

# GSM based LAN Monitoring System

Aditya Kadam<sup>1</sup> Sachin Baikar<sup>2</sup> Arvind Kote<sup>3</sup> A.P. Trupti Shah<sup>4</sup>

<sup>4</sup>Assistant Professor

<sup>1,2,3,4</sup>Department of Computer Technology

<sup>1,2,3,4</sup>Atharva College of Engineering University of Mumbai, India

**Abstract**— Many organizations have a huge network of LAN which is difficult to manage by a single system administrator manually. The GSM based LAN monitoring system will monitor all the physical devices i.e. PC's from handheld device called mobile. The system has shut down, process list, broadcasting message and net view modules to trace and keep track of various client activities. The targeted users are labs in colleges and various other organizations. The most required module in the field of IT industries is the efficient computer network management. There are many requests related to such networks which network manager needs to solve immediately for avoiding the any kind of interruptions. But sometimes, network managers may not be flexible, so in such cases there is not possible to resolve any requested issues with the office network tasks. Thus in order to solve such problems in this project we describes the architecture of a novel tool for network management using GSM/GPRS mobile devices. Rather than depending on third party information, you can always have your cell phone serve the purpose. Just download the project in your mobile phone, login anytime to the application and see who is busy with what in the office. There is a LAN setup with the server machine connected to GSM service provider via a GSM modem. The communication between the clients and the wireless media happens through this server and then, it shows results by depicting the screen of several mobile devices, which provide network management information.

**Key words:** GSM, LAN Monitoring System

## I. INTRODUCTION

Nowadays, almost every IT department settles Service Level Agreements (SLAs) with their users, which requires additional resources in network monitoring systems. Network monitoring has many disciplines, such as installation, integration, and the coordination of hardware, software and human resources for the monitoring, test, configuration, analysis and evaluation. The final goal is to control the network in real-time, knowing its resources, its performance, and then comparing this information with the user requirements. All these tasks should be executed within an acceptable budget. The increasing demand for applications and services that allow the development of new business, stimulate companies to increase the investment on network infrastructure services and telecommunication systems. These systems have had their complexity increased, interconnecting equipments of different manufacturers, which generally use different technologies. Accordingly, the increasing use of SLAs has demanded sophisticated monitoring and management systems IP based network management protocols appeared in the 80's with the development of the Host Monitoring Protocol (HMP), High-Load Entity Management System (HEMS) and Simple Gateway Monitoring Protocol (SGMP). These protocols evolved towards the Simple Network Management Protocol (SNMP). The Internet Engineering Task Force (IETF) Application MIB Working Group is responsible for the definition of a set of managed objects that provides information about configuration, faults, performance, accountability and security. These managed objects offer the necessary information to define the quality of service and reliability of a network infrastructure. The basic parameters of SLAs are established by this information. Technology development in the mobile communications area has been growing substantially in recent years. The success of Global Systems for Mobile (GSM) [2] technology is a fact and the continuous growth of the Internet creates opportunities for the mobile cell companies to offer new data services, mostly Internet and Intranet access for mobile users.

## II. TERMINOLOGY

### A. Technology used in Project: VB.Net

Visual Studio .NET is now built on top of the .NET Framework. The .NET Framework takes application development to viewing the Internet as your new operating system. Your applications will no longer recognize hardware as a boundary limitation. This is an evolution of the Windows DNA model. This new framework is built on open Internet protocols for a standardized interoperability between platforms and programming languages. The .NET Framework will also allow the creation of new types of applications. Applications will now run using the Common Language Runtime (CLR). All .NET applications will use this same runtime environment, which allows your Visual Basic applications to run on equal ground with other languages. The next step is to move towards complete applications running on the Internet. Visual Basic .NET promotes these new Web applications. Web services allow objects to be located anywhere on the Internet and to be called from any application across the Internet (no more trying to get DCOM configured). If you have seen earlier versions of Visual Basic, the IDE for VB.NET will look very familiar. But if you have also worked with InterDev in the past, even more of the new interface will be old hat. That is because the new IDE used for VB.NET has integrated the best ideas from both environments to provide a more effective way of getting work done.

### III. RELATED WORK

The System consists of three major subsystems/modules as depicted in the system architecture diagram. They are explained below:

#### A. Design of System

Design of system characterized into three modules: Client module, GSM Server module and Administrator:

##### 1) Administrator

Administrator is having an application installed on his cell phone, using this application he can send command using text message.

##### 2) Client

The client or user on the network requests for information (kill, delete, create file) to access, requests for rights & privileges to access.

##### 3) GSM Server

The requests received are analyzed by server. Then server performs the respective action as directed by the Administrator.

#### B. Software Product Features & Modules

##### 1) Authentication

- Description: The system offers access to client details only by validating the admin with the unique username and password.
- Functional Requirements: All system should have client program running. The server should identify all clients by their respective static addresses.
- Input: Username and password.
- Output: Client details.

##### 2) Process List

- Description: This utility is used to view the activities of various clients. Moreover it provides real time reporting. The administrator using this module can determine the processes that are currently running in a particular system, present in a network. The administrator by specifying the IP address of the remote system obtains the details of the processes. The administrator can terminate any of the process by selecting that particular process. By terminating a process, that particular application will be stopped. This module is similar to that of a task manager present in the windows operating system.
- Stimulus/response sequences: Reporting and alerting:
- Functional Requirements: All system should have client program running. The server should identify all clients by their respective static addresses.
- Output: process report.

##### 3) Net View

- Description: This utility gives information of all the clients which are connected to the server. Moreover it provides real time reporting.
- Stimulus/response sequences: Reporting and alerting:
- Functional Requirements: All system should have client program running. The server should identify all clients by their respective static addresses.
- Output: clients report

##### 4) Remote Handling

- Description: The Remote Handling module handles the terminal operations such as shutdown, restart and logoff, by specifying the IP address of the remote system.  
This module asks the administrator to enter the system address on which he wants to perform the terminal operations. It also asks the administrator to mention one of the above three terminal operations to be performed on the remote system. All system should have client program running. The server should identify all clients by their respective static addresses.
- Output: particular pc shutdown, restart, logoff

##### 5) Broadcast:

- Description: This utility actually Broadcast the message that administrator would like to say to all the pc which are connected
- Stimulus/response sequences: Reporting
- Functional Requirements: All system should have client program running. The server should identify all clients by their respective static addresses.
- Output: Message Broadcasted.

#### C. Non-Functional Requirement:

Following are the non-functional Requirement.

- 1) Availability: The System is availability to the user is 24\*7\*365 days.
- 2) Flexibility: Our system is flexible so that new thing can be add or remove from the project.

- 3) Performance: The performance of the system is depend on the network of the GSM Higher the Network quality higher the Faster the task will be done Through Server .
- 4) Reusability: The GSM based LAN Monitoring component is can be reused in much application further.

#### D. Hardware and Software Requirement:

##### 1) Hardware:

A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a subscription to a mobile operator, just like a mobile phone. From the mobile operator perspective, a GSM modem looks just like a mobile phone.

When a GSM modem is connected to a computer, this allows the computer to use the GSM modem to communicate over the mobile network. While these GSM modems are most frequently used to provide mobile internet connectivity, many of them can also be used for sending and receiving SMS and MMS messages.

A GSM modem can be a dedicated modem device with a serial, USB or Bluetooth connection, or it can be a mobile phone that provides GSM modem capabilities.

For the purpose of this document, the term GSM modem is used as a generic term to refer to any modem that supports one or more of the protocols in the GSM evolutionary family, including the 2.5G technologies GPRS and EDGE, as well as the 3G technologies WCDMA, UMTS, HSDPA and HSUPA.

- a) Hardware Requirement:
  - LAN
  - PCs (At least two)
  - Network Cards
  - GSM Modem (SIM 300)
- b) Software Requirement:
  - Microsoft Visual studio 2010
  - .net framework 4.0

## IV. PROPOSED APPROACH

The disadvantages present in the existing systems can be overcome using the proposal systems:

Using the GSM Controlled LAN the administrator can control the operations of the remote system from his Server system as well with the mobile phone itself. The administrator can get the configuration & process list of the remote system from the server system itself using this software or through the SMS on his phone.

The administrator can view of all the users currently online from remote location on the mobile phone.

In order to terminate the operations on the remote systems, the administrator can obtain the current process details of the remote systems.

Admin can send Broadcast & Unicast messages to the users for the communication through the mobile phone if he is away.

Admin can issue system level call (restart, shutdown,..) from the remote server or the mobile phone.

Here aim is to build a user interface, using which we can interface with different PCs connected in LAN by sending only SMS to perform large number of operations on them. It is a tool which can be used in various fields. Using mobile computer communication using SMS we can operate any PC with particular IP address in LAN. Suppose administrator wants to shutdown any computer connected to the LAN he/she need to send SMS to the mobile connected to the server. Server continually read for any new SMS if he found new SMS then command stated in the SMS will be executed by the server and server will shutdown the stated computer. Numbers of operations that can be performed by administrator are as follows:

#### A. Process Management:

- Shut down:
  - Admin of the application can shut down the user PC.
- Restart:
  - Admin of the application can restart the system.
- Logoff:
  - Admin of the application can logoff the system.
- Kill the process:
  - Admin of the application can kill the process of the application.
- View the list of running processes:
  - Admin can view the list of the running processes.

## V. FEASIBILITY STUDY

The feasibility study plays a major role in the analysis of the system. The very decision of the system analyst, to design a particular system depends whether the system is feasible or not. Hence, the feasibility study forms the very basic of the system. The feasibility study can be categorized into:

#### A. Technical Feasibility:

It has been determined that the technology needed for the proposed system is available and that this technology can be integrated into the application. Technical evaluation has also evaluated the existing system to find that it cannot be upgraded in keeping with the users needs. Hence, we need to create an entire new system which caters to the specific needs of the user. The end user can be equipped with the pre-mentioned hardware and software requirements.

#### B. Operational Feasibility:

There are two aspects of operational feasibility for the system. One aspect is that of technical performance and other is of acceptance. It has been determined that the system can provide correct and timely data required for the end user needs. Also it has been determined that the system will be accepted by both users with and without technical knowledge.

#### C. Economic Feasibility:

The economic feasibility of the system is mainly concerned with its financial aspects. It determines whether the project is economically feasible. As the hardware and software are already available easily in the market, no further investment is to be made in that direction, the only cost involved is that of implementing the system. The front end system is built in jdk1.5.0 which is freely available. The backend is built in MS Sql server which the can be made available with easy efforts and lower cost. Also since the application works on middle-level phones it is not necessary to spend a lot of money in obtaining a phone.

### VI. LITERATURE REVIEW

The literature related to the research topic has been reviewed for last twenty years in order to find out work carried out by various researchers. There are many systems for remote monitoring and control designed as commercial products or experimental research platforms. It is noticed that most of the research carried out belongs to the following categories a. Internet based Monitoring using Servers, GPRS modems, etc. with different approaches. b. GSM-SMS protocols using GSM module individually or in combination with Internet Technologies. c. Monitoring using Wireless Sensor Networks. d. Wireless Monitoring using Bluetooth, Wi-Fi, Zigbee and RF. e. Applications have varied widely like Home Automation, Security Systems, Biomedical applications, Agriculture, Environment, Reservoir, Bridge health monitoring, etc. Internet Based Monitoring Internet monitoring is one of the common approaches for remote monitoring. Many researchers have worked in field of Internet based remote monitoring. (Saito et al., 2000) Developed home gateway system for interconnecting home network consisting of IEEE 1394 AV network and X10 power line home automation network with Internet. This provided remote access functions from Internet for digital AV appliances like Digital Video Camera, Digital VCR connected to IEEE 1394 network and home appliances like TV, desk lamp, electric fan connected to X10 controller.[3]

(Al-Ali and Al-Rousan, 2004) Developed Java based home automation system via World Wide Web. The home appliances were controlled from ports of embedded system board connected to PC based server at home. [4]

(Alkar and Buhur, 2005) Implemented Internet based wireless flexible solution where home appliances are connected to slave node. The slave nodes communicate with master node through RF and master node has serial RS232 link with PC server. The nodes are based on PIC 16F877  $\mu$ c. PC server is formed of a user interface component, the database and the web server components. An Internet page has been setup running on a Web server. The user interface and the Internet front end are connected to a backend data base server. The control of devices is established and their condition is monitored through the Internet. [1]

The main objective of GPRS based LAN monitoring and controlling is to give maximum details about the network to the administrator on their mobile phone, when the administrator is away from the office or out of station. A time when administrator needs to stay away from the server, it can be more dangerous as there is no control of anyone over the server. It may convert into any bad mishap like client will not do their allocated work, clients can be idle without doing any work, and the client can access unauthorized files or can access restricted sites over the Internet.[5]

The main objective of this system is to provide maximum details about the network to the administrator on their android phones, when administrator is away from office or goes out station. There can be number of protocols are used to monitor and control the network using android phone; it can be android protocols and network management protocols or combination of them. Simple Network Management Protocol (SNMP) is an "Internet-standard protocol for managing devices on IP networks." [6]

### VII. CONCLUSION

In our project or system of Monitoring System through GSM and using a phone was used for the effective approach that is Administrator can move anywhere easily without attending system for 24X7 and Another one is it will be fulfill all the needs of clients which will be requested to the server at quick time. This System provides fast, robust and extremely high Quality performance because of having improved maximum details about the network to the administrator on their mobile phone, when he/she is away from office / goes out station. Apart from this following are the objectives of this project:

To provide the detailed study over the working of GSM/GPRS networks. To design the strategies for the remote monitoring of LAN. To implement the designed skeleton for monitoring the LAN. To provide the network management information's on the mobile screens as results.

### **VIII. PROBLEM STATEMENT**

Current LAN Monitoring System is manually and can prove inefficient and time consuming process. The security model and algorithms of GSM were developed in secrecy and were never published. The GSM security model is broken on many levels and is thus vulnerable to numerous attacks targeted at different parts of an operator's network.

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