SNS COLLEGE OF ENGINEERING

Kurumbapalayam(Po), Coimbatore – 641 107
Accredited by NAAC-UGC with 'A' Grade
Approved by AICTE, Recognized by UGC & Affiliated to Anna University, Chennai

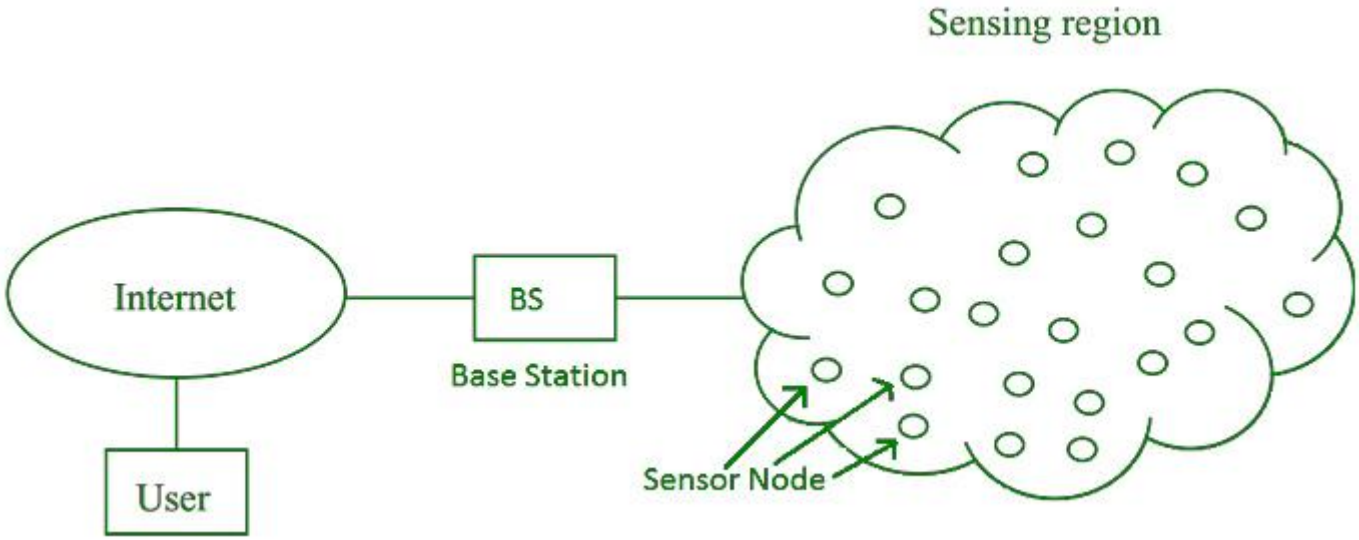
Department of AI & DS

Course Name – Internet of Things & AI
III Year / V Semester

CONNECTIVITY TECHNOLOGIES AND COMMUNICATION PROTOCOLS

WSN

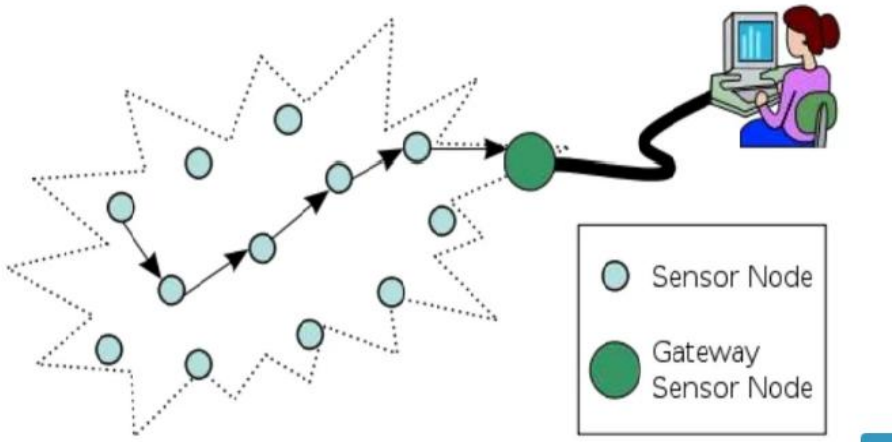
- Wireless Sensor Network in IoT is an infrastructure-less wireless network that is used for deploying a large number of wireless sensors that monitor the system, physical and environmental conditions.
- A collection of sensing devices that can communicate wirelessly
- Sensor nodes are used in WSN with the onboard processor that manages and monitors the environment in a particular area.
- They are connected to the Base Station which acts as a processing unit in the WSN System.
- Base Station in a WSN System is connected through the Internet to share data.
- WSN can be used for processing, analysis, storage, and mining of the data.


Sensing region
Internet
BS
Base Station
User
Sensor Node

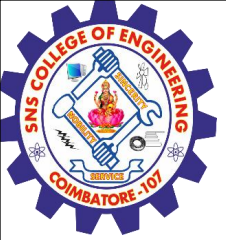
wsn

- Even though the wireless sensors has limited resources in memory ,computation power ,bandwidth,and energy.
- With the small physical size .it can be embedded in the physical environment

Wireless Sensor Network Architecture



- The wireless sensor network architecture is built with nodes that are used to observe the surroundings like temperature, humidity, pressure, position, vibration, sound, etc.
- These nodes can be used in various real-time applications to perform various tasks like smart detecting, a discovery of neighbor nodes, data processing and storage, data collection, target tracking, monitor and controlling, synchronization, node localization, and effective routing between the base station and nodes.
- A Wireless Sensor Network is one kind of wireless network that includes a large number of circulating, self-directed, minute, low powered devices named sensor nodes called motes.
- The sensor node is a multi-functional, energy-efficient wireless device.



Wireless Sensor Network Architecture

- A collection of sensor nodes collects the data from the surroundings to achieve specific application objectives. The communication between motes can be done with each other using transceivers
- the number of motes can be in the order of hundreds/ even thousands.
- The most common wireless sensor network architecture follows the OSI architecture Model
- The architecture of the WSN includes five layers and three cross layers.
- Mostly in sensor n/w, we require five layers, namely application, transport, n/w, data link & physical layer.
- The three cross planes are namely power management, mobility management, and task management.

Types of WSN Architectur

Layered Network Architecture

Clustered Network Architecture

Layered Network Architecture

- This kind of network uses hundreds of sensor nodes as well as a base station.

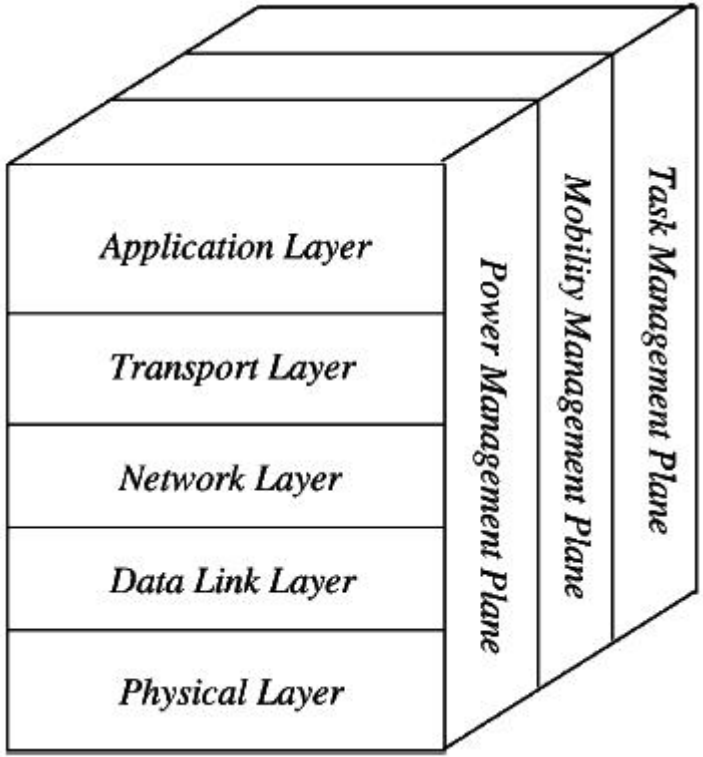
  The five layers in the architecture are:

- Application Layer
- Transport Layer
- Network Layer
- Data Link Layer
- Physical Layer

  The three cross layers include the following:

- Power Management Plane
- Mobility Management Plane

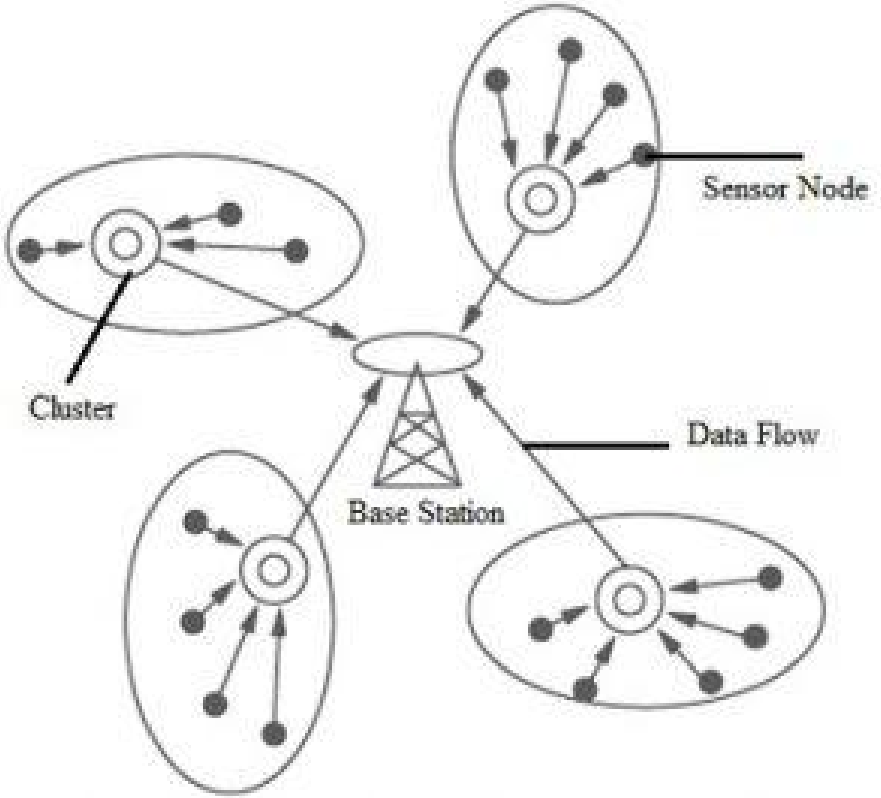
Types of WSN Architectur



Clustered Network Architec

- separately sensor nodes add into groups known as clusters which depend on the “Leach Protocol” because it uses clusters.
- The term ‘Leach Protocol’ stands for “Low Energy Adaptive Clustering Hierarchy”.
- This is a two-tier hierarchy clustering architecture.
- This distributed algorithm is used to arrange the sensor nodes into groups, known as clusters.
- In every cluster which is formed separately, the head nodes of the cluster will create the TDMA (Time-division multiple access) plans.
- It uses the Data Fusion concept so that it will make the network energy efficient.

Clustered Network Architec

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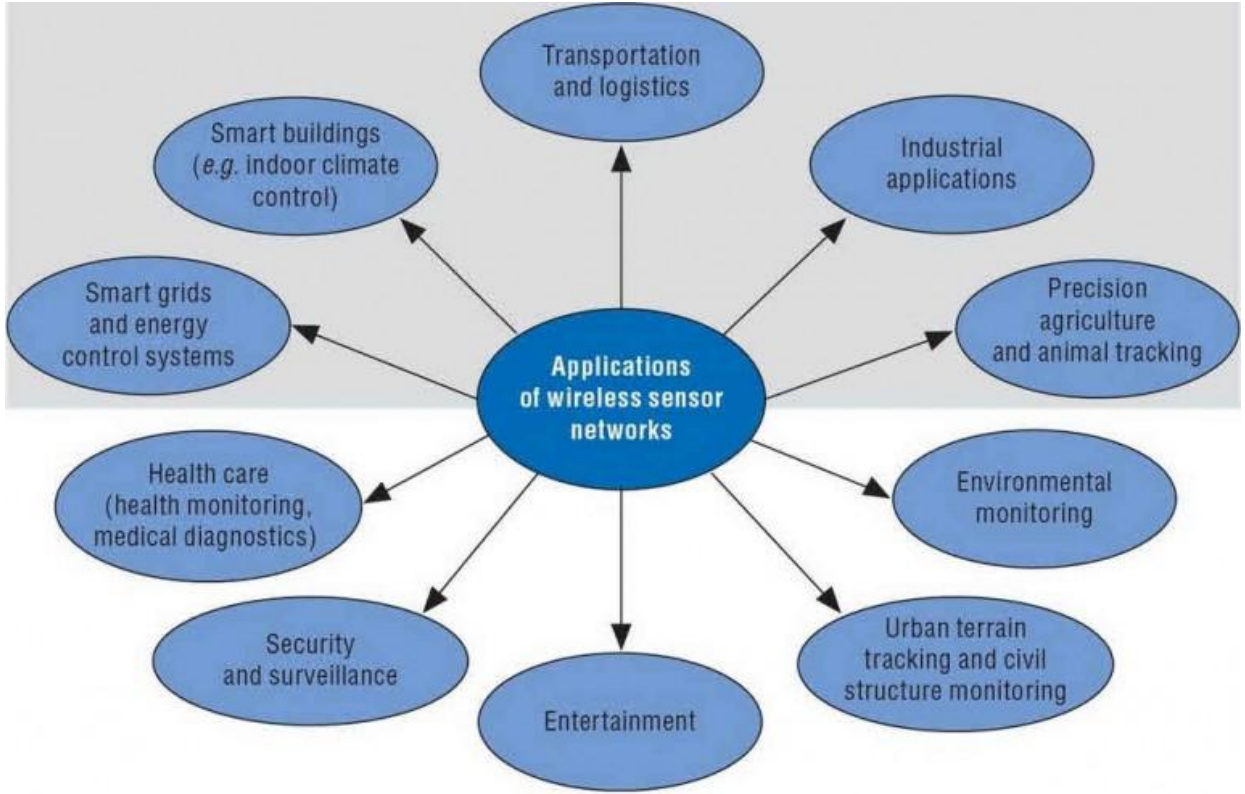
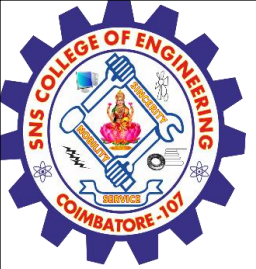
WSN APPLICATION





WSN APPLICATION

- Military Applications
- Health Applications
- Environmental Applications
- Home Applications
- Commercial Applications
- Area monitoring
- Health care monitoring
- Environmental/Earth sensings
- Air pollution monitoring
- Forest fire detection
- Landslide detection