International Journal of Advanced Information Science and Technology (IJAIST) *ISSN: 2319:2682*
Vol.5,No.3 March 2016 **DOI:10.15693/ijaist.2016.v5.i3.48-52**

Wireless LAN Monitoring Using Android Application

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Abstract- **With the development of computer and information technology, computer and network have become very popular. Now a days all the organizations and campuses use wireless local area network to access their network resources. The activities of the users of the network are monitored by the administrator. But as the size of these networks has increased so much monitoring it has become a tedious task for the administrator. Also the on-campus presence of the administrator is necessary. In this paper we design and implement a distributed wireless LAN monitoring system that helps the administrator to monitor the network nodes without being physically present in the campus with the help of Android Smartphone. Through this system an administrator can access all the nodes present in the network using his mobile. He can kill a process on a node, shut down a particular node, read all the activity being performed on all the nodes, send a message to any node, take the screenshots of the remote node etc. Through this paper it can be seen that this system can better solve the problems faced by the administrator of a LAN network.**

Keywords: Wireless LAN, Android Smartphone, LAN Monitoring, Server.

I. INTRODUCTION

In order to achieve the sharing of internal resources, local area network (LAN) has made a considerable development. There are many network equipment's in the internal network, including personal PC, laptop computers, small server, etc. These various kinds of equipment's are used by the employees and staff in different enterprises. But as more people communicating through networks, they have become larger and more complex. Hence network monitoring applications need to use effective ways of checking the status of the networks so that the administrator can fully control their network. This provides economical and high-quality networking services to the users. Hence we are going to design and implement a system through which the administrator can control each and every node present on the organizations network through his cell-phone.

The aim of this project is to develop an application that will help the system administrator to monitor and control the LAN network without being physically present in the campus. The WLAN network control system will be cost effective and more efficient then the systems presently available in the mark. Right now the monitoring is done manually by administrator in office. This proposed system is designed for controlling and monitoring LAN network, it includes smart phone which will be connected to the server and all other nodes that will be communicating with server. Whole system should be WIFI enabled. Once application is installed on Smartphone, administrator can carry out monitoring activities. Through this system an administrator can access all the nodes present in the network using his mobile. He can kill a process on a node, shut down a particular node, read all the activity being performed on all the nodes, send a message to any node, take the screenshots of the remote node etc. In this application the administrator will be able to view the list of nodes along with their IP Addresses. From the list he can select a particular node and control all the functionality of that system. Through this paper it can be seen that this system can better solve the problems faced by the administrator of a LAN network.

II. NETWORK MONITORING

The term network monitoring describes the use of a system that constantly monitors a computer network for slow or failing components and it notifies the network administrator (via email notifications, SMS or other alert messages) in case of outages. Managing and controlling the activities of the network while sitting in office is manageable task. But, while you are far away from office or your workstation, it is difficult task to monitor and control the network. Rather than depending on third party information we can think of different Network Monitoring schemes. In scientific and industrial facilities we need more and more information, due to the increased capabilities of the electronics and computing devices. Communications must be assured for this reason in every place of the facility. And it should be done in a fast, secure and reliable way.

In recent days all these activities of monitoring LAN was done by cables. For performance reasons they are not really needed, hence wireless can be the good option to monitor and control. In comparison with wired communication, wireless communications have many advantages like ease of maintenance, mobility, scalability and reduced costs. Several wireless solutions such as Wi-Fi or Bluetooth can be found in the market. The IEEE 802.11 standard for WLAN, Wi-Fi, is a very flexible technology, easy to implement, cheap and provides a wide bandwidth. For all these reasons, it has been implemented in large-scale systems.

III. LITERATURE SURVEY

Widely, networks are formed by connecting multiple computers in the LAN. Monitoring and controlling the activities of network form the admin office is very easy task but if the admin is not in his office, the problem one can face is to control and monitor the network. Instead of depending on any third person for the information and activities about the network we are developing a new android application which can be used to monitor the network easily. The communication between particular the admin and client is achieved through a centralized monitoring server; our goal is to develop integrated software. i.e. an android application so that it will help network admin to remotely access and monitor network elements like PC's through android phone. The communication between the client and the android phones is carried out through the server [1].

In this era of wireless networking there are many techniques to monitor the network from remote place. One of the techniques is LAN monitoring using SMS based system. But it has some disadvantages of monitoring network. To overcome these disadvantages we are going to implement new system using android platform with Wi-Fi connectivity. In this application the android phone is connected to the server using Wi-Fi from there onwards server will able to track all the activities that a client is performing. So it is convenient to monitor the network using android phone. This application is more reliable, flexible, fault tolerant and easy to communicate.

To monitor and control the network many utilities are available

A. Remote Desktop Connection

In Remote Desktop Connection usually two PC's are connected in the LAN. In this utility both systems can be a server as per the requirement of administrator. Two PC's are connected with each other either by using IP address or by Unique PC-Name. On establishment of connection client PC screen get Log Off and monitoring of its activities can be carried out from other computer[1]

B. TelNet Service

TelNet is a client-server protocol, based on a reliable connection-oriented transport. It is used on local area networks to provide a bidirectional interactive text-oriented communication facility using a virtual terminal connection. It stands for terminal emulation program through which we can manage remote networking device. **E.g.** Router, Server, Switches & Firewalls, Wireless Access Point (WAP). Port Number of TelNet is 23.[2]

C. Team Viewer:

For operation of this utility we need Internet connection. Team Viewer allows the user to manage remote systems connected in LAN. This utility doesn't support any data transfer or file transfer. Following are some limitations of Team Viewer [3]:

- Administrator doesn't have full control.
- No provision is given to reboot or shutdown through mobile.
- Supports only one remote command on the remote machine at the same time.
- It cannot capture the remote systems Desktop.
- No device to detect lost hardware resources except camera.

D. GSM Based System

This system can control and monitor network through message sending from any location outside the server room. In this scenario the administrator sends the request through SMS from his cell phone via GSM modem to the control monitoring server. Server then identifies the client machine and does the work of establishing a connection according to the request and prepares response and sends back to the admin. The communication between server and admin is done through the GSM service provider. Client machines are controlled by admin through the SMS[1].

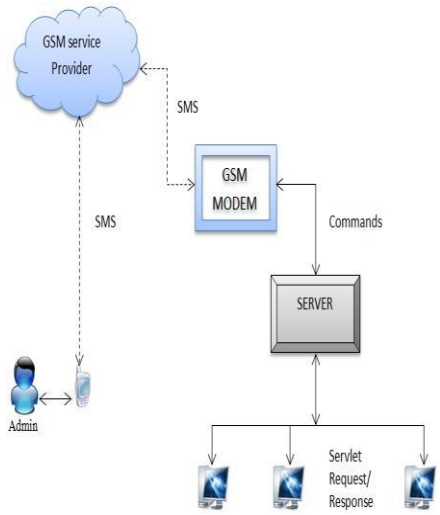

Fig. 1 GSM Based System.

Fig.1 shows the overview of GSM based system. In this system admin sends SMS to the server through GSM modem. SMS that is to be send contains mobile number of user, client name and operation to be performed is mentioned. The client is identified by server after receiving the SMS by the server. The incoming message is parsed so that specified operation is performed on the identified client and the server response is sent back using same steps.

GSM based system fails in some cases as it has some drawbacks these are, cost of SMS is high, and failure of the GSM modem in some situation. Hence this system is not convenient and useful for user. Another way

is to monitor the network via email. It has the benefit that it provides more information about the network to the admin by dropping a mail into their mailbox, when admin is outside of LAN. Email services are widely used by internet users but remote monitoring of networks through email is also not convenient because admin has to check his emails periodically. This system also has some disadvantages while operating in LAN. To overcome all these drawbacks of existing utilities we are developing android based LAN monitoring system.[1-3]

IV. PROPOSED SYSTEM

A. Problem Definition:

In previous system Admin was sending his request to the LAN server via SMS using mobile phone through GSM modem. Server finds the client machine of which admin wants to monitor. GSM service provider helps to communicate using GSM modem which can be used for the communication between client and server. But the system failure occurs whenever there is no any SMS service available or low balance[1]. Recently administrator is performing more than one task at a time, so he needs such a system using which he can control the server from his remote place and for this purpose only we are proposing a system using android platform to monitor and control the network. So in the era of android systems we can implement an application which can be used to monitor the network, provided that Wi-Fi is enabled.

B. Android Based System

Our proposed system presents the idea of network monitoring through Android Phone. The aim of our system is to provide maximum information about the network activities in LAN to admin with the help of Android Phone; this system is useful when the admin is not present in the server room.

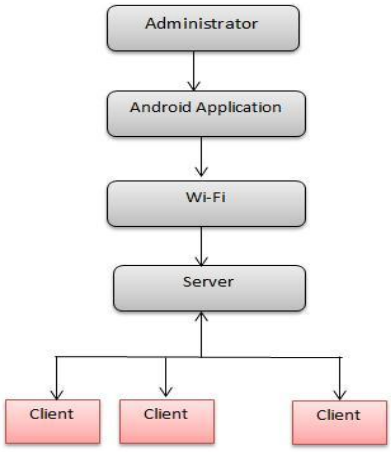

Fig 2. Android Based System

In this system we are using number of protocols to control the network. These are mentioned below[3-5].

1. Simple Network Management Protocol (SNMP): It is standard protocol for managing devices on networks using IP address. Routers, Switches, servers, workstations, printer, etc. are some devices that support the SNMP protocol. SNMP protocol operates in the 7th layer of OSI model i.e. Application layer. It receives request at UDP port no. 161 and the response is sent back to the port no. 162.

2. Session Initiation Protocol (SIP): To set the incoming and outgoing voice calls without having transport level communication SIP protocol is used. All the features of this protocol are controlled by the GSM based system and email based system as we discussed earlier. It is also controlled by the android phone system very conveniently and in efficient way because the android phone system provides very good user interface to carry out operations. It helps to improve the speed of the operation and save the time required to login in email based system. Time which can be spent in typing a command is also saved. Finally operations can be performed by just starting the application as it provides user friendly GUI.

C. System Architecture

There are many reason of developing new android based system these are described as follows. SMS based system doesn't ensure the delivery of SMS. In case cost of SMS is high there will be problem in operation of system.

a. Basic Design:

Following Fig.3 describes about the basic architecture of our proposed system. Here admin can monitor the local area network in two situations one is when he is inside the network and another is when he will be at his another branch of company or he is out of the network.

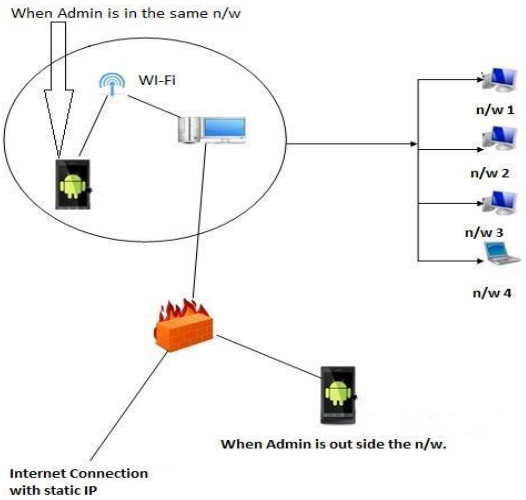

Fig. 3 Basic Design Architecture

While considering these two cases we used the concept of static IP address when admin is out of station

in this case one static IP address is assigned for the LAN monitoring through which he can monitor all the activities going on the PC's of the LAN. Another case is when he is in same network to which he is monitoring. In this scenario one server machine we have assigned to our LAN where server program is running. The IP address of this server is used for the monitoring the PC's in LAN.

Features and Advantages of Android Based System: We can use this system to monitor and control large networks like university, colleges, offices etc.

Features:

- List of Client – using this feature we can get list of client logged in at any time. Also we will be able to keep track of status of every client at given instance of time.
- List of processes – this feature enables us to obtain the list of processes running on machine.
- Activating a process – this feature can be used to start different processes on server or client machine.

b. Detailed Architecture

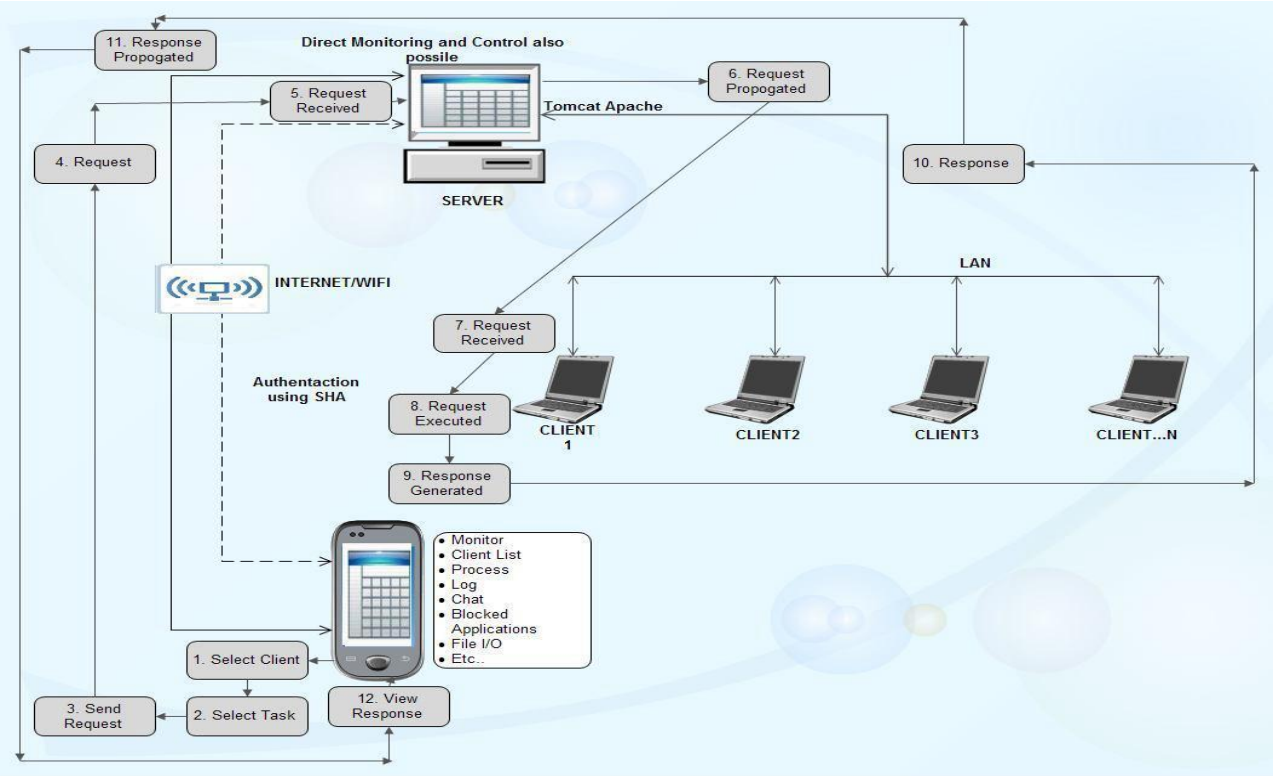

Fig.4 Detailed Architecture.

- Killing a process – using this feature we can kill the unwanted process running in client machine.
- Process Scheduling – this functionality can schedule the processes according to the priorities assigned to them.
- Data recovery- this function gives the facility to recover the lost data during the processes communication and execution.

2. CONCLUSION AND FUTURE SCOPE

The developed application will help the system administrator to keep the track of users who are accessing the network resources irrespective of the location of the administrator. Proposed system is implemented for Wi-Fi area and can be used over internet with the static IP. Due to wide usage of smart phone devices, this system will be developed for tablets and other handled devices. Also it will provide mobility to the users for controlling their desktops over internet. This system can be modified for troubleshooting purpose. Thus extended scope of the system will prove to be useful in providing the mobility and accessing the remote desktop over the internet.

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