

Smart Employee Tracking System

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Abstract

Employees are provided with a card that contains a beacon broadcaster their unique ID. In this project there are some devices which act as scanners, so we can keep these scanners in the location where we want to track the employees. The scanner at each room of the work place scans for the available beacon broadcasters and gets the employee ID from it. The location of each employee with their ID and time is updated to the cloud and stored in the database. There will be a provision for admin to track the location of every employee at a particular zone in the web app.

1. Introduction

Now a days smart employee tracking system playing a major role in present day to day life. IOT playing a vital role in designing smart tracking system in industrial and information technology applications. IOT is a combination of embedded communications system which interconnects hardware devices to the internet. In these proposed system ESP32 Wi-Fi module is used for collecting data from equipment's and transfer it into a wireless internet, parameters are uploaded in the cloud and continuously monitored by the user either mobile using mobile application or internet using data clouds.

ESP32 is the most advanced Wi-Fi module and Bluetooth inbuilt microcontroller and Bluetooth. It consists of Wi-Fi module which works as beacons (servers) and a Bluetooth which works as scanners. Beacons are small, wireless transmitters that use low-energy Bluetooth technology to send signals to other smart devices nearby.

BLE which is also referred to as bluetooth4.0. BLE is a form of wireless communication designed especially for short-range communication. BLE data transfer is essentially a one-way communication. BLE is very similar to Wi-Fi in the sense that it allows devices to communicate with each other. However, BLE is meant for situations where battery life is preferred over high data transfer speeds. BLE data transfer is essentially a one-way communication. With BLE we can connect client and server. The range of Bluetooth wireless technology for exchanging data over short distance is 2.4 GHz

A simple Wi-Fi scanner, using an ESP32 development board (NodeMCU ESP-32S) & display. It will scan & show active SSID (Service Set Identifier) and also RSSI (Received Signal Strength Indicator) of surrounding Wi-Fi. Wi-Fi scanner allows you to easily locate visible wireless networks and its corresponding information

2. Literature Review

Wi-Fi is a wireless radio local area network technology based on IEEE 80211 standards and it is used for connecting to the network. The Wi-Fi works at 24 GHZ or 5GHZ frequencies. Basically Wi-Fi is a radio wave the broadcast from a Wi-Fi router. The devices such as desktop and laptop .video game console, smartphones, tables, and smart TV's are using Wi-Fi technology. The coverage of one or more interconnected access points(hotspots) can extend from an area as small as a few rooms to as large as many square kilometers. Wi-Fi is a trademark of Wi-Fi Alliance, an association of manufactures and regulators defining standards and certifying products as Wi-Fi compatible. In this tutorial we demonstrate how to works scanning of Wi-Fi or ESP32 controller

supports point to point , broadcast and mesh network. By the use of BLE we connect client and server .client will be scans the near by devices. Server advertises the data ,so it can be found by other devices and contains data that client can be read

The generic attribute Profile establish how data will organized and exchanged over a Bluetooth low energy connection. Certain use-case-specific profiles (GATT based profiles) are standardized by the Bluetooth Special Interested Group (SIG). The GATT server may defined permissions independently for each characteristics.

The server may allow some characteristic to be accessed by any client, while limiting to access to another characteristic to only authenticated or authorized clients .This permissions are usually defined as part of higher level profile specification for custom profiles, the user may select the permissions as there fit. For more information about the GATT security, referred to the security considerations of the Bluetooth core specification version 4.2

3. Proposed System

This system is implemented with ESP32-DEV module by are widely applicable in easy-to-use applications due to the interconnecting Wi-Fi and Bluetooth module like limited range between the sender and the receive. These enabling inbuilt Wi-Fi module of ESP32, the system is communication techniques are restricted to simple connected to the cloud as well as android mobile loaded applications because of their slow communication speeds. ESP32 is a series of low-power, low-cost system employs a microprocessor of type Tensilica Xtensa LX6 available in both single core and dual core variations and includes in- built sensors, antenna switches, RF balun, low noise, power amplifier receiver amplifier, filters and power-management modules. ESP32 is created and developed by Espressif systems, a Shanghai-based Chinese company, and is manufactured by TSMC using their 40nm process. It is a successor to the ESP8266 microcontroller.

The Raspberry Pi may be a low cost, credit-card sized computer that plugs into a computer monitor or TV, and uses a typical keyboard and mouse. it's a capable little device that permits people of all ages to explore computing, and to find out the way to program in languages like Scratch and Python. This Raspberry pi equipped with ENC28J60 which may be a Ethernet chip to urge connected with internet [6]

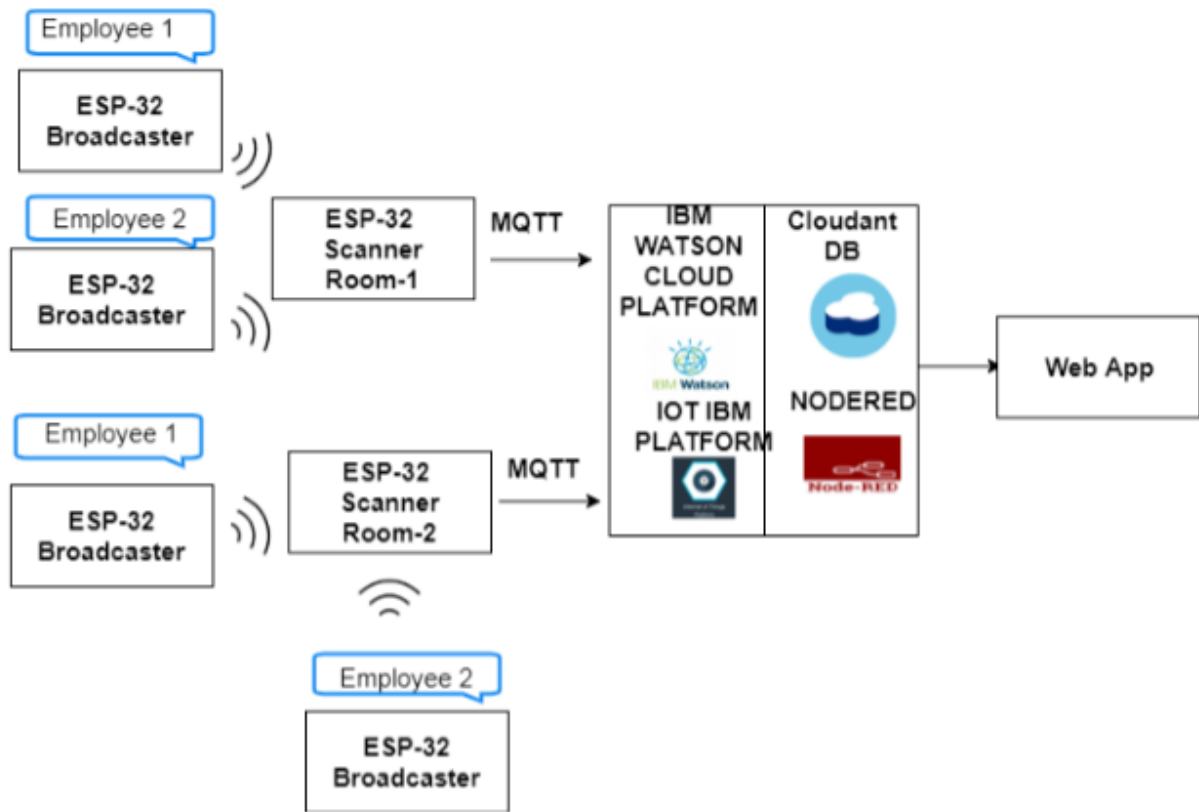


Fig.1 Proposed System

The ESP32 is design for low power IOT applications in mind. Its high processing power with-in built Wi-Fi /Bluetooth and deep sleep operating capabilities makes it ideal for most portable IOT devices. Also now, since Arduino IDE has officially released board managers for ESP32 it has become very easy to program these devices.

There are totally 39 digital Pins on the ESP32 out of which 34 can be used as GPIO and the remaining are input only pins. The device supports 18-channels for 12-bit ADC and 2-channel for 8-bit DAC. IT also has 16 channels for PWM signal generation and 10 GPIO pins supports capacitive touch features. The ESP32 has multiplexing feature, this enables the programmer to configure any GPIO pin for PWM or other serial communication though program. The ESP32 supports 3 SPI Interface, 3 UART interface, 2 I2C interface, 2 I2S interface and also supports CAN protocol

4. Conclusion

This system is used in real time tracking applications to track the employee distance and time. The module outline was tried, accuracy and working of the system was verified. If the future worked on, this functionality can assist determining the performance of employees based on their ability to finish tasks on time. One of the major drawback for this employee tracking system is we cannot find the particular employee

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