11 March 2022

Constraints on the sensor nodes

Limited Power or Energy

Limited Processing speed

Limited Storage Capacity

Limited Bandwidth for communication

Limited size node

characteristics of WSN :

1. Power or Energy
2. Responsiveness
3. Reliability
4. Scalability (small or large scale development)
5. Mobility of nodes
6. Static (fixed) or dynamic (Adhoc)
7. Capability to survive harsh environment -al conditions
8. Homogeneity or Hetrogeneity nodes

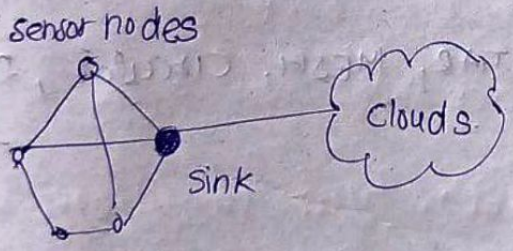


fig: WSN

Nature of data in Sensor Networks:

Body Sensor: Health data (SPO_2, BP, Sugar, Heart Rate, temp etc)

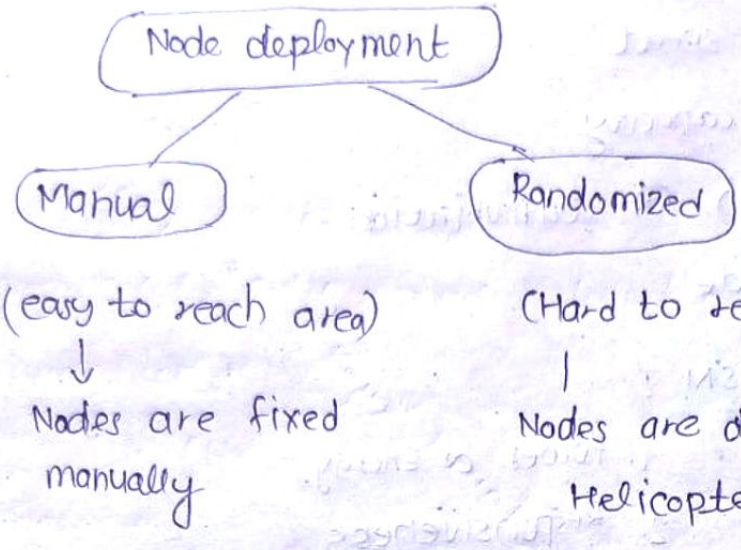
Humidity sensor: Temperature

Pressure sensor: Pressure

Accelerometer: Gravitational acceleration

Proximity Sensor : Electromagnetic signals

Gyroscope : Angular velocity



Event Aware Topology management in WSN

It includes monitoring the event.

It means managing / organizing the physical arrangement of nodes

It is done to ~~conserve~~ conserve energy while maintaing n/w connectivity

topology can be organized as per the even

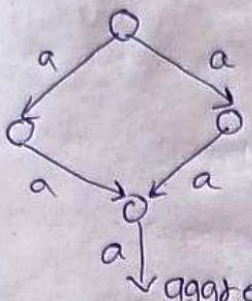
WSN topologies - BUS, TREE, STAR, MESH, Circular, RING, Grid

Data Dissemination

It is performed from sensor node to the same for data gathering.

It is the process for by which data or queries for data are requested in WSN

Data Aggregation: process of collecting and combining the usefull information of a region



Redundant data can be filtered by this process

virtual sensor Network (VSN):

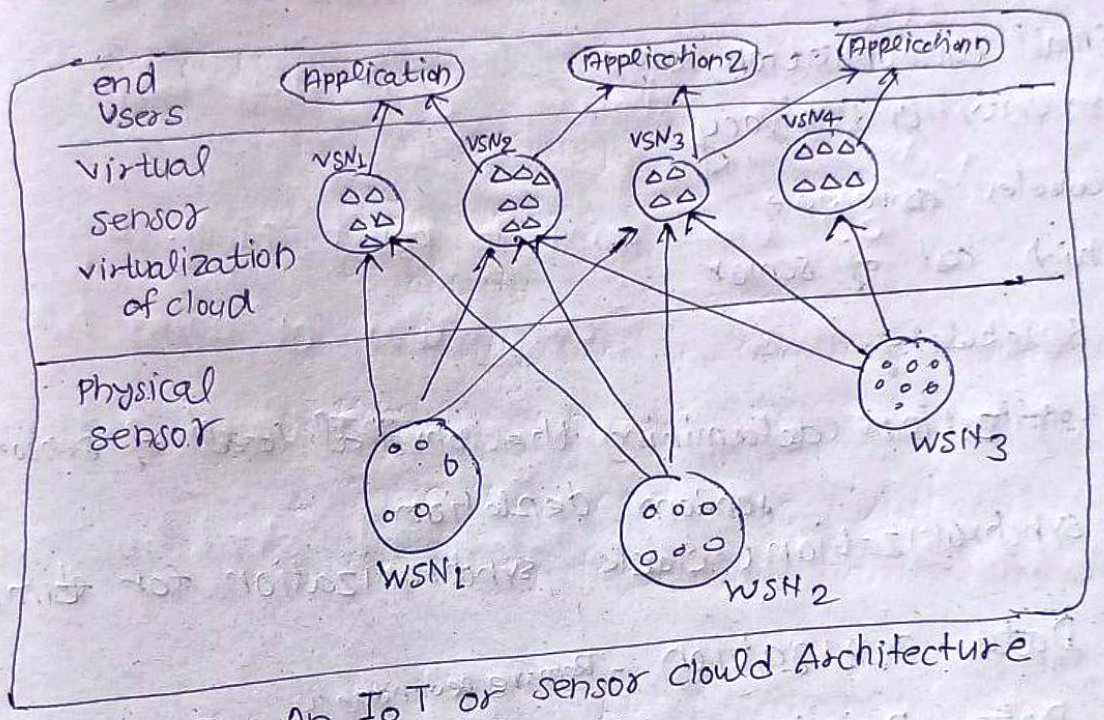


Fig: An IoT or sensor cloud Architecture

Operating System for WSN:

OS	Memory Management	Simulation Support	Programming lang.
Tiny OS	static Memory management	TOSSIM	NesC
Contiki	Dynamic " "	COOJA	C
MANTIS	" " "	through AVRORA	C
Nano-RK	static " (support for realtime application)	Not available	C
Li	Dynamic " "	Through AVRORA like	C

Ref: OS for WSN: Asuaveey, IEEESensors, 2011, 11 PP. 5900-5939

24/3/22

Issue with challenges with WSN

High energy consumption (battery life)
High bandwidth demand
low storage
Quality of service (QoS)
Data processing and compression
Cross layer Design (for hetrogeneous network or nodes)
small communication range
security and privacy
wireless coverage
high cost of sensor
scalability.
Localization (determining the physical local of sensor after random depletion
synchronization (clock synchronization for time)
Data aggrigation - Remove redundancy
Data Disimination
Database and Quering

(Node depth, hlw congestion, self configuration
low data yield)

Some Application of WSN:

Military application
environmental application
traffic monitoring
weather monitoring
fire detection
Under water mohitoring
Underground monitoring
agricultural application
Habital monitoring
surveillance application

Vehicular application
Helth care system
Industrial application

class skiped:

machine to machine communication:

Communication b/w machine or devices without human interaction (wired or wireless)

Help the devices two connect

IOT needs end to end but end to end does not need IOT

Helps in data sharing and data analytics

use point to point comm. b/w machines, sensors over cellular or wired networs while IOT system relay on IOT based networks

- m to m system are often isolated and standalone network equipment
- * IOT system take m2m to the next level briking together into one large connected eco system.

Diff. IOT and M2M

IOT	M2M
IOT devices has object which are responsible for decission making	M2M some degree of intelligence is observed

Networked connect using dive various type of comm.	point to point connection
internet protocals (HTTP, FTP, Telenet) are used	Traditional protocal and comm. technique are used
Data is shared blw athir application that are used to improve the end user experienced	Data is share with only communicating parties.
Interconnection is required for communication	Devices are not depends on internet
large scope due to large no of devices are involved	limited scope for devices.
Business type used B2B, B2C	Only B2B
support open API integration	No support for open API
Ex: smart variable, big data & cloud	Ex: sensors, data and information

Layered architecture of IOT:

3- Layered Architecture

3 Layered Arch.	4 Layered Arch	5 Layered Arch	7 Layered Arch