

MOBILE WIRELESS LAN

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Abstract— The Main Theme of this research paper includes the brief introduction of our project “Mobile Wireless LAN”. The purpose of this research 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 is discussed. The WLAN 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.

Index Terms— *Wi-Fi, PUSH message, Mobile Platform, Wireless LAN, Mobile Virtual Network, Android, API, SIP Protocol.*

I. INTRODUCTION

People who have diverse needs of the growing number of user-centered ubiquitous computing environment are being changed. This requires the user via their personal Mobile devices anywhere, anytime they want to create the campus network, connect to the network and want to provide some feature.

The technology of Mobile Wireless LAN, where multiple Mobiles used to create mobile network via ‘Wi-Fi’ is discussed. In this network, 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.

The proposed idea is that the client will send query to the server and server will acknowledge related to the connection or send reply back to the client. If server found that particular client want particular information from server, then server will first Search the client query into internal memory itself. Otherwise, the search progress in the mobile browser. . The server will save the resultant page and returns its text format to that client. The server will be able to provide information to many clients simultaneously as per the request of the client.

II. RELATED WORK

Wireless LAN

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 use of spread-spectrum or OFDM technologies may allow users to move around within a local coverage area, and still remain connected to the network. Products using the IEEE 802.11 WLAN standards are marketed under the Wi-Fi brand name. Fixed wireless technology implements point-to-point links between computers or networks at two distant locations, often using dedicated microwave or modulated laser light beams over line of sight paths. It is often used in cities to connect networks in two or more buildings without installing a wired link.

The following figure demonstrates the concept of Mobile Wireless LAN:

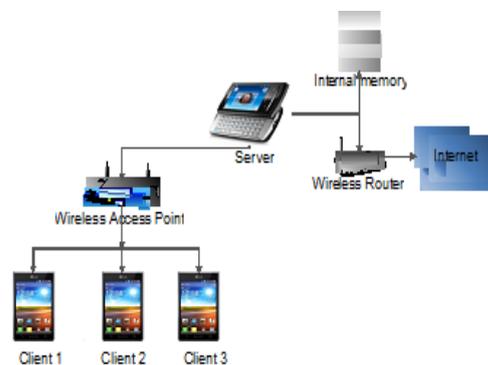


Figure: Mobile Wireless LAN Architecture

Android Technology

The Android SDK provides a set of APIs for Retrieving information about the Wi-Fi networks available to the device and Wi-Fi network connection Details. This information can be used for tracking signal strength, finding access points of interest, or performing actions when connected to specific access points.

III. MOBILE WIRELESS LAN

This paper introduces the new idea about the implementation of Mobile Wireless LAN on Android mobile platform with the aim of creating Office Campus network. The smart phones in the campus are connected through Wi-Fi. The Successful solution of our project may concluded with the creation of Mobile WLAN having following Services: File Sharing, Query optimization, news broadcasting etc.

A. Query Optimization

The client will send query to the server and server will acknowledge related to the connection or send reply back to the client. If server found that particular client want particular information from server, then server will first Search the client query into internal memory itself. If the result is available in the internal memory of server and return it to the client. Otherwise, the search progress in the mobile browser. . The server will save the resultant page and returns its text format to that client.

In below section, we are introducing the concept of PUSH message notification.

B. PUSH notification:

This feature is very useful, where one of the group members want to share the common information simultaneously with all group members and make user work efficient and convenient in group. Vice-versa Server broadcast messages which will be received by all clients connected in Wireless LAN .any mobile (Server or Client) will share resources like File Sharing.

The push notification is a short message pushed to a specific application on an end user's smart device. The message informs the end user about an update that's available for the application, or an event relating to the application. For example, a push notification can be used to notify the end user about latest notifications, calendar. The Apple network supports such messages as text alerts, a badges or audible alerts, and combinations of these. Android supports toast notifications, a brief message that appears momentarily on the screen and messages to the phone's status bar.

Push notifications represent an additional messaging channel for your mobile strategy. Any business that develops or is looking to develop smart phone applications should consider using Push Notifications as a messaging channel to compliment SMS or MMS messaging. Consider using push notifications to:

- Inform end users about notifications relevant to the application.

- Communicate timely information about events such as sports scores or stock movements.
- Inform users of their turn to play in multiplayer game.
- Implement peer-to-peer messaging between users of an application.

C. Mobile Platform

Increase in the popularity of android mobile platform in smart phone world, we focuses on the android platform while implementing this project. The APIs and Classes useful for creating mobile network are:

- **Android API [Classes]**

WIFIMANAGER

This class provides the primary API for managing all aspects of Wi-Fi connectivity. Get an instance of this class by calling

Context.getSystemService(Context.WIFI_SERVICE).

It deals with several categories of items:

- The list of configured networks. The list can be viewed, updated and attributes of individual entries can be modified.
- The currently active Wi-Fi network, if any. Connectivity can be established or torn down, and dynamic information about the state of the network can be queried.
- Results of access point scans, containing enough information to make decisions about what access point to connect to.
- It defines the names of various Intent actions that are broadcast upon any sort of change in Wi-Fi state.

This is the API to use when performing Wi-Fi specific operations. To perform operations that pertain to network connectivity at an abstract level, use **ConnectivityManager**.

SCANRESULT

Describes information about a detected access point. In addition to the attributes described here, the supplicant keeps track of `quality`, `noise`, and `max bitrate` attributes, but does not currently report them to external clients.

- **Packages**

android.net.wifi.p2p

Provides classes to create peer-to-peer (P2P) connections with **Wi-Fi Direct**. Using these APIs, you can discover and connect to other devices when each device

supports Wi-Fi Direct, then communicate over a speedy connection across distances much longer than a Bluetooth connection. The primary class you need to work with is **WifiP2pManager**, which you can acquire by calling **getService(WIFI_P2P_SERVICE)**.

The **WifiP2pManager** includes APIs that allow you to:

- Initialize your application for P2P connections by calling **initialize()**
- Discover nearby devices by calling **discoverPeers()**
- Start a P2P connection by calling **connect()**

Several other interfaces and classes are necessary as well, such as:

- The **WifiP2pManager.ActionListener** interface allows you to receive callbacks when an operation such as discovering peers or connecting to them succeeds or fails.
- **WifiP2pManager.PeerListListener** interface allows you to receive information about discovered peers. The callback provides a **WifiP2pDeviceList**, from which you can retrieve a **WifiP2pDevice** object for each device within range and get information such as the device name, address, device type, the WPS configurations the device supports, and more.
- The **WifiP2pManager.GroupInfoListener** interface allows you to receive information about a P2P group. The callback provides a **WifiP2pGroup** object, which provides group information such as the owner, the network name, and passphrase.
- **WifiP2pManager.ConnectionInfoListener** interface allows you to receive information about the current connection. The callback provides a **WifiP2pInfoobject**, which has information such as whether a group has been formed and who is the group owner.

In order to use the Wi-Fi P2P APIs, your app must request the following user permissions:

- **ACCESS_WIFI_STATE**
- **CHANGE_WIFI_STATE**
- **INTERNET** (although your app doesn't technically connect to the Internet, communicating to Wi-Fi Direct peers with standard java sockets requires Internet permission).

WIFI CONFIGURATION

A class representing a configured Wi-Fi network, including the security configuration. Android will not necessarily support all of these security schemes initially.

WIFI MANAGER.WIFILOCK

Allows an application to keep the Wi-Fi radio awake. Normally the Wi-Fi radio may turn off when the user has not used the device in a while. Acquiring a **WifiLock** will keep the radio on until the lock is released. Multiple applications may hold **WifiLocks**, and the radio will only be allowed to turn off when no **WifiLocks** are held in any application.

IV. RESULTS AND ANALYSIS

The objective of this project may fulfilled with the expectation of the below results:

Functionality	Results
File Sharing	The file shared between all mobiles connected in a network.
Push Message	The latest notification broadcasted by server to all client mobiles.
Query Optimization	The client query processing by Server Successfully.

V. CONCLUSION

The Mobile Wireless 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 Wireless LAN can provide the convenient and easy to use application for the user. The mobile phones communicate through access point. The configuration of mobile Wireless LAN is managed within the range of Wi-Fi. This System can provide an efficient and secure way to configure the mobile Wireless LAN.

The Successful implementation of M-WLAN 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.

VI. REFERENCES

- [1]. IEEE Papers : 'Research on Virtual Network for Mobile Virtual Network' by Jong-Seo Lee and Il-Young Moon
- [2]. <http://developer.android.com/training/basics/supporting-devices/index.html>
- [3]. <http://www.navizon.com>
- [4]. <http://www.drizzle.com/~aboba/IEEE/11-03-154r1-1-Virtual-Access-Points.doc>
- [5]. www.developers.sun.com/mobility/apis/articles/bluetoothintro/
- [6]. www.oracle.com/
- [7]. <http://sourcedaddy.com/networking/wireless-lanapplications.html>.
- [8]. <http://www.wireless-center.net/Cisco-Wireless-Networking/726.html>.
- [9]. IEEE Papers: Application of MAC-Based VLANs for Mobile Office in Campus Area Network
- [10]. IEEE Papers : Integrity monitoring and mobile implementation aspects of WLAN positioning
- [11]. <http://www.cisco.com/en/US/docs/switches/lan/catalyst6500/catos/7.x/configuration/guide/vmps.html>, 2005



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