

A NOVEL STUDY OF WIRELESS SENSOR NETWORK

ANKIT KHANDELWAL

*Lecturer in Computer Application Department
Aryabhata International College of Technical Education, Ajmer
Email- ankitkhandelwal44@gmail.com*

ABSTRACT

Wireless sensor network is widely used to examine physical and environment conditions. The previous records of this technique are outstanding and very much successful. So in this modern Era peoples are broadly using this technique by using various applications. The expansion of wireless sensor networks was forced for better executions of military applications such as combat zone surveillance; today such network systems are used in many engineering, manufacturing and consumer applications, such as industrial process monitoring and control, medical equipment monitoring and many more.

KEYWORDS: WSN, Sensor node, ADC, Protocol, Topology.

INTRODUCTION

The Wireless sensor networks (WSNs) is a technique that has been used in a wide variety of applications and environments with outstanding performance in the previous years. Broad level of studies on medical sciences, commercial and industrial applications have provided successful and promising outcomes, it increases the interest of many new peoples towards this type of monitoring solutions.

Wireless sensor network is group of autonomous sensor nodes which transport their sensed data main network gateway using radio frequency channel communication. These devices often based on low power consumption methodology, most of these devices consists their own batteries and keep a longer lifetime and perfectly works through several years without any major interruptions.

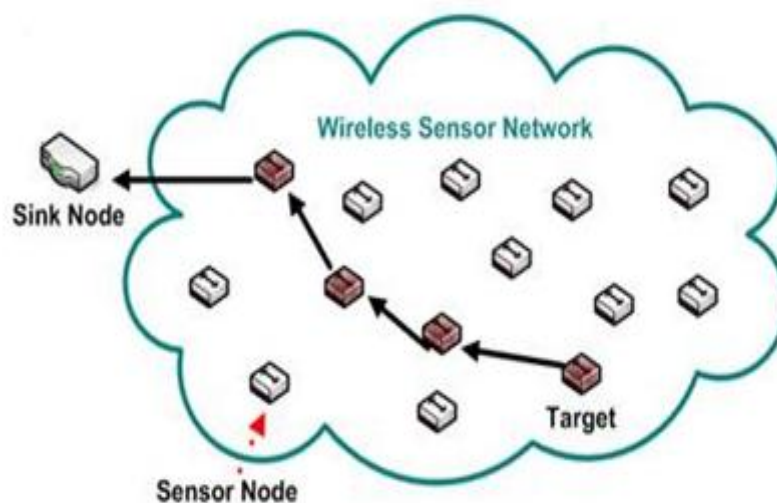


Fig. 1 Wireless Sensor Network Organization

ORGANIZATION OF A WIRELESS SENSOR NODE

A sensor node mainly consist four basic components such as sensing unit, processing unit, transceiver unit and a power unit. It has also an application dependent component such as a location finding system, a power generator and a mobilize. The sensing unit of WSN is usually composed of two subunits: sensors and analogue to digital converters (ADCs). The analogue signals are produced by the sensors and these are converted to digital signals by the ADC, and then fed into the processing unit. The processing unit is basically associated with a small storage unit and it can manage the dealings that make the sensor node cooperate with other nodes to carry out the assigned sensing tasks. A transceiver unit connects the node to the network. The most important component of a sensor node is the power unit. It can be supported by a power scavenging unit such as solar cells. The other subunits, of the node are application dependent.

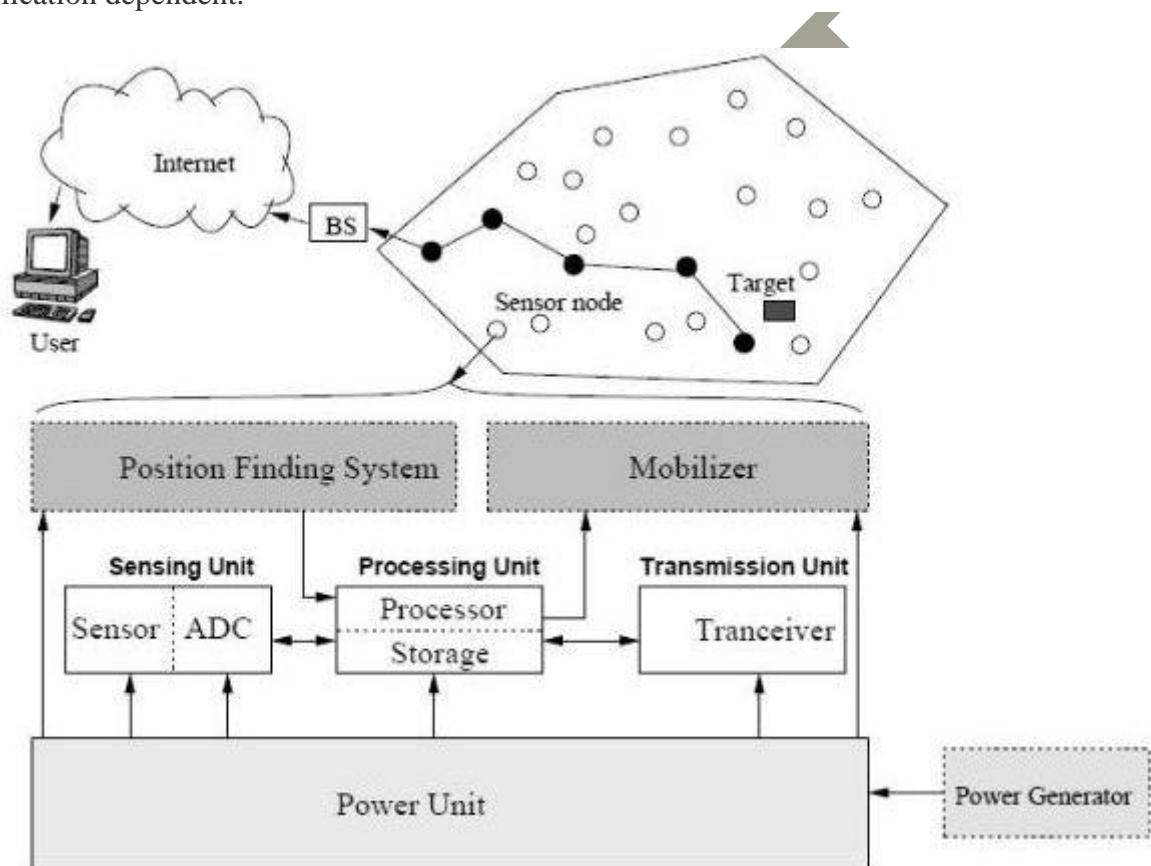


Fig. 2 Sensor node and its processing units

APPLICATIONS OF WIRELESS SENSOR NETWORK

Wireless sensor networks have gained significant recognition because of its flexibility in solving problems in different application domains. It has the right potential to change our lives in many different aspects. Wireless sensor network is broadly used many reputed areas now a day's including Military Operations, medical equipments monitoring , weather forecasting , pollution monitoring , land size detection, green house effect evaluation. It is also using in large scale for structural monitoring because it is very useful to observe the any type of movement in any building or place, by applying this technique farmer can easily maintain the wiring and irrigation in any weather forecast and can reduce the wastage of resources.



Fig. 3 Application areas of Wireless Sensor Network

DESIGN ISSUES OF A WIRELESS SENSOR NETWORK

There are many challenges is being faced in the deployment of sensor networks which are a superset of wireless ad hoc networks. Sensor nodes communicate over wireless, lossy lines without any particular infrastructure. An additional challenge is to the limited, usually non-renewable energy supply of the sensor nodes. In order to get more utilization and lifetime of the network, the protocols need to be designed from the very starting with the objective of efficient organization of the energy resources. Apart from all these some other factors are also very much affects the operations and stability of WSN like system scalability, cast of production, the constraints of hardware, the topologies being used in sensor network, media of transmission and most importantly power consumption.

CONCLUSION

In above study we discussed various aspects of wireless sensor network including its working process, effects on various fields directly related to human beings The role of sensor node in wireless sensor network. We also discussed some common issues which generally founds in creation of any wireless network, and validate the its requirement in human being life in a grand scenario.

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