

Smart Phone based Profile Verification System

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Abstract: The Internet of Things (IoT) advocates for an ecosystem of connected devices anywhere and anytime. This has kindled the integration of billions of embedded devices into our surroundings. Through Smart devices human efforts can be reduced to a large extent. Smart phone based profile verification system plays a vital role in the identification of the temporary employees in corporate companies. A device which emits the beacon signal has been installed in our smartphones so that our device is connected to the cloud server. The cloud server contains all the details about the employee which is registered by them in the phone itself using the app. The verification of the profile is done and the pass is generated and produced to the guard. Thus the details of the employee are hidden to the third party and it cannot be hacked. This uses very low energy of about 18.3 J and consumes only 0.1% of the battery's life. They use Bluetooth low energy to transmit the information.

Keywords: BLE energy consumption, Beacon Device

1. Introduction

It is of connected devices anywhere and anytime. This has kindled the integration of billions of embedded devices into our surroundings. Through smart applications, these connected devices promise to improve our lives by communicating and exchanging data seamlessly without any (or minimal) human intervention. An automated temporary profile verification system is one such application. In the sequel, we describe motivations and our contributions in the context of automated temporary profile verification system. This is done by a low energy device called Beacon. Bluetooth beacons are hardware transmitters of Bluetooth low energy devices that is sent to electronic devices. the technology enables smartphones, tablets and other devices to perform action when in close proximity to a beacon. Bluetooth beacons use Bluetooth low energy which sends a signal to a compatible app. The identifier send signal which can be used to identify the device physical location, track customers or trigger a location based on the action of the device that interact and send the notification.

2. Literature survey

I. *Project Title:* [1] Accelerometer based transportation mode recognition on mobile phones. Author Name: Shuangquan WangJian Ma Year of Publishing: 2014 Keywords- accelerometer; transportation mode recognition. This project deals with the detection of the mode of transport which people uses daily. Accelerometer is combined with the Global

Positioning System and Global System for mobile communication helps us to identify the mode of transport taken by the people. They collect the details of the individuals according to their preferences which they used to do regularly. This can be monitored in our mobile phone. This paper deals with the idea about how the transportation mode can be tracked and recognised in our mobile phone. They used two basic methods like acceleration synthesization and gravity estimation method to detect the individual's movement automatically.

II. *Project Title:* [2] An empirical investigation of mobile ticketing service adoption in public transportation. Author Name: Niina Mallat, Matti Rossi, Virpi Kristiina Tuunainen, Anssi Oorni Year of Publishing: 2006. Keywords- Mobile ticketing system, Mobile commerce

This paper shows how the ticketing system can be monitored and controlled in our mobile phone. Today's world is a digital world and all have their personnel phone which they along with them wherever they go. Thus we can use our own mobile phone to book the tickets and travel from place to place. This reduce the human effort to a huge extend and reduce the time. The boarding and terminal place is detected automatically and the required amount can be withdrawn from our account. In modern world mobile phone plays a major role in all the fields. This mobile phone ticketing system is less costly when compared to the tickets with is bought by cash. This technology enhances the mobile commerce technology among the people. This consumes less time and makes our travel easier.

III. *Project Title:* [3] Be-In/Be-Out with Bluetooth Low Energy: Implicit Ticketing for Public Transportation Systems Author Name: Wolfgang Narzt, Stefan Mayerhofer, Otto Weichselbaum Stefan Haselböck, Niklas Year of Publishing: 2015. Keywords- Bluetooth Low Energy(BLE), Be-In/Be-Out System.

Technical system is programmed to perform a particular task repeatedly when people interact with them. Sometimes people use their natural language instead of programming languages without the knowledge that they are interacting with a robot. Thus the technical systems should be well aware of all the details entered by the individuals. To avoid this a system called Be in and Be out is being implemented in public transport ticketing system to detect the places to where the passenger travels using Bluetooth low energy and the cost is drawn from their account. The hands free interaction between the device and user does'nt know to which range it can detect the people

waiting for the vehicle. The main challenge is it does not implement across the national borders. Some passengers arrived from foreign country have to struggle to adapt the environment. This technique is a promising technique to be used in future.

IV. Project Title: [4] Energy Consumption and Latency in BLE Devices under Mutual Interference: An Experimental Study. Author Name: Jan Jaap Treurniet, Chayan Sarkary, R. Venkatesha Prasad, Willem de Boer Year of Publishing: 2015 Keywords- Bluetooth-short range communication, Bluetooth piconets, Bluetooth Low Energy(BLE) This paper deals with an idea that the short range communications can be done through Bluetooth. Limited device density and frequency hopping plays a vital role in short range applications.

Independent Bluetooth piconets the elimination of mutual interface can be done. The mutual interface is increased by the production of multiple collected piconets which will affect the Bluetooth communications. This paper discusses about the development models for energy consumption and latency to influence the mutual interface. Since the Bluetooth enabled devices is going to increase an amount in the future an study about how to reduce the energy consumption and latency is done. This is done to avoid the degradation of communication among the devices. This is a robust method and does not degrade the communications unless they are connected to a large number of devices.

V. Project Title: [5] How Low Energy is Bluetooth Low Energy? Comparative Measurements with ZigBee/802.15.4 Author Name: Matti Siekkinen, Markus Hienkari, Jukka K. Nurminen, Johanna Nieminen Year of Publishing: 2012 Keywords- Bluetooth Low Energy(BLE), ZigBee/802.15.4 device.

This paper concentrates on Ultra low power communications which uses Bluetooth low energy for communications. The energy is measured using a power monitor and the observed results are derived into models. The experiment is done with ZigBee/802.15.4 device which consumes more energy when compared to the Bluetooth low energy devices. Thus the BLE is more efficient than the ZigBee/802.15.4 device. This can be used efficiently by removing the limitations that occur at the execution. This paper mainly deals with the amount of energy spent by the ZigBee device and the BLE device. The energy consumption of BLE is less when compared to ZigBee. Thus by improving the methods we can make use of ZigBee energy efficiently.

VI. Project Title: [6] A One-Pass Key Establishment Protocol for Anonymous Wireless Roaming with PFS. Author Name: Yuan Wang, Duncan S. Wong, and Liusheng Huang Year of Publishing: 2014. Keywords- Key establishment protocol for anonymous wireless roaming (KEP-AWR), Key compromise impersonation security (KCI)

This paper gives a detailed view about the Key Establishment Protocol for anonymous Wireless Roaming (KEP-WAR). They allow a wireless user to develop a session key in the foreign

server. This system was proposed by WWH, Wang, Wong and Haung. Usually they need all the foreign, home and the roaming server to communicate with each other to exchange the information, which is tedious. To solve this problem a new method of creating a session key in foreign server and using only that foreign server for processing. This is achieved by the Key Compromise Impersonation Technology (KCI). In this paper the KEP-WAR is being proposed so that the message flow is low in order to achieve high efficiency. The home server is established between the foreign and roaming server. The communications can be done directly through the key establishment.

VII. Project Title: [7] Privacy-Preserving Universal Authentication Protocol using Hierarchical Key and Group Signature. Author Name: S. Ravikumar, A. Marimuthu Year of Publishing: 2013. Keywords- Priauth, Verifier Local Revocation. Group Signature with Backward Un Linkability (VLR-GS-BU)

Priauth is a wireless communication used for the privacy in global communication. In this paper we see about the Verifier Local Revocation Group Signature with Backward Un Linkability (VLR-GS-BU), which plays a major role in keeping the exchanged information in a secured way. They enable communication among the temporary people who visit the place and the details are encrypted. This helps in keeping the information secured. The trade-off between the storage and the revocation cost is evaluated and the cost varies due to the encrypted data. This method shows that the privacy among the wireless communication device can be preserved for universal communications. The cost of creating the key is less in this model and can be used effectively to a high extent.

VIII. Project Title: [8] Privacy for Public Transportation. Author Name: Thomas S. Heyat-Benjamin, Hee-Jin Chae, Benessa Defend and Kevin Fu Year of Publishing: 2006 Keywords- RFID Transponders, Bluetooth Low Energy (BLE).

This paper deals with the application of second enhanced in E-cash, anonymous credentials and proxy re-encryption to the problem of privacy in public transport ticketing system with electronic system. The peculiarity of transit ticketing is the main defect in this system. They use the passive RFID transponders for ticketing system and the user carry small RFID tags with them. They use Bluetooth low energy for storage and it is the powerful technology in this domain. The technique described in this paper uses E-cash for the withdrawal of money. The transit system is the important problem and uses proxy re-encryption to increase passenger privacy without the secure payment requirements.

IX. Project Title: [9] A Lightweight roaming authentication protocol for anonymous wireless communications. Author Name: Xiaowei Li, Yuqing Zhang Year of Publishing: 2012 Keywords- GLOMONET: Global Mobility Networks, This paper says about the Lightweight roaming authentication protocol for anonymous wireless communications, which uses a wireless network device to access the network while the

person is inside or outside the house using a foreign network. This involves roaming which is the burden to the home network. To resolve this defect this paper has been proposed which uses cryptography to provide user anonymity. This paper uses the cryptographic primitives and other operations for authentication. An automated tool protocol verification is proposed for the security analysis. Both the security and performance analysis makes the project free from attacks.

X.Project Title: [10] Paper: Pairing based authentication protocol with anonymous roaming for wireless mesh networks. Author Name: Nazatul Haque Sultan, Nityananda Sarma Year of Publishing: 2014 Keywords- authentication, Efficiency.

Mobile internet is the most promising technique. This paper deals with the agreement between the home and foreign network for the purpose of communications. This ensures the trust between the users. The pairing based authentication protocol with anonymous roaming for wireless mesh networks establish the relationship between the user and the foreign server. They check the revocation status in the processing system and withhold the impersonation attacks in the system. It is an novel approach to achieve efficient authentication among the users. Foreign networks have some secret values assigned to them for authentication. This may lead to the problem when the secret key is published.

XI.Project Title:[11] Security and Privacy for cloud based IOT. Author Name: J.Zhou, Z.Cao, X.Dong and A.V.Vasilakos Year of Publishing: 2017 Keywords- Efficiency, Security.

This paper is based on the Internet of things. The security and privacy for cloud based IOT is a ubiquitous computing service which helps in the storage of huge datas. They used short range which leads to the threats and security issues in the executing system. This helps in the identification of the inappropriate work done and provide open problems in the system. The problem is the fine grained cipher text access control which leads into the multiple dimensions in the system. The confidentiality, privacy should be well protected. They should provide efficient privacy preserving techniques.

XII.Project Title: [12] Modelling the maximum throughput of Bluetooth low energy in an error Author Name: C. Gomez, I. Demirkol, J. Paradells. Year of Publishing: 2011 Keywords- Bluetooth low energy(BLE), throughput

This paper is an analytical model for Bluetooth low energy (BLE). It is used to identify the uncorrelated big error in system. They have some BLE parameters to show the time taken between two connected events for particular applications. It lies between the master and slave node and the throughput is of the bidirectional unit. This is an analytical model for maximum BLE. They validate the deprived model for thr system.

XIII. Project Title: [13] Bluetooth low energy based ticketing system. Author Name: Sriharsha Kuchimanchi Year of Publishing: 2015. Keywords- Bluetooth low energy(BLE), ICT-Information and communication technology. Bluetooth low energy based ticketing system enable user to complete their work at a faster rate. This technique can be utilized by our

smartphones and it is evolving as one of the greatest techniques. The ICT gets the products under their own name. Thus the booking of tickets is done automatically through low energy system. Thus this system reduces the time required to book the ticket. The energy used is very low when compared to other devices as they use Bluetooth low energy system

3. Proposed system

During the company visit, the temporary visit people do not wear the ID properly. And the person can't handle their original ID proof by the office receptionist, hence it's highly risk; So this concept differs totally from the present system. In the proposed system, IoT based Monitor System is implemented for people in the industry. The person who wants to visit the office, they have to register the complete details in the app installed in mobile and these data are send to the server. If the people enter into office they have to turn on the beacon in the mobile. The monitor system receives the beacon ID and compare with the data base in the server. Then it sends the data to the microcontroller system. The thermal printer in connected to the microcontroller. It'll print the complete data in the sheet to the guard who check the person. It'll be easy to carry and the person data are store in the database for future verification.

4. Architecture

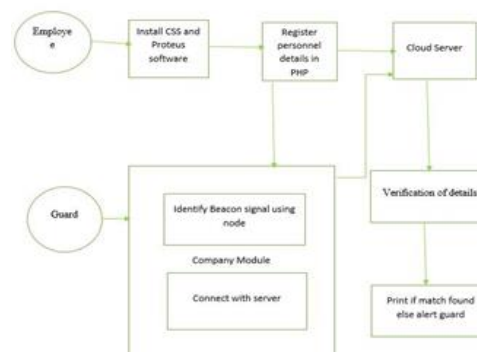


Fig. 1. Block diagram

A. Explanation

This model has been proposed for the tracking of temporary employee details in the corporate companies. Initially a device called Beacon has been installed in our smart phone which produces The Beacon signal. We use smart phone to register our personnel details in the website produced in PHP. Whenever the employee has to enter the company he has to switch the device, so that it can produce signal to match the details stored in cloud server. It then verifies the details and print the pass through the thermal printer which uses heat energy connected to the microcontroller. If not, it sends the alert signal to the security guard. Thus the third party does'nt know our personnel details at any level. The communications are done through the Bluetooth which uses very low energy of about 18. 3 J. It consumes only 0.1%og battery's life.

B. First Module

- Install CCS and proteus software in your pc
- Implemented 35% of code in our project
- Connect and get the Beacon ID from node



Fig. 2. Seat register

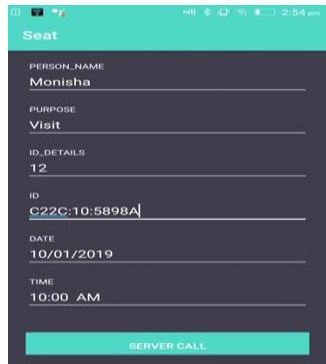


Fig. 3. Seat

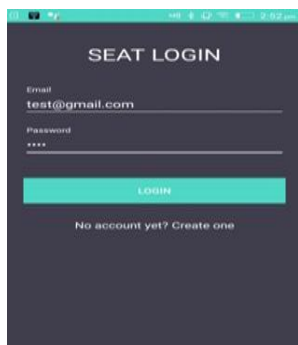


Fig. 4. Seat login

C. Explanation

The interaction between the programmer and the personnel computer is done in this module. Initially Cascading style sheet is to be done in the device which we are going to do the process. Then the Proteus software is to be installed. The communication between the programmer and the personnel computer starts by implementing the code. Code has been completed to an extend to connect the beacon device and to activate it, using the node.

D. Second Module

- Working with Thermal printer using TTL Logic
- Programming Microcontroller with Embedded C++ language
- Connecting Device to the server using NodeMCU.
- Creating website in php.



Fig. 5. LCD display



Fig. 6. Details



Fig. 7. Printout

E. Explanation

The communication and the information that is being exchanged between the programmer and the personnel computer is monitored by a thermal printer. The TTL logic is implemented in the device. Microcontroller has been connected in the server for the communication control. And the MCU node has been connected to the server Finally the website has been created in the PHP format for running the program.

F. Third Module

- Complete full project
- Submit Full document
- Run the working Model

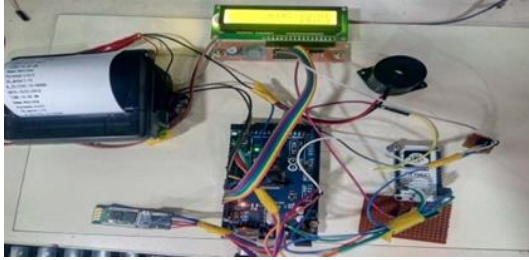


Fig. 8. Experimental hardware setup

G. Explanation

After the completion of the overall coding the project starts to run. The beacon device which has been installed produce the beacon signal. This gets connected to the cloud server and checks the details provided by the employee who tries to enter the company. It generates the pass if the employee details are correct and allow the employee to pass through. This eliminate the need of providing the details to a third party like the guard.

5. Conclusion

We have proposed a Bluetooth Low Energy (BLE) based automated profile verification system for the corporate companies. We provided system requirements including a number of research problems. In this system, we focused our study on two major aspects, (i) energy consumption and interference aspect of BLE devices, (ii) an energy-efficient protocol design for the payment system with emphasis on security and privacy aspects. We provided detailed design of the complete system.

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