Chapter 11
Minimize the Energy Consumption for Communication Protocol in IoT

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ABSTRACT

Any internet of things (IOT) deployment must have connectivity; this is accomplished by WSNs (wireless sensor networks). A few factors need to be taken into account when choosing a wireless technology for an IoT device: the maximum throughput, the distance range, the availability in the deployment zone, as well as the power consumption. The aim of this research is to maximize the lifetime of the nodes of WSN and to reduce the energy consumption. The system is also focused on managing WSN nodes with huge residual energy, small routing distance, and with maximum number of neighbors. This system makes use of LEACH protocol, and this protocol is hierarchical clustering protocol and also energy efficient. The cluster is constructed in such a way that average dissipation of energy in each node is minimized, and speed of the network is increased. To connect sensor networks with gateways and transfer data from these sensor networks, other technologies such Sub-1 GHz are Zigbee can also be employed.
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INTRODUCTION

Communications refer to exchanging information between various entities, such as humans, computers, organizations, agencies, and firms. During digital communication, data is transmitted between several computing devices. Here data transmission (datacom) takes place over a wired or wireless radio signal, fiber optic cable, or telephone line. A computer network which consists of group of digital devices enables gadgets to "speak" to one another according to their connection. Devices for communications use both wired and wireless connections. In communication over a wired connection, the devices are physically connected to one another. Devices used for wireless communication are not physically connected to one another during communication. Data and voice transmissions take place during the communication. The availability, accessibility, and efficiency are all improved through wireless transmission. The coverage area is increased by wireless networks. Despite the fact that wireless networks offer greater opportunities, there are often installation-related disadvantages with wireless communications.

WSN (Wireless Sensor Network)

A wireless sensor network (WSN) comprises many sensor nodes that gather environmental data and deliver it to a sink. WSNs also refer to a collection of specialized sensors that are distributed spatially and are used to track environmental and physical conditions, record them and organize the information at a central point. WSN is used in various industries including the military, the environment, healthcare, home and other businesses. Numerous elements such as fault tolerance, scalability, cost of manufacture, operational environment, transmission medium and power consumption impact the design of sensor networks. A wireless network composed of various wireless sensors called the Wireless Sensor Network (WSN). In WSN, sensor nodes with an embedded CPU regulate and monitor the environment in a given space. They are connected to the Base Station (BS), which acts as the central processing node for the WSN System. To share data, the BS of a WSN system connected to the internet. Figure 1 depicts the user connection, internet, and WSNs (Geeks for Geeks, n.d.; Sharma et al., 2015).

WSNs are typically set up in a environment to watch over either static or dynamic events. Measuring static events (like temperature and humidity) is very simple. The drive of an unwelcome vehicle on a battlefield or the motion of whales in the ocean are examples of dynamic occurrences, which are often non-cooperative. It is difficult to monitor and unstable as they fluctuate (Fantin Irudaya Raj & Appadurai, 2022; Neelakandan et al., 2022; Thilakarathne et al., 2022). A certain protocol is needed for sensor networks to function well. For instance, a protocol can take the form of