SNS COLLEGE OF ENGINEERING

Kurumbapalayam(Po), Coimbatore – 641 107

An Autonomous Institution

Accredited by NAAC-UGC with 'A' Grade

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UNIT 2
IOT Reference Architecture and Technologies

Wired Communication

Wired communication is **the transfer of data from the transmitter to the receiver through a wired medium like Ethernet, USB, etc**. However, For IoT, understanding communication protocols is very important, why they are, why they are used and the difference between different protocols.

Types of Wired Communication

- Twisted pair. Shielded, copper-based, twisted-pair cable.

- Coaxial. Copper-based coaxial cable.

- Ethernet. Unshielded, copper-based, twisted-pair cable.

- Fiber optic. Glass or plastic-based fiber-optic cable.

Wifi

- WiFi technology is a wireless technology that **allows devices access to the internet without the need for cables**

- Integration and interoperability delivered by Wi-Fi will enable IoT solutions to securely interconnect to one another and to billions of user-centric devices to unlock the greatest value from IoT applications and environments

GPS

- The functionality of an IoT GPS tracking device at a glance

- **The information is transmitted to a server via a wireless radio standard**: The satellite broadcasts its position and time using coded radio signals. A GPS tracker 2 uses this information to calculate its position and passes it on to a server 4 via radio 3.
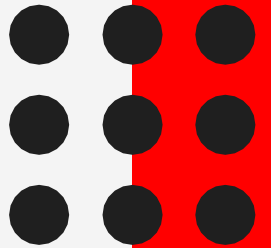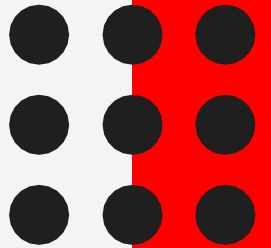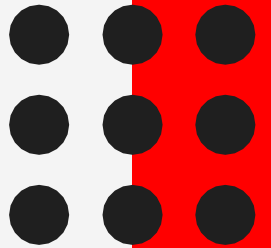
IOT Protocols

- Internet protocol (IP) is **a set of rules that dictates how data gets sent to the internet**. IoT protocols ensure that information from one device or sensor gets read and understood by another device, a gateway, a service.
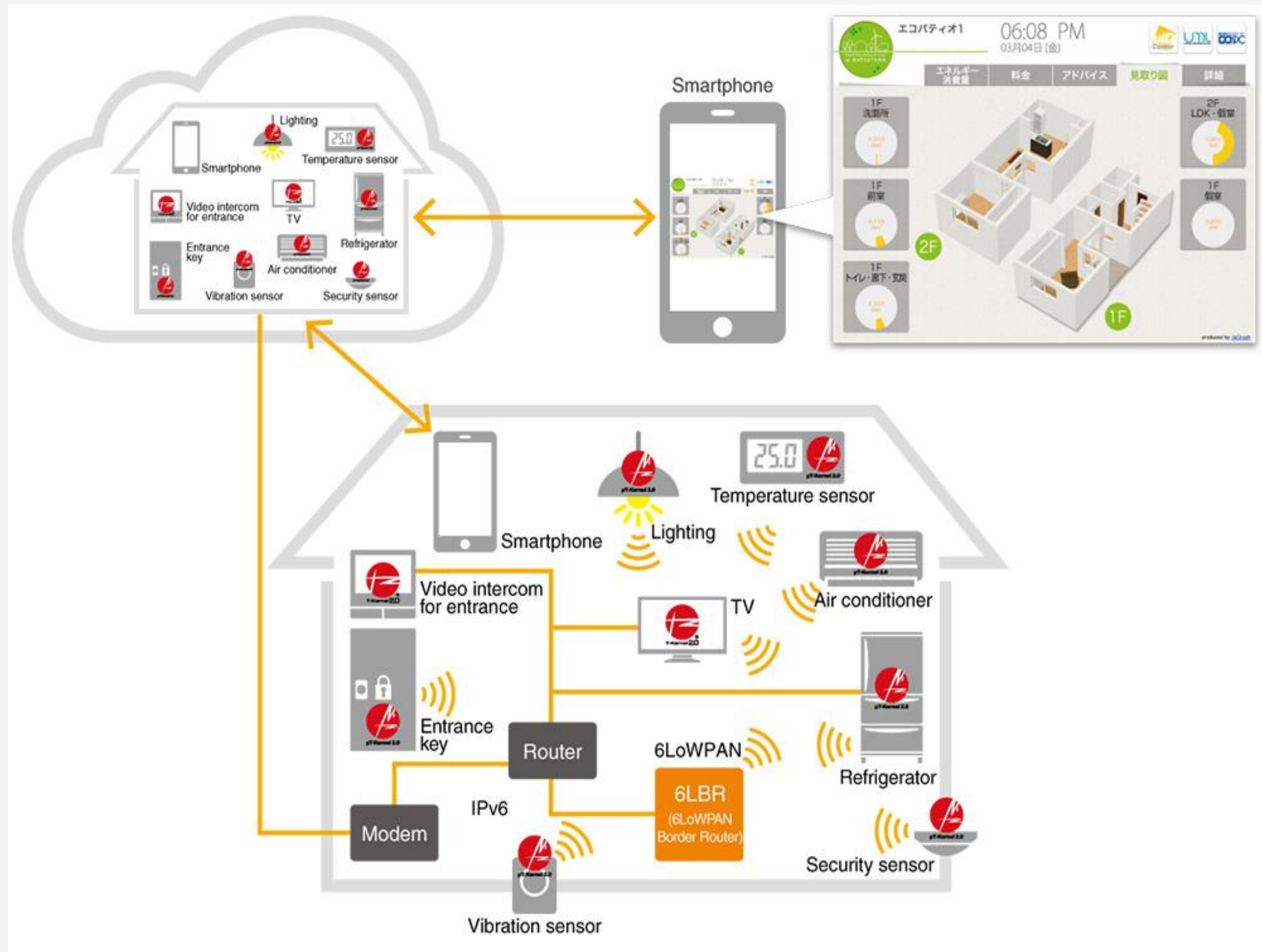
IPV6

- Internet protocol version 6 (IPv6) is **a network layer protocol that allows communication to take place over the network**.

- IPv6 In IoT has a **highly efficient multicast communication feature that eliminates the requirement for routine broadcast messaging**. This improvement helps in preserving the battery life of IoT devices by reducing the number of packets processed. IPv6 provides multiple addresses to devices.

6LOWPAN

- 6LoWPAN is **the name of an Internet Engineering Task Force (IETF) standard that defines an approach for routing Internet Protocol version 6 (IPv6) over low-power wireless networks**.

- 6LoWPAN specification contains packet compression and other optimization mechanisms to enable the efficient transmission of IPv6 packets on a network with limited power resources and reliability, which makes efficient IPv6 communication over low-power wireless networks possible.

**IOT A&P/IOT Reference Architecture and Technologies/CSE - IoT/ SNSCE**

RPL

- Routing Protocol for Low-Power and Lossy Networks (RPL) is **an IPv6 routing protocol that is standardized for the Internet of Things (IoT) by Internet-Engineering Task Force (IETF)**. RPL forms a tree-like topology which is based on different optimizing process called Objective Function (OF).

- RPL is a flexible and scalable routing protocol and using it as a standard **makes it easier to build an interoperable solution for any application making it a part of IoT**. There are many efforts to improve and create enhanced versions of RPL taking advantage of its flexible and scalable design.
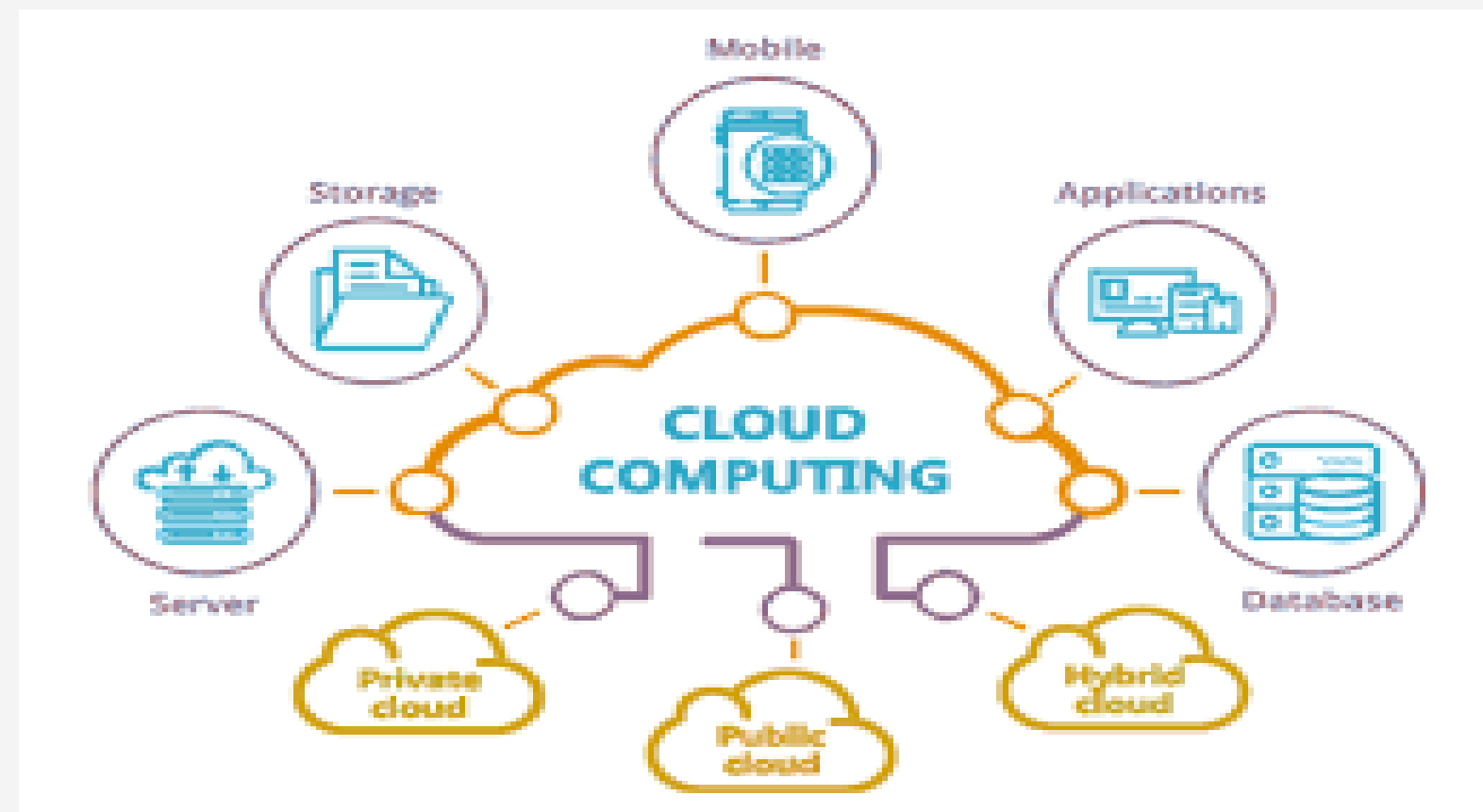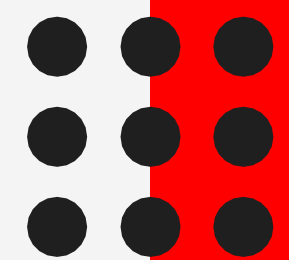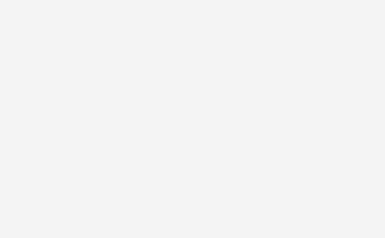
MQTT

- Message queuing telemetry support (MQTT) is defined as **a low bandwidth consumption machine-to-machine protocol that helps IoT devices communicate with each other, with minimal code requirements and network footprint**. MQTT stands for message queuing telemetry transport.
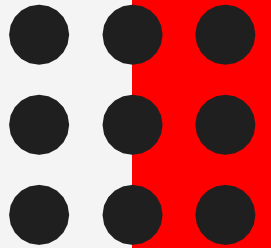
Cloud Computing

- cloud computing is the delivery of computing services including servers, storage, databases, networking, software, analytics, and intelligence over the Internet to offer faster innovation, flexible resources, and economies of scale.

THANK YOU