

Course Title

## IoT Wireless & Cloud Emerging Technologies

### ❖ Modules

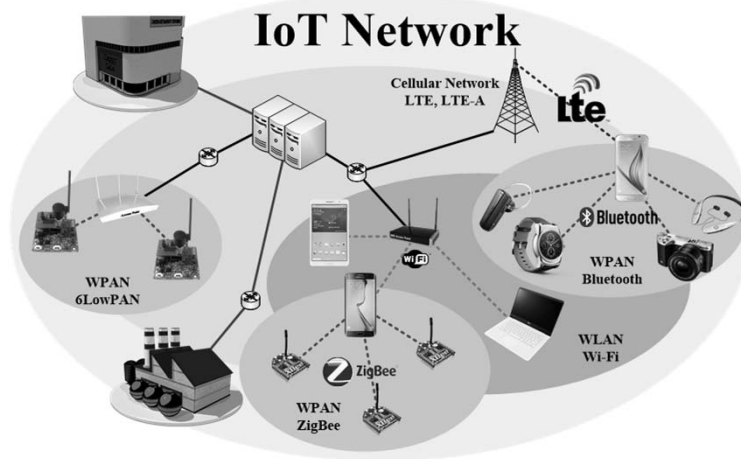
- 1. IoT Business & Products
- 2. IoT Architecture & Technologies
- 3. IoT Networks
- 4. Wi-Fi & Bluetooth
- 5. Cloud Technology
- 6. IoT Bluetooth & Wi-Fi and EC2 Cloud Projects

IoT Networks

# IoT Wireless Networks

## IoT Wireless Networks

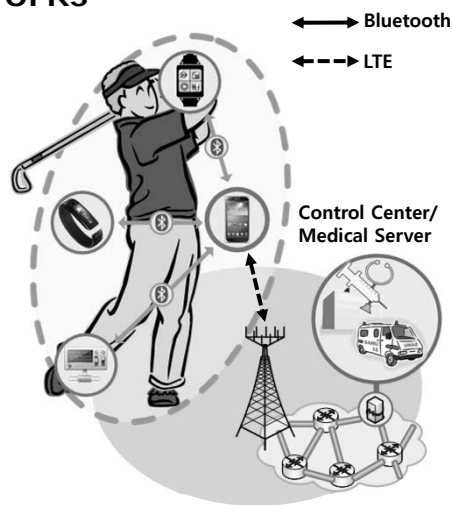
### ❖ IoT Network Architecture



## IoT Wireless Networks

### ❖ Wearable IoT Networks

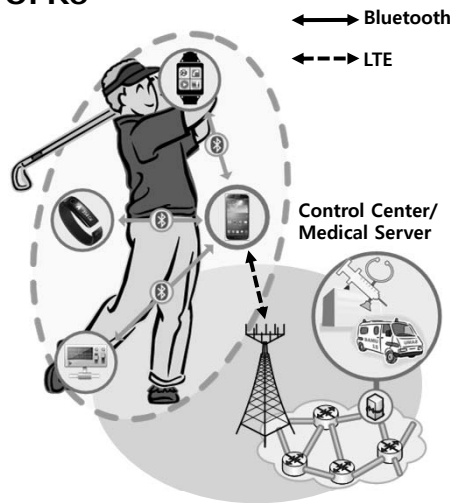
- Wearable devices can be used to detect biometric information
  - Shoes
  - Watch
  - Glasses
  - Belt
  - Pacer, etc.



## IoT Wireless Networks

### ❖ Wearable IoT Networks

- Smart device collects information from the wearable devices and communicates with the control center and medical server through the Internet



## IoT Wireless Networks

### ❖ Wi-Fi

- Wi-Fi is a WLAN (Wireless Local Area Network) technology based on the IEEE 802.11 standards
- Wi-Fi Devices
  - Smartphones, Smart Devices, Laptop Computers, PCs, etc.
- Applications Areas
  - Home, School, Computer Laboratory, Office Building, etc.

## IoT Wireless Networks

### ❖ Wi-Fi

- Wi-Fi devices and APs (Access Points) have a wireless communication range of about 30 meters indoors
- Wi-Fi data rates are based on protocol type
  - IEEE 802.11a can achieve up to 54 Mbps
  - IEEE 802.11b can achieve up to 11 Mbps
  - IEEE 802.11g can achieve up to 54 Mbps
  - IEEE 802.11n can achieve up to 150 Mbps
  - IEEE 802.11ac can achieve up to 866.7 Mbps
  - IEEE 802.11ad can achieve up to 7 Gbps

## IoT Wireless Networks

### ❖ Bluetooth

- Bluetooth is a WPAN (Wireless Personal Area Network) protocol designed by the Bluetooth SIG (Special Interest Group)
- Replaces cables connecting many different types of devices
  - Mobile Phones & Headsets
  - Heart Monitors & Medical Equipment



## IoT Wireless Networks

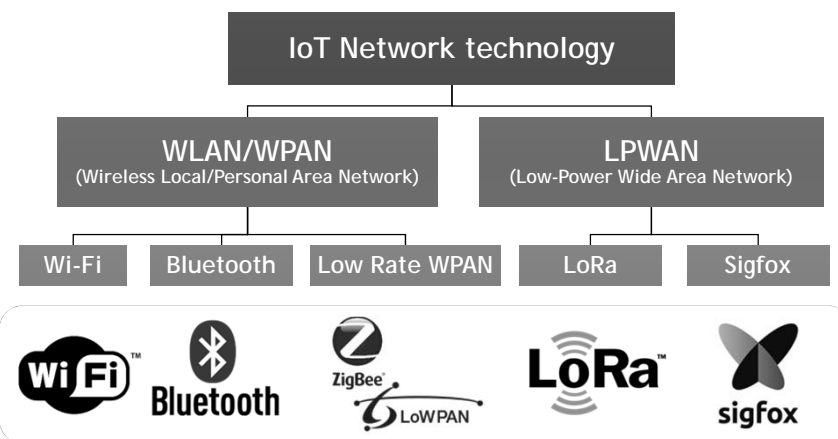
### ❖ Bluetooth

- Bluetooth's standard PAN range is usually 10 meters (50 m in Bluetooth 4.0)
- Bluetooth Low Energy (in Bluetooth 4.0) provides reduced power consumption and cost while maintaining a similar communication range
- Bluetooth protocol types & data rates
  - Bluetooth 2.0 + EDR can achieve up to 2.1 Mbps
  - Bluetooth 3.0 + HS can achieve up to 24 Mbps
  - Bluetooth 4.0 can achieve up to 25 Mbps
  - Bluetooth 5 can achieve up to 50 Mbps

## IoT Wireless Networks

### ❖ IoT Wireless Communication Technology

- IoT Network technology



# IoT Networks

## Reference

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