International Journal of Scientific Research in Computer Science, Engineering and Information Technology
© 2019 IJSRCSEIT | Volume 5 | Issue 2 | ISSN : 2456-3307
DOI : https://doi.org/10.32628/CSEIT1952243

A Study on IOT for Smart Water Quality Monitoring Using MQTT Algorithm

G. Vadivel, A. P. Thangamuthu, A. Priyadharshini
Department of Computer Applications, SNMV College of Arts and Science, Coimbatore, Tamil Nadu, India

ABSTRACT

The decrease in quality of water resources has become a common problem. The standard methods of water quality surveillance include water sample manual collection from various locations. These water samples were tested in laboratory using intelligence capabilities. Such approaches take time and are no longer considered inefficient. The old method of water quality detection was time consuming, less accurate and expensive. By focusing on the above problems, IOT can be used to monitor water quality in real time, a low cost water quality monitoring system. Water quality parameters in the proposed system are measured by various sensors such as pH, temperature and dissolved oxygen to transfer data on a platform via a microcontroller system. Therefore, to meet these needs, you can use other technologies such as MQTT (Message Sorting Delimiter Transform), allowing the Sensor and End device rankings to publish and subscribe. And the number of data simultaneously between sensors and servers with the help of the MQTT algorithm.

Keywords : Watermark, Internet of Things (IOT), MQTT, Rank, Sensor, Server, Server

I. INTRODUCTION

Since IOT has created a lot of problems have been settled in this world. There are various issues in communication, data collection, data analysis, and early alerts by using IOT in this water quality monitoring system. But to get this image, technologies and ethics are connected to get the desired output. The MQTT application here makes the whole process faster and reliable.

The main purpose of using the IOT approach to monitor the quality of water using the MQTT algorithm is to create a system that provides a useful data using the end user. Usually, water samples are collected from various locations and are tested hard by scientists in the lab using many techniques to determine the quality of water. So old methods were time consuming, but now IOT has the potential to modernize water production, its technology is connected to the Internet. This IOT approach is far better than regular methods because it is friendly, fast and easy to use.

Water quality testing parameters are monitored with the help of GSM (Global Message Service) technology but there are several limitations to this technology. First of all, using GSM for all development expenditures. Furthermore, GSM is concerned about security issues by violating user identity confidentiality by turning the identities in an insecure form.

During the transaction of data, it is sent after a late, which creates a book and lasts for a transaction. However, data exchange should be fast and secure at

the same time. Instead of using a GSM network or any other technology, the implementation of the MQTT algorithm will be implemented to perform system, modular, scalar and cost efficiency. Not only this, with the help of the MQTT algorithm, there will be a number of data simultaneously between sensors and servers.

II. METHODS AND MATERIAL

Some jobs were made before the results were needed to meet the needs of the system. The system that created previous system sensors to collect information about water parameters. The collected information was then sent to the raspberry bike, showing the computer or any devices. After data acquisition received, information was made using GSM technology as part of the information. This system was helpful, but the prices were like, while real-time data was not created and there were security issues.

Scope

To overcome these limitations, changes are made with IOT support in this system, created by a new water surveillance system, where all water parameters are tested using sensors.

Subsequent useful data will be sent to the end user through the MQTT algorithm. MQTT makes communication and transaction data reliable and speed free. Besides, it reduces the overall cost of the system and expenses computer expenditure. The main source of use of MQTT is the number of data simultaneously between sensors and servers. This makes it an ideal choice for the connection.

CHALLENGES

The system faces three major challenges for security, sensor network and communications.

Security Security is a key factor for any organization. Safety is crucial to the operation of IOT in both the device and the network level.

Secure booting: When introducing the device first, the software's software credibility and integrity is checked using digital signatures generated by cryptography.

Access control: The various forms of resource and access control are used later. The compulsory or roll-based access control built on the operating system limits the concessions of the components and applications so they only access the resources required to do their jobs. If any components are compromised, access control ensures minimal access to the rest of the system as long as possible.

Device authentication: When the device is inserted into the network, it must be authorized to obtain the data prior to receiving or transmitting data. Deeply embedded device Users are not sitting behind the keyboard and waiting to enter the credentials to access the network.

Sensor Network A sensor network consists of small, typically battery-powered devices and wireless infrastructure groups that monitor the environment of a clinic in the environment, monitor the environment, and even in the wild from anywhere in the factory. The sensor network connects to the Internet, a company WAN or LAN or a dedicated industrial network, which collects data sent to the back-end methods in analysis and applications.

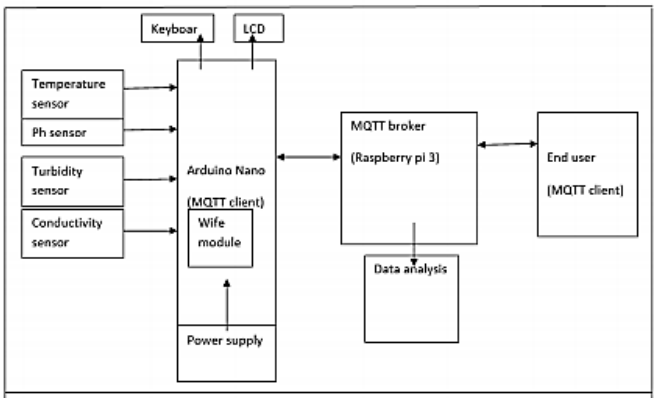
Communication Wireless communications system is an important part of the IOT infrastructure, which acts as a bridge for dual direction communication for data collection and control message delivery. It uses a number of major IOT applications, such as the typical grid, oil field and events in our routine life, in a way

similar to the general challenges and problems of wireless communications for IOT applications.

- ✓ Sensors in different types and shared sites should be combined, managed and maintained.
- ✓ Many trusted information needs under the environment.
- ✓ Spectrum resources available for the new IOT wireless network are very low.
- ✓ Strong external area, low power consumption and simple configuration required.

III. METHODOLGY

- ✓ Water deficit is the first task to determine the close symptom of water pollution. For detailed research, pH should be combined with dissolved oxygen and temperature.
- ✓ The second step is the local selection that provides useful data. In the area and industrial areas, sewage waste and city lines were interrupted, where human intervention significantly influenced. Different sensors were established in places such as testing.
- ✓ The third step is to send data from the sensor onto the Arduino kit for further processing.
- ✓ Transmission of data received from the next step is from the location of the MQTT image. With the help of MQTT with raspberry pi, the received information is sent to the server and end user.
- ✓ Last data analysis is done by Nave Bayes' algorithm with any help obtained from the required information using algorithm



Block Diagram

NAIVE BAYES' THEOREM

Naïve Bayes' theorem is used to analyze data from enzymes to MQTT. With the help of this class here, a specific or integral parameter of water quality can not be attributed to other properties or that each feature is categorized. The value of any aspect should be independent. Naïve Bayes' Theorem can be designed in simple terms:

IV. CONCLUSION

During the exchange of data, this sends a backward background, creating a puzzling and delay. However, data transfer should be fast and secure at the same time.

Therefore, to meet all these requirements, other technologies can be used to use MQTT (newsletter telemeter transport). Instead of using the GSM network or any other technology, the MQTT algorithm will be implemented to generate computational system, modular, scalar and cost efficiency, which communicates with the flow of information simultaneously between sensors and servers. Lots of data can be sent without any restrictions.

In the future, the system can be implemented with the help of various resources. Sensitivity is also used

for more precise and accurate data analysis of other water quality diagnoses.

V. REFERENCES

[1] Pavana NR and Dr. M.C. Padma, "Design of Low Cost System for Real Time Monitoring of Water Quality Parameters in IOT Environment", International Journal of Advanced Research in Computer Science and Application Volume 4, Issue 5, May 2016.

[2] A.N. Prasad, K.A. Mamun, F.R. Islam, H. Haqva," Smart Water Quality Monitoring System", IEEE, 2015.

[3] N Vijayakumar, R Ramya,"The Real Time Monitoring of Water Quality in IOT Environment", International Conference on Circuit, Power and Computing Technologies, IEEE, 2015.

[4] Young Hua Ling, Jiabin Tang, Qing Yang, Chao Zui "Wireless Communication for IOT(Internet of Things)", IBM Research. Accessed December 17, 2016.

[5] Wind River," SECURITY IN THE INTERNET OF THINGS –Lessons from the past for the Connected future "2015. Accessed Dec 17, 2016.

[6] Design Spark,' 11 Internet of Things (IOT) Protocols you need to know about ". Accessed December 10, 2016.

[7] OASIS –MQTT Version 3.1.1 plus Errata 01.Accessed November 7, 2016.

[8] Alfiya Abubaker, Kavya C R, Tilju Thomas, Nikhil Joseph, Shifana Begum, "A Study on IOT Approach for Monitoring Water Quality Using MQTT Algorithm"International Research Journal of Engineering and Technology (IRJET) March 2018

Cite this article as :

G. Vadivel, A. P. Thangamuthu, A. Priyadharshini, "A Study on IOT for Smart Water Quality Monitoring Using MQTT Algorithm", International Journal of Scientific Research in Computer Science, Engineering and Information Technology (IJSRCSEIT), ISSN : 2456-3307, Volume 5 Issue 2, pp. 869-872, March-April 2019. Available at doi : https://doi.org/10.32628/CSEIT1952243

Journal URL : http://ijsrcseit.com/CSEIT1952243