Real Time Bus Status Monitoring System

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Abstract: In this project, we have proposed a Real-Time Bus Tracking Application which runs on Android smart-phones. This enables the user to find out the location of the bus so that they won't get late or won't arrive at the stop too early. The application also estimates the time required to reach a particular stop on its route. This device is a standalone system designed to display the real-time location(s) of the buses in Mumbai city. The system will consist of an application installed on the user's mobile, with information on the bus stops. The bus transportation routes at the centralized controller. Assembly of these hardware component modules consisting Arduino mega controller, GSM and GPS module, Battery, etc will enable the tracking device to obtain GPS data of the bus locations, which will then transfer it to centralized database of system i.e a server using 000Webhost in the approximate geographic positions of the buses on the route map. It will also transmit its bus numbers and route names continuously as soon as the bus comes to its Destination. In addition, the device will be portable and sustainable.

Keywords:000Webhost Server, Arduino mega controller, Real-Time Bus Tracking, GSM, GPS

I. INTRODUCTION

Nowadays, due to the growing world & the importance of the time in day to day life, there is a need for effortless transport. So, we are also providing an Android application which will provide the all system information of Bus tracking and monitoring. It also provides the feature of density measure for the user convenience and nearest bus available on the route and will make the user up to date as bus moves. This application can be widely used by college students, office worker's, etc. since Android smart-phones have become common and affordable for all. The application also estimates the time required to reach a particular stop on its route. The application uses client-server technology. The Real-Time Bus Status monitoring system is a bus tracking device that will serve as a viable notification system that will effectively assist pedestrians in making the decision of whether to wait for the bus or walk.

II. LITERATURE REVIEW

In Real Time Bus Status Monitoring System, we have hardware module inbounded in the bus, which are made available for users via the bus tracking application. It came into existence due the server interaction with system application and hardware with the complete information about these buses. Complete information namely the number of buses that go to the required destination, bus numbers, bus timings, the routes through which the bus would pass, time taken for the bus to reach, maps that would guide the passenger with his/her route and most importantly, track the current location of the bus and give the correct time for the bus to reach its bus stop. Secondly it describes comparative Study of Similarity measures and its integration technique

Fig 1: Real Time Bus Status Monitoring

We have proposed a Real-Time Bus Tracking Application which runs on Android smart-phones. The hardware display showcases the name as follows. This enables the user to find out the location of the bus so that they won't get late or won't arrive at the stop too early. The main purpose of this application is to provide an exact location of the user's respective buses in Google Maps when a particular bus is selected besides providing information like bus details, driver details, stops, contact number, routes, etc. This application can be widely used by college students, office worker's, etc since Android smart-phones have become common and affordable for all. It is a real-time system as the current location of the bus is updated every moment in the form of latitude and longitude which is received by the user through their application on Google maps.

III. SYSTEM DESIGN

Basically, in our project we are using different types of hardware modules which will track the location of the bus. The following will showcase the different hardware components used in our project

1. Arduino Mega controller 2560:

The Arduino Mega 2560 is a microcontroller board based on the ATmega2560 (datasheet). It has 54 digital input/output pins (of which 14 can be used as PWM outputs), 16 analog inputs, 4 UARTs (hardware serial ports), a 16 MHz crystal oscillator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started.

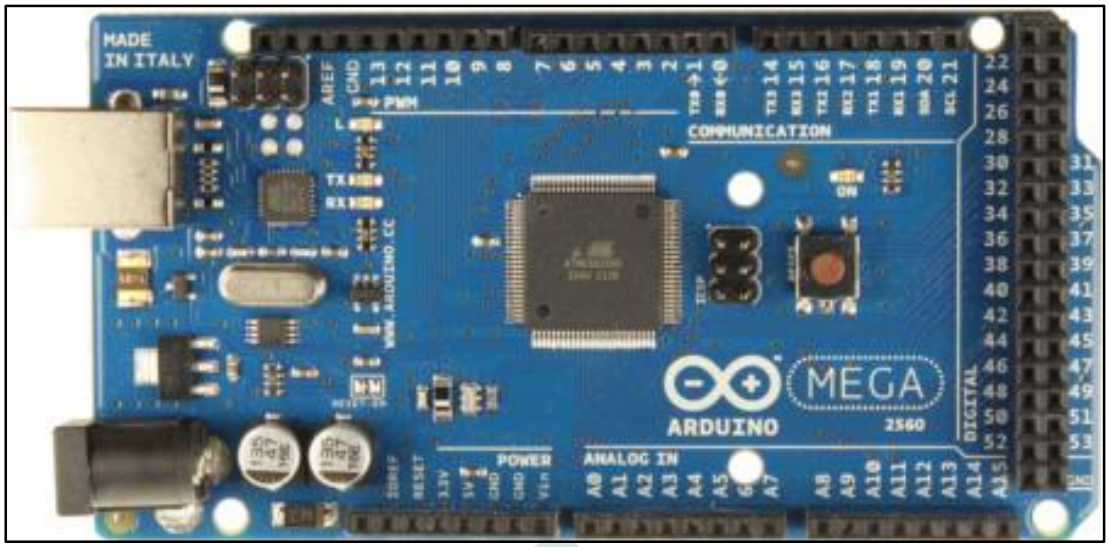

Fig 2: Arduino Mega controller 2560

2. SIM808 GSM GPRS GPS Modem:

A GPS navigation device, GPS receiver, or simply GPS is a device that is capable of receiving information from GPS satellites and then to calculate the device's geographical position. Using suitable software, the device may display the position on a map, and it may offer directions.

Fig 3: SIM808 GSM GPRS GPS Modem.

The GPS satellites only transmit 27 W (14.3 dBW) from a distance of 20,200 km in orbit above the Earth. By the time the signals arrive at the user's receiver, they are typically as weak as −160 dBW, equivalent to one-tenth of a million-billionth of a watt (100 attowatts). This is well below the thermal noise level in its bandwidth. Outdoors, GPS signals are typically around the −155 dBW level (−125 dBm). Based on Latest SIMCOM sim808 GSM/GPS engine, which offers GSM and GPRS data along with GPS technology for satellite navigation. The compact design which integrated GPRS and GPS in an SMT package will significantly save both time and costs for customers to develop GPS enabled applications.

3. Lead Acid Batteries 14v:

Fig 4: Lead Acid Batteries 14v

Lead–acid batteries designed for starting automotive engines are not designed for deep discharge. They have a large number of thin plates designed for maximum surface area, and therefore maximum current output, which can easily be damaged by deep discharge. Repeated deep discharges will result in capacity loss and ultimately in premature failure, as the electrodes disintegrate due to mechanical stresses that arise from cycling. Starting batteries kept on a continuous float charge will suffer corrosion of the electrodes which will also result in premature failure. Starting batteries should, therefore, be kept open circuit but charged regularly (at least once every two weeks) to prevent sulfation.

4. Resistors:

In this circuit of resistors, we have components attached to it so that to prevent short circuiting in the whole circuit of our hardware module. In this section of hardware, we have voltage regulators that controls the voltage flow in the circuit.Secondly, we have three different types of capacitors that maintains current integrity during working of the module.

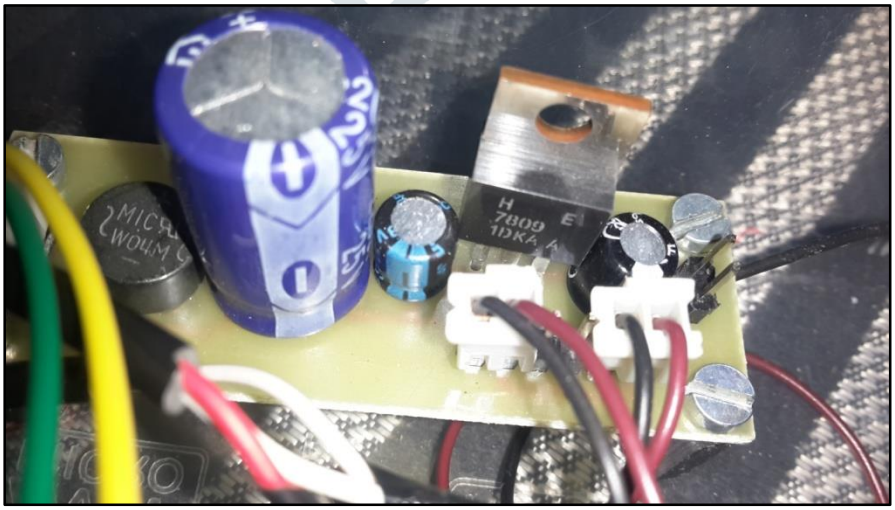

Fig 5: Resistors

5. Key switches:

The most important aspect of the project is select the key buttons attached with 3 colored wires. The grey button is the reach button that will send the data about latt-long meanwhile the remaining red and the white button is the showcase for selecting route of the bus.

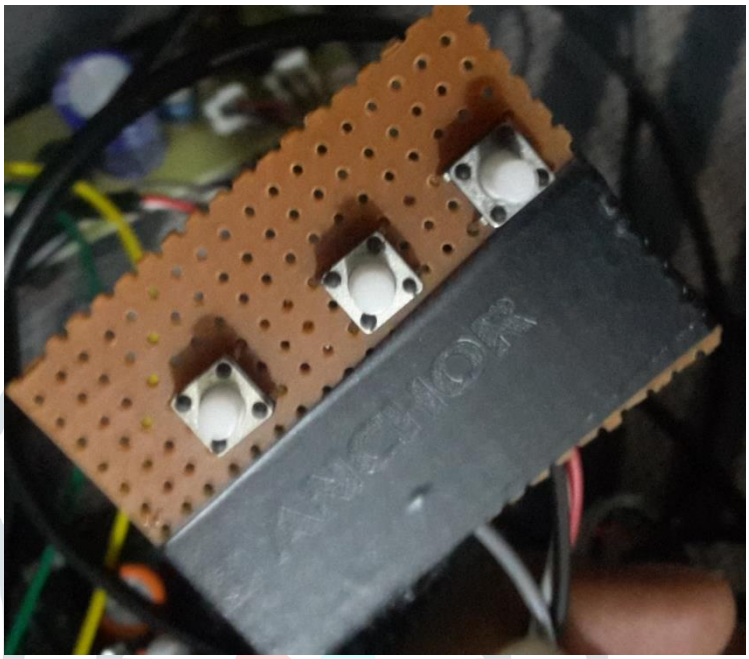

Fig 6: Key switches

6. LCD Display(16X2)

LCD (Liquid Crystal Display) screen is an electronic display module and finds a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi-segment LEDs. The reasons being: LCDs are economical; easily programmable; have no limitation of displaying special & even custom characters (unlike in seven segments), animations and so on.

A 16x2 LCD means it can display 16 characters per line and there are 2 such lines. In this LCD each character is displayed in the 5x7 pixel matrix. This LCD has two registers, namely, Command and Data.The command register stores the command instructions given to the LCD. A command is an instruction given to LCD to do a predefined task like initializing it, clearing its screen, setting the cursor position, controlling display, etc. The data register stores the data to be displayed on the LCD. The data is the ASCII value of the character to be displayed on the LCD.

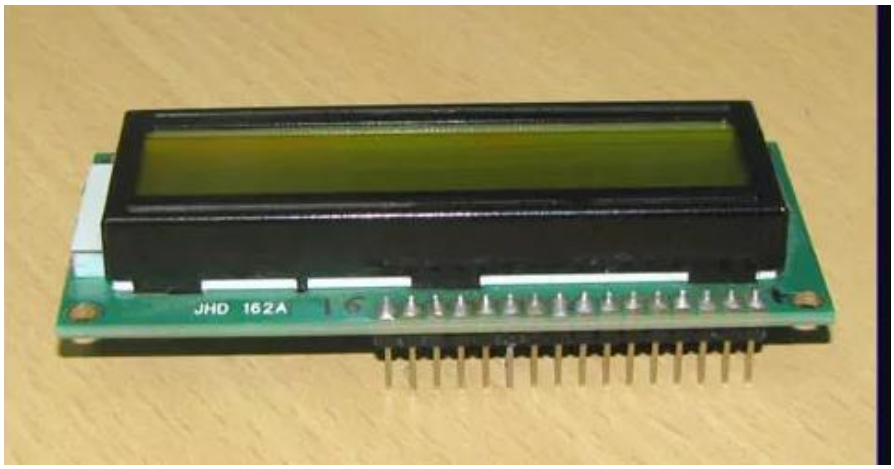

Fig 7: LCD Display

7. Real time Application

The android application consists of the whole bus time table and the bus route that will enlist bus timings. For different stops at different period of time

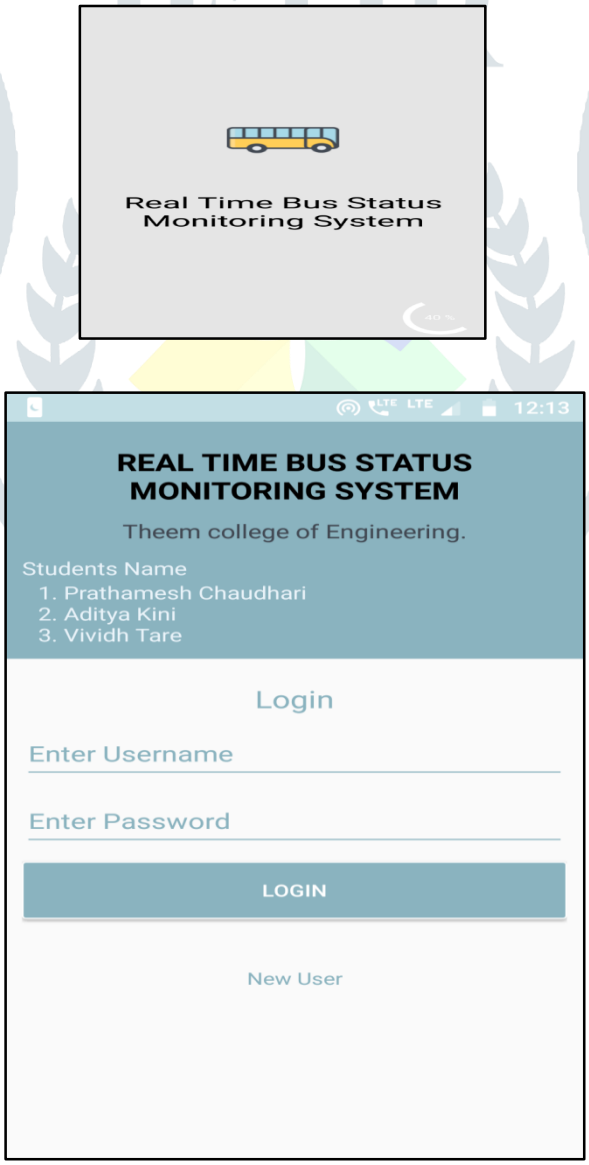

Fig 8: Layout of Android Application

It consists of login Credentials and the bus details as shown in the png snapshot of the Android application. An Android is a mobile operating system (OS) currently developed by Google, based on the Linux kernel and designed primarily for touchscreen mobile devices such as smartphones and tablets. Android's user interface is mainly based on direct manipulation, using touch gestures that loosely correspond to real-world actions, such as swiping, tapping and pinching, to manipulate on-screen objects, along with a virtual keyboard for text input. In addition to touchscreen devices, Google has further developed Android TV for televisions, Android Auto for cars, and Android Wear for wrist watches, each with a specialized user interface. Variants of Android are also used on notebooks, game consoles, digital cameras, and other electronics. Now we have phones which can even access GPS, GPRS, Wi-Fi, NFC and a lot of other cool and advanced features which you cannot even imagine. So in this Mobile world of this complication. Android is one of those operating system platforms which made it easy for manufacturers to design top class phones

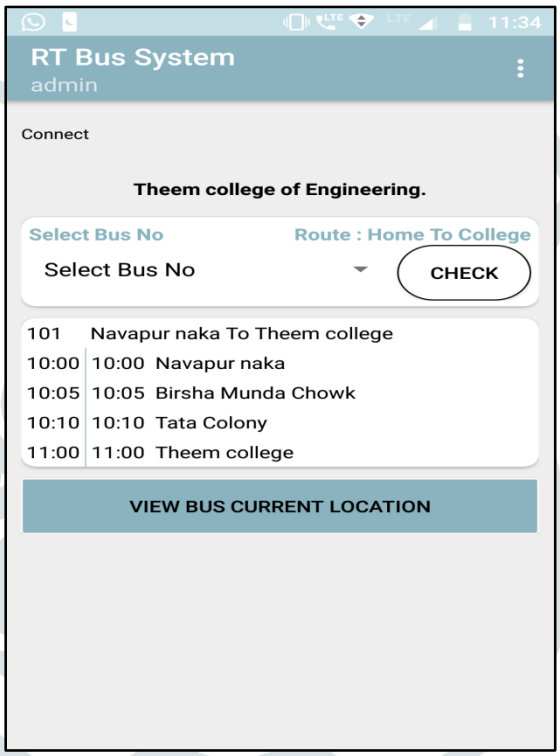

Fig 9: Bus Tracking.

IV. METHODOLOGY

V. Fig 10: Working Diagram

1. There is login page on the application
2. Then once the application is login it tracks the location using the hardware components.

3. The hardware components consist of Arduino mega controller which fill with details and connected to the GPRS module and then it signified to GSM module using latitude and longitude positionThe following diagram will showcase that how the bus tracking is executed
4. Once this location is ensured by hardware components the application is notified with the stop and the real time position is assigned
5. User can track the location the bus and if he/she is done with it can logout.

VI. FUTURE SCOPE

Our system is based on smartphone and server. Our System we are add admin, where admin can track driver location and view bus details. As this system uses a combination of processing elements: PCs, Mobile Phones etc., there is a possibility of the overall system malfunction due to a particular type of attack, it is termed as 28 Denial of Service (DoS) attack by malicious agents who might try to disrupt the function of the system.

VII. CONCLUSION

In this paper we discussed the problems arising from the immense use of web-based applications in mobile phones and other mediums, which leads us to the need of higher level of authentication. The proposed system uses a RSA to implement ZKP using random number generator for every login instance and the hash (stored in crc32) is added to it and the server counter checks the values for access granting.

VIII. ACKNOWLEDGEMENT

In this paper Our project is **"REAL TIME BUS STATUS MONITORING SYSTEM"** we are thankful to **Prof. Azhar Nabi** who is our project guide. He provided most of the material for study and was readily accessible every time. We would also like to thank all the employees of our college who helped in our project directly or indirectly and it is because of them. Lastly, we would like to thank our parents, friends and teachers of our college who encouraged us morally and guided us to put in our best.

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REFERENCES

[1]. Gunjal Sunil N., Joshi Ajinkya V., GosaviSwapnil C, KshirsagarVyanktesh B has developed a system which is a GPS based and manual system designed to display the real-time location and timetable of buses which can be useful for any public transport system. The system requires working internet connection and may or may not be GPS tracker.

[2]. G. Jemilda, R. Bala Krishnan, B. Johnson, G. LingaSangeeth have used two Android applications designed are: One for the Driver to start uploading the bus's location to the server and the other for the user to retrieve the location of the bus and check how much time the bus takes to reach a particular stop and also to see the location of the bus on the Google Map.

[3]. Karan Punjabi, PoojaBolaj, PratibhaMantur, SnehaWali uploads the current location of the bus to the server. The server then sends an SMS to all the registered students those are about to board at the bus stop. Here the driver‟s mobile phone is used as a GPS receiver. It is a tiresome process where the details of all the students are to be kept and updated from time to time. The server is overloaded every now and then to get details of a student at every stop.

[4]. Dr. (Mrs.) Saylee Gharge, Manal Chhaya, GauravChheda, Jitesh Deshpande, Niket Gajra have developed a system using GPS displays the current locations of the bus. The system consisted of a transmitter installed on the buses and receiver boards installed on the bus stops. It provided the relevant bus routes and other information to their clients.

[5]. Manini Kumbhar, Meghana Survase, Pratibha Mastud, AvdhutSalunke, Shrinivas Sir deshpande provided the relevant information regarding all the bus going from user‟s source to destination. The system is operated by GPS which is attached to every bus. It uses external hardware set-up for its implementation.