H-4R5

IoT

O-Level

Ch-01

INTRODUCTION TO INTERNET of THINGS

M2H — Machine to human communication.

Ex: Speech recognition
Biometric Authentication
Geographical Navigation
Scanning.

M2M — Machine to Machine Communication.

Communication without human intervention

Ex: ZigBee
Bluetooth
ModBus
M-Bus
Wireless M-Bus
Power line Communication PLC
6LowPAN
IEEE 802.15.4

* High Range
* Low latency
* High through Put.
→ take low energy

WoT — Web of things

It is an web standard of IoT, which are used for communication b/w web based applications and things.

Ex: Mozila web thing

IIoT — Industrial Internet of things.

IoE — Internet of Everything.

* Internet is real network that connects nodes all over the world.
Web is an interface through which user interacts with internet.

Advantages of IoT Application :

Easy access

Communication

Speed

Cost Reduction

Automation

Save Time

Data Collection

Disadvantages of IoT Application :

Security & Privacy

Complexity

Safety

Compatibility.

Characteristics of IoT :

Connectivity

Intelligence

Sensing

Hetrogenity

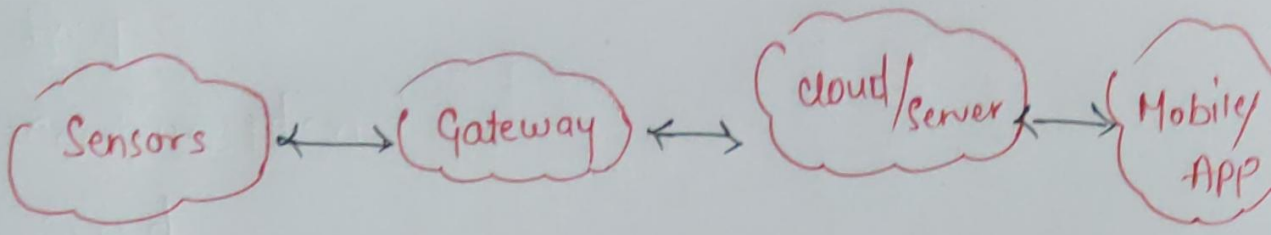
Security

Communication

Scalability

Integration

Working of IoT



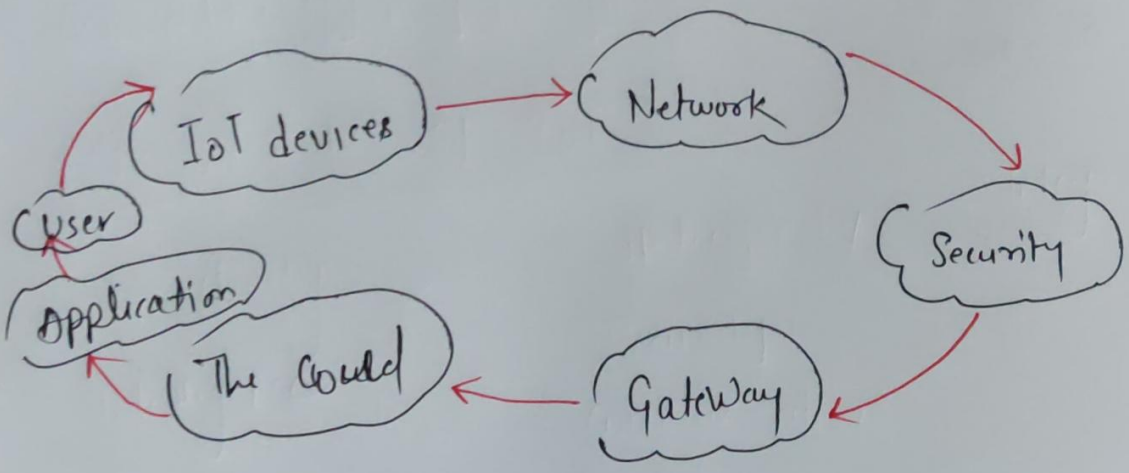
IoT Components :

Sensor / Device

Connectivity

Data Processing

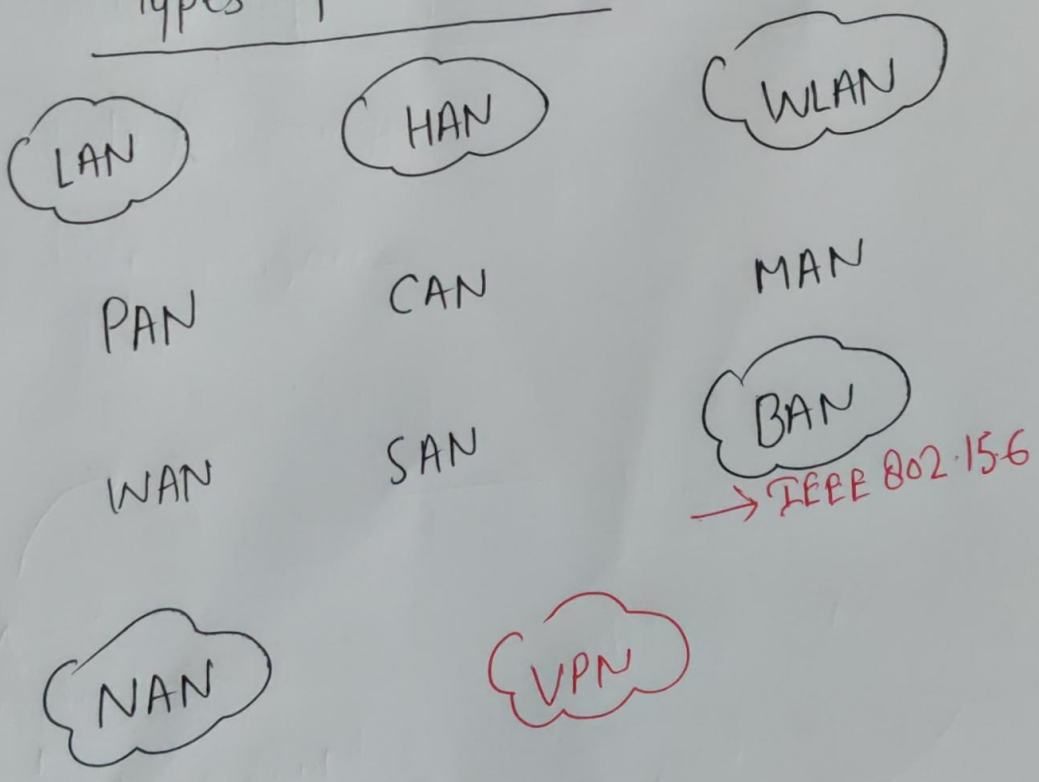
User Interface



Components of IoT Ecosystem

- Sensor
- Actuator
- Gateway
- Analytics
- Connectivity
- Dashboard
- Standard / Protocol
- Automation

Types of Network



Technologies in IoT

GPRS

LTE-A

Bluetooth

Bluetooth low Energy

WiFi (Wireless fidelity)

WiFi - HaLow (Low Power WiFi)

LiFi (light fidelity)

Cellular Network (LPWAN)
Low Power Wide Area Network
(M2M - IoT)

Z-Wave

RFID (Thread Protocol)

X-10

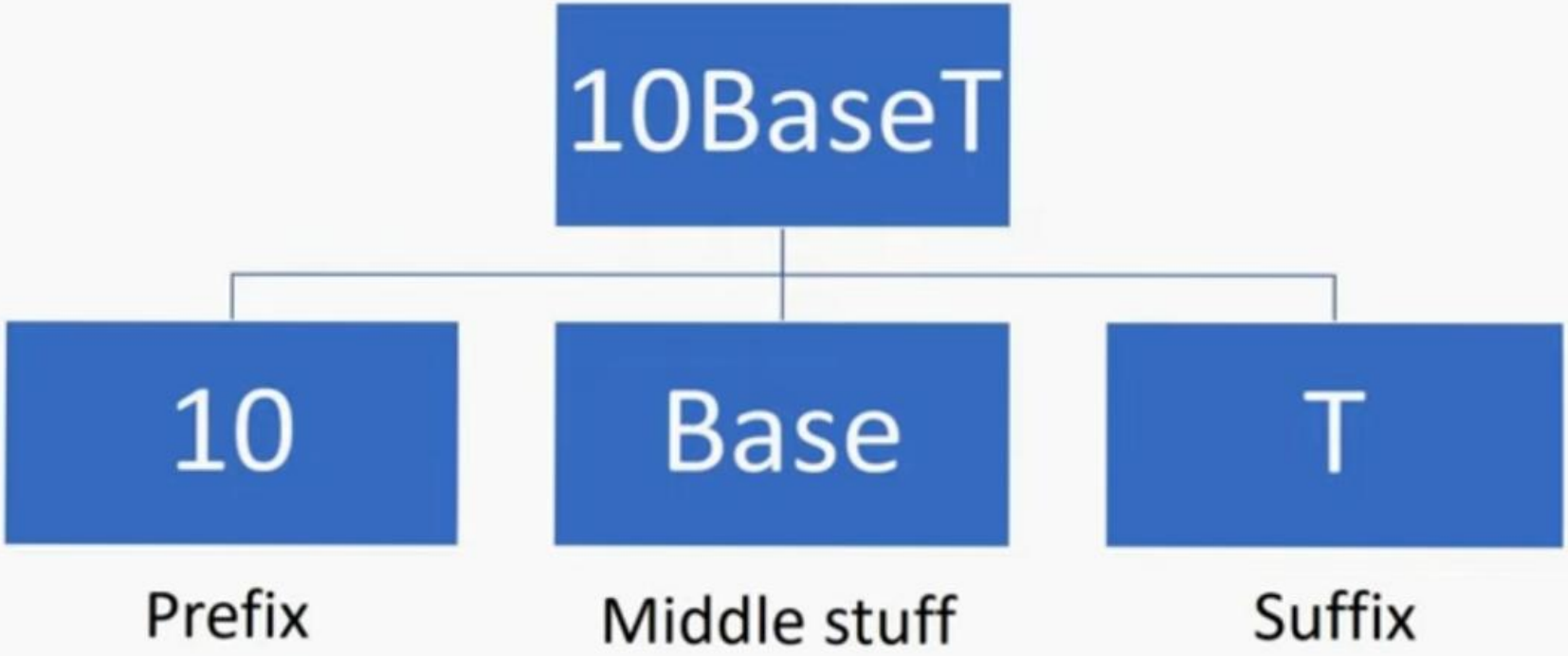
SigFox NFC

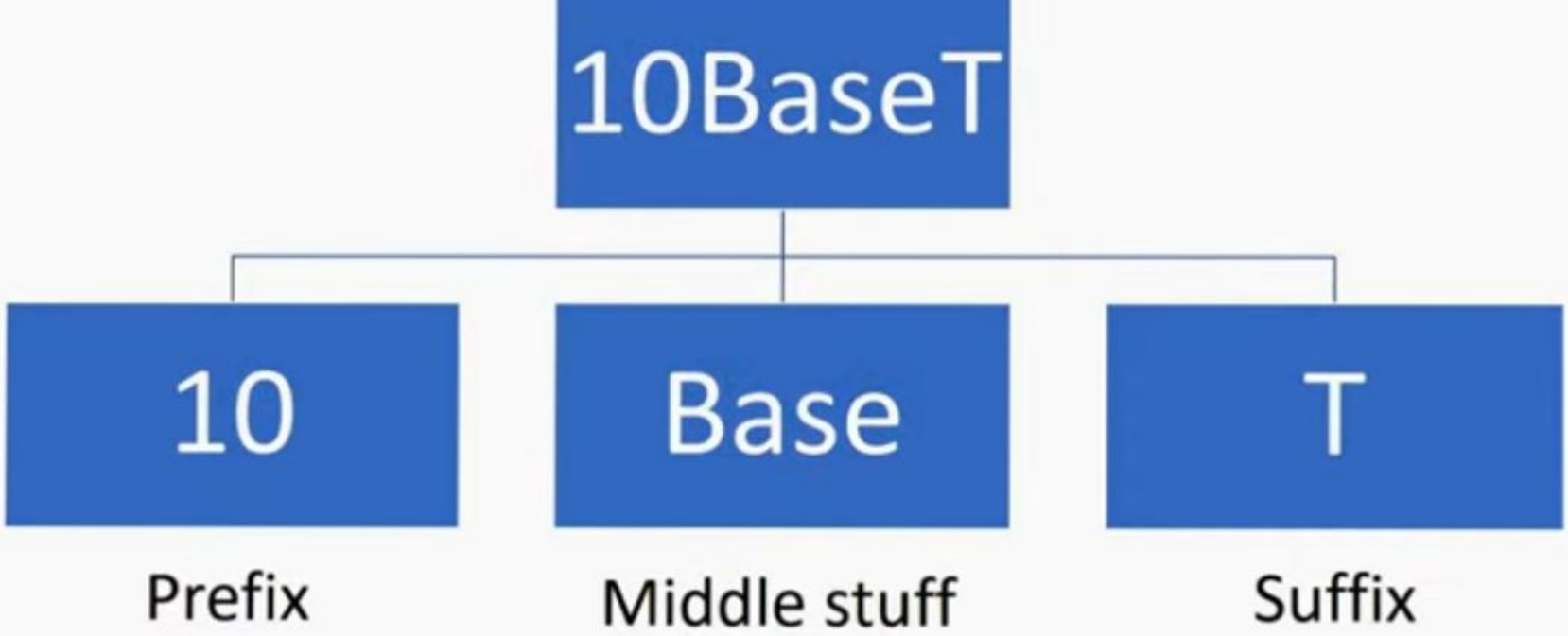
Zigbee GSM

LoRaWAN (Long Range Wide Area N/w)

6LoWPAN (Low Power Wireless Personal Area N/w)
(IPv6) (802.3.15.4)

5G


10BaseT
10
Base
T
Prefix
Middle stuff
Suffix
Speed in Mb/s
10, 100, 1000
G indicates Gb/s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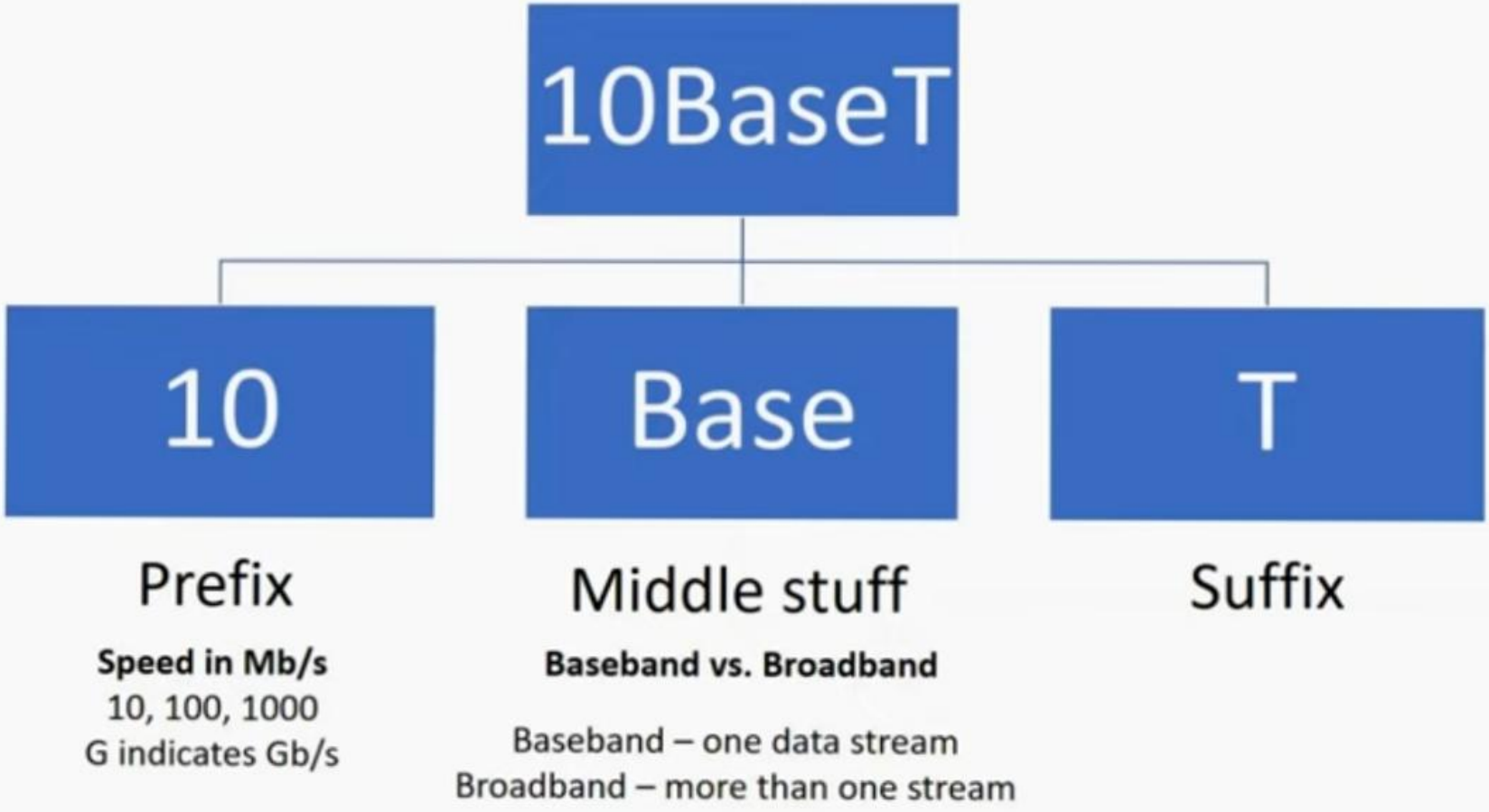
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Middle stuff
Baseband vs. Broadband
Baseband – one data stream
Broadband – more than one stream
Suffix

10BaseT

10

Prefix

Speed in Mb/s
10, 100, 1000
G indicates Gb/s

Base

Middle stuff

Baseband vs. Broadband

Baseband – one data stream
Broadband – more than one stream

T

Suffix

Cable Type and Maximum Distance

Numbers 2 and 5: Coax at are ~200m and 500m
T-letters: Twisted pair at 100m, always
Other letters: Fiber at various lengths
E – extended 40km (25 miles) SMF
F – 2000m, MMF
S – 300m, MMF