LIVE VIDEO STREAMING USING ANDROID

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ABSTRACT

Nowadays, most of the users have smart phone that supports videos as well as have fast internet connection. Mobile learning, also known as m-learning, is a convenient, means of delivering an informational content to learners using current mobile technology. This paper proposes framework which allow the mobile devices to receive live streaming service using client server approach. The mobile devices, as a client, will connect to the server and receive a digital broadcast including decode and display the schedule of events in real time mode, as proof of the concept, in the Android platform. This paper shows that users can access live streaming and display images in a good quality through their mobile. Moreover, users are capable to select the required date to get real time schedule of TV event on Android smart phone.

Keywords: High- Definition, Live Video Streaming

I. INTRODUCTION

More and more people watch live video on the Internet instead of traditional media. High-Definition Live Video Streaming(HD-LVS) would be the most popular Internet service in the future. VoD and LVS are two kinds of streaming services. VoD allows the users to control the video playback absolutely. The functionality of pausing, forwarding and rewinding are enabled just like playing a local video file. LVS [1], [2], [3] is fundamentally different from VoD. It provides users the video content that is currently broadcasted by streaming servers.

Many TV stations have live streaming services which can only be enjoyed on the website, but has a poor quality for mobile devices. This streaming media has a great potential to be one of the most effective and technologically advanced methods for sending quality video and audio to any web site over existing computer networks. One of the reasons why the smart phone's popularity is increasing is that it gives more convenience to its users in their everyday live activities. This condition has motivated us to develop live streaming application on a mobile Android platform.

This paper will present the development of the mobile application which utilizes a digital capture broadcast media server.

- To facilitate users to watch TV using an android smart phone,
- To provide TV schedule which can be viewed before live streaming,
- To provide acceptable image quality with a limited bandwidth which will not be too burdensome on an android smart phone

Any, mobile learning architecture which needs internet connection to provide learning contents to users should follow certain criterions such as using of low bandwidth and minimum network latency. Agent based technology is flourishing as a low bandwidth solution for mobile learning platform. The Agent is defined as an

independent software program which runs on behalf of a network user. An agent may run when the user is disconnected from the network, even involuntarily. They process data at the data source, rather than fetching it remotely, allowing the higher performance operation. The efficiently and economically use low .They efficiently and economically use low bandwidth. Because the agent data processing takes place locally to the source, the network has no effect on the agent as it executes. On the other hand client/server architecture needs good quality network connections, large bandwidth. First, the client needs to connect reliably to its server. Second, the client needs to be assured of a predictable response. Third, it needs good bandwidth, due to its very nature; client/server must copy data across the network. So, in case of streaming a live video into user's mobile if user starts roaming and get disconnected from network then his learning will be interrupted if client/server architecture is followed. But agent based architecture can resume the downloading of video from the point where it was disconnected.

The rest of this paper is organized as follows. In Section II, we point out some characteristics of HD-LVS and explain why we prefer a single-tree-based P2P design. In Section III, we introduce the proposed system design and algorithms. Implementation-related issues are given in Section IV. Section V is our conclusion.

II. ILLUSTRATIONS

Present worker develops a prototype for mobile virtual classroom. This prototype allows live streaming of lecture videos to mobile phone with user interaction facility. In FIG-I there are boxes by ip1, ip2, ip3 which stand for ip addresses of virtual classrooms where real time lectures are taking place. They are connected to video broadcasting server. There is only one broadcast server but each server can be hosted on a server cluster. This server is connected to Agent server or Agent host via internet. It provides the resources to the agents when they migrate. The adaptation program is also added as a task of agent host. When a request is initiated from a remote host (mobile phone), agent reaches to agent host with the device related data and fixes the adaptation requirement as ADP=1 if adaptation needed or ADP =0 if adaptation not required. The steps that is followed to deliver streaming video to mobile device is Digital Video data -> streaming server (agent based)-> compressed video (MPEG-4) -> adaptation -> final output -> mobile end user.

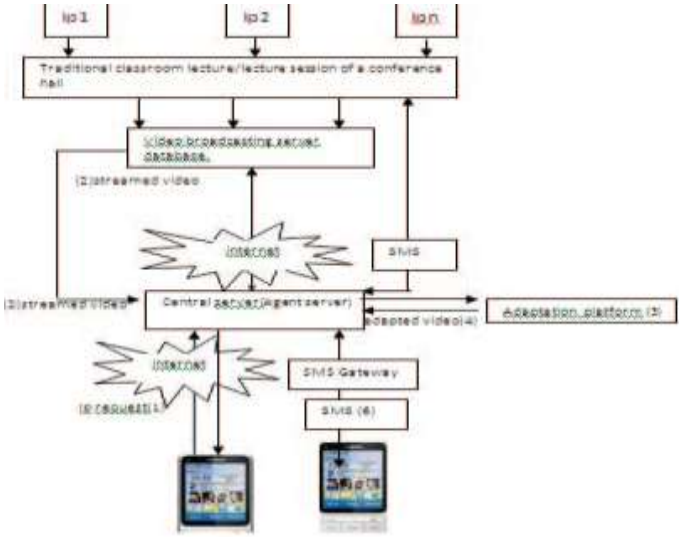

Figure1

Case study 1

There are several classrooms with ip addresses where lectures are going on (fig-1). They are connected to agent based video broad casting/streaming server.

1) A user wants to attend one conference lecture given by renowned faculty. But he is unable to reach the conference hall. So, he can access the lecture via his mobile device. He will send the request (ip address of the class) of the lecture. Suppose there are lectures taking place in the classroom 1, classroom2 etc. So, as soon as these videos are captured real Streaming starts by storing it in buffer of high powerful broadcast server. A part of buffered video is streamed in real and rest of video is still being downloaded .This prototype uses streaming protocol viz. (RTSP/SDP, RTP).

2) Now according to the request of user Central/Agent server connects to the broadcasted server and receives the streamed video.

3) Streamed video is sent to adaptation platform if required.

4) Adapted video is relayed to the end user.

5) For interaction with classroom teacher mobile user can send SMS through the SMS gateway which can be replied by the teacher instantly.

III.RELATED WORK

Live video streaming has experienced a considerable growth over the years since its introduction in early 1990s.Its growth, in part, is supported by the growth in the internet world which makes the network channel for the streaming is easier to be accessed. Utilising the Internet technology, there is HTTP-based streaming which uses web servers to deliveren coded mediacontent. Hong et. al also studied the Internet based video delivery by using the QoS control to improve the quality of the video at the receiver side . Zhang et.al as well explored the QoS for video delivery. However, the transmission that used in the study is over a wireless internet connection One of the worker thus proposed a mobile learning system that enables mobile video streaming with agent software.

3.1 Video streaming

Streaming video is a term applied to the compression and buffering techniques that allow one to transmitand view video in real-timethrough the internet.

Video streamingis of two types.

1) Pseudo streaming or progressive download.

2) Real streaming

3.1.1 Progressive download

Delivery of a file over HTTP is normally referred to as ‘progressive download’ or ‘http streaming’. In reality, it is not streaming at all but a very simple bulk download of a video file to the end user’s computer. A temporary copy of the video file is then stored on the local computer so that the viewer can watch the file over and over without having to download the file each time. If the bandwidth available to the machine downloading the file is smaller than the encoded bit-rate there may be a wait before the file will start to play. For example, on a 56kbps dial-up modem, trying to play a file that is encoded at 500kbps

people may have to wait a fairly long time before enough of the file has been downloaded for it to start playing. On a 500kbps interne tconnection, or faster, playback should start almost immediately and the file should download faster than it will play, meaning that playback will not have to stop because not enough data has been downloaded. HTTP (Hypertext transport protocol) operates over TCP (Transport control protocol) which controls the actual transport of the packets over the network. TCP is optimized for guarantee of delivery, regardless of file format or size. If a packet is skipped during the transfer of a file, it will request a resend of that packet. Resend requests take time and bandwidth and could increase the load on the server.

3.1.2 Real Streaming

A streaming server is a piece of software which deals with video requests. Unlike a standard web server delivering a video file over HTTP (progressive download), a streaming server opens a conversation with the local machine. There are two sides to this conversation, one is for transferring the video and the other is for control messages between the media playerand the server. These control messages include commands such as ‘play’, ‘pause’, ‘stop’ and ‘seek’. Streaming has many advantages.

1. Video can be played back at any point.

2. It makes a lot more efficient use of bandwidth as only using bandwidth for part of the video that are actually watched as opposed to HTTP delivery where the whole file gets delivered.

3. The video file is not stored on the viewer’s computer – the video data is playedand then discarded by the media player.

IV.IMPLEMENTATION

We proposed an algorithm to implement theproposed prototype.

1. User initiates a query for aparticular classroom lecturesuppose for lecture going on classroom 3.

2. Agent server receives the request

3. Read the device related data

4. Fix the adaptation parameters

5. If adaptation requires then set ADP

(adaptation parameter)=1 else ADP=0

6. Create agent 1.

7. Migrate agent to the one of video streaming server from the cluster listed in the itinerary.

8. Video streaming server receives the agent 1. The requested video starts streaming and embeds into agent 1. Agent 1moves with required amount of video to adaptation server if ADP=1 or move to the central server. During this period other agents released from main agent server standsin queue inside the broadcasting server.

9. Agent 1 starts streaming the same to the mainagent server.

10. Agent server relays the video to the enduser and destroys agent1. In this context it is important to discuss that if afterreceiving first part of video user gets disconnected then what will happen? The answer is, in due course of time, agent 2 will be activated only but its job is notto complete.From the characteristics of agents it

can be told that agent 2 will keep on trying to get connected to the end user again and again until its job is not finished. Thus user will have uninterrupted learning environment.

V. RESULTS AND ANALYSIS

Present work proposes a prototype to download or stream live video onto users' mobile devices and incorporates an interface to interact with the classroom teacher if required. We also proposed an algorithm to implement architecture with agent technology as because it helps to fight with the constraints of mobile platform. This kind of mobile learning scenario clearly increases the usability of mobile hand held devices and of course a new kind of learning solution when users' cannot reach to the classroom on time due to various problems like traffic jam or illness. Also agent base technology has been used for implementation to give a smooth learning experience to the users. The incorporation of the interaction facility with live broadcasting has created real time traditional classroom environment. A usability test of this mobile app was conducted in a one day workshop in NIT; Agartala with20 Android based mobile phone users. A real time video was broadcasted with interaction facility to the attendees' mobile phone. After that they were asked to fill up questionnaires with 5 queries. The queries were-

1. Assists them in learning efficiently.
2. Mobile phone as a learning media in such situation is well enough.
3. They can interact with the teacher through SMS conveniently.
4. Help them in learning in urgency with live streaming.
5. Help them in learning by watching the lecture in their free time. It has been observed that 54% of the attendees' replied positively.

VI.LIMITATIONS

The prototype is not fully implemented. Only an algorithm for implementation has been proposed. So, different parameters like time speed to stream a chunk of live or recorded video onto a mobile phone has not been analyzed. What will be the difference of the above parameters in case of client - server architecture and the agent based architecture are not analyzed . But another limitation is the unanalyzed cost to implement the prototype with agent server and host. This work does not discuss the security related issues in such mobile application.

VII.CONCLUSION

This paper proposes architecture of live video streaming into mobile phone. It highlights various issues like what type of video streaming is perfect for mobile platform? How to handle the bandwidth and latency problem of mobile network while streaming video? How to make the feeling of strearning as continuous when user is on roaming and is therea chance of getting disconnected from the network? Present worker proposes a solution to adopt live streaming and agent software.

Also it has added one adaptation platform which takes care of proper delivery of content to heterogeneous mobile devices . Due to the increasing heterogeneity of wireless devices and increasing quality of multimedia stream on the other hand, video adaptation will be very important in future wireless networks.

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