SNS COLLEGE OF ENGINEERING

Kurumbapalayam(Po), Coimbatore – 641 107
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Approved by AICTE, Recognized by UGC & Affiliated to Anna University, Chennai

Department of Information Technology

Course Name –Internet of Things &AI

III Year / V Semester

Unit 1 – IoT INTRODUCTION AND APPLICATIONS

Topic 2- IoT Framework

IoT Framework

A high level M2M system architecture (HLSA)

- Defined by ETSI TS 102 690 V1.1.1 (European Telecommunications Standards Institute – Technical Specification)

- The HLSA comprises the **device and gateway domain**, **the network domain**, and the **applications domain**

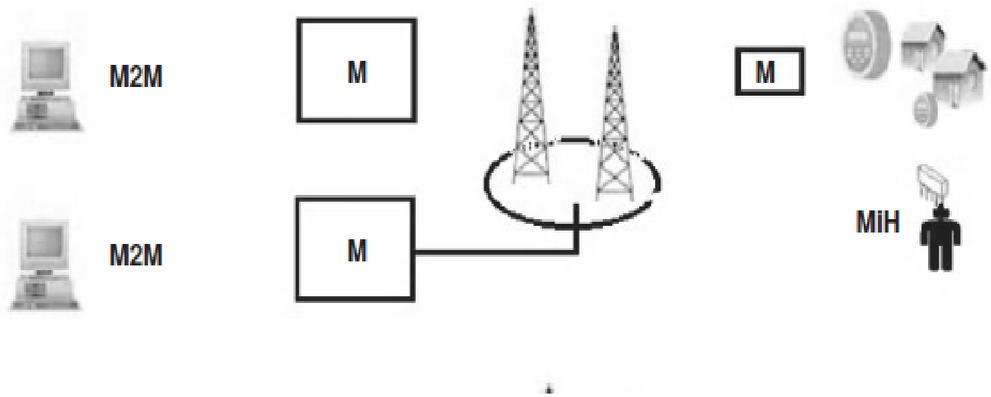
The **device and gateway domain** is composed of the following elements,

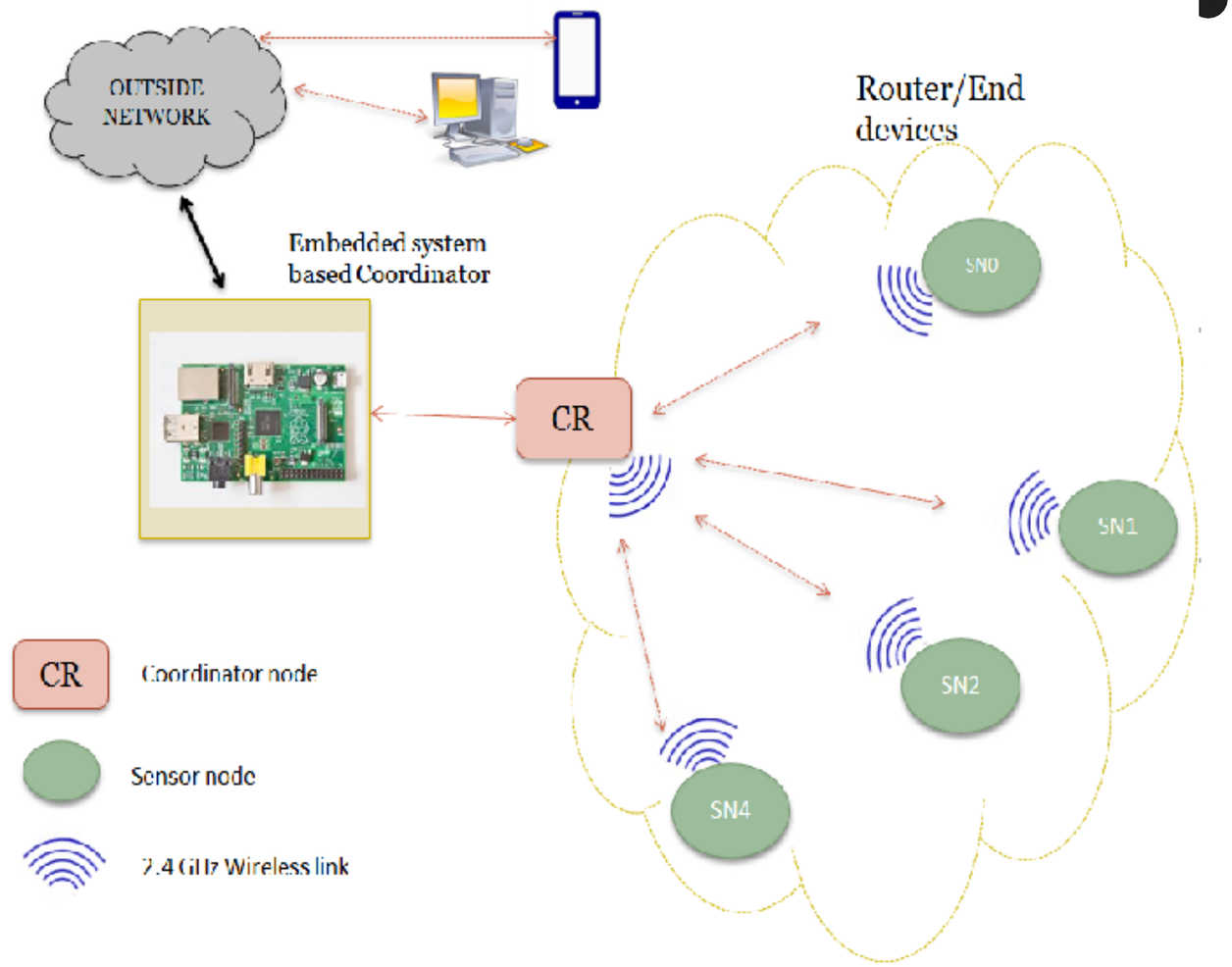
1. **M2M device**: A device that runs M2M application(s) using M2M service capabilities.

2. **M2M area network**: It provides connectivity between M2M devices and M2M gateways.
   Examples of M2M area networks include personal area network (PAN) technologies such as IEEE 802.15.1, Zigbee, Bluetooth, IETF ROLL, ISA100.11a, among others, or local networks such as power line communication (PLC), M-BUS, Wireless M-BUS, and KNX.

   3. M2M gateway: A gateway that runs M2M application(s) using M2M service capabilities. The gateway acts as a proxy between M2M devices and the network domain. The M2M gateway may provide service to other device.

IoT Framework





M2M devices connect to network domain in the following manners

- Direct Connectivity
- Gateway as a Network Proxy - The M2M device connects to the network domain via an M2M gateway. M2M devices connect to the M2M gateway using the M2M area network

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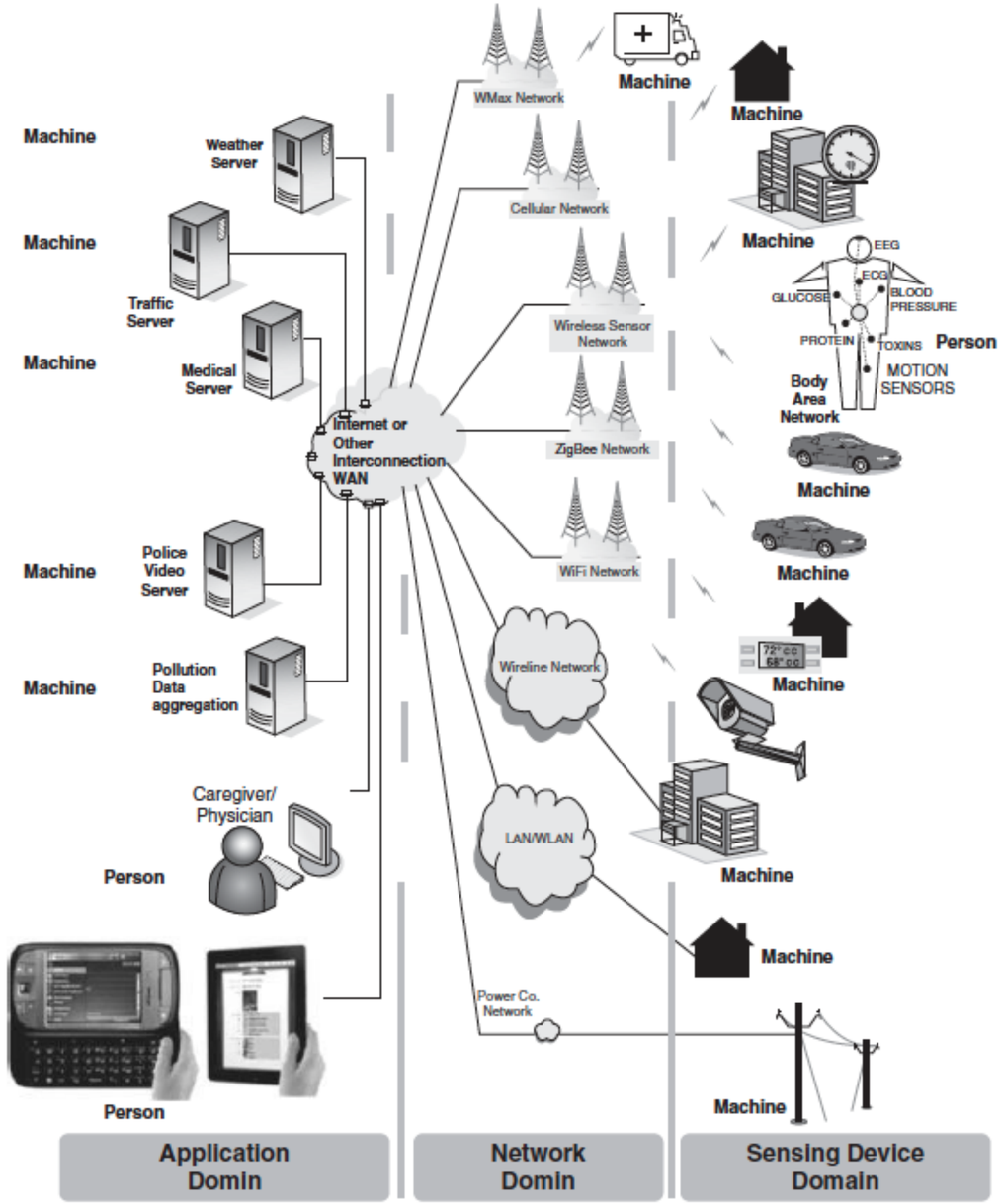
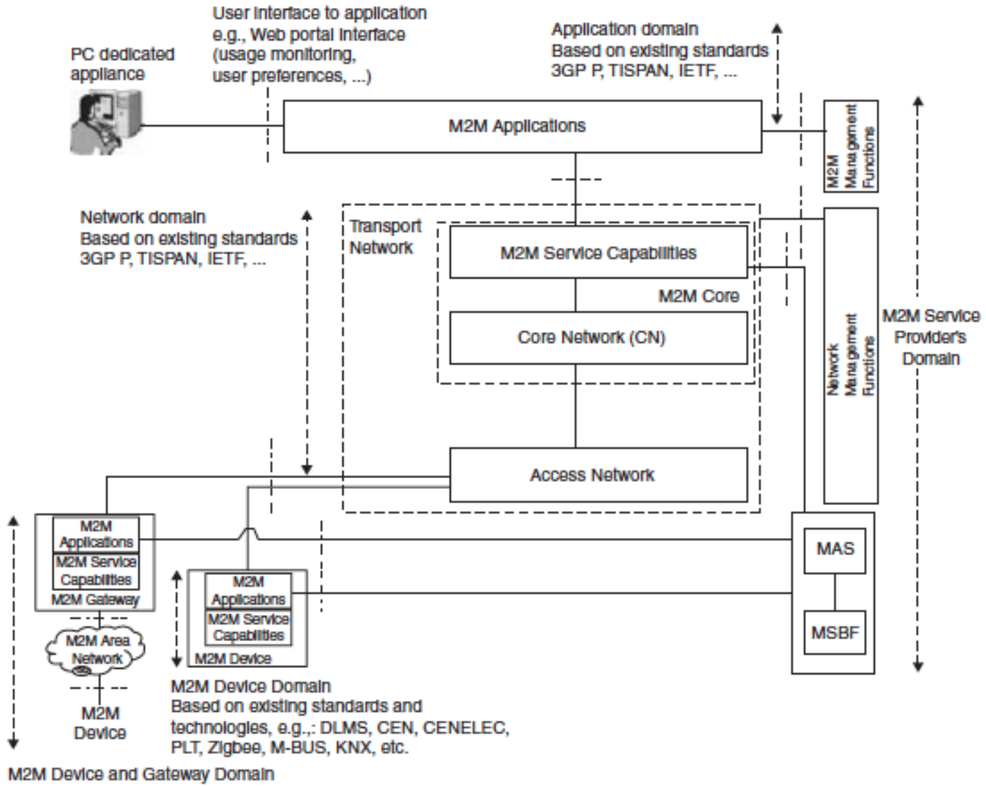

WMax Network
Machine
Machine
Machine
Weather Server
Cellular Network
Machine
Traffic Server
Wireless Sensor Network
EEG
ECG
GLUCOSE
BLOOD PRESSURE
PROTEIN
TOXINS
Person
MOTION SENSORS
Body Area Network
Machine
Medical Server
Internet or Other Interconnection WAN
ZigBee Network
Machine
Machine
Police Video Server
WiFi Network
Machine
Machine
Pollution Data aggregation
Wireline Network
Machine
Caregiver/ Physician
LAN/WLAN
Machine
Person
Machine
Power Co. Network
Machine
Person
Application Domin
Network Domin
Sensing Device Domain


User interface to application
e.g., Web portal interface
(usage monitoring,
user preferences, ...)
Application domain
Based on existing standards
3GP P, TISPAN, IETF, ...
PC dedicated appliance
M2M Applications
M2M Management Functions
Network domain
Based on existing standards
3GP P, TISPAN, IETF, ...
Transport Network
M2M Service Capabilities
M2M Core
Core Network (CN)
Network Management Functions
M2M Service Provider's Domain
Access Network
M2M Applications
M2M Service Capabilities
M2M Gateway
MAS
MSBF
M2M Area Network
M2M Applications
M2M Service Capabilities
M2M Device
M2M Device
M2M Device Domain
Based on existing standards and
technologies, e.g.,: DLMS, CEN, CENELEC,
PLT, Zigbee, M-BUS, KNX, etc.
M2M Device and Gateway Domain

IoT Framework

The **network domain** is composed of the following elements:

1. Access network: A network that allows the M2M device and gateway domain to communicate with the core network

Access networks include (but are not limited to) digital subscriber line (xDSL), hybrid fiber coax (HFC), satellite, GSM/EDGE radio access network (GERAN), UMTS terrestrial radio access network (UTRAN).

2. Core network: A network that provides the following capabilities (different core networks offer different features sets):

– ***IP connectivity at a minimum, and possibly other connectivity means ,Service and network control functions, Interconnection (with other networks), Roaming, Core networks***

3. M2M service capabilities:

– Provide M2M functions that are to be shared by different applications, Expose functions through a set of open interfaces, Use CoN functionalities, Simplify and optimize application development and deployment through hiding of network specificities

IoT Framework

The **applications domain** is composed of the following elements:

1. **M2M applications:** Applications that run the service logic and use M2M service capabilities accessible via an open interface.

There are **also management functions** within an overall M2M service provider domain, as follows:

1. Network management functions: Consists of all the functions required to manage the access and core networks; these functions include provisioning, supervision, fault management.

2. M2M management functions: Consists of all the functions required to manage M2M service capabilities in the network domain

THANK YOU