and their request. The efficient streaming techniques and AMoM will manage the streaming flow and enhance the quality with a media coding technique. ESoM keep track of the social network interactions.

The contributions of our initial survey, as presented in this work are as follows:

- We provide analysis of media quality even when there is a link fluctuation and limited Bandwidth.
- We present an evaluation architecture which allows the simulation of H.264 SMC delivery over wireless network. The conditions of packet drops in network because of channel losses and payout buffer overflow are also considered.
- We motivate the use of high non-interference media quality evaluation that can used as part of a media quality assessment system in social deployments

II. LITERATURE REVIEW

The studies so far predict that the media sharing and reception in wireless devices and mobiles were carried over the long time. Juan Carlos Fernandez et al [1] 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 [2] 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 allocates reliable resource for the customer as per their requested service.

Guenther Liebl et al[3] 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 EvalVid framework [4] allows evaluation of H.264 framework using subjective metrics and objective metrics. As such, any derivations of EvalVid, such as EvalSMC also restrict media quality evaluation to SNR based metrics, which has the disadvantages of being a full-reference metric and thus, not practical in consumer delivery scenario.

Ksentini et al. [5] use a priority based cross layer architecture where they prioritize the I frames transmission of H.264 media over a wireless network to improve the overall performance. However, the number of priority classes in H.264 is restricted to 2 only, against SMC which gives a range of scalability options [6]. Lee et al. present a subjective performance evaluation of H.264 SMC but they don't consider network losses or evaluation with no-reference metrics. Seling et al. [6] present a comparison of H.264 SMC and VP8 but don't consider the quality issues.

III. GOALS

Proposal and evaluation of adaptive mechanism for the users to provide maximum sustainable bit rate and media services with non terminating and non buffering experience.
To improve the service quality of mobile streaming on two aspects:

- Scalability: It is the ability of a system, network to handle a growing amount of media in a capable manner or its ability to be enlarged to accommodate that growth. Mobile media streaming services should support a wide spectrum of mobile devices; they have different media resolutions, different computing powers, different wireless links (like 3G and LTE) and so on.

- Adaptability: The 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" media streaming services. To address this issue, we have to adjust the media 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.

- Media Enhancement: Due to mobility of users, it is difficult to provide the best quality of media in mobile networks. Thus, by exploiting different interfaces, e.g., 3G/4G, a media streams via a wireless link can be fetched as a streams of media segments with a higher quality. To enhance the media sharing services effectively among users.

IV. METHODOLOGY

The Media cloud was built specifically to provide service of image/video sharing and streaming over the cloud [1]. The user of the media service in cloud would be mobile users most of the time. The data rate and the quality of service should not be affected in any way such as data disruption or low bandwidth etc. Media provides protocol to be serviced to client and service provided to monitor and give the reliable service. Cloud computing promises lower costs, rapid scaling, easier maintenance, and service availability anywhere, anytime, a key challenge is how to ensure and build confidence that the cloud can handle user data securely. The media cloud provides services under two main methodologies adaptive mobile media streaming and efficient mobile media sharing. The media streaming and media sharing plays the vital role in providing the reliable service to the customers. The rate in which frames of the media are streams determines the quality and availability of the media service. Media data are most commonly shared among the users in the network. Mobile users are most commonly found to use social networking sites more often. The mobile device and mobile computing provides them space to be connected on the social network. Multimedia data such as images and videos are shared among the friend and users of the social media. The request of the media and sharing of media are two main actions requested from customer. Media cloud provides platform to provide these two services in better way.

By the 2-tier storage, the Media-Cloud provides the user the most popular media without buffering and terminating disruptions. For every mobile user, a private agent is dynamically created whenever there is demand from the user. The sub-MC has a sub media base (subMB), collects the recently retrieved media segments. The media deliveries among the private agents and the MC are not the actual "copy", but just "link" operations on the same file within the data center. If a new media is requested from the mobile user that does not exist in the subMB or the MB in MC, the private agent will search, retrieve, encode and provides the media. While media streaming, mobile users specifies the link conditions to their corresponding private agents trough reporting, and then the private agents provides adaptive media streams. Each mobile device has a temporary caching storage called local Media base (localMB), which is used for buffering and prefetching as per user needs.

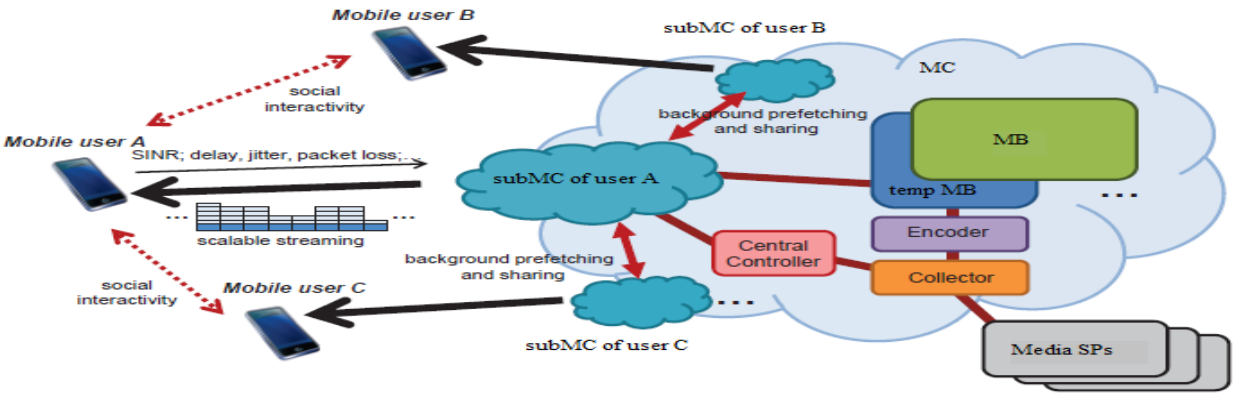

Fig. 1: Architecture of the Media Cloud

A. Adaptive Mobile media Streaming (AMOM)

In the adaptive streaming, the rate of media traffic is adjusted on demand so that a mobile user can utilize the utmost available media quality based on their link fluctuation and time-varying bandwidth capacity. Based on whether the adaptivity is controlled by the client or the server, there are two types of adaptive streaming techniques, The Microsoft's Smooth Streaming which is a live adaptive streaming service that can switch between different bit rate segments encoded into SMC format with dynamic bit rates and media resolutions at server side and clients dynamically request the media based on availability of link quality. Adobe and Apple are developed as client-side HTTP adaptive live streaming techniques.

B. Efficient Social Media Sharing (ESOM)

The buffer time of the media over mobile devices which reciprocates to and from different places affects the normal streaming and sharing of the media among one user to another over social network. The survey shows the functioning of various methods and architecture which used cloud to provide effective solution for providing better service to the users. Media cloud is the cloud architecture designed specially to provide media service to the mobile user. The study has came up with a optimal solution, proposing with media cloud, which collects the media from media service providers and providing the accurate services to the user[1].The network providers youtube helps in media downloads but it has some delays due to network dynamics so this technique is used to remove congestion and provide media on demand.

A recent Microsoft survey found that "58 percent of the public and 86 percent of business leaders are excited about the possibilities of cloud computing. But more than 90 percent of them are worried about security, availability, and privacy of their data as it rests. In this technique we propose an adaptive mobile media streaming and sharing framework, called Media Cloud, which efficiently stores media in the clouds (MC), and utilizes cloud computing to construct private agent (subMC) for each mobile user to try to offer "non-terminating" media streaming adapting to the fluctuation of link quality based on the Scalable Media Coding technique. Also Media Cloud can further seek to provide "non-buffering" experience of media streaming by background pushing functions among the MB, subMBs and localMB of mobile users. The cost of encoding workload in the cloud while implementing the prototype is ignored.

V. MODULE DESCRIPTION

There are 3 Modules:

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

1. Admin Module: In this module, Admin have three sub modules. They are,

- Upload Media: Here Admin can add a new media. It is used for user for viewing more collections.
- User Details: Admin can view the user those have registered in this site.
- Rate Media: This module for avoiding unexpected media from users. After accept/reject videos then only user can/cannot view their own media.

2. User1 Module: In this module, it contains the following sub modules and they are,

- News Feed: Here user of this social site can view status from his friends like messages or media.
- Search Friends: Here they can search for a friends and send a request to them also can view their details.
  - ➢ Share Media: They can share media with his friends by adding new media also they share their status by sending messages to friends.

- Update Details: In this Module, the user can update their own details**.**

3. *User2 Module:* In this module, user can register their details like name, password, gender, age, and then. Here the user can make friends by accept friend request or send friend request. They can share their status by messages also share media with friends and get comments from them.

VI. CONCLUSION AND FUTUREWORK

Media cloud is the combination of adaptive mobile media streaming and efficient social media. It constructs a private agent to provide media streaming efficiently for each mobile user. The prefetching of media can be enhanced by using scalable media coding with high efficiency and also can predict user's behavior effectively. The paper shows the streaming and sharing mechanisms occurring with non buffering and non terminating disruptions in the Media Cloud. The cloud computing technique provides marginal improvement on the adaptivity of the mobile streaming. As future enhancement, serious consideration on energy and price cost can be included effectively as per the real time application needs.

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