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PERFORMANCE ANALYSIS OF IOT BASED SMART SENSORS IN AGRICULTURE APPLICATIONS

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ABSTRACT

A novel technique named "The Internet Of Things (IoT)" has been introduced based on communications methods .The design solutions for sensible property may be a important technical challenge of the day. The smart connectivity will be established only if all communication devices get connected over an IoT network. Majority of IoT network nodes used in different applications involve numerous property standards like close to Field Communication (NFC), ZigBee, Bluetooth for mobile/retail payments, Wi-Fi, 3G, 4G and Sub – one GHz for smart Home and Industrial Application, smart Agriculture, smart Water and Transportation applications. In order to get the knowledge about IoT, First we need to understand the concept of RFID systems (used to identify and communication with other devices). IoT depends on Wireless Sensor Networks by collecting the information, processing and transmitting the collecting data's. Some advanced technologies such as in order to initialize and solve the problems and control the machine-to-machine interfacing

Keywords: Internet of Things (IoT), Agriculture IoT, CC110L, MSP430, CC3200, Temperature SensorDHT11, cloud computing, Thingspeak.

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1. INTRODUCTION

While planning the IoT device, the wireless property technologies need to be properly chosen since communication plays the core role within the applications. The IoT wireless transceiver nodes should be designed taking into thought numerous factors like vary, output and low power. The nodes therefore designed will be accustomed construct AN IoT wireless transceiver network. The wireless take a look at signals are simulated and therefore the network is tested for best property by analysis of standard QoS parameters. The Internet of Things connecting everyday devices like smart-phones, web TVs, sensors and actuators to the world Wide network wherever the smart devices are intelligently connected along enabled the new modes of communication between objects and receiver, and between the things itself.

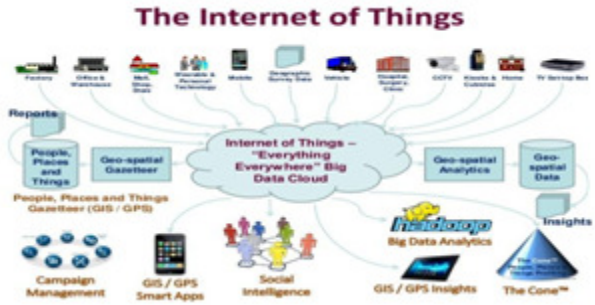

Figure 1 Internet of things

2. IOT ARCHITECTURE LAYERS

The architecture of IoT comprises of mainly four layers.

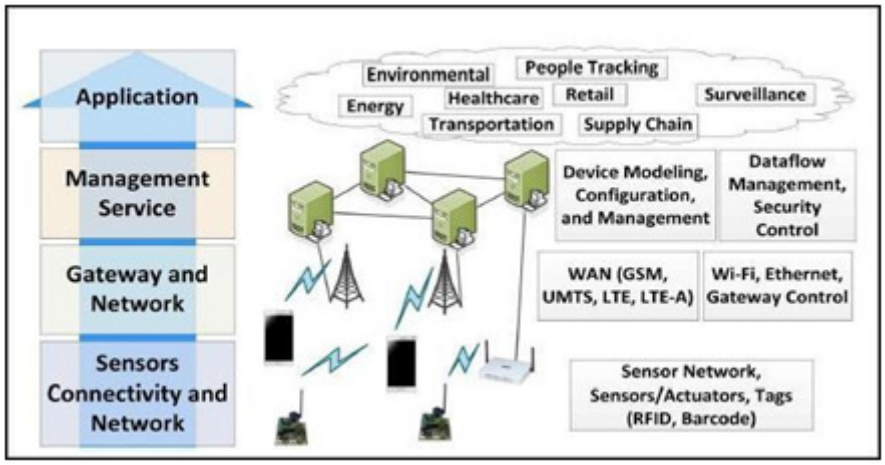

Figure 2 Architecture of IoT

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3. ELEMENTS OF IOT

3.1. SENSING

The initial step in IOT is gathering the in data at a “point of movement.” The information can get from an machine, a portable gadget and common devices.

3.2. COMMUNICATION

Most of the IoT devices are not suitable for cloud environment. This is connected by either WiFi (wireless LAN communications) or WAN communications.

3.3. CLOUD BASED CAPTURE

The accumulated data is transmitted to a cloud predicated accommodation where the information coming in from the IOT contrivance is aggregated with other cloud predicated data to provide subsidiary information for the utilizer..

4. PROPOSED SYSTEM

4.1. Simple IoT wireless Transceiver node:

The simple wireless transceiver node consists of cluster hub CC3200 and the MSP430 pad and the CC110L transceiver node. Along with that the temperature or humidity sensor is interconnected with the each node. The sensor senses the temperature in the agricultural field and continuously give the data to the user.

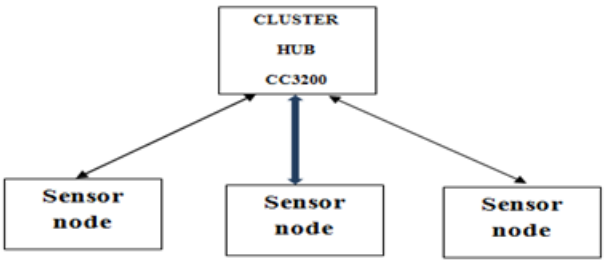


Figure 3 Wireless Transceiver node

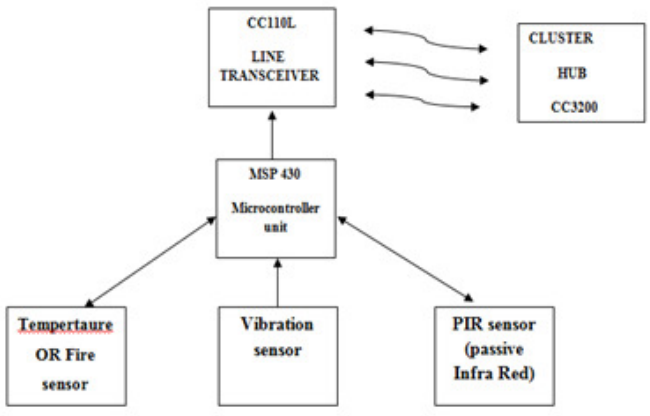


Figure 4 Wireless Transceiver with sensor node

The simple wireless IoT Transceiver node consists of three main Components.

They are, CC3200 - SimpleLink Wi-Fi and IoT With microcontroller Pad

MSP430-Ultra-low-power sensing & measurement MCUs

CC110L- Value Line Sub-1 GHz Transceiver

4.2. IoT wireless transceiver node Temperature sensor Module (DHT11)

The IoT wireless transceiver node is incorporated with the sensor Module .Along with the QoS parameters bandwidth, LQI, CRC and data the sensor value can be receive for each node. At a particular distance we have to measure the, bandwidth of the received signal from each node. The sensor will measure the temperature of the building at a particular threshold voltage. At the attainment of that voltage or it exceeds that voltage the sensor will act as a fire sensor.

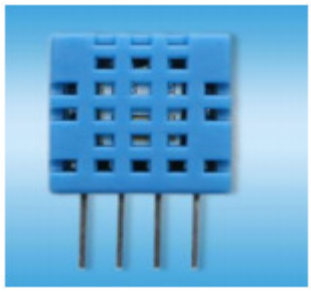


Figure 5 DHT11 Temperature

DHT11 digital temperature and humidity sensor is a composite Sensor contains a calibrated digital signal output of the temperature and humidity.

4.2.1. Circuit Diagram of DHT11

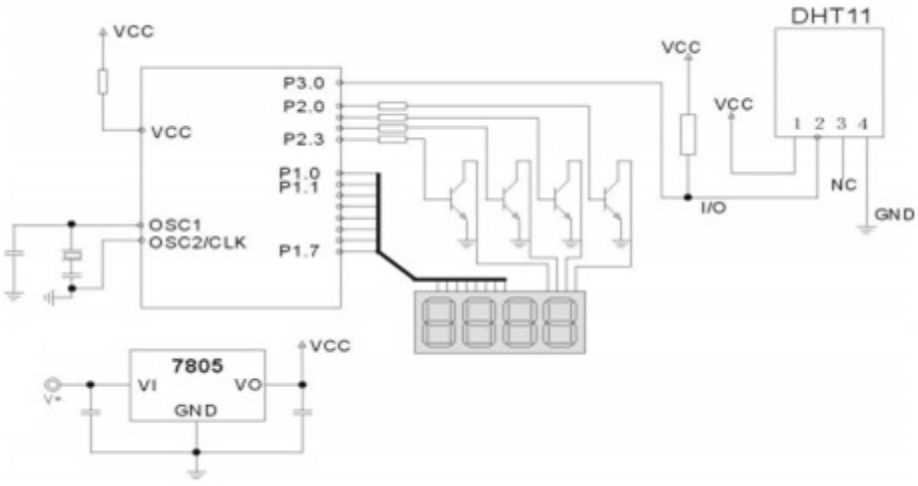


Figure 6 Typical circuit

The pin outs versions of DHT11:

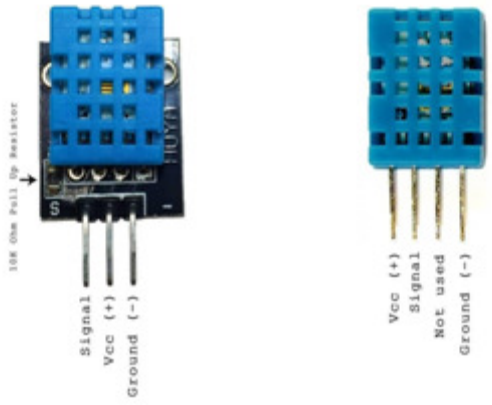


Figure 7 Pin out versions of DHT11 sensor

5. ENERGIA TOOL

5.1. Software Description

Energia is an accessible antecedent & community-driven chip development atmosphere (IDE) & computer cipher framework. Supported the Wiring framework, Energia provides an automatic autograph atmosphere additionally as a able framework of easy-to-use applied Apis & libraries for programming a microcontroller. Energia supports several TI processors, primarily those on the market within the launch area development scheme. Energia is open supply & the ASCII text file is on the market.

Features

- Simple & easy-to- use.
- Features a athletic framework of automatic applied Apis for ascendant Support for abundant TI anchored accessories
- Open supply & hosted in GitHub
- Higher level libraries are on the market (i.e. Wi-Fi, Ethernet, displays, sensors & more)
- Energia project into Code musician Studio v6, permitting developers to require advantage of the launch area kit's on-board programme.
- Prototyping package to form Things straightforward

Energia eighteen is predicated on the newest and greatest Arduino IDE.The Energia fitting come by means of sustain intended for the MSP430. Alternative cores like TivaC, CC3200, MSP430 may be put in through the board manager selectively. For additional details on a way to install extra cores/boards see the board manager guide guide.

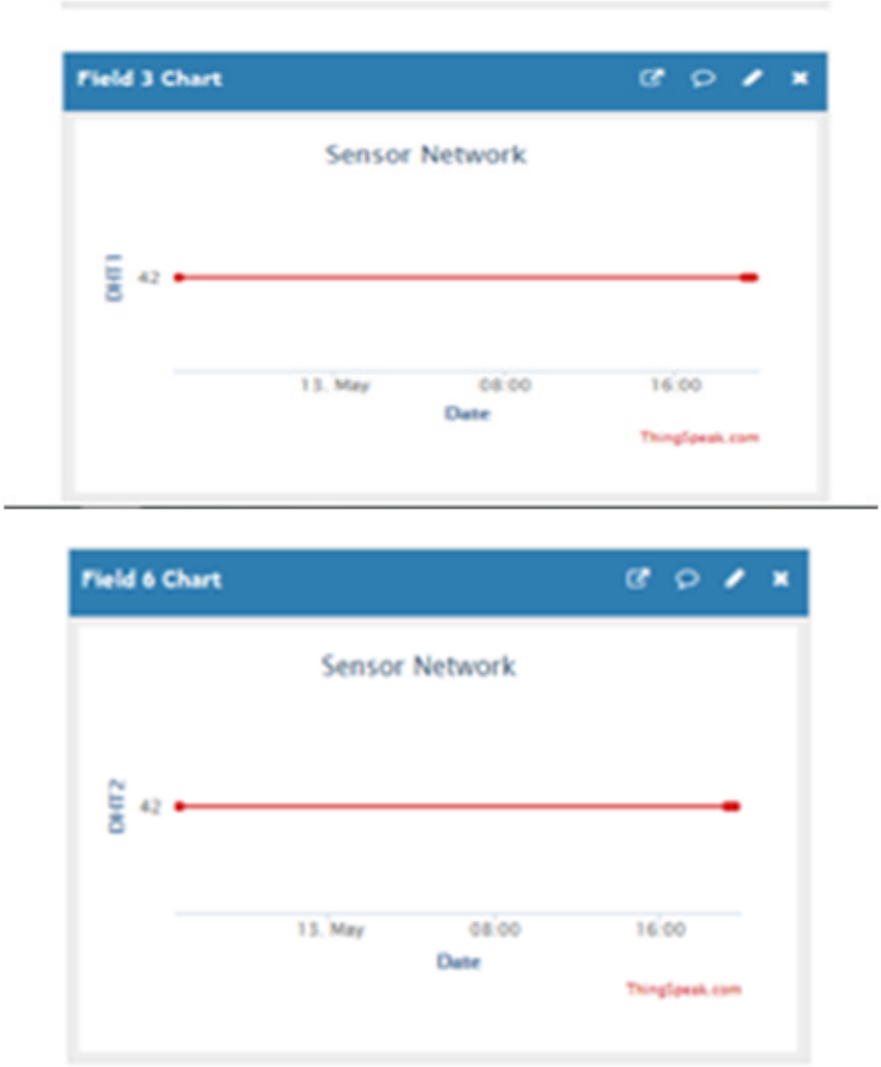
6. RESULT AND DISCUSSION

An IoT transceiver node is constructed by integrating a microcontroller unit(CC3200 Simple Link WiFi) and a line transceiver (CC110L Wi-Fi Booster Pact). This would serve as a single communication link for a simple Wi – Fi link. In a similar way, IoT transceiver nodes for various Smart City applications are constructed with CC2650 Launch Pad and Sensor Tags, CC1310 Ultra – Low Power Sub – 1GHz Wireless MCU.A network of such nodes is constructed with n number of transceiver nodes thus designed. The Signal Studio software is

used to create the wireless signals for different standards. The signals thus generated are transmitted and received at the other nodes. The QoS parameters of the network are studied. The wireless communication standard which provides the necessary QoS values is selected as the appropriate standard for a particular application.

The proposed clustering technique is implemented using Energia tool. For measuring performance analysis purpose, we have carried out a thorough experimental analysis understand the impact of the proposed clustering mechanism on IoT .

Temperature Sensor node outputs:



7. CONCLUSION

IOT platforms can help organization lessen the cost from side to side improved procedure competence, asset utilization and productivity. In this project , we presented the technologies and its specification that can be used to make Internet of Things a reality. An IoT transceiver node is constructed by integrating a microcontroller unit(CC3200 Simple Link WiFi) and a line transceiver (CC110L Wi-Fi Booster Pact). This would serve as a single communication link for a simple WiFi link. In a similar way, IoT transceiver nodes are formed with temperature, Vibration and PIR sensor. The values obtained by the each node at a different distance are analysed and the QoS parameters are studied for various Smart City applications.

The combination of IoT by means of cloud services and the research issues which need to be addressed at the time of integration.

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REFERENCES

[1] Xiaolong Jin, B. Waha, X. Cheng, Y. Wang, “Significance and Challenges of Big Data Research, Big DataResearch”vol. 2, 2015,PP 59–64.

[2] R. Colella, L. Catarinucci and L. Tarricone, "Improved RFID tag characterization system: Use case in the IoT arena," 2016 IEEE International Conference on RFID Technology and Applications (RFID-TA), Foshan, 2016, pp. 172-176.

[3] K. Fan, C. Liang, H. Li and Y. Yang, "LRMAPC: A Lightweight RFID Mutual Authentication Protocol with Cache in the Reader for IoT," 2014 IEEE International Conference on Computer and Information Technology, Xi'an, 2014, pp. 276-280.

[4] S. Amendola, R. Lodato, S. Manzari, C. Occhiuzzi and G. Marrocco, "RFID Technology for IoT-Based Personal Healthcare in Smart Spaces," in IEEE Internet of Things Journal, vol. 1, no. 2, pp. 144-152, April 2014.

[5] A.K. Evangelos, D.T. Nikolaos, and C.B. Anthony, “Integrating RFIDs and smart objects into a Unified Internet of Things architecture,” Advances in Internet of Things, vol. 1, pp. 5-12, 2015.

[6] S. Krithika,”Performance Analysis of CDMA Technique in Optical Fibre Networks Using Signal Processing, National Conference on “Recent trends in Communication Techniques”

[7] IoT and Cloud Technology in Residential and Business premises as Ubiquitous Computing, International Journal of Internet of Things and Web Services, ISSN: 2367-9115, Volume 2, 2017.

[8] Ahmed A. Elngar ,”Employing an efficient tamper detection mechanism for IoT-based healthcare systems International Journal of Internet of Things and Cyber-Assurance” (IJITCA), Vol. 1, No. 2, 2018

[9] RK Kavitha, MS Irfan Ahmed, “Knowledge sharing through pair programming in learning environments: An empirical study”,vol 3.issue 2. PP 319-339,springer publications

[10] SN SHIVAPPRIYA VISAKAA ,”Review on Routing Protocols in WSN for Low Power Applications , International Journal of Pure and Applied Mathematics, vol.117,issue 2.2017.

[11] Big Data Analytics and Internet of medical Things Make Precision Medicine a Reality, International Journal of Internet of Things and Web Services ISSN: 2367-9115Volume 3, 2018