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REVIEW OF WIRELESS SENSOR NETWORK ARCHITECTURE AND APPLICATIONS

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***Abstract*— Wireless Sensor network is a group of specialized devices or sensor which are used to monitor different environmental conditions and to collect and organize that data at some certain central location. It consists of collection of small/tiny device called sensor node. It consists of multiple detection station in which each node is small lightweight and portable. In this paper we will discuss on classified and application of WSN. Today's state of art WSN's have lower deployment and maintenance costs, least long and are more rugged. We are finding their way into numerous applications in our homes, workplace, bringing new source of information and convenience to our personal and professional lives and also concentrate on network security.**

Keywords— **WSN, Classification, Application, Network security**

I. INTRODUCTION

To understand on today's WSN, it is important to examine the modification of WSN's. Wireless sensor network has become broad field in research and development due to the large number of application that can become significantly useful for such system and cost effective, no reusable. A wireless sensor network consists of spatially timed distributed autonomous sensor to control physical or environmental conditions (i.e. sound, vibration, pressure, temperature, etc.) and to friendly send their data through the network to an exact location. The most application of wireless sensor network is to control environment for low frequency data trends. Wireless sensor network have the ability to adapt to changing environments due to reducing installation costs. It can respond to change in network topologies or can cause the network to shift between different modes of operations.

In sensor node each node is connected to one or sometime many sensor or few to several hundreds or even thousands of sensor node. Each sensor node has a different part for radio transceiver with an internal antenna or connected to an external antenna. A sensor node contains various sensors that are used to collect the data and monitor the physical process.

The current wireless sensor networks only excise the surfaces of possibilities emerging from the integration of low power communication, sensing, energy storage and computations. But in traditional wireless devices, wireless sensor nodes do not need to communicate directly with the nearest high-power control tower or base stations, but only with their local peers.

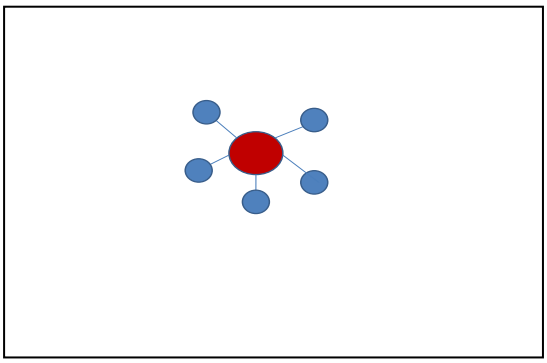
II. CLASSIFICATION OF WSN (BASED ON NETWORK TOPOLOGY)

1. One too many points(Star Topologies)
2. Tree topologies
3. Mesh Topologies

- ONE TOO MANY POINTS (STAR TOPOLOGY):

A star network is a different type of communication topology in which a single base station can send or receive a message to multiple numbers of remote nodes. At the time of message send and receiving the remote node don't work both tasks either the remote nodes can send the message or receive a message from the single base stations.

To manage the network on a single node, the gateway must be within the radio transmission range of all the individual nodes due to their dependency. The advantage of this topology for WSN's is in its simplicity and the ability to keep the remote nodes power consumption. The disadvantages of this topology are that the base station must be within radio transmission range of all the individual nodes and is not a robust to other



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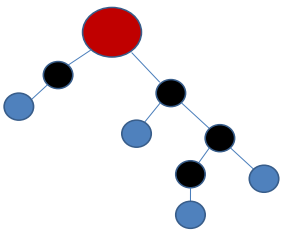
network due its dependency.

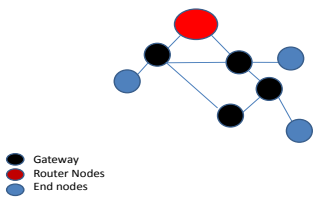
- TREE TOPOLOGY:

It is also known as cascaded star topology. In tree topology, each node connects to a node that is placed higher in the tree, and then to the gateway. The main advantages of this topology are that the expansion of a network can be easily possible, and also error detection becomes easy. Disadvantages of this topology are this network is that it relies heavily on the bus cable, if it breaks, all the network will collapse.



- MESH TOPOLOGY:

Mesh topology allow transmission of data from one node to another node, which is within its radio transmission range. If a nodes wants to send a message to another node which is not in the transmission range, it needs an intermediate node to forward the message to the desired node. Advantages of these nodes are that this topology includes easy isolation and detection of faults in the network. Disadvantages of this topology are that the network is large and requires huge investment.



III. APPLICATION OF WSN

These networks a using are used in animal tracking, environmental tracking, flood detection, forecasting and weather prediction, and also in commercial application.

- Military application: The first wireless network that bore any real resemblance to a modern WSN is the Sound Surveillance developed by United States Military in 1950s to detect and track Surveillances. Enemy tracking, security detections are also performed by these networks.
- Industrial Process Control: Rapid emergency response, automated building, climate control, eco system and habitat control, civil structural health control, etc.
- Energy Storage and Harvesting Technologies: The plethora of battery technologies available today for WSNs enables system designers to tailor their energy storage devices to the needs of their applications.
- Area monitoring: In this application the WSN is deployed over a region where some phenomenon is to be monitored.

IV. NETWORK SECURITY

Generally WSNs are used to collect information from various locations of physical worlds and also they are deployed in controlled and uncontrolled environment. So by their applications and deployments nature wireless sensor networks are ultimately insecure. These network have numerous limitation like node, network and physical limitations which makes them supplementary vulnerable to various security attacks.

Wireless sensor network are extremely prone and susceptible to external and internal attacks as they consist of numerous devices with constraints for example: less memory associated low energy and low battery power. Secure protocols should be designed and some access control mechanism can be applied to provide a secure network for mobile devices in an organization.

V. CONCLUSION

Networks are shifted from wired to wireless quickly but wireless networks are costly but in wireless networks; WSNs is growing day by day and hot field in the area of research. WSNs are cost effective because it saves the energy by using low power tiny sensor nodes that makes it popular. The only

need is the selection of the right approach on the right place, for getting the maximum benefit from the WSN and its types.

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