

EFFICIENT ARCHITECTURE FOR INVOLUNTARY REMOTE COMMUNICATION USING IBUTTON AND GSM NETWORK

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Abstract— - Multi Queue Message server system utilizes the existing GSM service with low-cost hardware equipment to create a system which mechanizes the one-dimensional transmission of SMS triggered by the direct sensing of the hardware probe on its reader which is implemented with 1-Wire Technology. With the advent of GSM technology, the wireless transmission of data has been more securely routed with the inclusion of Base Station System and Mobile Switching System. Here in this synopsis, we have devised a way by which Client can keep a track of every minute of activities of their assets even of they are physically distanced from each other. The amalgamation of GSM and 1-Wire Technologies will be adapted to develop such a device which we will discuss in this synopsis.

Keywords-component: 1-Wire Technology, iButton,GSM,Modern Telecommunication using GSM

I. INTRODUCTION

The penetration of office technology into home life combined with the boom in mobile technology raises interesting questions about how people draw on such technologies to manage their own boundaries between work and home. With this theme in mind, various components are deployed to monitor the activities of the inmates. One of them is “Home incarceration system” where an incarcerated identifying circuit used in a free monitoring system includes an incarcerated identifier worn by the incarcerated at a remote location with an electrical component having a selected electrical characteristic. A comparator circuit measures the selected electrical characteristic and compares the selected electrical characteristic to a reference electrical characteristic. The comparator circuit triggers a timer if the selected electrical characteristic matches the reference electrical characteristic. The timer provides a signal to a speech circuit to disable a speaker. The tone generator is responsive to the signal and provides a verification signal via a telephone link to a central station. A verification circuit at the central location receives the verification signal and determines the presence or absence of the incarcerated at the remote location. Another component deployed is “Secure personnel monitoring system” where a personnel monitoring system includes a tag worn by each monitored person. The tag

repeatedly emits digital radio signals, and a predetermined bit in the signal changes with time according to a predetermined pattern. Monitoring apparatus detects the radio signals and sends an absence alarm signal if the signals cease. The monitoring apparatus detects spurious, forged signals which do not replicate the predetermined pattern of variation and provides a forgery alarm signal. The tag may be attached to the person by a strap bearing parallel electrical conductors. Attempts to remove the tag by severing the strap cause electrical contact between the conductors. Such contact triggers a detector, which in turn alters the radio signal.

We decided to explore the everyday lives of people who have demands in both work and home spheres to understand the role of technologies in crossing home-work boundaries. The ultimate goal was to see whether there were interesting opportunities to improve or invent new technological solutions that would support a variety of needs across the different contexts in which people find themselves (e.g., at home, at work, or when mobile). The entire concept of this proposed development is based on the after confirming the promising field of GSM and 1-Wire Technology.

II. PRELIMINARY STUDY

The iButton is a computer chip enclosed in a 16mm thick stainless steel can. Because of this unique and durable container, up-to-date information can travel with a person or object anywhere they go. The steel iButton can be mounted virtually anywhere because it is rugged enough to withstand harsh environments, indoors or outdoors. It is small and portable enough to attach to a key fob, ring, watch, or other personal items, and be used daily for applications such as access control to buildings and computers, asset management, and various data logging tasks.

The physical device is a 16mm dime-sized metal can. There are a number of advantages to the iButton™ compared to previously used hardware token devices:

- Rugged. The iButton™ is housed in a water-proof, stainless steel metal housing. Due to the housing armor, the iButton™ can withstand extreme environmental conditions and handling with no loss of data or performance. The device has been wear-tested for 10-year durability. The ruggedness of the device is an extreme advantage over smartcards and other devices that contain only minimal circuitry protection. For example, smartcard contacts are inherently fragile and any mishandling often leads to wire bond breakage and irreparable damage.
- Wearable. Unlike credit card-sized smartcards and large keychain-sized USB keys and other hardware tokens, the iButton™ is small enough to mount onto wearable accessories.
- Tamper Responsive. The iButton™ has been touted as having a number of tamper proofing features which prevent the device from being physically attacked with invasive methods. A later section describes these specific features.

A. iButton and its classification

The family of iButtons™ is split into two sections:

- Touch Memory iButtons™ make up a large portion of the family. These devices can serve as replacements for stored-value or debit card applications, the majority of which are currently handled by smartcards.
- Java™-powered Cryptographic iButtons™ consist of a microprocessor and high-speed math accelerator, the foundations for a complete cryptographic engine. The device also runs a Java Card 2.0-compliant Java Virtual Machine.

B. IBUTTON APPLICATIONS

Conversant in the universal digital language of 1s and 0s, the iButton, has circled the world as a peripatetic extension of the computer. iButton technology has found a home on every continent, with the possible exception of Antarctica - and we're not certain about that. The button's unique form factor and features address widespread cultural and economic needs: to identify and authenticate, time- and date-stamp events, guard property, and track inventory.

C. ABOUT GSM

GSM (Global System for Mobile communications: originally from Groupe Spécial Mobile) is the most popular standard for mobile phones in the world. Its promoter, the GSM Association, estimates that 82% of the global mobile market uses the standard. GSM is used by over 3 billion people across more than 212 countries and territories. Its ubiquity makes international roaming very common between mobile phone operators, enabling subscribers to use their phones in many parts of the world. GSM differs from its predecessors in that both signaling and speech channels are digital, and thus is considered a second generation (2G) mobile phone system. This has also meant that data communication was easy to build into the system.

D. GSM SECURITY MEASURE

The subscriber is uniquely identified by the IMSI. This information, along with the individual subscriber authentication key (Ki), constitutes sensitive identification credentials analogous to the ESN in analog systems such as AMPS and TACS.

Security in GSM consists of the following aspects:

- Authentication
- Signal and Data confidentiality
- Identity confidentiality

E. DESIGN OF IBUTTON

By designing the iButton™ with hardware cryptographic support and by allowing the device to execute Java™ applications, a number of security solutions can be implemented. The tamper proofing features of the iButton™ are designed to prevent intruders from accessing critical data and obtaining private keys from the device.

The physical design of the device is aimed to be responsive to tampering. By viewing the internal detail of the Cryptographic iButton™, some of the attempts at tamper detection are evident. The two micro switches could potentially be bypassed or replaced as to avoid tamper detection. The 32.768 kHz quartz crystal is used to control the real-time clock, not the whole system. However, manipulating this signal might have some attack benefits.

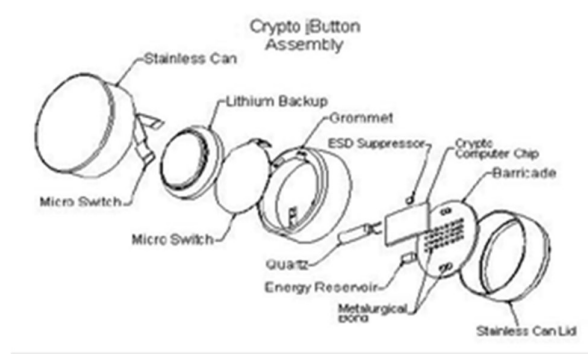


Figure 1. Design of iButton

III. PROPOSED SYSTEM

- With the advent of GSM technologies and its respective promising services all over the world, we will try to derive one of the implementation section of it in terms of short messaging services (GSM), as SMS Messages can be Sent and Read at Any Time, SMS messages can be Sent to an Offline Mobile Phone, SMS Messaging is Less Disturbing While You can Still Stay in Touch, SMS Messages are Supported by 100% GSM Mobile Phones and They can be Exchanged between Different Wireless Carriers, SMS is a Suitable Technology for Wireless Applications to Build on.
- In our proposed work, the kids will be provided with an i-button, which is a computer chip enclosed in a 16mm thick stainless steel can. Because of this unique and durable container, up-to-date information can travel with a person or object anywhere they go. The steel i-Button can be mounted virtually anywhere because it is rugged enough to withstand harsh environments, indoors or outdoors. Here, the ibutton can be embedded in Kid's Smart Card or can also be taken in key ring. The kid has to press the ibutton to Blue-dot receptor, which will be fixed to every threshold of schools entrance.
- Each iButton has a unique and unalterable address laser etched onto its chip inside the can. The address (e.g. 2700000095C33108) can be used as a key or identifier for each iButton. Once the ibutton probe is touched to a Blue Dot Receptor or any other iButton probe, which will be connected to Schools PC acting as Server and instantly accordingly programmed it shoots an SMS to the Working Parent's Cell phone about the position and situation of their kids. So, instantly update the parents about the whereabouts of their children. So the parents always have the alternative to take steps in case of some unfortunate events.

IV. EXISTING SYSTEM AND ITS EFFECTS

In the existing system, the working parents actually have a very busy schedule for which they are totally unaware of the activities of their kids in house and in school. They usually depend on their nanny or some third person or some webcam device to monitor their kids, which is actually not a reliable source. Some parents are now opting to invest in a home Webcam system to keep tabs on their children while at work. Some daycare centers even offer an occasional peak into their daily activities via an interactive Web site. Working parents take a short break and watch their preschooler play with friends—or even check in on the nanny at home.

V. BENEFIT OF THE PROPOSED WORK

- The iButton is durable device and it can withstand any rough condition. It is very cost-effective compared to other communication equipments.
- SMS messages are supported by 100% GSM mobile phones and they can be exchanged between different wireless carriers.
- SMS Messages can be Sent and Read at Any Time, SMS Messages can be Sent to an Offline Mobile Phone
- The SIM contains the ciphering key generating algorithm (A8) which is used to produce the ciphering key is hard to decode, ensuring full proof from any interception of the signal
- The proposed work is actually a very cost-effective solution, compared to other surveillance equipments like RFID, Bluetooth, ZigBee, Internet based Surveillance products, which is not only costly but difficult to maintain, thereby not ensuring the correct information delivery on hour of need.
- The working parents are updated about the location of their kid instantly.

VI. PRODUCT DESCRIPTION AND CHARACTERISTICS

The product is designed to be operated by

1. Administrator
2. User

Characteristics:-

1. As Administrator: - The administrator plays a vital role in monitoring the system, as the module consist of the all the configuration settings for the project to be in functional condition. The administrator has got the priviledge to enter all the relevant contact information and records as per institution entries for each inmate to whom the ibutton will be issued. The administrator invokes the schedules to be observed by the cell. To avoid dual touch by mistake for the ibutton against the Blue Dot receptor, the administrator assigns a queue time of ibutton touch as well as alert for absent. Finally the administrator has the priviledge to create a simply report of the daily activity of the each inmates, which is actually automatically send via GSM network to the handset of the patrolling officer. The actual SMSC-GSM server is located near the proximity of the administrator module. The administrator module once configured than entire process is juts the automatic and spontaneous.
2. As User: - Here, in this proposed work, the user module is generally the inmates who is provided with ibutton embedded as ID for them. Here, we are considering with an assumption that there should be a strong protocol for security device in the institution in such a way that whenever the inmates enters any section of the institution, they need to use the ibutton ID to go for next door/section from internal of institution to school bus. The process is so automated by the administrator that moment the user touches the Blue dot receptor, it immediately triggers SMSC-GSM server to shoot a detailed real-time situation status to the GSM-enabled handset of the patrolling officer, thereby informing the patrolling officer about the minutes of the situation of their inmates.

VII. SCOPE OF THE PROPOSED WORK

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VIII. CONCLUSION

Choosing the iButton™ over other hardware token devices for system implementation is dependent on the customer's specific needs. The iButton™ is definitely the most robust of the existing hardware token devices. The tamper detection and security features of both the Touch Memory and Java™-Powered Cryptographic iButton™ make them useful for implementations where physical attack may be commonplace. The Java™-Powered Cryptographic iButton™ is an attractive solution for companies that would like to execute custom Java™ applications on-the-fly or on-button for security purposes. Although the iButton™ appears to be sufficiently secure for many applications, care must still be taken to assure that the implementation surrounding the device is also secure. The fact that the iButton™ has not been widely deployed in the United States might make clients, who are used to smartcards, feel uncomfortable. The iButton™ is used extensively in other countries, and supporting data of the success of the product can be found on the Dallas Semiconductor web page. Further research will be done to attack the assumed security of the Java™-Powered Cryptographic iButton™, which is the most directed for use in Internet commerce applications.

iButton bring unparalleled durability to access control applications. Sat on it? Stepped on it? Dropped it in water? There is no need to worry about destroying a key because iButton can withstand harsh indoor or outdoor environments. The durable iButton is wear-tested to last a minimum of ten years, so you are not constantly replacing flimsy plastic access cards. For added convenience, they easily attach to a key fob, ring, or even a watch.

The development of GSM almost coincided with a huge paradigm shift in the business of telecommunications: leaving the age of monopolies and entering the age of the liberalized markets. The benefits of this transition – e.g. in terms of price reductions, more effective sales and distribution channels, and flexible and customer oriented production lines have been emphasized.

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