

# Creating Web Server in Android Mobile and Easy Serving of Information to Clients

Koteswara Rao Gummadidala\* and R. Jeya

Department of Computer Science and Engineering, SRM University, Kattankulathur, Chennai - 603203, Tamil Nadu, India; gkrkoti3@gmail.com, jeya.r@ktr.srmuniv.ac.in

## Abstract

**Background:** The main objective of this paper is to develop a static web server which will run in a mobile with android application and by using this web server a mobile user can upload the files into his android mobile and can make the file available to all the system within the network to which the server is connected. The scope of this paper is limited to static web pages with a facility to download the content like PDFs, PPTs, or videos. **Methods:** Managing the existing servers is difficult in terms of cost, portability and maintenance. **Findings:** The proposed mobile web server is little innovative and implementing new technology in this approach. **Applications:** The proposed mobile web server acts as an alternative solution for the existing web servers which make a difference in the existing servers in terms of cost and maintenance. The proposed mobile web server is very much useful and can be made to work without the requirement of internet. Just that all we need is to make a hot spot network by using the same mobile or else we can use the existing the network.

**Keywords:** Android Operating System, File Sharing, File Sharing, Mobile Hosting, Multi-threading, Peer Network, Tethering Hotspot, Wireless Fidelity

## 1. Introduction

This paper is based on developing a static web server for an android mobile using Android SDK for serving static web content like HTML, java script or JQuery pages. In addition, the threads for running server and client can be creating by developing this web server<sup>1</sup>. Sockets produced using Socket programming concepts and multi-threading concepts is accomplished to manage the interchange of web content between the server and in JAVA. The front-end UI screens are developed using Android XML and JAVA files for the Android SDK environment are created for implementing the business logic<sup>1</sup>. The project design is based on two-tier architecture. UI and Business Logic are implementing using Android SDK programming concepts. Since android is the thing used, we can make use of the tethering to maintain two devices in a network. This application is usable during conferences, sharing highly secured data etc., Owner of the mobile can make use of the application and links the desired web pages in the form of html or files to the app. Then

the moment server is switched on, clients will be able to get the webpages hosted from the mobile. Imagine things like carrying a cell phone in pocket and it serves all your problems of carrying the server anywhere you want and data storage also comes handy with the use of storage memory cards used in mobile phones coming at advantage of 64GB memory also. Mobile Devices are one of best way to reduce the cost and increase the effectiveness of applications. The web server proposed here works on Wi-Fi networks and Hot-spot technology<sup>5</sup> using tethering by creating a local network with devices, therefore can be easily connected/extended to any system working in the LAN (wired/wireless) to access the web pages from the mobile.

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\* Author for correspondence

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## 2. Problem Statement

The problem and information which motivated the authors to design the web server for mobile is described in this section. The main objective of this paper is to design a static web server which can be made available on an android mobile. This static Web server the files existing in an android mobile can be made available to all other systems (PC or Laptop) within a specified network to which the mobile is connected.

The existing general web server are limited to wired device (laptops and standard systems). Since there is no provision for Wi-Fi in such systems the file from the web server cannot accessed by them. It requires wireless LAN Adapter in all the devices to access the web server, since, there is no facility for Wi-Fi.

The web servers are limited to only smart devices as shown in Figure 1. If there is no Wi-Fi in the area, then there is no possibility of client server communication. If there is a need to transfer the contents that are linked to the server.



Figure 1. General web server.

## 3. Mobile Web Server

To create threads for running server and clients encompasses the development of web server<sup>1</sup>. Sockets produced using Socket programming concepts and multi-threading<sup>2</sup> concepts is accomplished to manage the interchange of web content between the server and in JAVA.

### 3.1 Complications with Existing Systems

Existing system was restricted only for the wired devices like Laptops and standard systems. In addition, the existing system requires wireless LAN Adapter in all the devices to access the web server, Since, there is no facility for Wi-Fi. Also systems like PC is unable to access the file from the web server since there is no provision for Wi-Fi in such systems. Also, if there exist no internet connection, the existing system fails to contribute the main purpose of communications.

### 3.2 Mobile Server Mechanism

To access the webserver additionally wireless LAN Adapter is required in all devices. If there is no Wi-Fi in the area, then there is no possibility of client server communication. Based on two tier architecture the system like PC can access the files for the webserver and it is further extended for enterprise applications.

### 3.3 Processing

Execution of Mobile web server request is processed and it is divided into few stages. Before processing<sup>3</sup> the dynamic client content it determines the static content and then it processed the server request followed by server handler stages.

#### 3.3.1 Static HTML Content

This stage of process is for designing the static html pages and which are served from one android mobile to another android mobile or some legacy systems like PCs in network. In systems like PCs or in an android mobile the processes HTML Pages are printed and additionally HTML webpages uses Java scripting and some external or internal style sheets etc. By using all the features, a model website will be shown with the given content and it is given to the client.

#### 3.3.2 Dynamic Client Content Processing

This is the next stage of the process and it is used to display the client content in the browser. In the browser of PCs or client mobiles it will display the dynamic client content. In that application it provides IP address with port number, when the server is started. Browser of client will be loaded with the static web content once client enter the details in the URL field.

### 3.3.3 Server Module

Various clients are connected in this module and it requires synchronizing the data. So that this stage requires Multi-threading the webpages<sup>4</sup> and socket connection needed between the client and the server.

### 3.3.4 Server Handler

It acts as a mediator between the client and the server and it is used to calling the connection from the server and also it accepts the request from the client. In this stage of process Multi client Processing<sup>7</sup> is achieved.

## 3.4 General Activity Life Cycle

The general activities which happens in a single life cycle is shown in Figure 2.

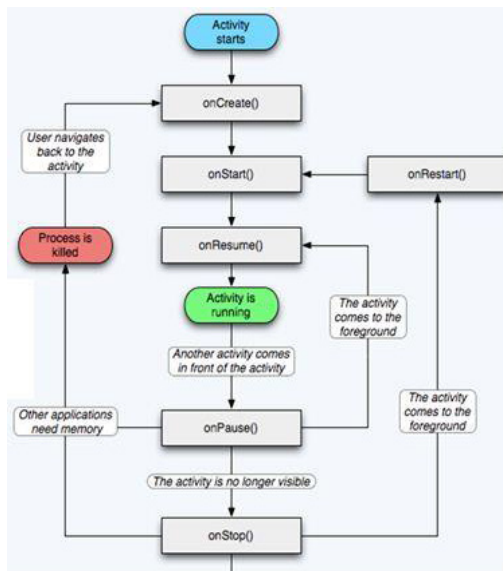


Figure 2. Activity life cycle (android).

### 3.5 Sequence of Events

step 1: Start

step 2: Set the server in Listener mode

step 3: Required port to run the application using sockets on client side if provided after getting the IP address of the network.

step 4: In the server if a new connection is requested the server stage will be called.

step 5: Then, the socket connection will be created by the server with the specified port to which the clients gets

added in the client queue.

step 6: Now server handler will be called by the server for handling the request and then the server waits for new connection. It is to be noted that new connections will not be allowed till the existing request are acknowledged by the server.

step 7: stop server.

Figure 3 shows the details of the sequence of events.

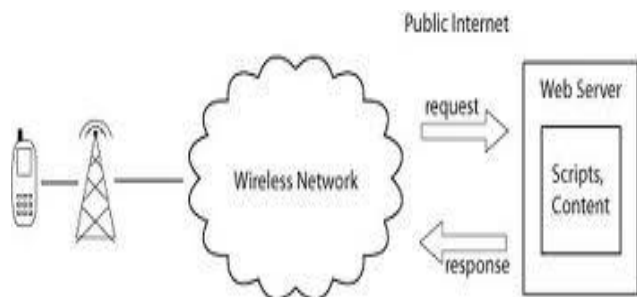


Figure 3. Sequence of events.

## 4. File Sharing

All the data in the server is stored in the form of HTML pages. Data that is going to share can be anything like Ppt, Pdf, music, videos and anything can be stored in the form of HTML pages. Such that we can able to maintain all the data in the form of mini website. This makes the users to access and download the content very easily and it is also very easy for the server to maintain the data in the full organized format. The file sharing here is in the form pc direct peer to peer connection<sup>6</sup>. We are not using any other intermediaries between files sharing which will make the intruders easily to hack the data.

## 5. How Mobile Server is Designed

provision of authentication to the peers and incoming connections is necessary as port numbers are changing dynamically. Sever will monitor the incoming connections and display the IP address.

Connections can be dynamically managed. Files are to be maintained carefully that only those which are to be accessed are made available to clients or so called peers. Figures 4 and 5 shows how the connections are made and how multiple clients are dealt with respectively.

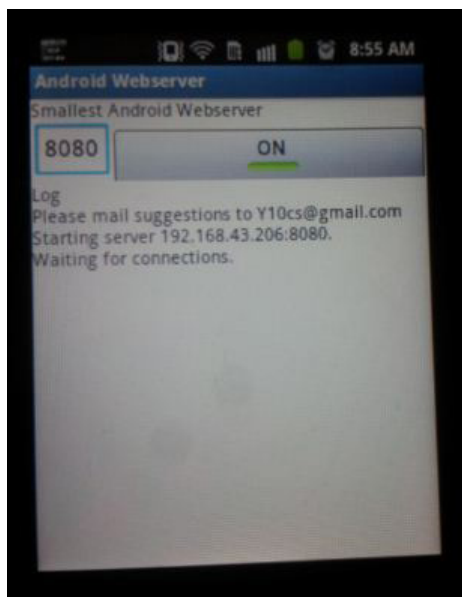


Figure 4. View of server in the mobile.

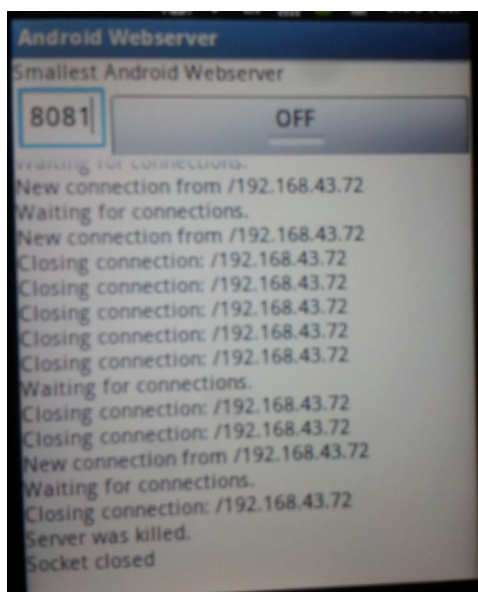


Figure 5. Connecting to multiple clients..

## 6. Conclusion

creating threads to run server and clients encompasses the development of web server. Connectivity of clients and Management of web content between client and server is managed with the help of Sockets. These sockets are produced by Socket programming concepts and multi-threading concepts.

The progress of web server involves to create threads for running server and clients. The switch over of web content from server to client and the connectivity of the clients is managed by sockets which is created using Socket programming concepts and multi-threading concepts in JAVA. This methodology finds application in conferences, sharing highly secured data and so on. Mobile Devices are one of best way to reduce the cost and increase the effectiveness of applications. Owner of the mobile can make use of the application and links the desired web pages in the form of html or files to the app. Once the server is switched on, clients will be able to get the Webpages hosted from the mobile. This technology comes handy with the use of storage memory cards used in mobile phones. The web server proposed here works on Wi-Fi networks and Hot-spot technology using tethering by creating a local network with devices, therefore can be easily connected/extended to any system working in the LAN (wired/wireless) to access the web pages from the mobile. The proposed technology can be efficiently used to serve clients using the mobile server.

## 7. Future Enhancements

In this paper, the proposed static web server which used static port number serves the clients with the data with the change in IP address every time. Enhancements can be made to develop a dynamic server which keeps on changing the port numbers. Some parts in security can also be improved such that we will make sure that there is no any harm to the data that is stored in SD cards of mobile which is now acting as the static server content for the serving to mobiles and laptops connected in the same network. In addition, more security concerns like providing the encryption and decryption to the system can be made to the proposed static web server.

## 8. References

1. Callaghan MJ, Harkin, J, El-Gueddari M, McGinnity TM, Maguire LP. Client-server architecture for collaborative remote experimentation. Third International Conference on Information Technology and Applications, 2005. ICITA 2005. 2005 Jul 4–7; 2:125,129.
2. McCann JA, Jawaheer G, Sun L. Patia: Adaptive distributed webserver (a position paper). The Sixth International Symposium on Autonomous Decentralized Systems, 2003. ISADS 2003; 2003 Apr 11. p. 303,310.

3. Guan M, Gu M. Design and implementation of an embedded web server based on ARM. 2010 IEEE International Conference on Software Engineering and Service Sciences (ICSESS); 2010 Jul 16–18. p. 612,615.
4. Johnson ME, McGuire D, Willey ND. The evolution of the peer-to-peer file sharing industry and the security risks for users. Proceedings of the 41st Annual, Hawaii International Conference on System Sciences; 2008 Jan 7–10. p. 383.
5. Ahmad D, Javed P. Security comparison of Android and IOS and implementation of User Approved Security (UAS) for Android. Indian Journal of Science and Technology. 2016 Apr; 9(14). DOI: 10.17485/ijst/2016/v9i14/87071.
6. Ghosal S, Chaturvedi S, Taywade A, Jaisankar N. Android application for ticket booking and ticket checking in suburban railways. Indian Journal of Science and Technology. 2015 Jan; 8(S2):171–8.
7. Neela TJ, Saravanan N. Privacy preserving approaches in cloud: a survey. Indian Journal of Science and Technology. 2103 May; 6(5):4531–5.