



Mobile Web Server on Android Platform with Live Video Streaming

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Abstract— Internet is the fastest transportation mean in this modern era. The web servers are the backbone of the internet. The goal of our project is to represent the optimized Mobile Web Services (MobWS) on the android platform providing the web services to internet users with more ease. Now a days the use of smart phone devices having high hardware configuration are rapidly increasing enabling the sharing of video, images, live event. People can share the live events by streaming mobile to mobile over network. But the current companies which provide such services limit the configurability and insert add which leads to more bandwidth consumption. Our project proposes the applications which enable the hosting of websites on android smart phones which can be accessible by any http web browser. This project proposes the real time video broadcasting which can be view by all the user of website.

I. INTRODUCTION

All the web browsers uses Hyper Text Transfer Protocol (HTTP) to communicate with websites. But Websites don't understand Hyper Text Transfer protocol. Hence, Website always get hosted inside a **web server**. E.G. Tomcat server, Apache server, IIS server (windows). These web servers actually understand HTTP protocol and helps web-sites to render properly on client browser.

The role of the phone has strictly been limited that of a client. Modern smart phones have processing power and memory that is sufficient for running the servers. There really is no reason anymore why web-servers could not reside on mobile phones. Why people could not create and maintain their own personal websites on their own android smart phones.

The internet combined with smart phones that can open limitless possibilities. One of these possibilities is explored and exploited by capturing video on a mobile device, in real-time, and transferring to a web page, viewable by the entire world. This project develops an open source solution capable of transferring the live video with little overhead on the phone and/or server.

The primary goal of our project is to bring a web-server on to Android Platform, So that one can host his personal website on his own smart phone. This website can be access or hit by any HTTP web browser on network. This will help users to create and maintain personal mobile websites on their smart phones. The application is provided with standard authentication process which leads to prevent the unauthorized access to the website. One of the goal of authentication process is to limit the user so as to prevent the server to be down because of excessive request from its customer.

Users will have the ability to broadcast news and events live using only an Android-enabled mobile devices and an internet connection. Developers will have access to suggest changes to the source code, paving the roads for new innovative ideas based on the technology. Personal users and enterprises will have complete control over where the video is transferred over the internet, whereas with existing services videos are transferred to a third party that can access the video for viewing or analysis.

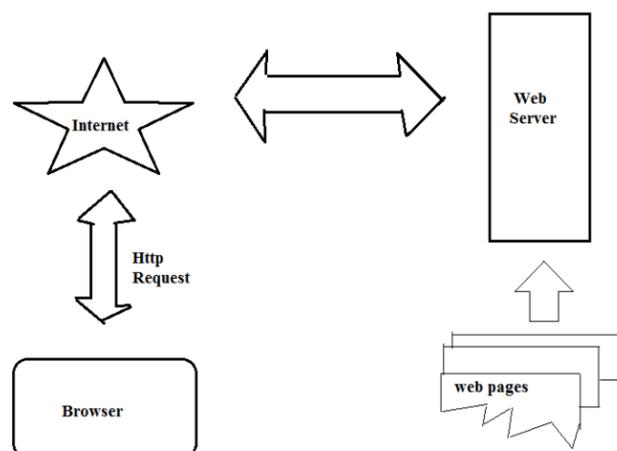


Fig A. Flow of Actions

As a mobile phone contains quite a lot of personal data it is easy to semi-automatically generate a personal home page. And contrary to websites in general, a website on a mobile phone always has its "administrator" nearby and he or she can even participate in the content generation

II. RELATED WORK

There are many software technologies related to the mobile web server field. None of them provide a complete solution for HTTP Server from a mobile device to an open platform viewable through a web page. The software does provide benefits for other classes of applications, such as streaming from a web camera device.

A. Nokia S60 Web Server:

Nokia one of the few cell phone companies brought Apache HTTP Server to their line of Nokia cell phones, running Symbian OS S60 mobile software platform. The S60 Mobile Web Server enables connectivity for HTTP traffic to a mobile device from the Internet.[1]

The Mobile Web Server components include a gateway application that runs on a computer with Internet access and a connector application that runs on the remote mobile device. The gateway and the connector applications with a valid DNS configuration can provide a mobile device with a global web address (URL). However, as of January 2010, the web server project has been discontinued by Nokia.[1]

B. Mobile-to-Mobile Multimedia Streaming

Mobile-to-Mobile (M2M) multimedia streaming, it becomes an ultimate responsibility of a mobile server platform to provide an efficient mechanism for the management and control of multimedia streaming on the fly. The paper deals with the problem and proposes multimedia extensions to an existing light-weight Mobile Web Server (MWS) platform, which is based on Representational State Transfer (REST) design principles.

The Real Time Streaming Protocol (RTSP) is used to control multimedia streaming and its mapping over REST designed server is discussed in detail. Multimedia transmission is achieved by Real Time Transport Protocol (RTP) and the simplest frame structure of RTP has been proposed for this purpose.[1,2].

Bambuser is one commercial product that provides live streaming from Android devices as well as several other mobile phones and devices. Videos streamed using Bambuser are sent to the Bambuser server and watermarked. There is no control over what the company does with the video such as analysis and profiling. Video quality is comparable to that obtained by this project with the project setting at low resolution. The projects high resolution does not display motion as well as the low quality but it gives a crisper and more detailed image. The web page uses the same method of Flash integration. [3]

III. PROPOSED SYSTEM

The primary goals of our system is to bring a web server to Smartphone and to make a web server running on a mobile phone accessible from the Internet using any web browser. Providing access to a mobile phone from the Internet is not straightforward, as operators typically employ firewalls that prevent access from the Internet to phones inside that firewall. By implementing a custom gateway we could circumvent that limitation and we are now able to provide a web server on a mobile phone with a global URL than can be accessed from any browser. In a sense, the mobile phone has now finally become a full member of the Internet. The components that enable this application are the following:

1. An android server which will allow users to host web-sites.
2. An android application which will be responsible for HTTP protocol
3. An Android application capable of capturing and streaming video to a server.
4. An implementation of the Real-time Streaming Protocol (RTSP) server that was based on the RFC 2326 specifications in order to transfer the Real-time Transfer Protocol to viewing clients.
5. An Android Device Communications Server was created to send and receive instructions between the web page and the Android device.
6. A web interface was designed for flexibility; SQL database statements were implemented for organization and ease of data access between interfaces.
7. An end-to-end performance evaluation of the resulting system.

This project allows a real-time video streaming service from an Android mobile device's camera to a server. The real-time video can then be viewed from a web browser on the client's computer. The project builds on open source code and open protocols to implement a set of software components that successfully stream live video using RTSP protocol (Real Time Streaming Protocol).

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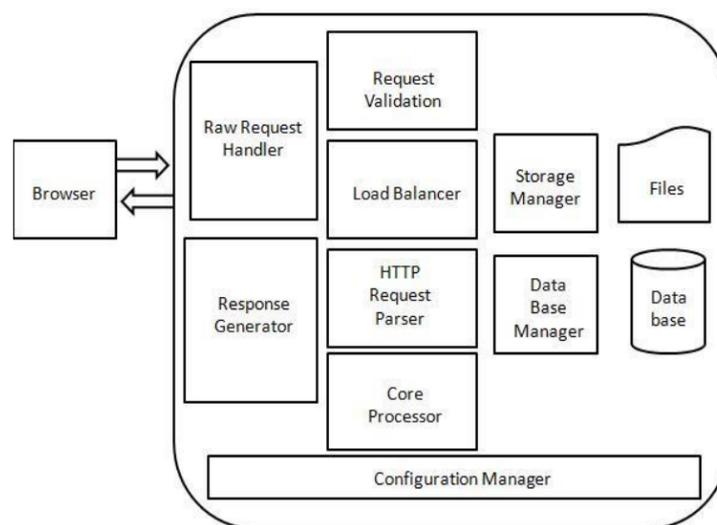


Fig. Mobile Web Server Architecture.

If every mobile phone or even every smartphone initially, is equipped with a webservice then very quickly most websites will reside on mobile phones. That is bound to have some impact not only on how mobile phones are perceived but also on how the web evolves.

A. SQLite Database

The current user's information is recorded in an SQL database. When a user visits the web page, the SQL database is queried to find current live streams. To display the live streams from the Android device for the web user, the Flash Video file is seeked to the end of file with a custom script on the server, new video data discovered by monitoring the Flash Video file size is transferred over HTTP where it is received by the Shockwave player on the web page.

B. Web Interface and User Management

Web Interface and User Management provides more in-depth details on the web integration. The web page is designed to be easily incorporated into a predesigned page such as Word Press. It does this by keeping the layout of the page minimal then embedding this layout into a frame on an ordinary web page or transferred via AJAX into an element to create dynamic web pages that update in the background after a page has already loaded.

C. Video Streaming

The server opens many different listening ports that accept incoming connections. The protocols used for the ports are TCP and UDP. The server spawns two listeners, one for clients wishing to view the incoming video, or the viewer, and one for clients wishing to send the video, the phone. Each new TCP or UDP port required an additional thread.

A different java class was developed for each thread type which may be spawned. A concurrent hashmap is used to synchronize the users viewing the video and the phones streaming the videos among the threads.

D. Communication

Most of the communication to the platform occurs over the TCP port connected to the Android Device Communications Server. Communication commands include information such as ports used for streaming the video, user log in information, session identification, play and termination commands.

Sign up and forgot password dialogs take advantage of the functions already implemented on the server side web page by using the java built in HTTP client to fetch web pages using GET by including required information in the GET URI.

E. Delay

Delay between recording and playback on the webpage varied based on video quality. At high quality, the delay was around 2 seconds while at low quality it was around 1.5 seconds. Viewing the stream directly through the RTSP server with RTP caching disabled and without converting to a Flash Video stream will result in a 2 second delay.

The delay measured above was while using the Internet Explorer 8 browser. Safari and Chrome show similar results while Firefox and Opera experienced a longer delay of at least 4-5 seconds.

Here, the flow of information and control transitions between different server components is shown. At the client side, user start the website and request the required contents by sending the HTTP request. At the server side, it (server) accept the HTTP request .The request is the input to the MobWS from client. Firstly the request is validate by the HttpRequestHandler().

The request is then parse by RequestParser.Parser separate the data from the request header format.It then identify the request,authenticate if the request is for authentication ,and if the request is for accessing the information ,it processing further and Invalid requests are discarded at this level. The response is generated as per the requested contents from the database.this response is convert into appropriate format by using the Htmlbuilder and send back to the client .

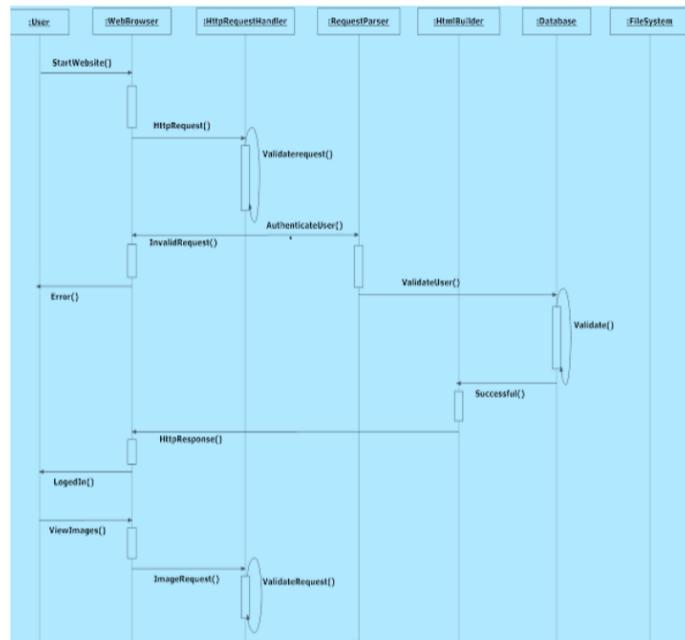


Fig. Flow Of process

IV. CONCLUSION

. In the proposed project we have introduced a system which has the primary goals to bring a web-server to Android Platform So that one can hit a website, hosted on mobile phone, from any browser. Using this application one can host and maintain his personal website on his own android smart phone. This website can be access on any device having browser which support HTTP Protocol. The live streaming is also provided with websites, so the admin of server can broadcast the live video by using his or her own device camera. For the security purpose we have provided the standard authentication process.

This project also have lot of areas on which more improvement can be possible. For the future work, we would like to expand and explore our system so that it can be able to host more than one website at a time on android smart phone, because now a day most of the people maintain multiple websites for different purpose. Mobile network is a difficult task due to less network bandwidth and less memory and power of mobile. Therefore considering live streaming, we will make the system more significant and light weight to work within less network resources.

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