

# LAN Monitoring and Controlling using Android

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**Abstract**—Computers are grouped together to form a network. To manage and control the activities of the network while in office is an easy task. However, while you are outstation away from office, how do you go about with monitoring and controlling of network? Instead of depending on third party information, you can always have your Cell Phone, email accounts serve the purpose. The interaction between the clients and the remote administrator is achieved via a central monitoring server. The main objective of this paper 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.

In this paper, we have also proposed Silent Unattended Installation Package Manager (SUIPM) that automates the process of silent unattended installations and requires the minimal possible level of interaction with the user. Silent Unattended Installation Package Manager (SUIPM) generalizes the process of silent and unattended installation. The process is fully autonomous and does not require any user interaction.

**Index Terms**—Android, Mobile phone, Monitoring, SUIPM, WLAN.

## I. INTRODUCTION

In a concern, computers are grouped together to form a network. To manage and control the activities of the network while in office is an easy task. Nevertheless, while you are outstation away from office, how do you go about with monitoring and controlling of network? Instead of depending on third party information, you can always have your cell phone and email accounts serve the purpose. The interaction between the clients and the remote administrator is achieved via a central monitoring server. Using cell phone, we can monitor and control the network using SMS service and see who is busy with what in the office. It aims to develop an integrated software solution that allows a network administrator to remotely monitor his LAN by his cell. The interaction between the clients and the wireless media happens through this server. The primary goal of the paper is to remotely handle the request of the clients and to install the software is on their machine remotely. Remote Software Installation and LAN Controlled uses some of the existing services that may already be deployed and in use within an

organization, as well as adds some additional services that one

may or may not be familiar with. The clients on their PC from the server can use silent software installation to deploy requested software's without even interrupting the client after processing their request. An administrator can roll out a new

Version of the operating system to hundreds, even thousands of clients at one time, and do so from a remote location.

Remote LAN Controlled can be used to handle Remote processes and remote operation of clients. Administrator sends the requested software's by the clients on their machine by forcing the installation to take place during image copy without requiring the client to click on the next and finish buttons or selecting the necessary check boxes in the dialogues. It outlines the steps necessary to install and configure any software. With the ever-growing computer networks, it has become challenging job for an IT professional to manage the network resources. In such environments, it becomes a hassle to install the software's of need. An installer is a program, which helps the user to install the software application on the computer. Today, every installer follows same standard for software installation and common operations performed during the installation include creation and modification of:

- 1) Shared and Non-Shared Program File
- 2) Directories (Folders)
- 3) Windows Registry Entries
- 4) Configuration Files
- 5) Environment variable and
- 6) Links

## II. PROBLEM DEFINITION AND SCOPE

### A. Problem Statement

LAN monitoring and controlling using Android system use to remote controlling of small-scale network using smart phone

### B. Scope

One of the most challenging and costly functions performed by IT staff today is the deployment of various software's to new or existing client computers and hectic to

controlling processes of each client. Currently, organizations spend a great deal of time and expense planning, designing, and rolling out the latest version of the operating system throughout the organization. Often this process is done manually, requiring a help desk professional to physically visit each computer. Either one needs to install 3 or 4 new programs on each computer without erasing the whole system or the second way is to burn all the distributives that one needs to a CD then go from one PC to another and perform some routine actions such as clicking the "Next" and "Finish" buttons, selecting the necessary check boxes in the dialogues. It's not so hard to do if one needs to install the software on 5 or less computers so, one should have enough patience to perform the same actions on each computer. In addition, if one needs to install 30 or 40 programs on 10, 20, 50 or more computers, it is very time consuming. In addition, it is very hectic to controlling remote activity of clients. For this purpose, we develop silent software installation and controlling clients remotely. Silent Software Installation and control system is developed to do the tasks remotely on the client machine through server. Using this service administrator can roll out new version of the operating system to any number of clients. In addition, all this processing is done from remote location. Using computer is impossible without installing the necessary software and handle process of client. This occurs over a network connection from a RIS server to a client computer. RIS can simplify the management of operating systems and applications and improve failure recovery. A number of installation procedures that gained popularity recently are-

- GHOST
- PCRDist
- WMIs

### III. NETWORK MONITORING

The term network monitoring describes the use of a system that constantly monitors a computer network for slow or failing components and that notifies the network administrator (via email, SMS or other alarms) in case of outages. To manage and control the activities of the network while in office is an easy task. However, while you are outstation / away from office, how do, you go about with monitoring and controlling of network? Instead of depending on third party information, we can use different Network Monitoring schemes. In modern large scientific and industrial facilities, more and more information is needed due to the rising capabilities of the electronics and computing devices. For this reason, communications must be assured in every place of the facility. And this must be done in a reliable, fast and secure way. At this point cables seem to be the perfect solution. ly.

However, when they are not really needed for performance reasons, wireless is a good option for monitoring and control. Wireless communications offer many advantages as reduced costs, mobility, scalability and ease of maintenance. Several wireless solutions such as ZigBee Bluetooth or Wi-Fi can be found on 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 these reasons, it has been implemented in large-scale systems.

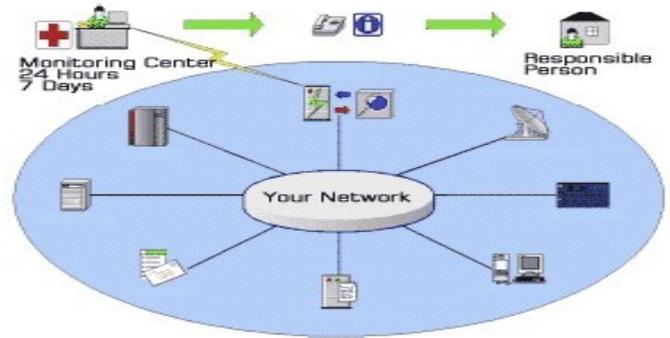


Fig.1: General View of Network Monitoring

### IV. LAN MONITORING USING ANDROID

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." Devices that typically support SNMP include routers, switches, servers, workstations, printers, modem racks, and more." It is used mostly in network management systems to monitor network-attached devices for conditions that warrant administrative attention. SNMP operates in the Application Layer of the Internet Protocol Suite (Layer 7 of the OSI model). The SNMP agent receives requests on UDP port 161. The manager may send requests from any available source port to port 161 in the agent. The agent response will be sent back to the source port on the manager. The manager receives notifications (Traps and Inform Requests) on port 162. The agent may generate notifications from any available port. When used with Transport Layer Security or Datagram Transport Layer Security requests are received on port 10161 and traps are sent to port 10162. Android provides an API that supports the Session Initiation Protocol (SIP). This lets us add SIP-based internet telephony features to your applications. Android includes a full SIP protocol stack and integrated call management services that let applications easily set up outgoing and incoming voice calls, without having to manage sessions, transport-level communication, or audio record or playback directly. Java Remote Method Invocation (Java RMI) enables the programmer to create distributed Java technology-based to Java technology-based applications, in which the methods of remote Java objects can be invoked from other Java virtual machines\*, possibly on different hosts. RMI uses object serialization to marshal and unmarshal parameters and does not truncate types, supporting true object-oriented polymorphism.

The remote method invocation (RMI) model represents a distributed object application. RMI allows an object inside a JVM (a client) to invoke a method on an object running on a remote JVM (a server) and have the results returned to the client. The server application typically creates an object and makes it accessible remotely. The server registers the object that is available to clients. A client application receives a reference to the object on the server and then invokes methods to it. The client looks up the name in the registry and obtains a reference to an object that is able to interface with the remote object. The reference is referred as a remote object reference.

### V. UNATTENDED SOFTWARE INSTALLATION

Silent Unattended Installation Package Manager –SUIPM is a specialized and advanced silent unattended installation package creator. SUIPM generalizes and automates the process of silent unattended installation by creating Silent Unattended installation packages, which can be deployed on the PC without user intervention/interaction. The packages created can be deployed on the network without user intervention using an existing Agent Based Activity Monitoring System - ABAMS. The system consists of the following three main modules:

- Installation Monitor Module – IMM
- PID Tracker
- Package Manager – PM

#### A. Installation Monitor Module

Installation Monitor monitors the activity of installer during installation of certain application and generates a log file, which contains the information of system changes made by installer during installation. Initially for monitoring purpose Installation Monitor Module – IMM is using Microsoft System internals Process Monitor for monitoring. Process Monitor is an advanced monitoring tool for Windows Operating System, which shows real time file system, Registry and process/thread activity. Process Monitor and Package Manager – PM are integrated together and Process Monitor acts as a foundation to Package Manager. The key role of Process Monitor is to monitor the activities during the installation and generate a log file in XML format. Package Manager needs two type of information from Process.

- 1) Registry Monitoring – Changes made in registry by the installer during the installation process.
- 2) File Monitoring – Changes made in File System by the installer during the installation process.

The installation and logging of the installation events is a complex process and once it is complete, the Process Monitor generates a XML log file, which contains all the activities (registry, file) regarding the installation process.

#### B. PID Tracker

Log file created by Installation Monitor Module contain information of many other processes as it monitors the whole system activity during installation of the application. The workaround to this problem is to capture the ID of the application, which is being installed, and use this ID to ignore the information of other processes. This not only reduces the size of the Log File but also reduces the time for filtering the Log File.

#### C. Package Manager

Package manager is a bundling tool for Silent Unattended Installation Package Manager – SUIPM. The purpose of this module is to bundle all the necessary information including files, inis, registries, shortcuts and other necessary information to a custom SUIPM Package that will later be used by an SUIPM Installer to perform the actual installation. The package manager consists of following two modules.

##### 1. SUIPM Builder

SUIPM Builder creates the silent unattended installation a package for the software for which log file was created. This module collects the application files from the system along with system-file manifest and registry manifest and creates Silent Unattended Installation Package.

Fig.2: Filtering criteria for the Log File

Sr.	Operation	Result
1	Create File	SUCCESS
2	Set Rename Information File	SUCCESS
3	Reg. Create Key	SUCCESS
4	Reg. Set Value	SUCCESS
5	Reg. Delete Value	SUCCESS
6	Reg. Delete Key	SUCCESS

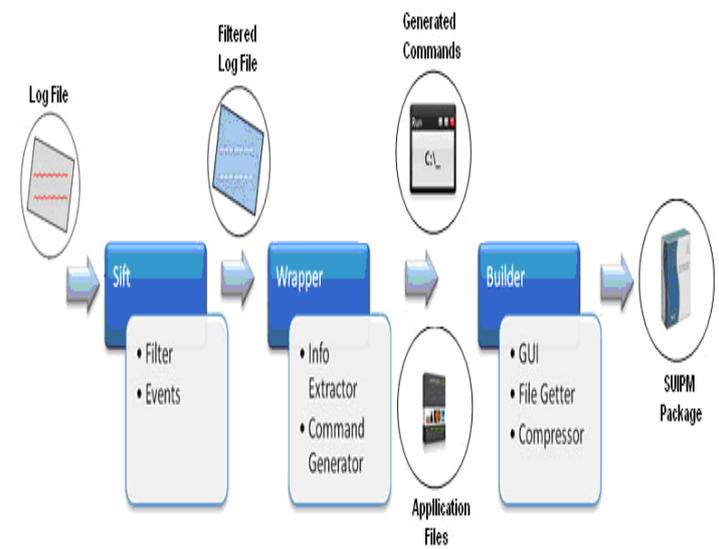


Fig. 3: SUIPM Builder Modules and their Interaction.

This module is further divided into three more modules:

- 1) Sift
- 2) Wrapper
- 3) Builder

Log file created by Installation Monitor Module and filtered using PID Tracker contains valuable and invaluable information which needs to be filtered. The information, which Package Manager needs for making Silent Unattended Installation Package, is shown in Table 1. Sift extracts the information (registry and file system information) of the application based on the filtering criteria as shown in Table 1 from the log file and creates a new filtered log file. Sift is responsible for filtering and gathering the required events to perform the installation. Wrapper on the other hand uses that filtered log file to generate commands to perform the required installation. Wrapper will generate the following three files.

IGetter – the Builder module of the Package Manager to collect all the application files will use this file. Builder Module just has to run the IGetter.bat file and all the application files will be copied to the specified folder automatically.

ISetter – This file will be bundled in SUIPM Installation Pack by the Builder module and will be used by the SUIPM Installer Module to copy all the application files to the specified folder. SUIPM Installer Module just has to run the ISetter.bat file and all the application files will be copied to the specified folder automatically.

IRegistry – This file will be bundled in SUIPM Installation Pack by the Builder module and will be used by the SUIPM Installer Module to copy all the registry entries in the Windows registry at the specified locations. SUIPM Installer Module just has to run the IRegistry.bat file and all the registry entries will be done automatically.

Builder Module will use the IGetter.bat file to get the application files and bundle the application files along with the ISetter.bat and IRegistry.bat files generated by the wrapper in SUIPM Installation Package as shown in Fig. 3.

## 2. SUIPM Installer

SUIPM Installer extracts the SUIPM Installation package and installs it to the desired location. It works like any other installer but the difference is that it does not need any user interaction and the installation is performed silently. The input to this module is the SUIPM Installation package created by the SUIPM Builder Module. The installer unwraps all the bundled items and places them at their location throughout the system where necessary. SUIPM Installer Module makes use of Installer.bat file to unwrap the SUIPM Installer Package.

Sample of SUIPM Installer:  
Sample Installer File

```
rmdir "C:\Documents and Settings\  
Default User\Local Settings\Temp\Test"  
/S /Q  
mkdir "C:\Documents and Settings\  
\Default User\Local  
Settings\Temp\Test"  
rare %1 "C:\Documents and Settings\  
\Default User\Local  
Settings\Temp\Test"  
call "C:\Documents and  
Settings\Default User\Local  
Settings\Temp\Test \ISetter.bat"  
call "C:\Documents and  
Settings\Default User\Local  
Settings\Temp\Test \IRegistry.bat"  
rmdir "C:\Documents and Settings\  
Default User\Local Settings\Temp\Test"  
/S /Q
```

## VI. CONCLUSION

Android market being the most widely used market for all types of applications; we have focused to develop an application using android. Thus concluding from the previously developed applications, we can say that, these applications did not provide the user to remotely monitor his computer. Keeping this in mind, we decided to develop 'Monitoring PCs using Android'. All the computers which he need to keep an eye on. When some of the applications, which are kept in the black list, are opened, then the computers will send a notification to the android user and the user can thus terminate this restricted application.

This paper contributes for IT Administrators to remotely control any computer present in the network, allowing them to remotely troubleshoot and solve problems faster. It can help the colleges to monitor the labs, to restrict the use of forbidden sites or applications. The application also helps one to monitor his own PC when he/she is away the workstation. The main goal of every software is to provide its user minimal hassle to bring it into use and this gave birth to intelligent installer who facilitate user with easy installation and skips unnecessary steps. In this paper, we have proposed Silent Unattended Installation Package Manager (SUIPM) that automates the process of silent unattended installations.

## ACKNOWLEDGMENT

We are very much grateful to department of computer science and engineering, Dr. D Y Patil School of Engineering Lohegaon, Pune to give us opportunity to work on ids in networking environment. We sincerely express their gratitude to director Dr. D Y Patil School of Engineering, head of the dept. Computer Science and Engineering, Dr. D Y Patil School of Engineering, Lohegaon, Pune for giving constant inspiration to carry out research work.

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