



SNS COLLEGE OF ENGINEERING

Kurumbapalayam (Po), Coimbatore – 641 107

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 COMPUTER SCIENCE AND ENGINEERING-IOT Including CS&BCT

**COURSE NAME : 19SB602 FULL STACK DEVELOPMENT FOR NEXT
GENERATION IOT**

III YEAR / VI SEMESTER

Unit V - NG-IoT-Next Generation Internet of Things
Topic :Broad definition of IOT



INTERNET OF THINGS

Internet of Things (IoT) is the networking of physical objects that contain electronics embedded within their architecture in order to communicate and sense interactions amongst each other or with respect to the external environment.

In the upcoming years, IoT-based technology will offer advanced levels of services and practically change the way people lead their daily lives.

Advancements in medicine, power, gene therapies, agriculture, smart cities, and smart homes are just a few of the categorical examples where IoT is strongly established.

HISTORY OF INTERNET OF THINGS

- 1982 – Vending machine
- 1990 – Toaster
- 1999 – IoT Coined (Kevin Ashton)
- 2000 – LG Smart Fridge
- 2004 – Smart Watch
- 2007 – Smart iPhone
- 2009 – Car Testing
- 2011 – Smart TV
- 2013 – Google Lens
- 2014 – Echo
- 2015 – Tesla Autopilot



Four Key Components of IOT

- Device or sensor
- Connectivity
- Data processing
- Interface



Key Features

- **Connectivity:** Devices communicate through the internet or other networks.
- **Automation & Control:** Remote access and automatic operation.
- **Integration:** Merges digital and physical worlds.
- **Real-Time Monitoring:** Constant data tracking and updates.
- **Data Collection & Analysis:** Insights for smarter decision-making.



Examples

- Smart Homes (e.g., Alexa, smart thermostats)
- Wearable Devices (e.g., fitness trackers)
- Smart Cities (e.g., traffic systems)
- Industrial IoT (e.g., machine monitoring)



Working with IoT Devices



- **Collect and Transmit Data :** For this purpose sensors are widely used they are used as per requirements in different application areas.
- **Actuate device based on triggers produced by sensors or processing devices:** If certain conditions are satisfied or according to user's requirements if certain trigger is activated then which action to perform that is shown by Actuator devices.
- **Receive Information:** From network devices, users or devices can take certain information also for their analysis and processing purposes.
- **Communication Assistance:** Communication assistance is the phenomenon of communication between 2 networks or communication between 2 or more IoT devices of same or different networks. This can be achieved by different communication protocols like: MQTT, Constrained Application Protocol, ZigBee, FTP, HTTP etc.

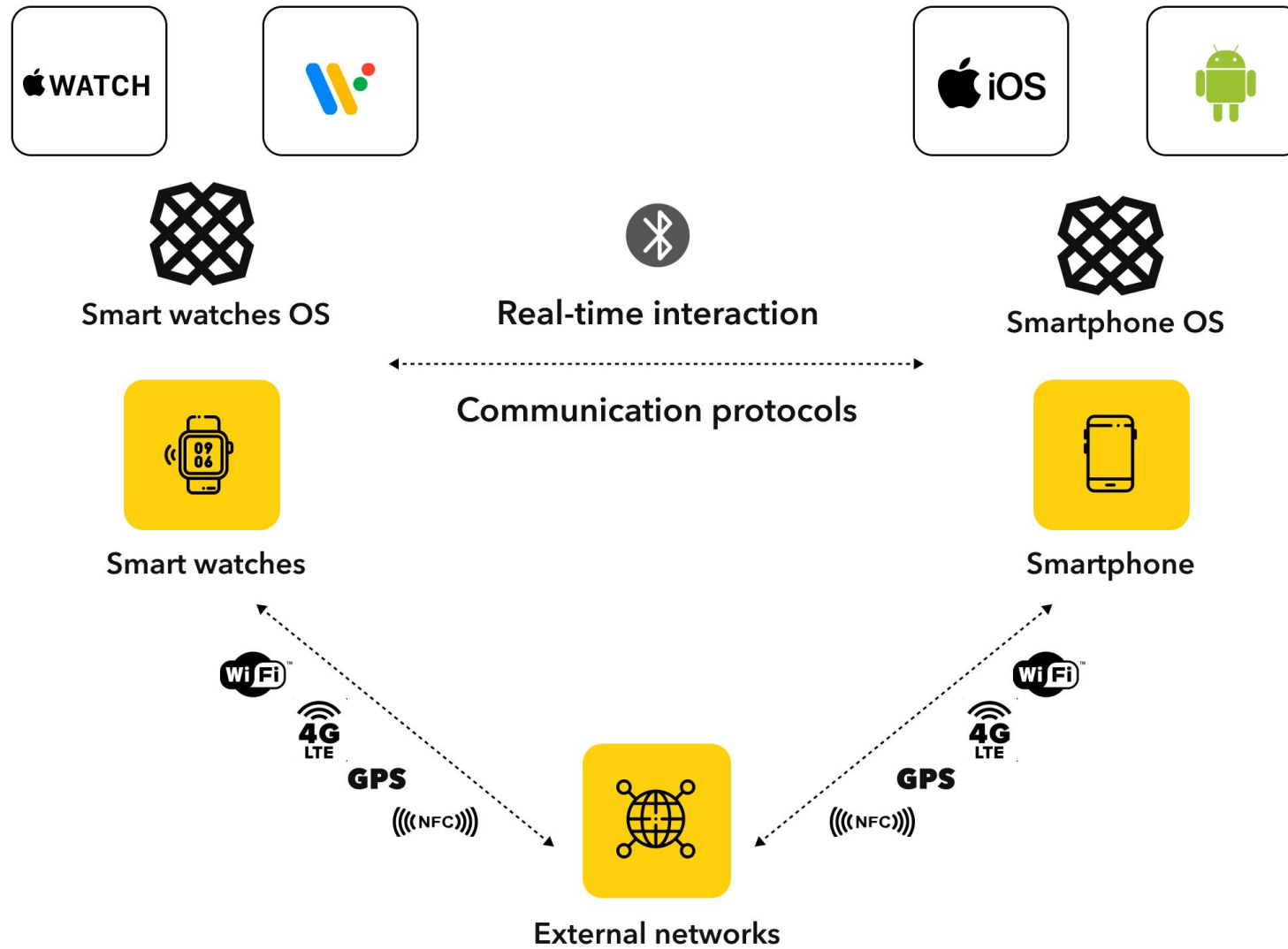


EXAMPLE

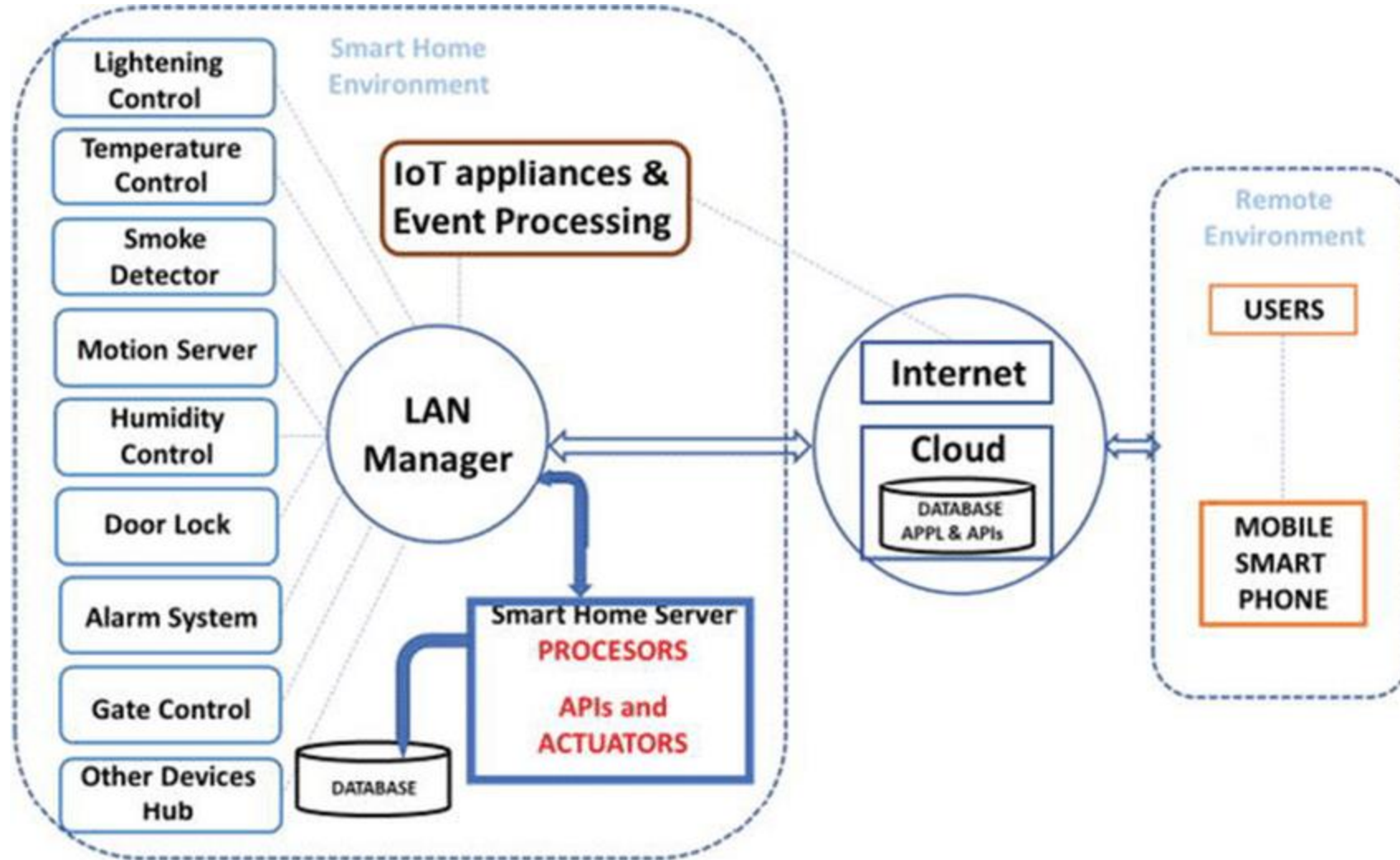
SMART WATCH

- **Sensors:** Track data like heart rate, steps, GPS location.
- **Connectivity:** Uses Bluetooth, Wi-Fi, or LTE to connect to phones/cloud.
- **Data Collection:** Continuously gathers user activity and environment data.
- **Cloud Integration:** Sends data to cloud servers for storage and analysis.
- **Smart Actions:** Triggers notifications, health alerts, and device controls via IoT networks.

HOW SMART WATCHES WORK



SMART HOME SYSTEM





Smart Home System Workflow



Smart Devices → LAN Manager → Home Server → Database & Cloud → Mobile User

1. Smart Devices and Sensors

Devices like *lights, temperature controllers, smoke detectors, motion sensors, humidity sensors, door locks, alarms, etc.*, **collect data** and **perform actions** inside the home.

2. LAN Manager

All devices send their data/events to a **LAN Manager** (Local Area Network Manager), which **manages and routes communication** between devices and the home server.



3.Smart Home Server : The LAN Manager connects to the Smart Home Server which has:

- Processors (for decision-making),
- APIs (for communication),
- Actuators (to control devices based on commands).

4.Database :

The server stores the data from device in a local database for logging,analytics and quick access



5. Cloud & Internet :

The Smart Home Server also communicates with the **Internet/Cloud** to:

- Store backup data,
- Use additional services (like AI recommendations),
- Enable remote control.

6.Remote User Access

Users can **remotely access and control** their home via a **mobile smartphone** app, connecting through the cloud.

- Example: Turning off lights remotely, receiving smoke alerts, etc.



Conclusion



The Internet of Things (IoT) connects devices, people, and systems, creating a smarter and more efficient world. It enables real-time data sharing, automation, and better decision-making across industries. While IoT offers immense benefits, challenges like security and privacy must be managed carefully. With advancements in AI and 5G, IoT promises a highly connected and intelligent future.



Any Query????

Thank you.....