

WSN : The Internet of transducer. (BSN)

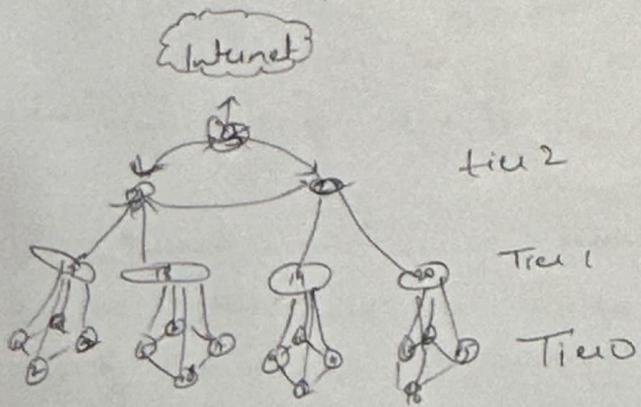
- BSN coordinator and nodes which are having wireless protocols that is work with routers to gateway to server.
- It comprises of distributed devices with sensor that are used, monitor the environmental & physical condition
- It consists of no. of end nodes & routers & a coordinator act as
- end nodes have several sensors attached to them and nodes can also attach routers
- Routers are responsible for routing the data packets from end nodes to the coordinator
- characteristic of wsn.

- Range (10 to 100 mtrs)
- Operating frequency
- Low power operating modes
- Robust structure

Example of wsn

- weather monitoring
- temp, humidity
- surveillance system
- smart grid w/ wsn's

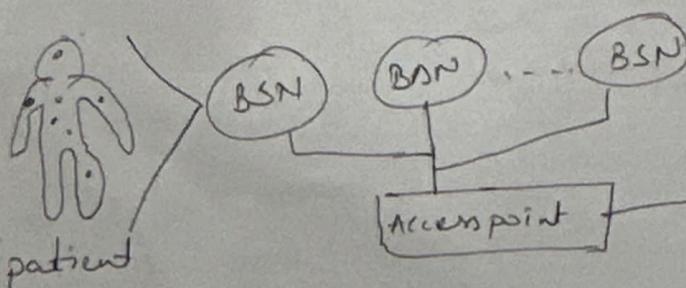
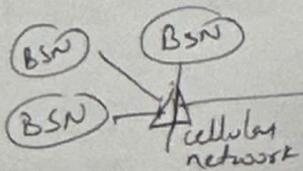
WSN (sensor n/w Architecture)



- wsn is more imp for sensing & info collecting purposes
- other n/w included BSN & VSN (visual or video sensor n/w & vehicle sensor n/w).
- the development of wsn, was motivated by Military appln such as battle surveillance.

- Each part such sensors n/w node has typically several parts.

- radio transceivers with antenna
- microcontroller
- electronic circuits
- energy source etc.



Appln of BSN

- healthcare domain
- heart attacks
- seizures
- diabetes
- asthma

BSN is a term used to describe the appln of wearable comp. devices to enable wireless communication b/w several miniaturized body sensor unit & a single body central unit worn on the Human Body to transmit vitals signs & motion readings to medical practitioners or caretakers.

SCADA

SCADA refers to supervisory control & Data Acquisition System.

SCADA sly sly also appn program real time data gathering & display

SCADA sly are used in manufacturing units

SCADA sly are used for supervising the lifetime of a plant
plant lifetime increased

SCADA is an industrial computer based control sly employed to gather & analyze the real time data to keep track monitoring & control industrial equipment in diff. types of industries.

SCADA sly collect data from a primary sly in order to control that primary sly

SCADA is an industries industrial sly it is user friendly front end to a control system that easily communicate with PLC's.

An existing SCADA sly usually consist of the following substation.

Human Machine Interface

- HMI which is apparatus that presents process data to a human operator &

through this the human operator monitors & control the process

- RTU's connect to sensor in the process, convert sensor signal to digital data, and send digital data to the supervisory sly

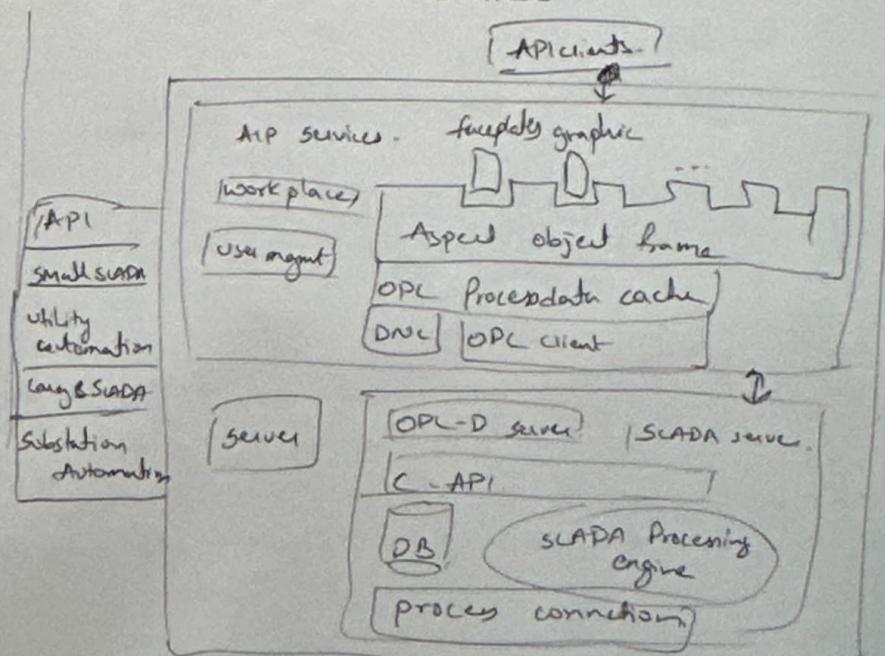
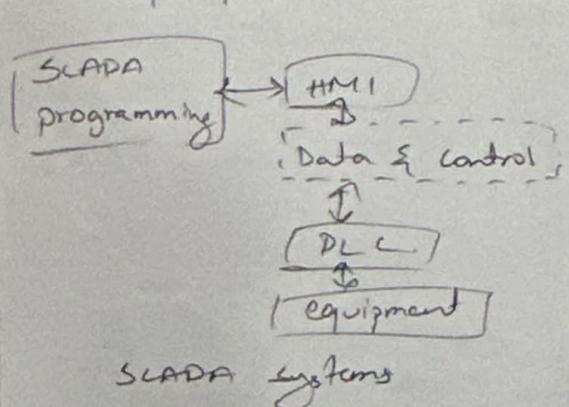
- PLC's are used as field devices because they are more economical, versatile flexible & configurable than special purpose RTU's

- DCS's as communication infrastructure with higher capacity become available

(but diff b/w SCADA & DCS is will take. SCADA is combination of traditional DCS & SCADA Distributed control sly).

ERP - Enterprise resource Planning API - Application Infrastructure provider

OPL - open platform communication DNC - Direct numerical control



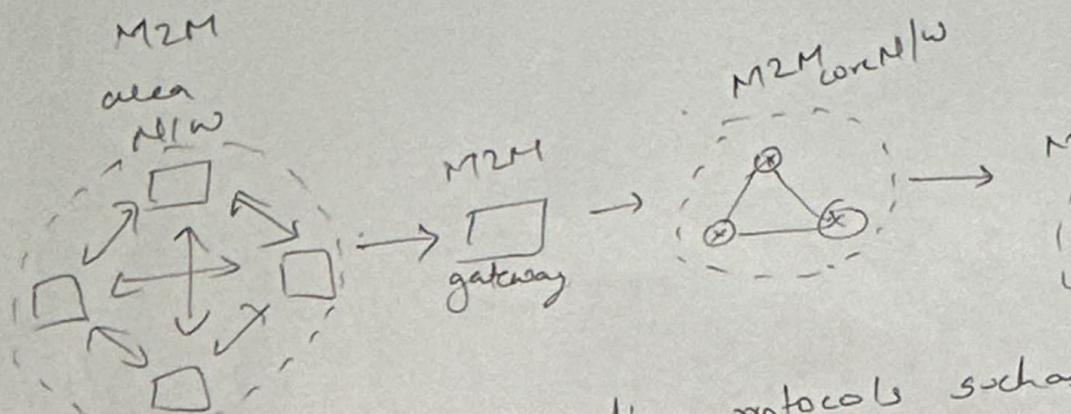
M2M

remotely accessing data over n/w & also remote monitoring & control
data exchange

The value chain of M2M business which can be separated into two parts

① The first relating to device

② the second to Appn development & service delivery.



We use various communication protocols such as zigbee, bluetooth, modbus, wireless mbus.

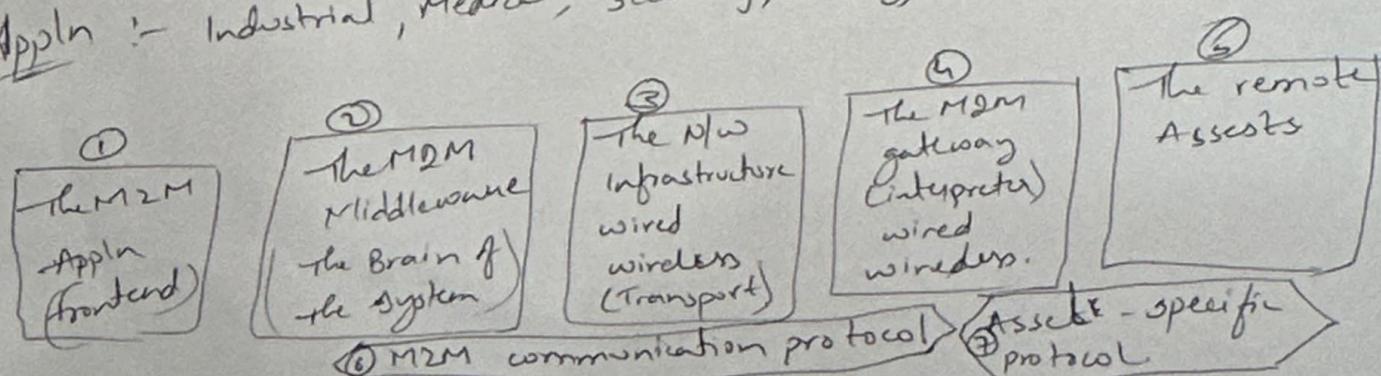
M2M area n/w comprises of machines which have embedded h/w modules for sensing, actuator, & communication

In M2M there are 6 pillars remote monitoring & smart features of

functions of an IoT system rather than pillars

- ① Remote monitoring in general terms SCADA & automation of industrial areas
- ② RFID is a data-collection tech that uses electronic tags for strong data
- ③ A sensor monitors physical or environmental conditions
- ④ The term smart services refer to the process of n/w equipment & monitoring
- ⑤ Telematics is the integration of telecommunication & informatics.
- ⑥ Telemedicine is usually associated with industrial medical & wildlife tracking

Appn :- Industrial, Medical, security, utility, Manufacture, transport



BITX M2M architecture based on middleware

The typical architecture of an M2M system from BITX the integration middleware at the server side is the brain of the entire system.

Cellular n/w were designed for circuit switched voice, while they do a perfectly adequate job for real-time packet switched data such as email & web browser.

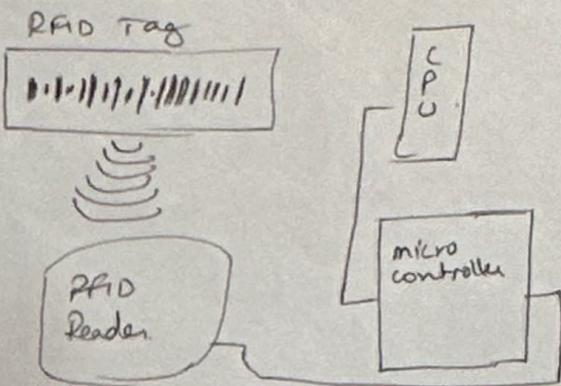
RFD : Intend of object

- It is the form of wireless communication that uses radio waves to identify track object.
- It uses EMF to automatically identifies track tags attached to object.
- It used to track animals & birds by attaching tag to them.
- It contains electronically stored info.
- A is attached to asset which consists of microchip, antenna & with in it, it stores info of about the object being tagged to it.
- It has a small memory within the chip.
- An RFD system involves in 2 diff hys components that is known as ^{RFD} readers, and tag as well as RFD middleware.

RFD is of three types :-

- ① Active tags + expensive with a battery in it. (long range, high efficient)
- ② Passive tags :- short range, low data transmission efficiency
- ③ Semipassive :- ② has a small battery on board that is activated when in the presence of a RFD reader.

RFD system components



An RFD tag is a simplified, low cost disposable contactless smart card. RFD tag stores a static number & store attribute of the tagged object & an antenna that enables the chip to transmit the stored number.

When the tag comes within the range of the appropriate RF reader, the tag is powered by the reader's radio frequency field & transmits its ID & attribute to the reader. The contactless smart card provides similar capabilities but stores more data.

In a contactless smart cards, NFC's, the chips communicates with the card reader through an ~~radiofreq~~ induction tech similar to the RFD. Mobile payments or mobile wallets is a alternate payment method that has been well adopted in many parts of Europe & Asia.

RFD - Applications

- People tracking
- Animal tracking
- Security
- Library
- Document tracking

Adv

- Small in size
- It can store upto 2kb

SDA SCK M0S1 M1S0 I2C GND RST VCC

