



# MAC-BASED VLANs FOR MOBILE OFFICE IN CAMPUS AREA

Yogita Chodhari<sup>1</sup>  
PG student  
(Computer Networking Engineering)  
Dr. BAMU, Aurangabad

Prof. Mrs.V.R.Chirchi<sup>2</sup>  
Asst. prof. in PG Department  
(Computer Networking Engineering)  
Dr. BAMU, Aurangabad

**Abstract**— the main Theme of this project entitled communication on Adhoc (VLAN) Network is to design and implement a telephony program that uses Wi-Fi in LAN as means of communication between mobile phones. The technology for creating mobile campus network via Wi-Fi. The VLAN is a wireless local area network (VLAN) links two or more devices over a short distance using a wireless distribution method, usually providing a connection through an access point for Internet access. The technology of Mobile Virtual LAN, where multiple Mobiles used to create mobile network via Wi-Fi is discussed. In this mobile Wireless net-work, the single mobile is configured as Server and rest of Mobile phones as clients. The implementation goals includes the several features including, file sharing, browsing and push message notification etc.

**Keywords**— Adhoc LAN, WLAN, wifi, communication, smart phones

## I. INTRODUCTION

Communication on Virtual LAN' is the technology for creating mobile campus network via Wi-Fi. Mobile phones have evolved from audio only devices to multi-function handsets capable of supporting email, Internet connectivity and access to line-of-business applications. As phone features have improved, employee demand for mobile access to corporate email, applications, and other critical business information has increased dramatically. The VLAN is a wireless local area network (WLAN) links two or more devices over a short distance using a wireless distribution method, usually providing a connection through an access point for Internet access. The problem is that the currently such system does not exist for mobile phones. Considering the current trends, emerging software technology and increase in SMART PHONES, we decided to develop 'Mobile Wireless LAN' with Client-Server architecture. The possible services provided including, file sharing, browsing and push message notification etc.

In Mobile Virtual LAN multiple Mobiles used to create Network through 'Wi-Fi'. Single Mobile configured as Server and rest of Mobile phones as Clients. The Client able to send Query to Server and Server reply the Query to the client.

## II. RESEARCH ON VIRTUAL NETWORK FOR VIRTUAL MOBILE NETWORK

In recent years, Network Virtualization has become a big issue which is utility computing, grid computing and cloud computing. Network virtualization provides the feasibility of running multiple architectures also, it can diversify the future Internet Architecture into separate virtual networks according to different applications and requirement. Previous researches focus on only virtual network in wired network or wireless network. In this paper we introduce virtualization technology in the network environment and Virtual Mobile Network based on Virtual Network.

## III. INTEGRITY MONITORING AND MOBILE IMPLEMENTATION ASPECTS OF WLAN POSITIONING.

Location technologies constitute an essential component of systems design for autonomous operations and control. The Global Positioning System (GPS) works well in outdoor areas, but the satellite signals are not strong enough to penetrate inside most indoor environments. As a result, a new strain of indoor positioning technologies that make use of 802.11 wirelessLAN (WLAN) appeared. Contemporary WLAN positioning maintains the database of location fingerprints which is used to identify the most likely match of incoming signal data with those preliminary surveyed and saved in the database. An issue with these systems, however, is the operation robustness. This paper investigates the issue of deploying WLAN positioning software on mobile platforms and studies an integrity monitoring technique to account for unstable signal characteristics, which are often observable in WLAN. Integrity monitoring algorithms can handle the redundancy of APs to identify rogue ones, isolate them and improve system robustness.

### A. STEPS TO CARRY OUT PROJECT WORK

A full SDLC lifecycle is followed while developing the project. Waterfall model and Iterative model is mainly used.

### B. RMMM PLAN

The RMMM Plan maybe developed in the form of a document. Alternatively, an organization may create a set of Risk Information Sheets.Document will be mainly used by the user, as part of the overall Project Plan, in monitoring the project. Risk monitoring consists of few objectives: To assess whether a predicted risk does occur

- To ensure that risk aversion steps defined for the risk are being properly applied.
- To collect information that can be used to analyze other risks in the future.

The Project is a complex project, in the sense that it is intensely difficult, if not impossible, for the individual developer to comprehend all the subtleties of its design. It is also a new project, where there is new existing system. A complex project such as this involves a lot of different type of risks. These risks will be described in the Project Risk Table.

Quality of product documentation and coding that must be produced may be low. The team is also unfamiliar with the standards of what good quality documentation and coding is supposed to be. Thus the degree of confidence in writing good quality documents needed in a Software Development Process, and coding is fairly low.

#### C. PRODUCT REQUIREMENT

- Android mobile platform
- Wi-Fi enabled mobile device
- Platform: Windows XP/7
- Programming Language: ANDROID, JAVA

#### D. SYSTEM REQUIREMENT

Other devices like Mobile handset, Mobile access point, monitor, keyboard, mouse and printer.

**TABLE 1: SYSTEM REQUIREMENT**

Processor	Pentium 4
RAM	Minimum 256 MB
HDD	Minimum 40 GB

#### E. PERFORMANCE REQUIREMENTS

- Performance requirements define acceptable response times for system functionality.
- Loading screen should not take more than 5 seconds to load.

#### F. ENVIRONMENTAL REQUIREMENTS

- Device with Android Mobile Platform
- Wi-fi Direct.

### IV. TECHNICAL SPECIFICATIONS

#### A. ADVANTAGES:

- Resource Allocation.
- Broadcast Domain.
- Grouping.
- Cost Efficient.

#### B. DISADVANTAGES:

- May lead to an exception in some condition.
- WI-FI is necessary.
- In case of server incompatibility it may hamper smooth working of the client mobile.

#### C. APPLICATIONS:

- Work as a client server model
- Many users can simultaneously compete with each Server.

### V. SYSTEM ARCHITECTURE

Client requests for Service to server, then after getting the request of client server fetch appropriate information form database and send results to the client mobile. Client Mobile request Server to serve the information of say keyword PVG. This query will be simply forwarded to Server mobile using File Transfer Protocol (FTP). Mean while Server continuously scan for Client request. If Server found that Particular Client wish to connect with him, then first the connection established and after the successful connection, Server simply first Search the client query into Internal Memory itself. Then the Search proceeds in its BROWSER. The Server will save the Resultant Page and returns its text format to that Client. Thus Server provides information to many clients at a time. For this application, the Virtual Access Point acts as middleware between many clients and Server.



Figure 5.1: System Architecture of M-VLAN

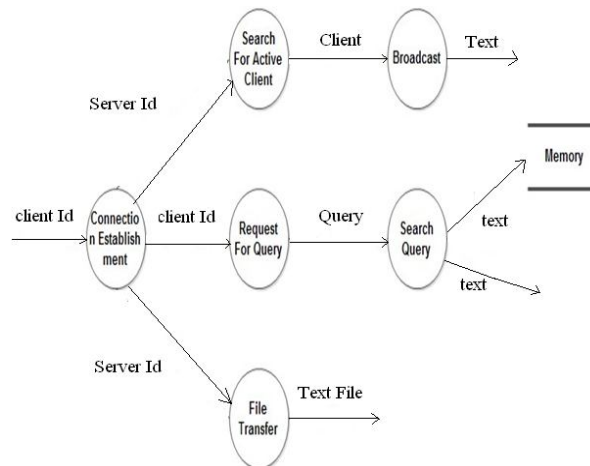


Figure 5.2: Data-Flow Diagram

## VI. IMPLEMENTATION

Software testing validates the developed software to demonstrate that it performs its functions in accordance with its design. The software test workflow manages the process testing and feedback during the integration and test stage.

### A. GOALS AND OBJECTIVES

Software testing is an investigation conducted to provide stakeholder with information about the quality of the product or service under test. One of the goals of software testing is to provide an objective, independent view of the software to allow the business to appreciate and understand the risks of software implementation. The scope of software testing often includes examination of as well as execution of that code in various environments and conditions as well as examining the aspects of code: does it do what it is suppose to do and do what it needs to do. In the current culture of software development, a testing organization may be separate from the development team. There are various roles for testing team members. Information derived from software testing may be used to correct the process by which the software is developed.

### B. WHITE BOX TESTING

White box testing is when the tester has the access to the internal data structures and algorithms including the code that implement these.

### C. BLACK BOX TESTING

This testing method focuses on the functional requirement of the software. It attempts to find out the error of the categories such as incorrect or missing functions, interface errors, error in data structure, performance error and initialization and termination errors.

### D. TESTING ANDROID APPLICATION

Android includes powerful tools for testing applications. The tools extend JUnit with additional features, provide convenience classes for mock Android system objects, and use instrumentation to give you control over your main

application while you are testing it.

- An Android test is itself an Android application that is linked to the application under test by entries in its AndroidManifest.xml file.
- Instead of Android components, an Android test application contains one or more test cases. Each of these is a separate class definition.
- Android test case classes extend the JUnit TestCase class.
- Android test case classes for activities extend JUnit and also connect you to the application under test with instrumentation. You can send keystroke or touch events directly to the UI.
- You choose an Android test case class based on the type of component (application, activity, content provider, or service) you are testing.
- Additional test tools in Eclipse/ADT provide integrated support for creating test applications, running them, and viewing the results.

The test application contains methods that perform the following tests:

- Initial conditions test. Tests that the application under test initializes correctly. This is also a unit test of the application's onCreate() method. Testing initial conditions also provides a confidence measure for subsequent tests.
- UI test. Tests that the main UI operation works correctly. This test demonstrates the instrumentation features available in activity testing. It shows that you can automate UI tests by sending key events from the test application to the main application.
- State management tests. Test the application's code for saving state. This test demonstrates the instrumentation features of the test runner, which are available for testing any component.

**TABLE2:TEST CASES AND RESULTS**

Id	Name	Input	Expected output	Observed Output
1	Device Discovery	Wi-Fi Direct ON	Device Found	Device Found
2	Service Discovery	Found Devices	Devices Paired	Devices Paired
3	Events	Key Pressed	Data transferred and displayed	Data transferred repainted
4	Multiple connections	Multiple Devices	Connected	Connected
5	Server Failure	-	Network Disconnected	Network disconnected and Message displayed
6	Client Failure	-	Message sent to other devices	Message displayed
7	PUSH Message Notification	-	Message Broadcasted and displayed	Message Sent
8	Latency	Data Transfer	Should be less near to 70ms	Variable Latency

## VII. RESULTS

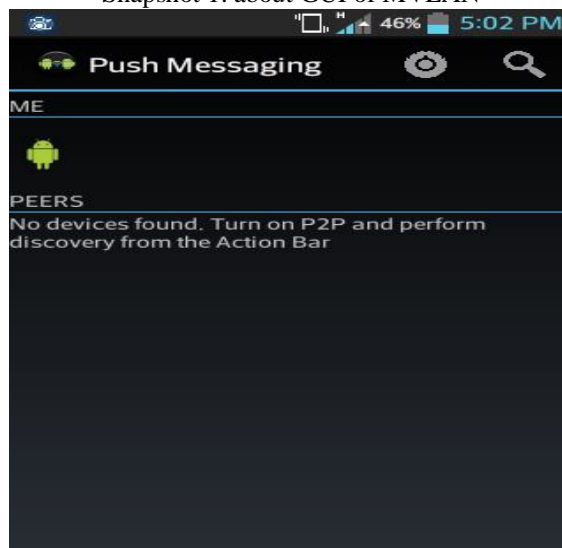
All above test cases have been tested on the Mobile devices with Android version 4.0-Ice cream Sandwich and above and have been passed. It may happen that other devices may fail in some of the test cases like

- Device Discovery
- Service Discovery
- Opening Multiple Connections
- Screen Shots and Code Sample

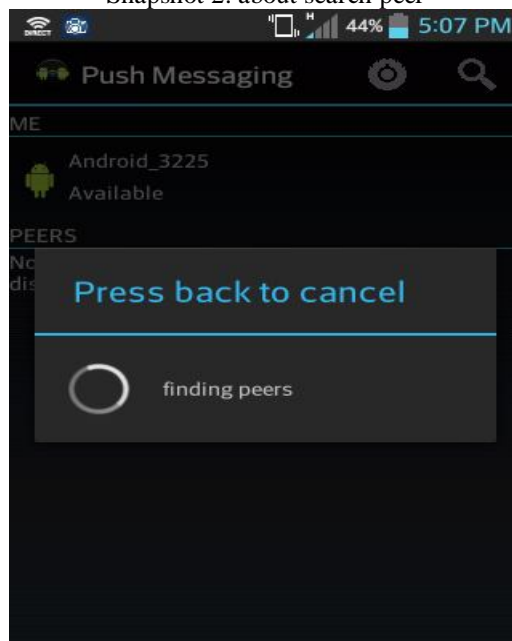
### SNAPSHOTS



Snapshot 1: about GUI of MVLAN



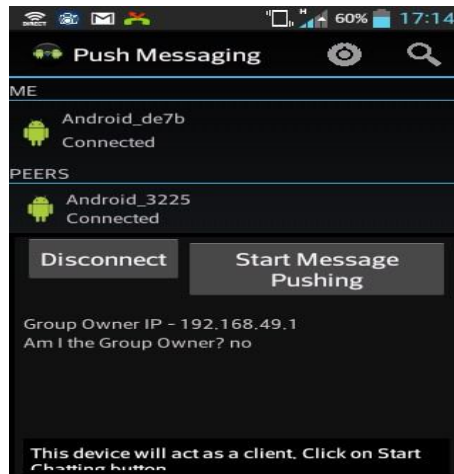
Snapshot 2: about search peer



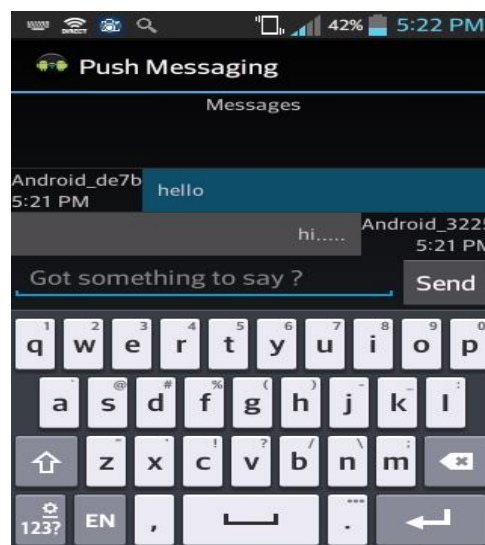
Snapshot 3: about searching peers



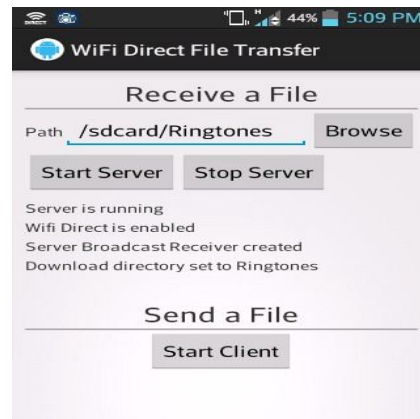
Snapshot 4: about successful connection establishment



Snapshot 5: about to start push message



Snapshot 6: about it uses mobile keypad for sending message



Snapshot 7: about browsing file to send it destination

### VIII. CONCLUSION AND FUTURE WORK

The Mobile Virtual LAN has the flexibility and convenience to connect more than two mobile phones using client-server architecture. In this paper, Client-server architecture is constructed. The mobile Virtual LAN can provide the convenient and easy to use application for the user. The mobile phones communicate through access point. The configuration of mobile Virtual LAN is managed within the range of Wi-Fi. This System can provide an efficient and secure way to configure the mobile Virtual LAN.

The Successful implementation of MVLAN project will be the creation of campus mobile network in staff department. The staff willing to use the feature of file sharing, Push message notification and Browsing etc.

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