Ephemeral Analysis of Mobile Video Streaming in Cloud Environment

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ABSTRACT
Mobile cloud computing (MCC) is emerging concept it combined two main computing techniques one is mobile computing and another is cloud computing. In smart phone it is a potential technology. Combination of mobile and cloud computing is able to overcome obstacles related to the mobile performance, environment and security and provide better quality of multimedia data in smart phone. Multimedia data bases such as text, audio, video data bases need security. Security, privacy and integrity of data are demanded in every operation performed on internet. In mobile platforms video sharing and streaming is done in successful way. The cloud computing paradigm is used for fast and intelligent processing in near-real time data transmission such as audio, video, text and games. Mobile cloud computing is bridging the widening gap between the mobile multimedia demand and the capability of various mobile devices.

This paper studies a various video streaming technique and analyzes the better method for increase quality of services.

Keywords
Adaptive Video streaming, ESoV, H.264 Encoder.

1. INTRODUCTION
Cloud computing provides countless benefits and opportunity to spread servers across the world without upfront investments or even operating a single data centre [1]. It is an innovative computing paradigm for storing data and running applications. Cloud computing appears to attract all sphere of computing. However, the current commercial clouds have been built to support multimedia database workloads, which are very different from typical scientific computing workloads [2].Desktop computing is Server-based multimedia computing addresses in which all multimedia computing is done in a set of servers, and the client interacts only with the servers [3]. The emergence of cloud computing more mobile applications such as 3D displays gaming are being developed to take advantage of the elastic cloud resources. In Cloud based 3D Mobile Gaming, where the 3D video rendering and encoding is performed on cloud servers, with the resulting 3D video streamed over wireless networks to mobile devices [4]. However, with the significantly higher bit rate requirement for 3D video, ensuring user experience may be a challenge, both in terms of 3D video quality and network delay (response time), considering the bandwidth constraints and fluctuations of wireless networks [5].

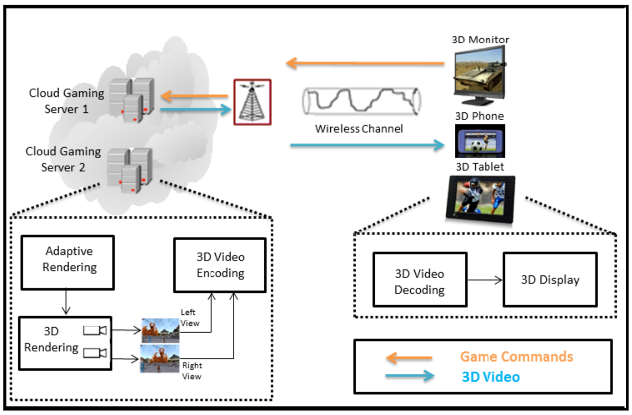

Fig. 1. Architecture of Cloud based Mobile 3D Display Gaming System

The wireless link capacity is not able to control high traffic demand of mobile networks because of time-varying link conditions. In that reason mobile networks is suffer From poor service quality of video streaming because sending video is take long buffering time and intermittent disruptions [6]. Recently, video sharing has been extended on mobile platforms with considerable success. Since it is significantly cheaper and more convenient, mobile video has boomed in many domains like storytelling, live event streaming, practice sharing, video chatting, watching TV anywhere, etc. [7]

2. VIDEO STREAMING METHOD
2.1 Mobile Video Cloud Services (Mvcs) Method
The mobile services architecture is based on Fig 2, the mobile client and cloud components are communicating with each other using different protocols for different purposes. RTP is used for video up and down streaming. The extensible messaging and presence protocol is used for the exchange of metadata, segments information, and device information. HTTP is required for file transfers like video upload to the cloud. Realizing the different functionalities of the MVCS client various handler are required. The MP4 handler is an important part of the video streaming functionality. RTP protocol is used for video streaming [1, 8]. To ensure good compatibility with various streaming servers the outgoing video stream should consist of a video encoded by the H.264 video codec and an MP4 video container. The RTP connector is responsible for the communication with the streaming server of recorded videos and also for delivering the video to the video player. The metadata handler is a very simple handler. It manages the fetching of the video segments and tags via the XMPP connector and parses the XML segments. The lazy list handler is an important part of mobile user experience as it reduces data transfer and memory usage. This

handler is utilized by the segment-based “seek bar” and by the browse activities which include preview thumbnails of the videos. It works in the way that it runs as a background thread with a low priority to not affect the interface performance [7, 8, 9].

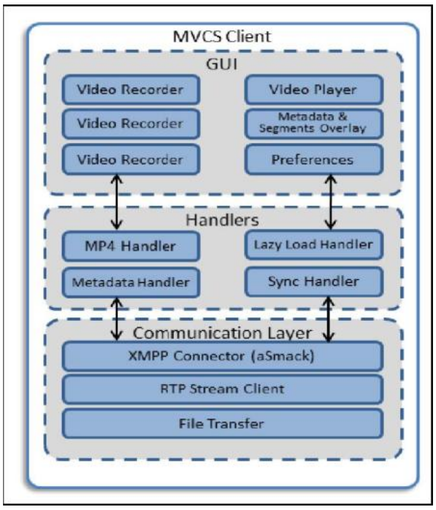

Fig. 2 MVCS client’s software architecture on Android platform

2.2 Asymmetric Graphics Rendering

A new asymmetric graphics rendering approach which can significantly reduce the video encoding bit rate needed for a certain video quality, thereby making it easier to transmit the video over wireless network. In these method subjective tests is conduct to study and model the impairments due to asymmetric rendering and network delay, thereby developing a user experience model for cloud based mobile 3D display gaming [1]. By conducting subsequent subjective tests, author proves the correctness of the impairment functions and the resulting user experience model. [1, 10].

2.3 Adaptive Video Streaming Technique

Inside the versatile feature spilling, the feature movement deferral rate is in order in view of the client learning the most elevated conceivable feature greatness in light of their join's chance changing data transfer capacity ability [12]. There are two types of adaptive video streaming method, depending on whether adaptivity is restricted by the client or the server. In this technique versatile portable feature administrations is done, which make individual specialists for dynamic clients in the portable cloud, to propose "non-ending" and "non-buffering" versatile feature streams to the versatile clients[12].

2.4 Cloud Agent For Mobile User (Amvsc)

As shown in Fig. 3, 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) [13]. A temporal video base (temp VB) is used to cache new candidates for the popular videos, while temp VB 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 temp VB first. By this 2-tier storage, the AMVSC can keep serving most of popular videos eternally. Management work will be handled by the controller in the VC [14].

Specialized for each mobile user, a sub-video cloud (sub VC) is created dynamically if there is any video streaming demand from the user. The sub-VC has a sub video base (sub VB), which stores the recently fetched video segments. In this the video deliveries among the sub VCs and the VC in most cases are actually not “copy”, but just “link” operations on the same file eternally within the cloud data center. There is also encoding function in sub VC (actually a smaller-scale encoder instance of the encoder in VC), and if the mobile user demands a new video, which is not in the sub VB or the VB in VC, the sub VC will fetch, encode and transfer the video. During video streaming, mobile users will always report link conditions to their corresponding sub VCs, and then the sub VCs offer adaptive video streams. In this each mobile device also has a temporary caching storage, which is called local video base (local VB), and is used for buffering [15].

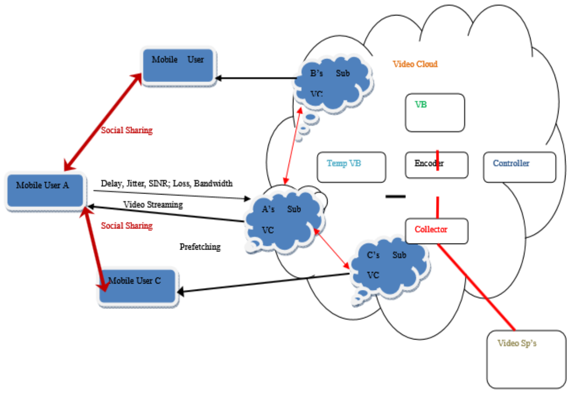

Fig. 3. Video Streaming in cloud

2.5 Bittorrent-Based Video Block Device

In BitTorrent networks video block device (VBD) is providing user-friendly viewing patterns. A VBD & NBD both module are used in BitTorrent technique. The NBD client module provides a network block device to the users. The VBD module communicates with neighbour peers and a seeders (i.e., contents server), which contain the block. If a block is already cached, the block is obtained by the local cache. The file sharing method is an alternative way to share videos on many servers. Frequently used blocks of videos are shared in a BitTorrent network. Unused blocks of videos are not cached until they are first used. Frequently used blocks of video images are shared in a BitTorrent network. Unused blocks of video images are not cached until they are first used [14].

2.6 Scalable Video Coding

SVC is the scalable extension of H.264/AVC that supports spatial, temporal and quality scalability. Using a layered video codec, SVC encodes a video as one base layer (BL) and several enhancement layers (ELs). Each of these layer scan be transmitted and received independently. With the BL, a streaming client can recover the video with low quality, while the more ELs it collects, the better the playback quality will be. This property, together with a multi-path provisioning strategy, provides an intuitive and promising solution to the problem of how to stream a video to heterogeneous clients with various QoS requirements efficiently [15].

The cloud server behaves like a SVC extractor, enabling a very large number of clients to receive live video streams at the same time by dynamically arranging available resources based on the streaming quality requested by clients. Svc standardizes the encoding of a high-quality video bit stream that also contains one or more subset bit streams [16]. A subset video bit stream is derived by dropping packets from the larger video to reduce the bandwidth required for the subset bit stream. The subset bit stream can represent a lower spatial resolution (smaller screen), lower temporal resolution (lower frame rate), or lower quality video signal. Through this technique quality oriented scalable video can be delivered. The high quality videos can be achieved using cloud-based proxy because cloud computing improves the performance of SVC coding [17].

2.7 P2p Live Video Streaming

Cloud-based P2P Live Video Streaming Platform (Cloud PP) that uses public cloud servers to construct an efficient and scalable video delivery platform with Scalable Video Coding (SVC) technology. The cloud server behaves like a SVC extractor, enabling a very large number of clients to receive live video streams at the same time by dynamically arranging available resources based on the streaming quality requested by clients[18].

3. ANALYSIS

Through this various method of video streaming, it is possible to set appropriate graphics rendering parameters according to network constraints, such that the user experience can be maintained to a high level. But in those techniques better work is done for future to increase better performance. Cloud services adapt the zooming level of the video streams to overcome the problems with small screen sizes. The evaluation revealed that the utilization of a cloud environment for a parallel processing of video chunks enables near-real-time delivery of complex tasks in this improvements of user experience in sharing mobile video applications have been achieved but improvements of are enable to personalized video streams, overlays with additional information layers, interactive zooming and ROI. According to that proposed approach leverages fast prototyping of mobile video applications from a developer's point of view. In that technique Cloud Mobile Gaming (CMG) is a better approach to support high quality 3D gaming to save computational power and extend battery life on mobile devices. In those technique three major categories of objective factors: graphics rendering parameters, video encoding parameters, and mobile network parameters are included. In graphics rendering parameters include texture detail and view distance which affects the user perceived visual quality of the graphics. Video encoding parameters include video quality, video bit rate, etc. which affect both visual quality and response time. Mobile network parameters include packet loss rate and bandwidth which will affect visual quality or response time. Leveraging the cloud computing technology, a new mobile video streaming framework, dubbed AMVSC is also developed which constructs a private agent at the cloud to provide video streaming services efficiently for each mobile user. In this given user, adaptively adjust her streaming flow with a scalable video coding technique based on the feedback of link quality through private agent. The cloud architecture though provides the easiness to the mobile user, but increases the complexity of managing the videos over it. This extra management for streams requires very high resources over the cloud to apply the SVC and encryption at run time. There is tradeoff between the total user supported by the cloud and the burden of user taken by the cloud. Adaptation of streams over the fluctuating bandwidth within the small stream is not much adaptable. There is no clue about error rate and security in the streams and its must developed in future research.

4. CONCLUSION

Adapting the combination of same architecture to the live video stream would bring the ubiquitous improvement to many applications. The educational conferences, live meetings, gatherings, events all have little different requirement of video. The quality and data loss are allowed at different extent to above fields. In video streaming include many challenges particularly for peak of user over each cloud and the criticality of bandwidth over large live events. Thus maintaining the same corpus over such situation is the futures steps needed to be considered.

A combination of different approaches and algorithms can play an important role in delivering fast and intelligent video processing services for a better mobile UX. State-of-the-art mobile video UX enhancement techniques were combined with the cloud computing paradigm. Video stream navigation on mobile devices is eased by segment cues and tags automatically generated by intelligent processing.

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