Remote Control and Administration of Computer Network via SMS

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Abstract— The administrators are always worried about not being informed of the failure which takes place in network, or they are informed lately. Even if they are informed soon, it is not possible for them to reach the location to solve the problem. This mainly occurs because the network manager needs to go there or need an access to internet to fix the problem. This paper suggests a method for remote administration of computer network. Also network managers can send commands to the application software by Short Message Service (SMS) to let it issue commands for fixing the failure. By applying this approach, network managers can control and manage their network when they are far from the network location. In this approach administrator can send an SMS and get all the information what exactly is client doing.

Index Term—Network;Monitor;Remote;SMS

I.   INTRODUCTION

In a concern, computers are connected in a group to form a network. To manage and control the tasks of the network when in office is a simpler task. But, while you are far, it becomes very difficult to manage the network. Instead of depending on third party for the information, you can be connected with your cell phone and email accounts to serve the purpose. The communication between the clients and the remote administrator is achieved with help of a central monitoring server. Using cell phone we can monitor and control the network using SMS service and see what activities are being going on in office [3]. It aims to develop an integrated software solution that allows a network administrator to remotely monitor the LAN by his cell. The communication between the clients and the wireless media happens through this server. Also using email we can develop different network utilities those are required to effectively and efficiently monitor a LAN network. It aims to develop a solution that allows a network administrator to monitor the LAN network by his email account.

Network monitoring can be useful in various applications such as college, university, malls, and offices. Network monitoring at the university/college level can be used for monitoring, logging and holding of network packets that changes university networks.[5] The aim of this project is to maintain confidentiality, candor and availability of the university network infrastructure and information assets. Network monitoring at the office level can be used to monitor the network by the administrator any time, if at a particular point he cannot be present there. He does not have to be dependent on any third party for information relating the network and can instead check the network status himself using his mobile.[2] Network monitoring at the malls is used to monitor all information of malls by administrator at any time if at particular time he cannot be present there. Using

mobile device the administrator can perform following action:

- Kill process
- Net view
- Broadcast message
- Screen shots
- Shut down
- Process list
- Feedback

The administrator will also get the feedback whether the operation perform is actually done or not. Server application retrieves the list of processes running on the client machine along with their process ID by making RPC call and sends it to administrator via SMS. The server keeps the list updated to check for live hosts. The server communicates with particular client using his client id. [3]

The Desktop of Client computer would be disabled unless User authenticate to the server. For accessing any workstation in network, it is require for the user to register himself at server, as a part of registration snapshot of user is captured by web cam. After registration user is provided with unique User ID and Password which he has to use at the time of login in to the workstation. [5]

II.   AIM AND OBJECTIVE

The main aim and objective of system is to develop an interface between server and client, where clients are connected via LAN and GSM modem is used for the communication between client and server.

The objective here is to develop a system that allows the administrator to remotely control and monitor multiple clients using a cellular phone.
This system will be a powerful and flexible tool which will offer the service any time, and from anywhere with the

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constraints of the technologies being applied. The main approach for designing this system is to implement the commands from a cellular phone over the GSM network on the client side. The operation will be performed on client side and a feedback will be send back to the cellular phone.

III.   DIFFERENT TECHNIQUES USED IN REMOTE ADMINISTRATION

It represents different methods and tools frequently used to administer remote Windows system, and which will let you access a command prompt and perform basic system administration, such as view /start /kill processes or services, reboot machines and view system logs, you can observe what is happening on the display, and even run GUI based programs all remotely, which depends on each features of these remote administrator software's.

a)   MSRPC "Win32 legacy management APIs"

The traditional method to administer remote Windows systems is to use Win32 legacy management APIs. These APIs can be identified very easily because they take a server name as one of their parameters, when the server name is empty "NULL", the API operates on the local server, and server name is specified then API operates on the specified remote server. For instance, all APIs starting with the name Net such as NetShareEnum() belong to this class of APIs. When used to administer a server, these APIs use MSRPC protocol, "Microsoft implementation of the DCE RPC standard" with the SMB transport. SMB is the main protocol of Windows networks and is operated on both port 139/tcp and 445/tcp. When SMB is used as a transport for MSRPC, the named pipes inside the IPC share are used as RPC services endpoints. Microsoft Remote Procedure Call "RPC" is an interprocess communication "IPC" mechanism that enables data exchange and invocation of functionality present in a different process. That process can be performed on the same computer, on the local area network "LAN", or across the Internet. The With RPC, essential program logic and related procedure code can exist on multiple computers, which is important for distributed applications [6].

b)   WMI "Windows Management Instrumentation"

WMI is the management framework available in current windows systems. WMI is developed on the COM "Component Object Model" infrastructure and can thus operate remotely, using DCOM "Distributed COM". Additional in this, several WMI-based administration tools are available by default on Windows systems to administer remote systems using WMI.   Windows Management Instrumentation is an infrastructure that allows you to access and modify standard-based information about objects, such as applications, computers, and network components in your enterprise environment. With WMI, you can form powerful administration applications to monitor and respond to specific events in your environment. For example, you can form applications to check CPU usage on your Windows Server 2003, based servers and warn you when it exceeds a specified

level. In fact WMI is a powerful tool for building customized applications; it does require a certain amount of developing time and expertise. Windows Management Instrumentation Command-line "WMIC" provides a simplified interface to WMI. By using WMIC, you can use WMI based information using CLI or scripts. You can use WMIC from any computer where it is allowed to manage any remote computer. It is not necessary that WMIC should be available on the remote computer [6].

c)   GUI-oriented Tools build in Windows

Many Windows system administrators likely to use graphical remote administration tools that allows access to Windows GUI. Recent Windows systems "Windows 2000, XP, Server 2003" supports Terminal Services, the feature of Windows NT is to allow multiple concurrent interactive logon sessions. The network protocol which is used by Terminal Services is RDP (Remote Desktop Protocol) which is operated by default on TCP port 3389. Terminal Services depend on Windows authentication to authenticate remote sessions created by users. In addition, applicative permissions are supported by Terminal Services to restrict the category of users allowed to establish Terminal Services sessions and Permissions tab in the Properties of the RDP-TCP transport in Terminal Services Configuration MMC snap in. Remote Desktop, included with Windows XP Professional, allow you connecting to your computer towards the Internet virtually from any computer, PC or Smartphone. With Remote Desktop, you can access your computer from anywhere which is present at the office without losing files, applications, and e-mail. Your sales force will be able to access the latest pricing sheet from on the road by using Remote Desktop in Windows XP Professional. With Remote Desktop, you can connect to your work computer from home and access all of your programs, files, and network resources as you were actually sitting in front of your computer at work [6].

d)   CLI-Oriented Tools

CLI "Command Line" remote administration tools are needed, to execute non- interactively system administration scripts. PsExec is a convenient tool for Windows systems administrators because it allows executing processes on a remote system, provided that the s service is available on "TCP ports 445 or 139" and that you have local administrator credentials on the remote system. PsExec first copies its executable psexesvc.exe, which is present in the psexec.exe binary by using SMB, under %systemroot%\System32\, installs the service and starts it. These steps require administrator authority. If you are logged on with local authority that also correspond to local administrator authority, with a domain administrator account or with an account with username and password unique to a local administrator account on the remote system, additional authorities are not needed Rcmd is a Windows NT 4.0 Resource Kit tool composed of a Windows service and a command- line client that supports remote process execution.

IV.   SYSTEM ARCHITECTURE

In a figure. a Illustrates the block diagram of the remotely control system using SMS. Administrator sends his request through SMS using his mobile phone with help of GSM modem to the server. Here program running on server side extract received SMS, identify command and then recognizes the client machine which administrator is supposed to monitor. It fetches data from client either by making RPC call or through socket input/output streams and sends this information to the administrator as response through SMS.
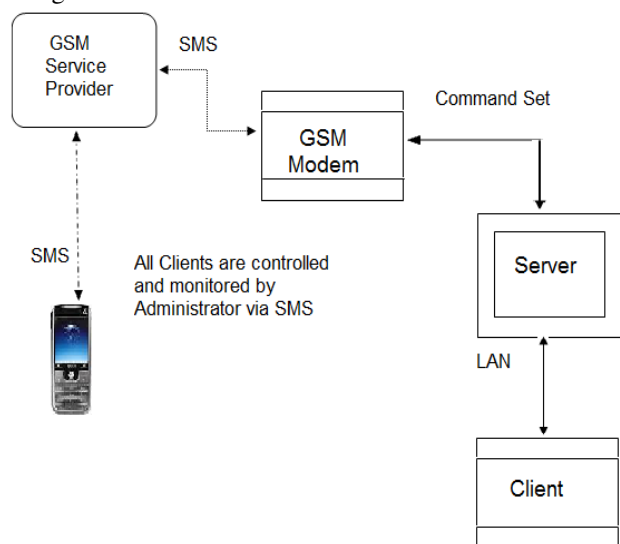

Figure a. Block Diagram of system

This tool comes with two modules client module and server module .Server module provides secure access control for clients and maintains log of user's current activities on workstation, by analyzing their current active tasks and screen outputs either through mobile or from server desktop application. The system utilizes a low cost modem that is easily available in the market. The structure of the system is working with following steps:

1). The remote user sends text messages (SMS) including commands to the receiver.
2). ii) GSM receiver receives messages sent from user cell phone or mobile phone.
3). iii) GSM receiver decodes the sent message and sends the commands to the GSM modem.
4). iv) The GSM modem then sends the command to server.
5). v) Then the command is taken place on client side.
6). vi) GSM receiver informs the remote user of the outcome of their request by sending a message back to remote user in the form of another SMS message. [8]

GSM Modem
A GSM modem is a specialized type of modem which accepts a SIM card, and operates over a contribution to a mobile operator, which is just like a mobile phone. From the mobile operator point of view, a GSM modem looks just like a mobile phone [1].

Some GSM Modems also has GPRS feature that allows transmission of data over TCP/IP (internet). To transmit data using GSM Modem, there are assortments of methods that can be used, such as:

- SMS
- CSD or HSCSD
- GPRS / UMTS

Even though a normal mobile phone can be used as GSM Modem, it is highly recommended that a special industrial grade terminal to be used as a GSM Modem due to its stability, and reliability. [2] A GSM Modem can be used to built the following applications:

- SMS Gateway i.e. to send and receive SMS.
- SMS application, SMS solution, or SMS program.
- Automatic reloading of pre-paid account with STK API.
- Machine to machine communication
- Sending SMS from PC.

V.   ADVANTAGES OF SYSTEM

The system offer several features like:

A. *Convenience:* SMS technology is easy to use and learn and can be accessed easily when needed.
B. *Accessibility:* Instructions can be sent to the client from any location provided there is the existence of an active GSM network or control from anywhere in world if cellular coverage is available.
C. *Saves Time:* An SMS based remote monitoring and computer control system saves time as the user is not required to gain access to an internet connection or make a dedicated connection to the computer to be controlled as opposed to a Bluetooth-based system or an Internet based system.
D. *Cheaper:* SMS services are generally cheap and are sometimes provided for free (at least for certain periods) by service providers. And also, most service providers do not charge user for receiving SMS.
E. *Mobility:* User and/or system administrators are more likely to have their phones with them at all times than they are likely to physically be in front of their computers. Therefore an SMS based system enables them to have ubiquitous access to the computer to be controlled and monitored.

F. To ease the implementation and cost effective approach.

VI.   CONCLUSION

The system has provided a low cost, secure, accessible, remotely controlling and monitoring of LAN using GSM is been introduced. The use of a Mobile, GSM modem, Server provides exciting possibilities. In concerned with industrial applications this can be viewed as a low cost, customized wireless LAN monitoring system. Thus this solution can be customized to suit any other industrial requirement related to monitoring and controlling LAN network. The approach in the paper has achieved the target to control LAN network remotely using the GSM SMS-based system satisfying user needs and requirements.

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