IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

ISO 3297:2007 Certified ⁜ Impact Factor 7.918 ⁜ Vol. 11, Issue 12, December 2022

DOI: 10.17148/IJARCCE.2022.111231

Review Paper on Wireless sensor network in IoT

Pooja A. Data[1], Vijay M. Rakhade[2], Ashish B. Deharkar[3]

Final Year Student, Computer Science Engineering, Shri Sai College of Engineering & Technology, Bhadrawati, India[1]

Professor, Computer Science Engineering, Shri Sai College of Engineering & Technology, Bhadrawati, India[2]

Assistant professor, Computer Science Engineering, Shri Sai College of Engineering & Technology, Bhadrawati, India[3]

Abstract: The IoT (Internet of Things) is the network in which physical devices, equipment, sensors and extra objects can communicate between themselves without human involvement. The WSN (Wireless Sensor Network) is a dominant component of the IoT, which has multiplied into numerous different applications in real-time. The IoT and WSNs now have many critical and non-critical applications impacting almost every area of our everyday life. Wireless sensor networks with the mobile sink can support to prevent the hot-spot problem and improve the network lifetime. Nevertheless, in practice, the courses of the sink cannot ideally change due to the obstacle of the environment or the necessity of the application.

Keywords: Internet of Things (IoT), Wireless Sensor Networks (WSN), Energy-efficiency, Data Aggregation.

I. INTRODUCTION

Our everyday life has dissimilar significantly in all respects with the opening of wireless networking technology. The Internet of Things (IoT) is specifically one of the wildest evolving technologies of the upcoming. Multiple devices can be linked in the physical world, which essentially changes our everyday life, by design IoT. Wireless sensor networks (WSNs) are a new class of wireless networks that are becoming very general with a huge number of civilian and military applications. A wireless sensor network (WSN) is a wireless network that covers distributed independent sensor devices that are meant to monitor physical or environmental conditions. Heterogeneous WSN that connect a wide range of intelligent sensors has develop the cornerstone for the IOT-based systems all around us, presenting significant enhancements in the near future.

II. INTERNET OF THINGS (IOT)

The period IoT, or Internet of Things, denotes to the collective network of linked devices and the technology that enables communication amongst devices and the cloud, as well as among the devices themselves. Thanks to the beginning of inexpensive computer chips and high bandwidth telecommunication, we now have billions of devices related to the internet. This resources everyday devices like toothbrushes, vacuums, cars, and machines can use sensors to collect data and respond intelligently to users.

The Internet of Things participates everyday “things” with the internet. Computer Engineers have been calculating sensors and processors to everyday objects meanwhile the 90s. However, progress was initially slow because the chips were vast and massive. Low power computer chips named RFID tags were first used to track expensive equipment. As computing devices contracted in size, these chips also developed smaller, faster, and smarter over time.

III. WIRELESS SENSOR NETWORKS (WSN)

Wireless sensor networks (WSNs) denote to networks of spatially dispersed and dedicated sensors that monitor and record the physical conditions of the environment and forward the together data to a central location. WSNs can amount environmental situations such as temperature, sound, pollution levels, humidity and wind.

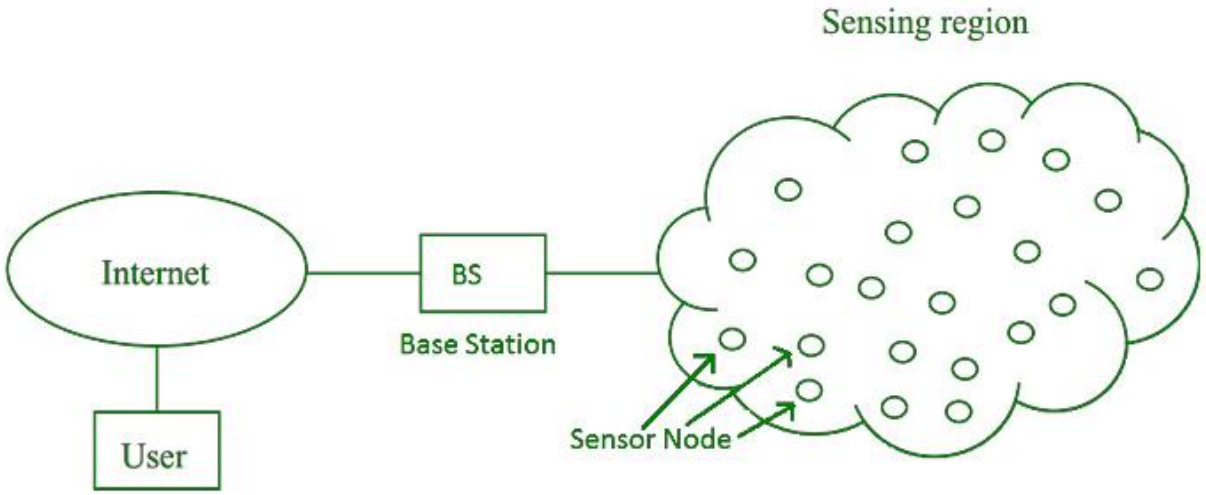
Wireless Sensor Network (WSN) is an infrastructure-less wireless network that is organized in a big number of wireless sensors in an ad-hoc way that is used to display the system, physical or environmental conditions. Sensor nodes are used in WSN thru the onboard processor that achieves and monitors the environment in a specific area. They are associated to the Base Station which performance as a processing unit in the WSN System. Base Station in a WSN System is related through the Internet to share data.

IJARCCE ISSN (O) 2278-1021, ISSN (P) 2319-5940

International Journal of Advanced Research in Computer and Communication Engineering

ISO 3297:2007 Certified ⁜ Impact Factor 7.918 ⁜ Vol. 11, Issue 12, December 2022

DOI: 10.17148/IJARCCE.2022.111231



WSN remain meant for processing, analysis, storage, and mining of the information.

Applications of WSN:

1. Internet of Things (IOT)
2. Surveillance and Monitoring for security, threat detection
3. Environmental temperature, humidity, and air pressure
4. Noise Level of the surrounding
5. Medical applications like patient monitoring
6. Agriculture
7. Landslide Detection

Challenges of WSN:

1. Quality of Service
2. Security Issue
3. Energy Efficiency
4. Network Throughput
5. Performance
6. Ability to cope with node failure
7. Cross layer optimisation
8. Scalability to large scale of deployment

Components of WSN:

1. **Sensors:**
   Sensors in WSN are used to capture the environmental variables and which is used for data gaining. Sensor signals are rehabilitated into electrical signals.

2. **Radio Nodes:**
   It is used to obtain the data formed by the Sensors and sends it to the WLAN access point. It contains of a microcontroller, transceiver, external memory, and power source.

3. **WLAN Access Point:**
   It obtains the data which is sent by the Radio nodes wirelessly, generally over the internet.

4. **Evaluation Software:**
   The data established by the WLAN Access Point is processed by a software named as Evaluation Software for giving the report to the users for further processing of the data which can be used for processing, analysis, storage, and mining of the data.

International Journal of Advanced Research in Computer and Communication Engineering
ISO 3297:2007 Certified ⁜ Impact Factor 7.918 ⁜ Vol. 11, Issue 12, December 2022
DOI: 10.17148/IJARCCE.2022.111231

IV. ENERGY-EFFICIENCY

Energy efficiency is the use of less energy to perform the same task or produce the similar result. Energy-efficient homes and buildings use rarer energy to heat, cool, and run appliances and electronics, and energy-efficient manufacturing facilities use rarer energy to produce goods. Energy efficiency is one of the easiest and most cost-effective conducts to combat climate variation, decrease energy costs for consumers, and expand the competitiveness of U.S. businesses. Energy efficiency is also a vital component in achieving net-zero emissions of carbon dioxide through decarbonization.

Energy Efficiency Benefits

- Energy efficiency protects money, rises the resilience and reliability of the electric grid, and offers environmental, community, and health benefits.

V. DATA AGGREGATION

Data aggregation is any procedure in which information is collected and expressed in a summary form for purposes such as statistical analysis. A common aggregation purpose is to become more information about particular groups created on definite variables such as age, profession, or income.

A common aggregation purpose is to get extra information about specific groups based on specific variables such as age, profession, or income. For a sample, a site that retails music CDs might advertise positive CDs based on the age of the user and the data aggregate for their age group. Online analytic processing (OLAP) is a simple kind of data aggregation in which the marketer routines an online reporting mechanism to process the information.

VI. CONCLUSION

Advancements in computer technology have contributed to the development of WSNs, which at any time sense the necessary parameters. The IoT constructed WSN systems are gaining huge attention in current times. However, through point-to-point transmission, these systems suffer from restricted bandwidth, power and resources. Data gathering is a well-known method for alleviating this problem. A main problem in sensor networks is how vital information can be managed in a more energy-saving way. The data aggregation techniques concentration on the energy conservation, lifetime enhancement, improved QoS and high-level security of the network.

REFERENCES

[1]. M. S. Islam, G. K. Dey, ‘‘Precision Agriculture: Renewable Energy Based Smart Crop Field Monitoring and Management System Using WSN via IoT,” 2019 International Conference on Sustainable Technologies for Industry 4.0 (STI), Dhaka, Bangladesh, 2019, pp. 1-6, doi: 10.1109/STI47673.2019.9068017
[2]. K. Begum, S. Dixit, ‘‘Industrial WSN using IoT: A survey,” 2016 International Conference on Electrical, Electronics, and Optimization Techniques (ICEEOT), Chennai, 2016, pp. 499-504, doi: 10.1109/ICEEOT.2016.7755660.
[3]. S. Sarkar, K. U. Rao, J. Bhargav, S. Sheshaprasad and A. Sharma C.A., ‘‘IoT Based Wireless Sensor Network (WSN) for Condition Monitoring of Low Power Rooftop PV Panels,” 2019 IEEE 4th International Conference on Condition Assessment Techniques in Electrical Systems (CATCON), Chennai, India, 2019, pp. 1-5, doi: 10.1109/CATCON47128.2019.CN004
[4]. I. F. Akyildiz, S. Weilian, Y. Sankarasubramaniam and E. Cayirci, "A survey on sensor networks", Communications Magazine IEEE, vol. 40, pp. 102-114, 2002.
[5]. S. Slijepcevic and M. Potkonjak, "Power efficient organization of wireless sensor networks", Communications 2001. ICC 2001. IEEE International Conference, vol. 2, pp. 472-476, 2001.
[6]. G. Kulkarni, R. Shelk, K. Gaikwad, V. Solanke, S. Gujar and P. Khatawkar, "Wireless sensor network security threats", Communication and Computing (ARTCom 2013) Fifth International Conference on Advances in Recent Technologies in, pp. 131-135, 2013.
[7]. M. Sheldon, D. Chen, M. Nixon and A. K. Mok, "A practical approach to deploy large scale wireless sensor networks", Mobile Adhoc and Sensor Systems Conference 2005. IEEE International Conference on, pp. 8, 2005.