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Laptop Tracking System

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Abstract*— Around the world everywhere, everyday many laptops are stolen by peculiar people. It is a very critical issue as the confidentiality of personal data, files and information is compromised. Letting this information in hands of the unknown will lead to unexpected and unwanted events. In the computing world tracing the laptop and locating the thief's position is a difficult process. Various solutions are provided by vendors to tackle the problem through GPS, GSM monitoring and cloud services. But there are various pitfalls of tracking laptops through above mentioned services. Our project aims at providing a Laptop Tracking System that would help the legal authorities, administrators to trace the stolen/misplaced laptop with the help of current IP address and MAC address.

Keywords—GPS, GSM, IP Address, MAC Address.

1. Introduction

Of our substantial assets, laptops are distinctly hard to safeguard. With the increased data cache capabilities of laptops, the loss of even a single laptop can induce thrilling costs to the consortiums or an individual. Protection against laptop theft is researched by the computer science and the crime science community. In the computer science community, the accent is on protecting the data residing in the laptop and finding the location of the stolen laptop. Many solutions exist for shielding the devices such as laptops, tablets which are purloined and also for protecting the data in them. These measures include techniques such as GPS, hardware locks, point-point tokens, Wi-Fi based etc. Next section in this synopsis offers a brief about the techniques mentioned here.

2. Literature Survey

***A*. Using Software based approach for tracking laptops:** Laptop tracking software is the tool used for protecting and tracking the laptop if it is lost or stolen. It reduces the problem for the users and corporate when dealing with the laptop theft case. There are noteworthy tools and programs available in the market which would curtail theft risk. But the users have to pay for these applications which can sometimes prove to be cost abortive since it more client/user dependent. Since the percentage of the population is less technology oriented and cannot afford to spend extra money for security, it becomes necessary to build a system which is less user dependent.

***B*. Using Hardware Based Approach for tracking laptops:** In paper subjected to Anti-Theft System for Laptop Tracking' a technique has been built to prevent laptops from theft and to track back misplaced laptops. Here a system has been proposed to protect laptops by adding sensors to it, an alarm will be rung if stolen and a noise will trigger the owner of the laptop. The advantage of this arrangement is that it is developed by integrating few sensors which will be connected to the device and to receive/transfer data from sensors. For processing and forwarding data to GPS, GSM and other sensors, the Arduino Nano is deployed.

***C*. Using available mobile communication technologies for tracking laptops:** In this technique the researchers have created an application for maintaining privacy and security of data. In case if any employer or an individual misplaces his laptop, the organization will be able to track and locate the position. The system is designed to retrieve IP address information of particular PC/laptops and then reverse engineer them into city coordinates. These city coordinates are then mapped onto a google map in order to graphically map them on a google map. This provides a robust and efficient PC/laptop tracking system for companies.

***D*. GPS, GSM and CDMA:** Basically, in this system it has been initiated an offline strategy for securing confidential data if a laptop is misplaced or stolen. Laptop can be traced back with location and pictorial metrics of unauthorized user' as kernel program or an operating system program, stored in ROM of a device handles important and basic operations from switching ON/OFF to data transfer between operations. If the stolen laptop is unable to trace with the help of GPS, GSM and CDMA technology the owner of that particular system is able to track back the location and also able to activate the Kernel program which will automatically turn off the laptop.

2.1 Summary of Related Work

The summary of methods used in literature is given in Table 1.

Table 1 Summary of literature survey

Papers	Methods	Advantages	Limitations
Laptop Tracking and Alert System using GPS and GSM Module	Implementation of GPS, GSM, Motion Sensor and Cloud Services for Anti-theft Purposes	The current design is an IOT application, which will continuously monitor the laptop and report the status of the laptop	The laptop does not connect automatically to the internet that will be served by the GSM module.
Anti-theft systemfor laptop tracking.	Location will be tracked using GNSS (Global Navigation Satellite System) provides geolocation	The GPS and GSM modules embedded in the laptop will trigger alarm.	More user-dependent, inclined towards hardware and software specifications less cost efficient.
Real Time Tracking and Alert System for Laptop through Motion Sensor and Cloud Services.	Laptop will trigger an alarm that will be embedded in the laptop. The alarm will make noise audible up to 10 meters.	The application is designed for maintaining privacy and security of data.	It does not deal with the ability to get connected automatically to the internet.
Offline Strategy of Securing A Confidential Data in A Misplaced or Stolen Laptop	Kernel level security program gets enabled with tracking system which will be added into the user's laptop.	A transmitting module which contains an embedded system is combined with devices to retrieve location of laptop	The tracing of the device is done with a secondary device using GOOGLE EARTH embedded with CDMA
IP Based Approach for Tracing Stolen Laptop and Data Protection with MAC Address	Laptop tracing is done with the help of IP Address and file protection is done using OTP.	Tracking and Protection of data is cost effective and doesn't require any third-party intervention in tracking them.	IP address of a system connected using the specific line will change since IP addresses are dynamic.
Theft Detection of Computers using MAC address by Map-Reduce Programming Model on a Cluster	An automatic method of detecting stolen hand-held laptop where the processing is carried out in a clustered network.	Incorporating a Hadoop cluster for searching on large logged data sets will reduce search time	The logging will be required to carry out at a higher Level and serve a broader requirement.

3. Proposed Work

We propose an action that would trace the stolen laptop using its MAC address. The Police stations/authorities will share a common central database where a report will be lodged and its details including name, address, laptop details specifically MAC address will be registered. ISPs will share the common database. If the stolen laptop is detected in the ISPs log file, an alert is generated to the police station under whose jurisdiction the ISP operates. The authorities would get an alert of the stolen laptop along with the IP address and other user details. Upon finding the stolen device, the station can update the database.

3.1 System Architecture

Below described its system architecture along with the explanation of particular block.

Fig. 1 Proposed system architecture

A. Police Complaint:

The first part will register the MAC address of the stolen laptop. The owner of the laptop will be requested to provide personal details and laptop specifications if known, to the police authority. The authority will update the database which will be reflected to authorized user. Every time there is a new complaint, the authority will update it in the database. This website is very user friendly and simple to use.

B. Database System:

The second part will sustain the data and it will be stored securely in knowledgebase dataset. This database will have different attributes to it. It will consist name of the owner of the laptop, contact number, address of the owner, MAC address, and other details of the laptop.
This database will send the data to the Internet Service Providers (ISP). Only the MAC address will be shared with the ISP and other details of the user will be kept confidential. If the laptop is found then the police administrator will update the database manually. This way the database is maintained.

C. ISP:

Once the MAC address is received by these Internet service Providers (ISP) they will start search for that MAC address in their log. This will be done by the searching algorithm. This step may take a lot of time as there are so many MAC addresses connected to that log in under a minute. Here the system will start detecting the MAC Address in a few different segments i.e., in different time slots. After the search is completed and if the MAC address is matched then it will send the details of that particular MAC address to the police.

3 Requirement Analysis

The experiment setup is carried out on a computer system which has the different hardware and software specifications as given in Table 3.1 and Table 3.2 respectively.

3.1 Software

Table 3.1 Software details

Operating System	Windows /Linux
Programming Language	JavaScript, Python
Database	MongoDB

3.2 Hardware

Table 3.2 Hardware details

Processor	2 GHz Intel
HDD	180 GB
RAM	2 GB

CONCLUSION

The proposed technique of Laptop Tracking System of data is cost effective and no third part intervention is required. No software or applications are required to be installed in order to prevent the laptop which can be expensive for owner. Every operation here will be done in Laptop itself. The main duty will be performed by authorities who will

maintain the website and keep updating the database. ISPs will work on their side to compare the logs with centrally shared database which will contain MAC addresses of stolen laptops. The database will be managed manually. This measure to prevent laptop from theft is efficient on small scale and owner of laptop will be at lesser risk.

FUTURE SCOPE

This system can be further integrated into mobiles. This will help in tracking lost mobiles as well. We can also track missing electronic devices if they are connected to the internet.

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