



# **SNS COLLEGE OF TECHNOLOGY**

**Coimbatore-35**

**An Autonomous Institution**

Accredited by NBA – AICTE and Accredited by NAAC – UGC  
with 'A++' Grade

Approved by AICTE, New Delhi & Affiliated to Anna  
University, Chennai



## **DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING**

### **WIRELESS TECHNOLOGIES FOR IOT**

III ECE / VI SEMESTER

UNIT 1 – OVERVIEW OF INTERNET OF THINGS

TOPIC 1 –IoT Conceptual Framework



# IoT Definition

- Internet of Things means a network of physical things (objects) sending, receiving, or
- communicating information using the Internet or other communication technologies and
- network just as the computers, tablets and mobiles do, and thus enabling the monitoring,
- coordinating or controlling process across the Internet or another data network.



# IoT Definition

- Internet of Things is the network of physical objects or 'things' embedded with electronics, software, sensors and connectivity to enable it to achieve greater value and service by
- exchanging data with the manufacturer, operator and/or other connected devices.
- Each thing is uniquely identifiable through its embedded computing system but is able to interoperate within the existing Internet infrastructure.



# IoT Vision



- Internet of Things is a vision where things (wearable watches, alarm clocks, home devices, surrounding objects) become 'smart' and function like living entities by sensing, computing and communicating through embedded devices which interact with remote objects (servers, clouds, applications, services and processes) or persons through the Internet or Near-Field Communication (NFC) etc.



# IoT CONCEPTUAL FRAMEWORK



Physical Object + Controller, Sensor and Actuators + Internet = Internet of Things

... 1.1



# IoT CONCEPTUAL FRAMEWORK



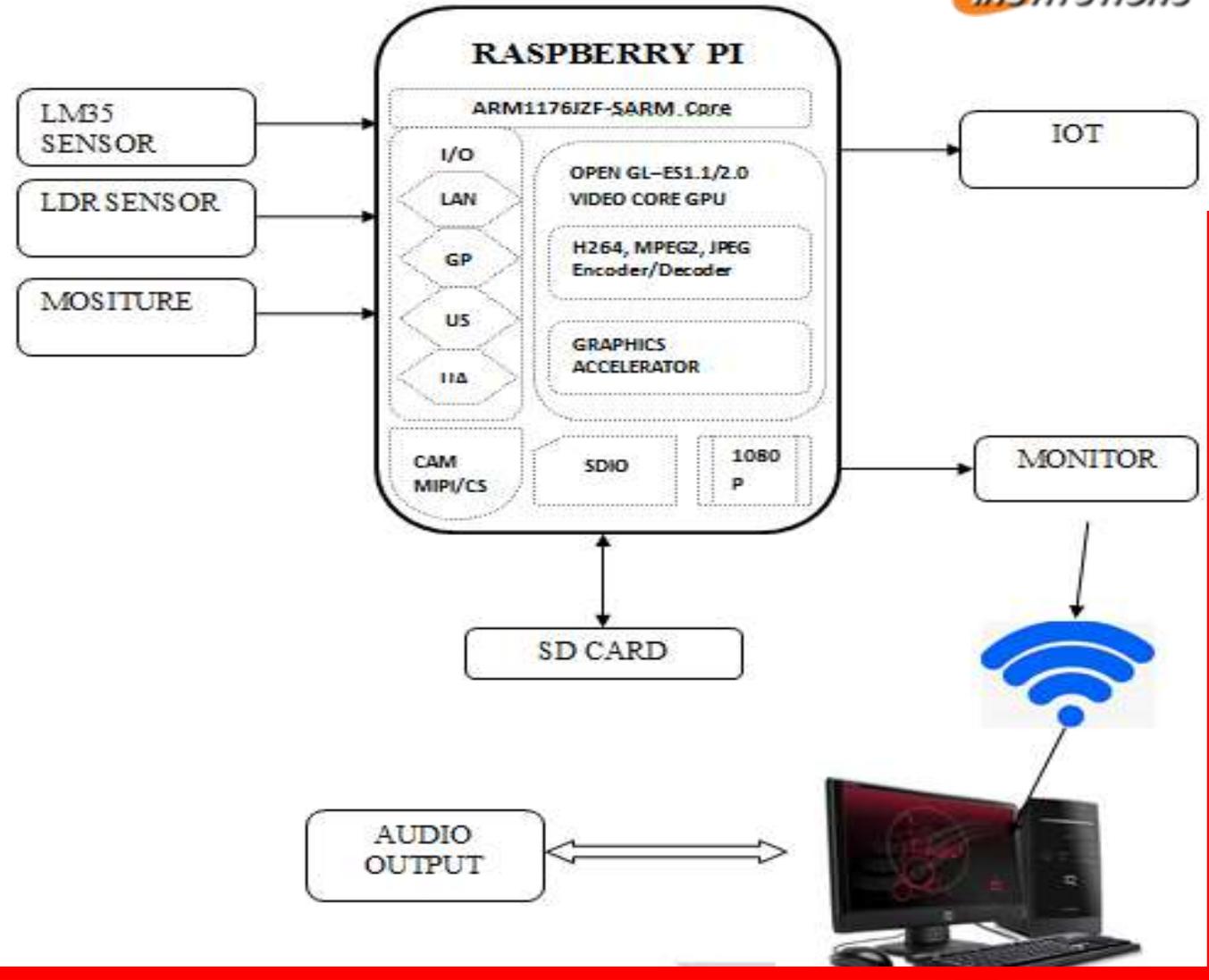
Enterprise processes and services, based on a suggested IoT architecture given by Oracle

**Gather + Enrich + Stream + Manage + Acquire + Organise and Analyse**  
**= Internet of Things with connectivity to data centre,**  
**enterprise or cloud server** ... 1.2

1. At level 1 data of the devices (things) using sensors or the things gather the pre data from the internet.
2. A sensor connected to a gateway, functions as a smart sensor (smart sensor refers to a sensor with computing and communication capacity). The data then enriches at level 2, for example, by transcoding at the gateway. Transcoding means coding or decoding before data transfer between two entities.
3. A communication management subsystem sends or receives data streams at level 3.
4. Device management, identity management and access management subsystems receive the device's data at level 4.
5. A data store or database acquires the data at level 5.
6. Data routed from the devices and things organises and analyses at level 6. For example, data is analysed for collecting business intelligence in business processes.

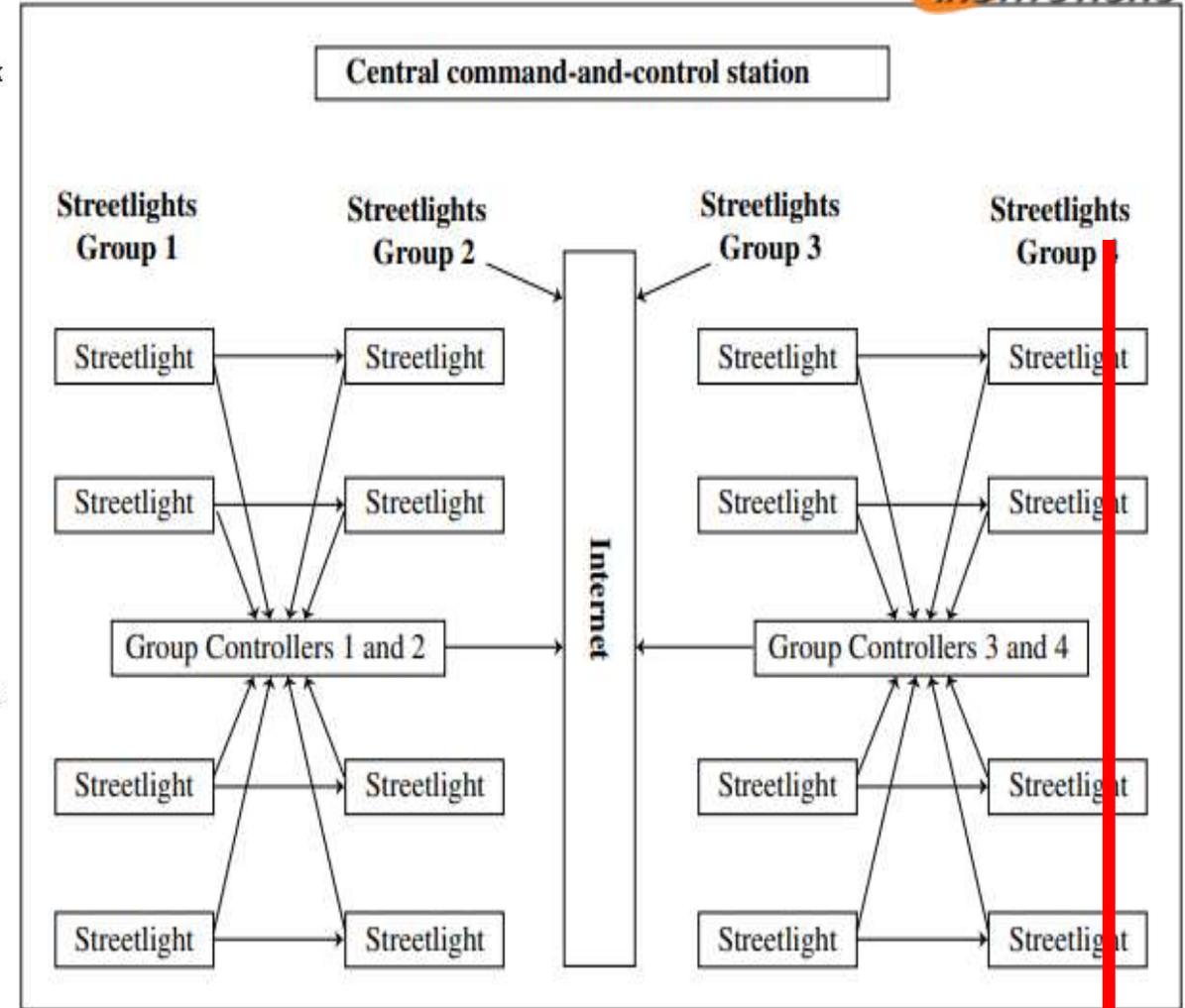
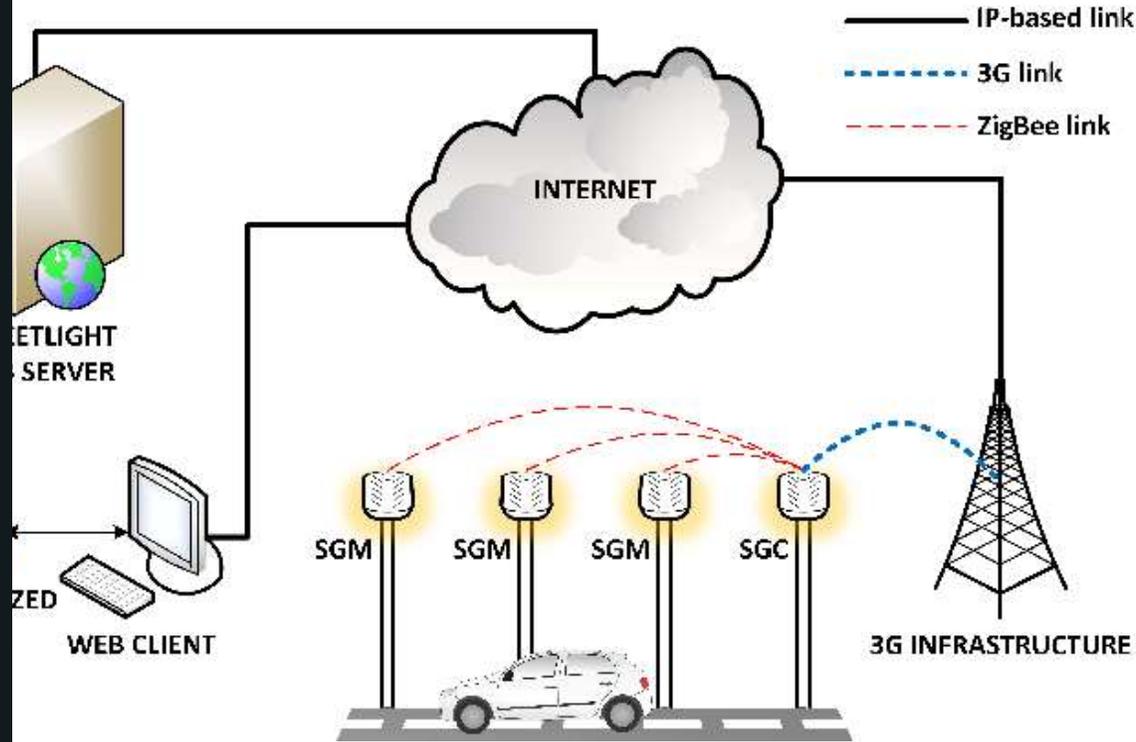


# IoT based Smart Umbrella System using Raspberry Pi





# Use of IoT concept for streetlights in a city





# IBM IoT conceptual framework



**Gather + Consolidate + Connect + Collect + Assemble + Manage and Analyse**  
**= Internet of Things with connectivity to cloud services ... 1.3**

1. Levels 1 and 2 consist of a sensor network to gather and consolidate the data. First level gathers the data of the things (devices) using sensors circuits. The sensor connects to a gateway. Data then consolidates at the second level, for example, transformation at the gateway at level 2.
2. The gateway at level 2 communicates the data streams between levels 2 and 3. The system uses a communication-management subsystem at level 3.
3. An information service consists of connect, collect, assemble and manage subsystems at levels 3 and 4. The services render from level 4.
4. Real time series analysis, data analytics and intelligence subsystems are also at levels 4 and 5. A cloud infrastructure, a data store or database acquires the data at level 5.

