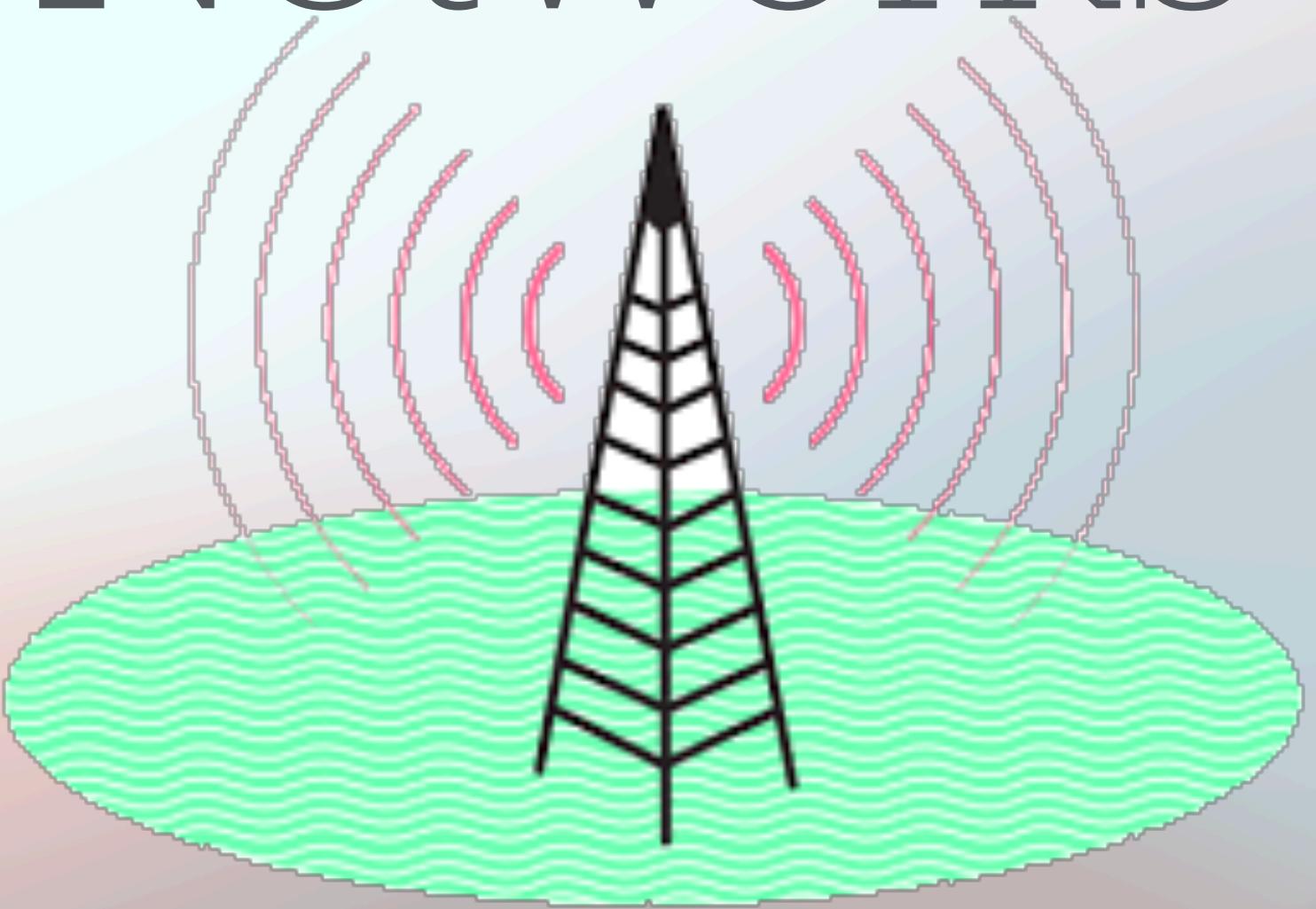


CSE—4128: Wireless Networks

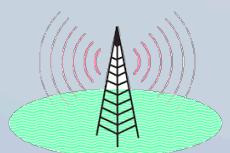
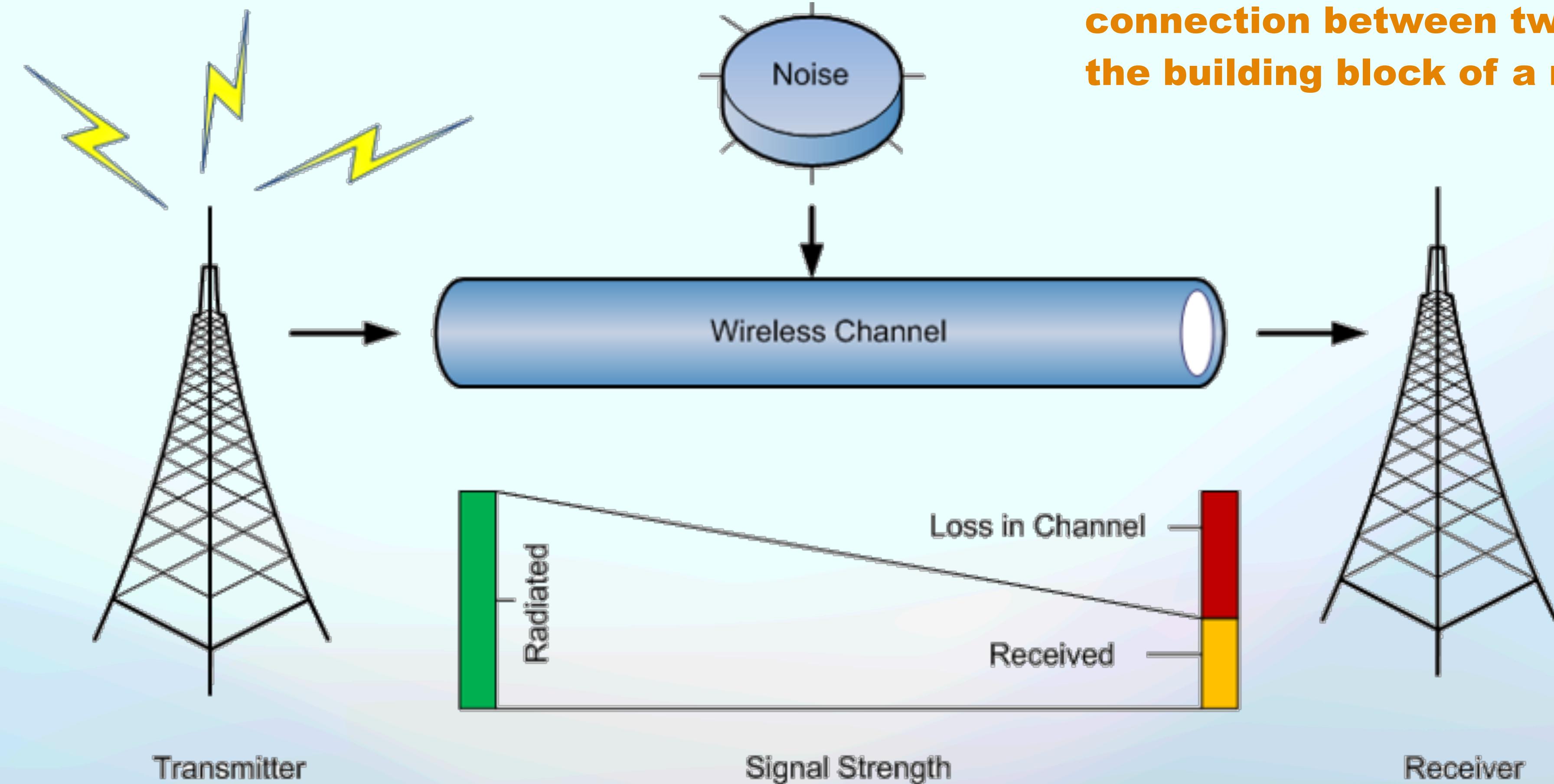
Wireless Network Fundamentals 1



Prof. Md. Mustafizur Rahman
Dept. of Computer Science and Engineering, University of Dhaka

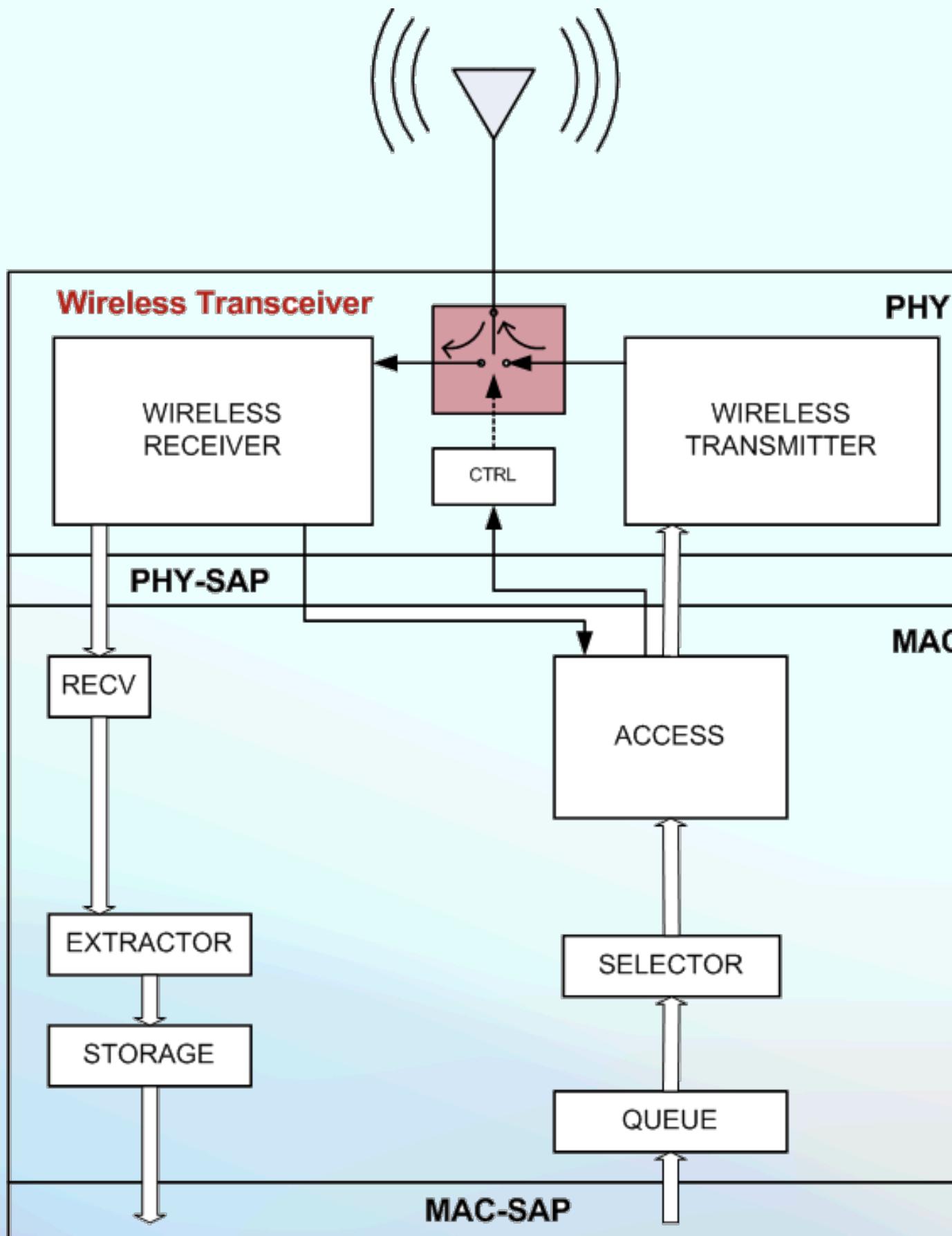
Wireless Communications

Network link

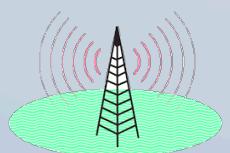


Wireless Communications

Wireless Radio (Single Channel)

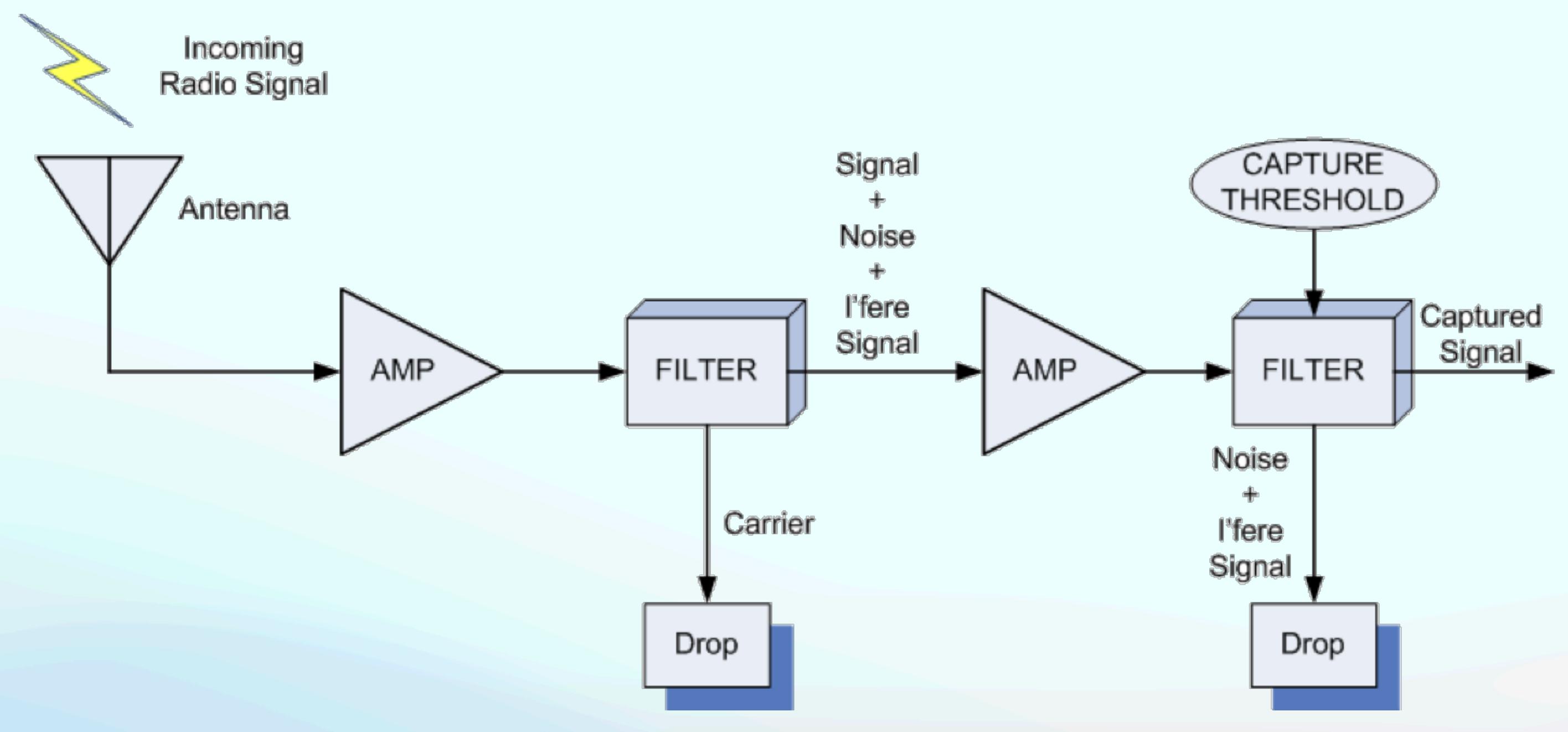


- STAs either can transmit or receive at any instant
- As the receiving circuit is inactive when transmit, STAs cannot detect collisions from the transmitting end (CSMA/CD is not possible)
- **Basic Access idea** is: Transmit packets if and only if there is **no signal in the channel**.

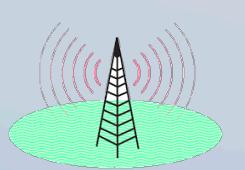
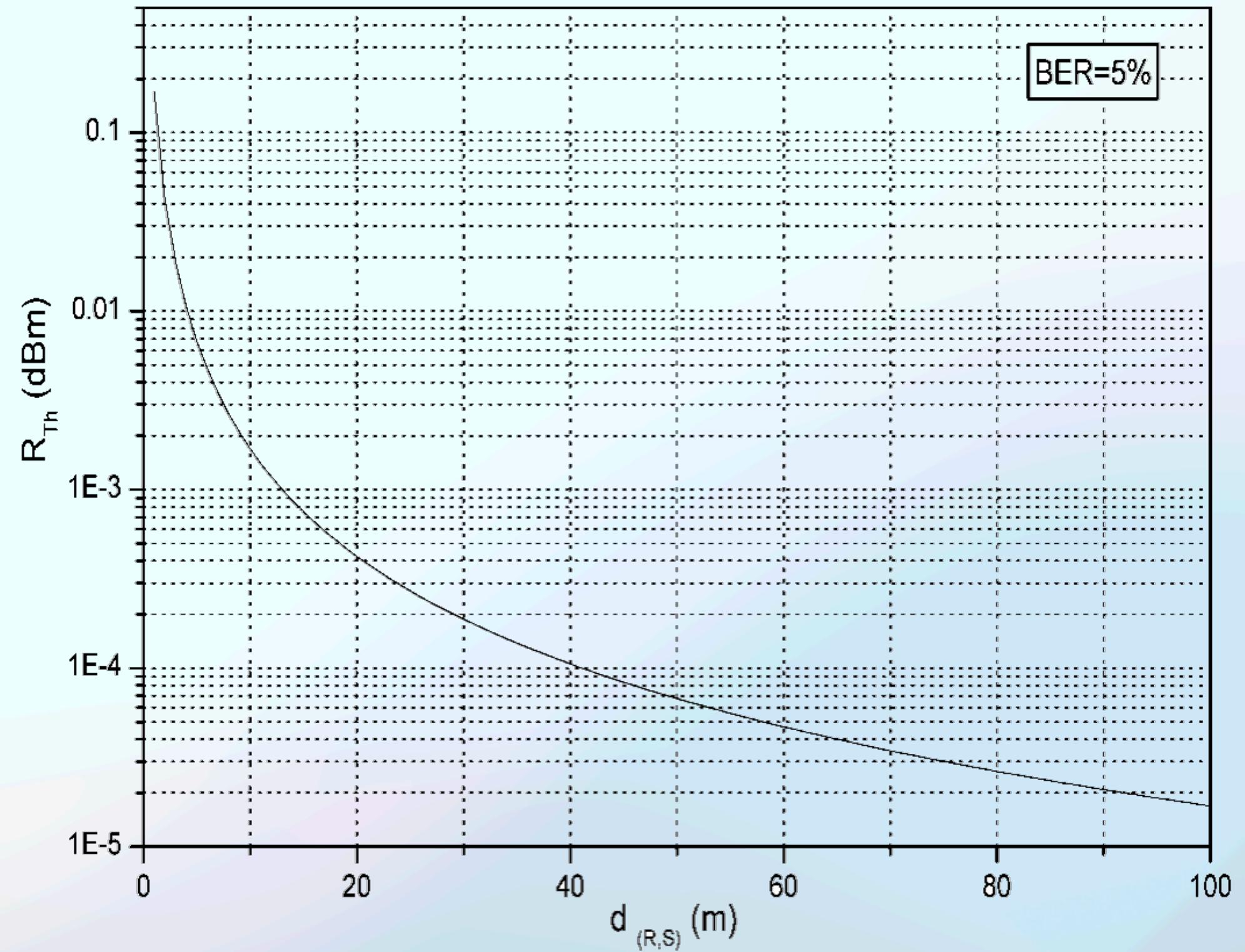


Wireless Communications

Receiver Operation

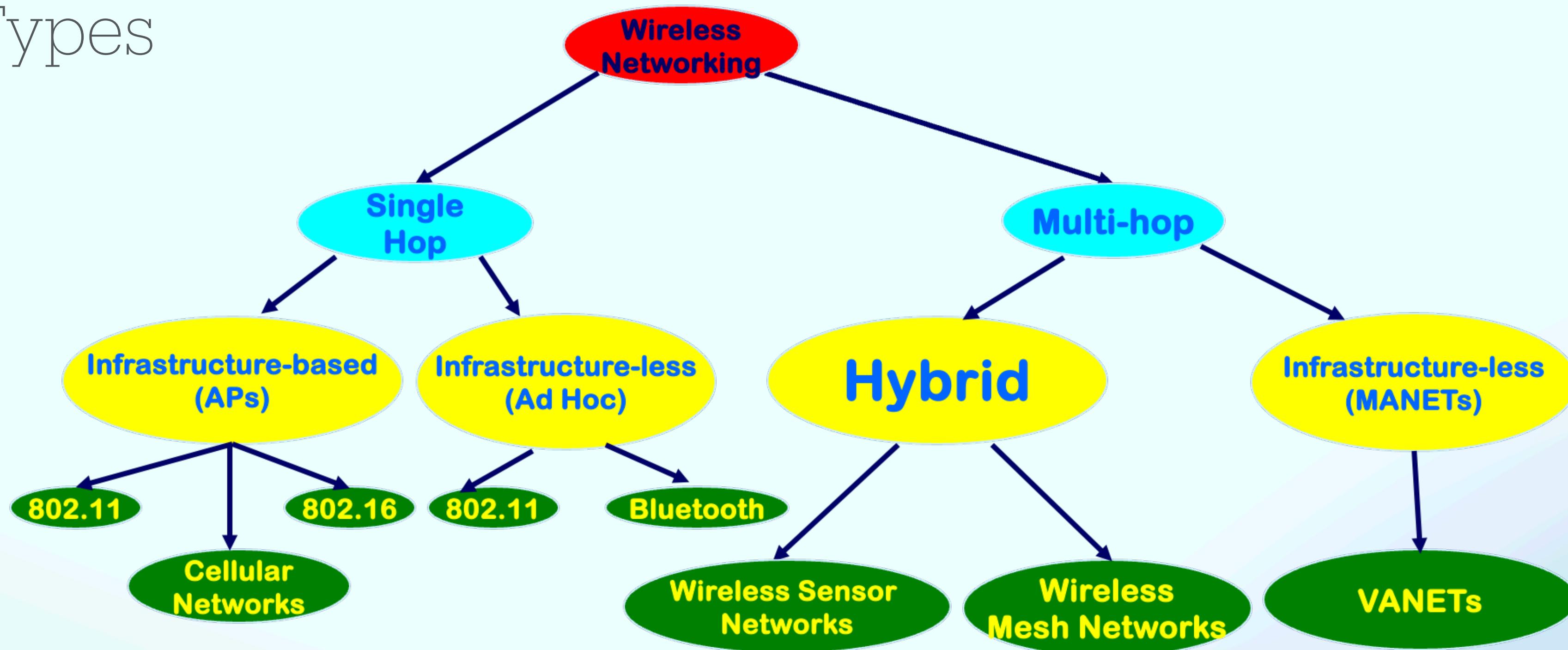


Required Receive Threshold vs. Source Distance

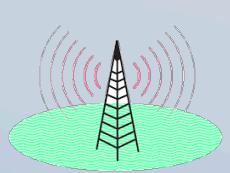


Wireless Communications

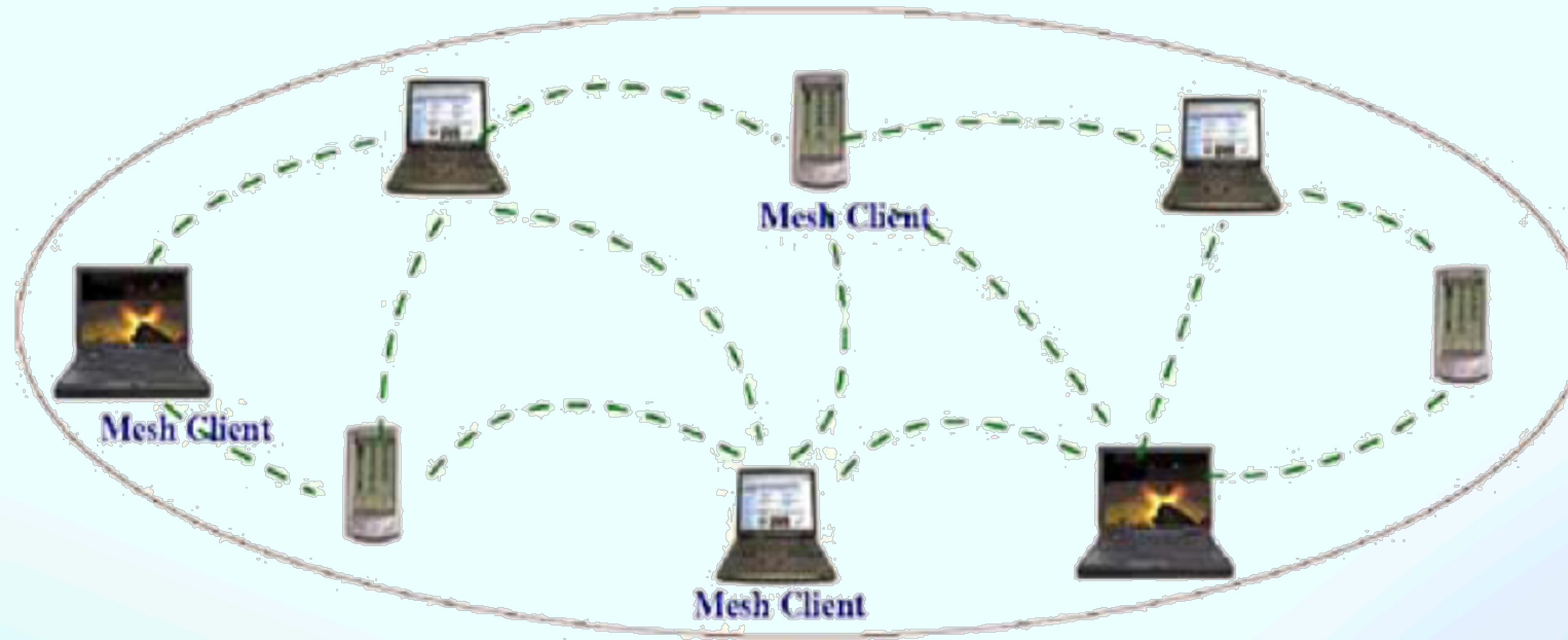
Network Types



- There are many more types of network:
- Personal Area Network (PAN), Body Area Network (BAN)
- Delay Tolerant Network (DTN),....



Ad-hoc network

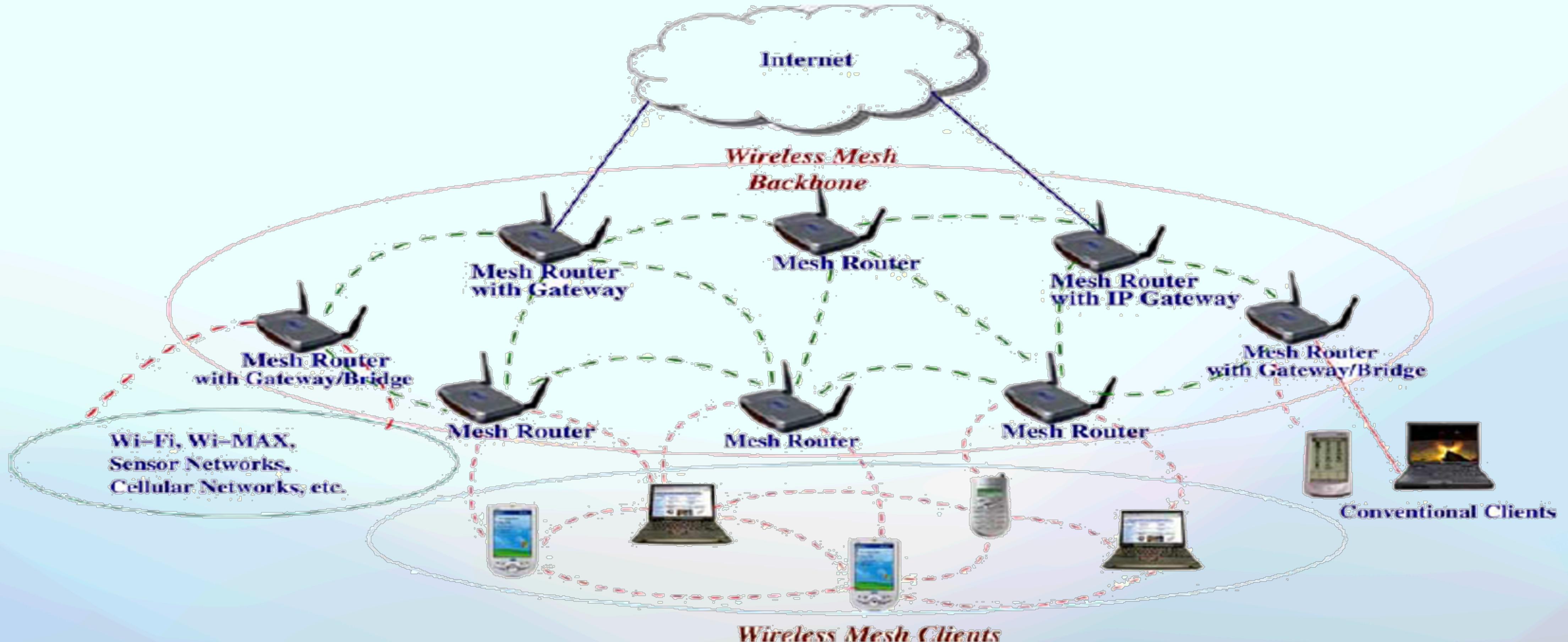


- Every node has equal rights to access the medium
- Needs coordination to avoid chaos
- Each node helps other nodes to communicate with distant nodes



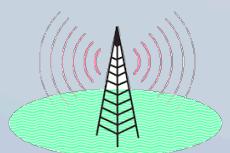
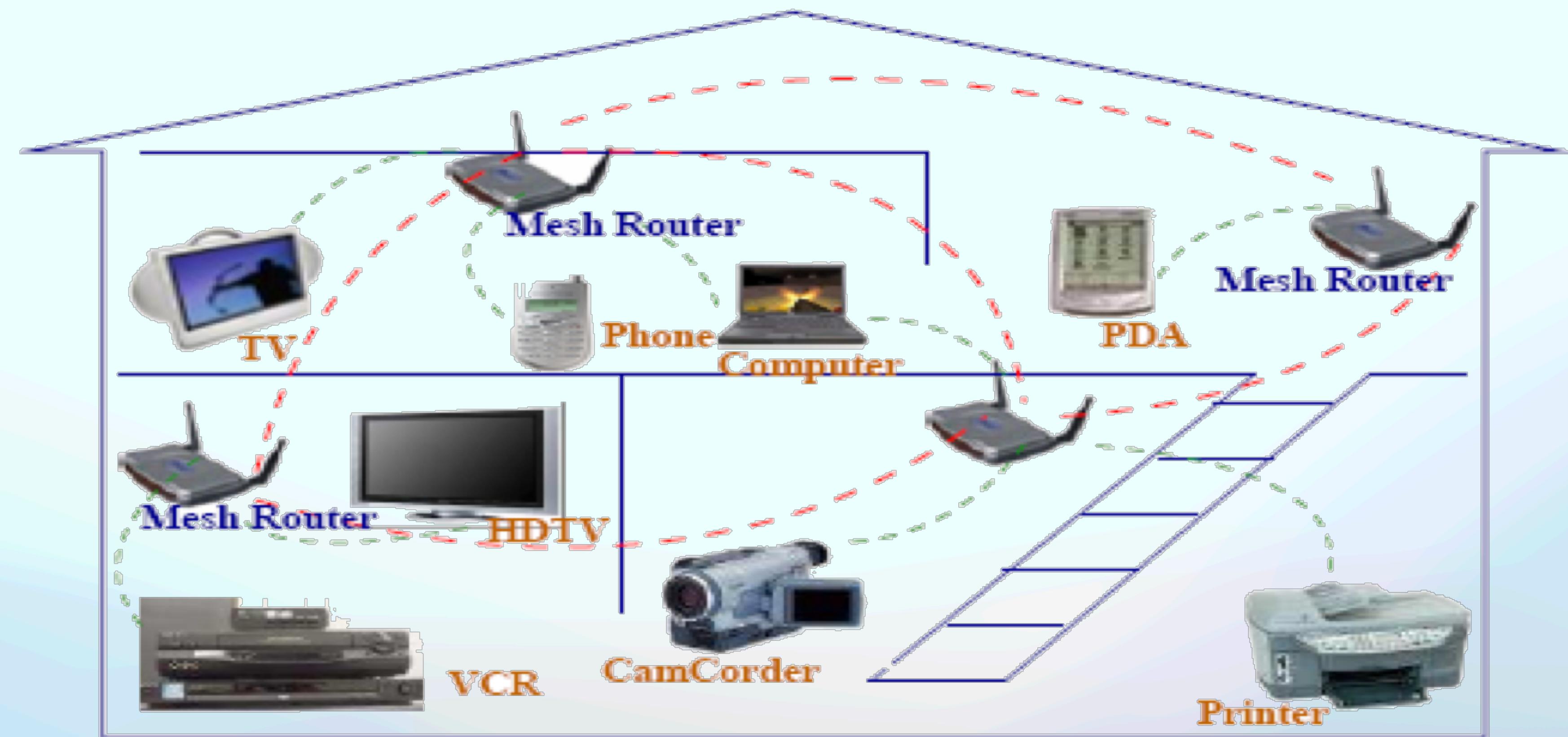
Mesh Network (Modern WLAN)

A bigger picture



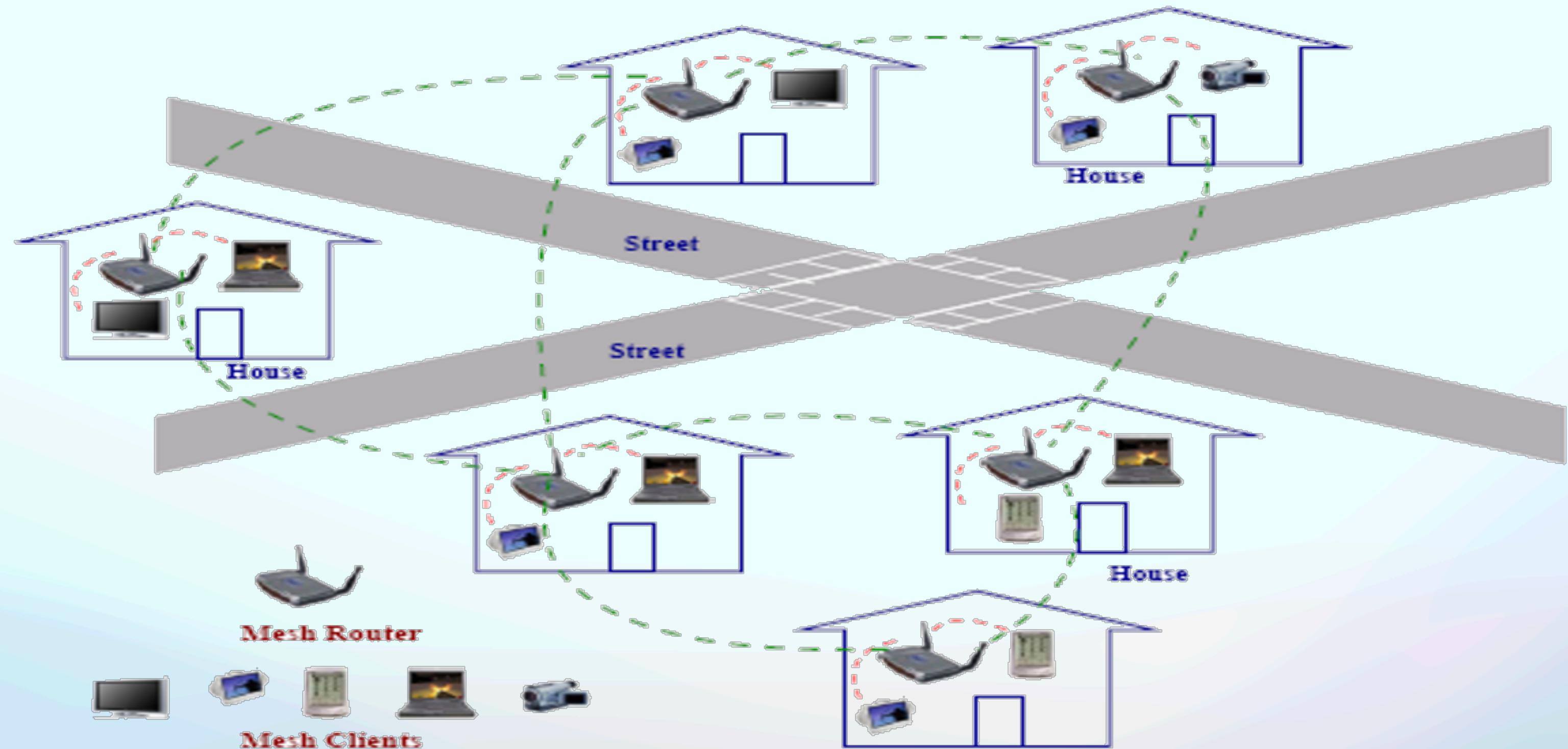
Hybrid (mesh) network

Home Network



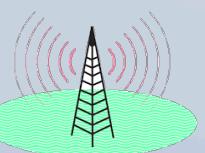
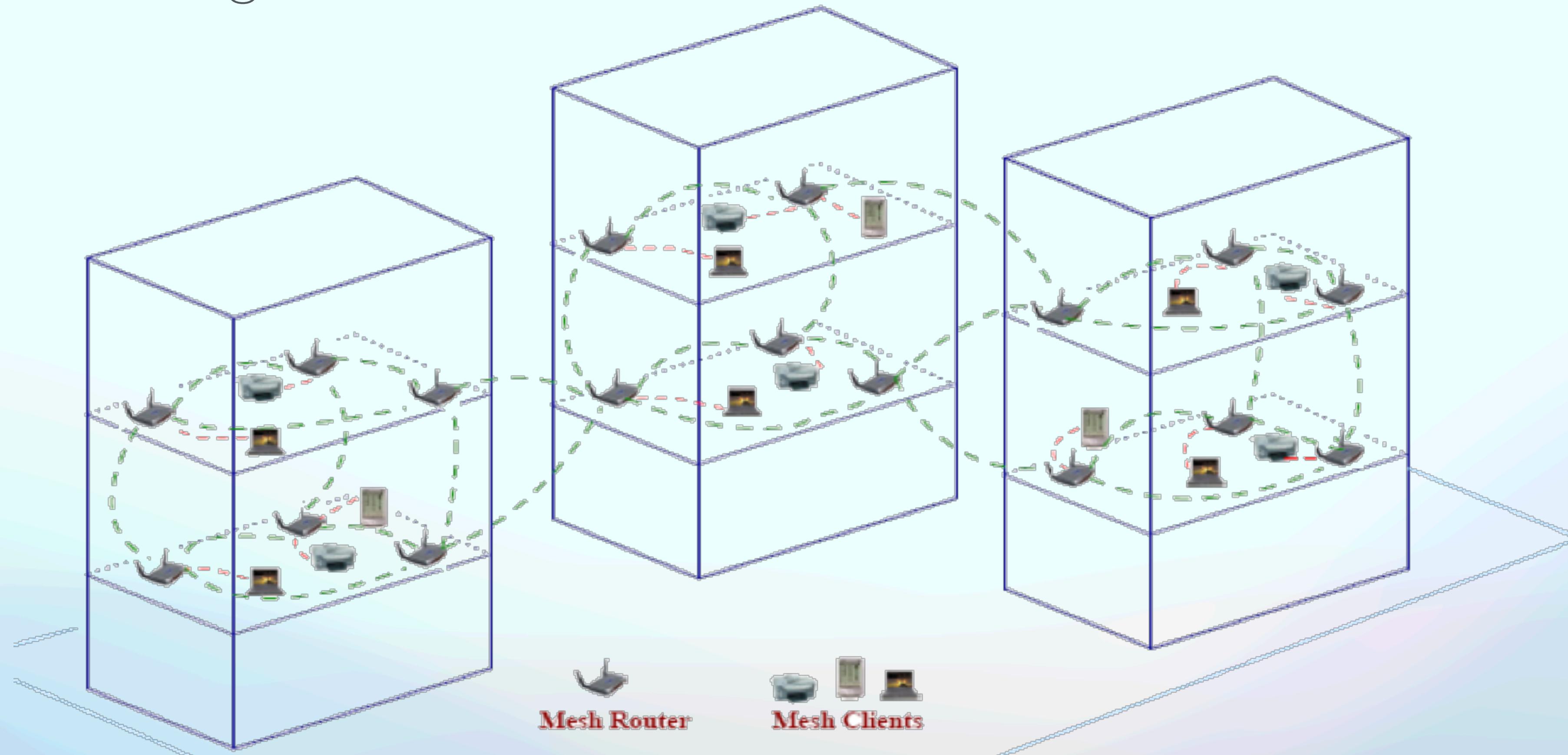
Community network

Local Area



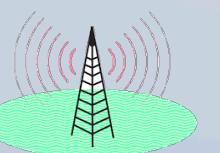
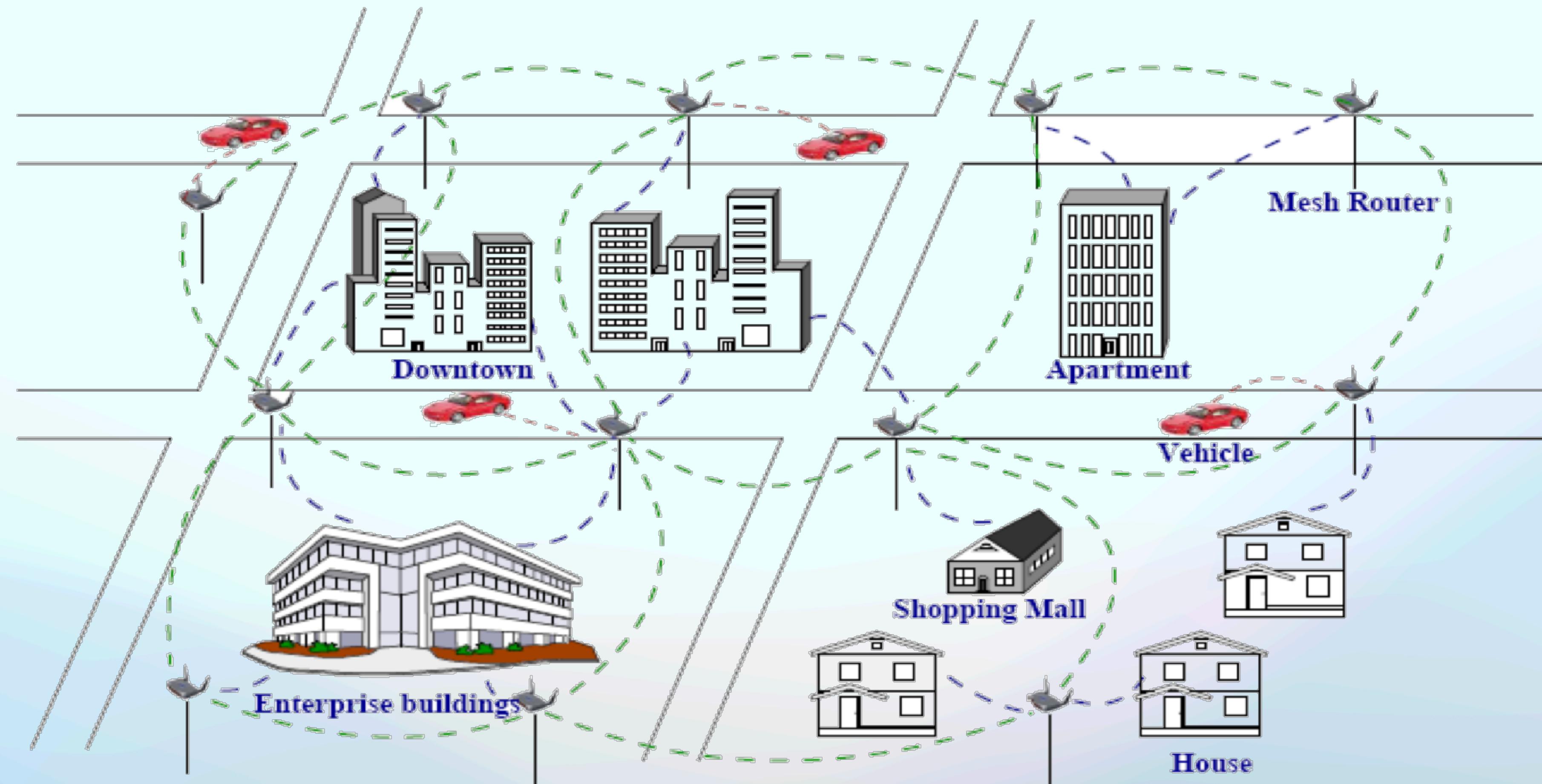
Enterprise network

Same Organization at different locations

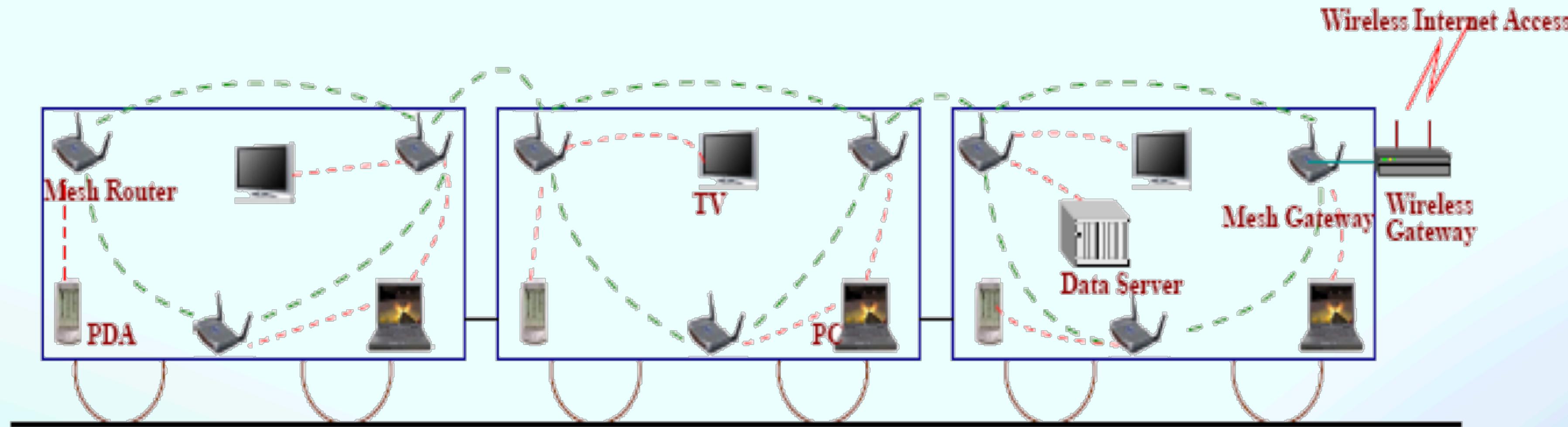


Metropolitan network

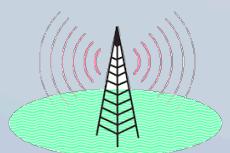
Town/City Network



Network in a Train (Bus/Aeroplane)

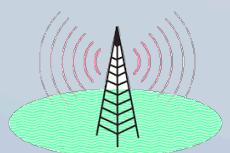


- **Entire network moves**
- **Internally, the network is static**
- **Long-distance wireless communication for outside communications**

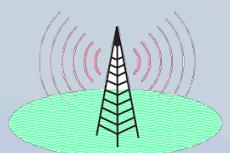
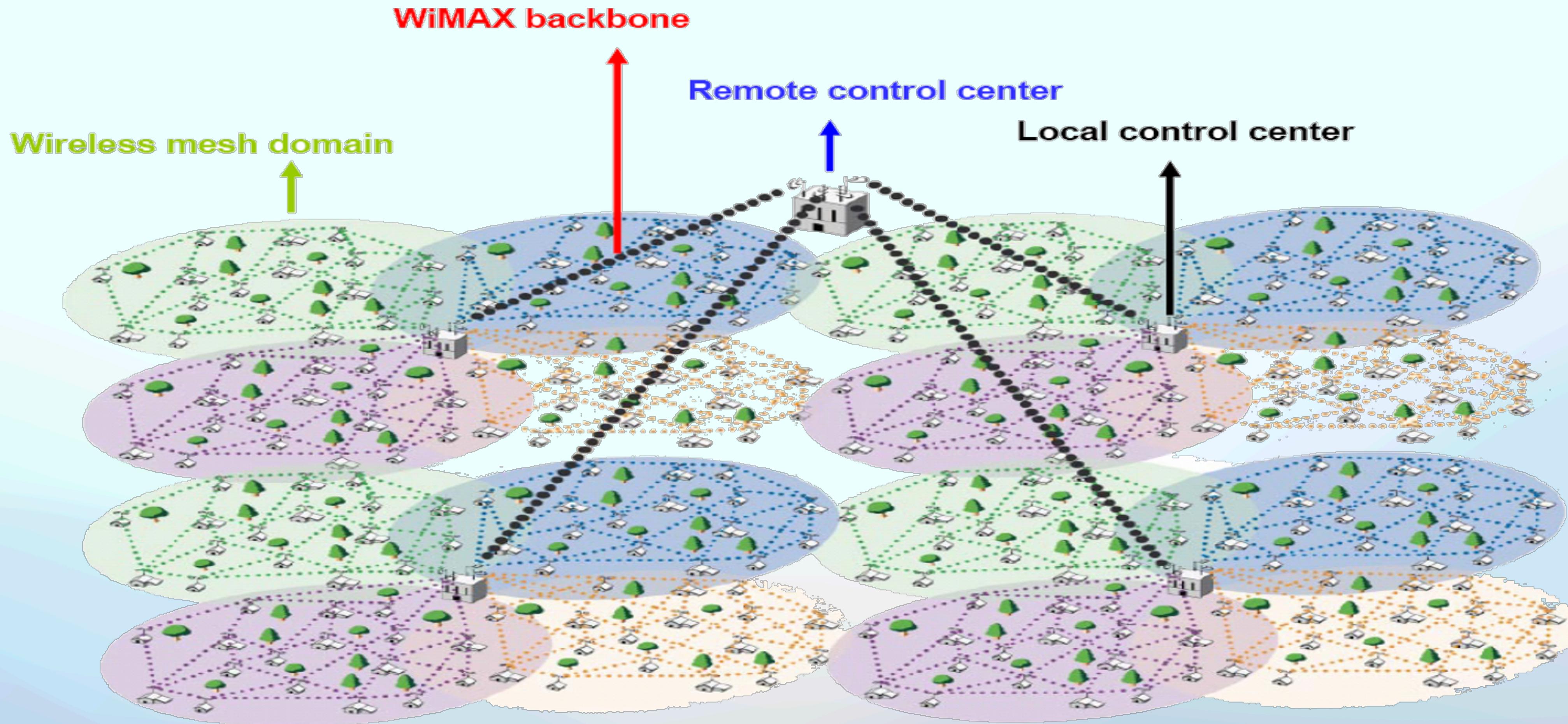


Broadband Internet Access

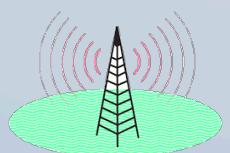
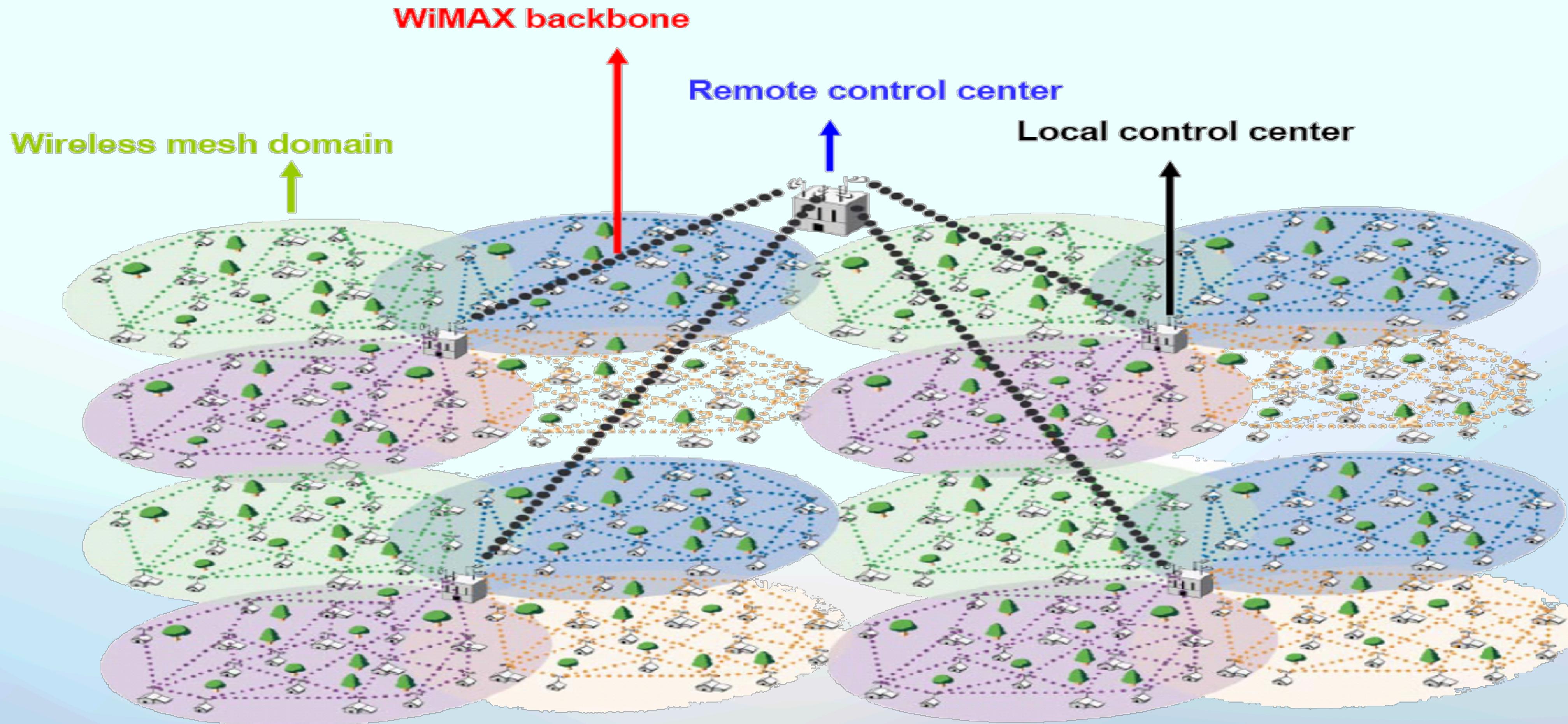
Wireless only/Wired-Wireless Combination



Electrical System Automation

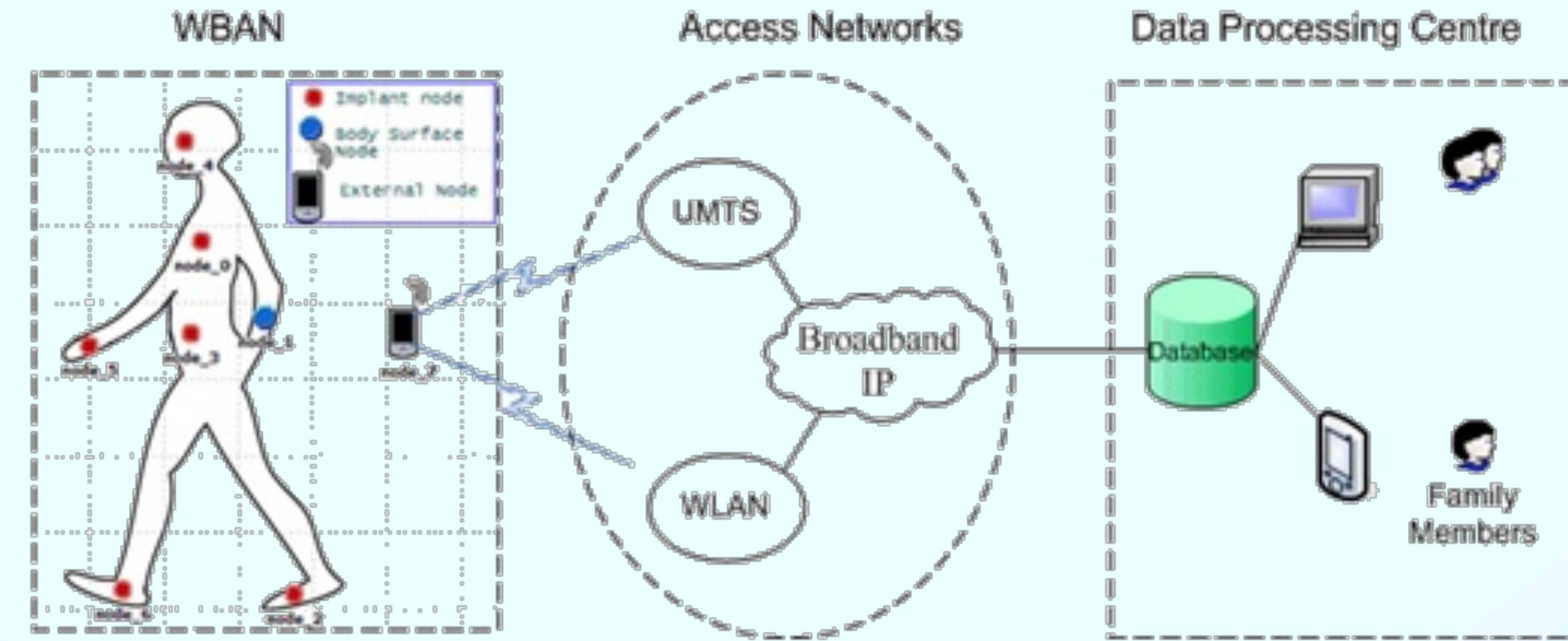


Electrical System Automation



Body Area Network

BAN



- **Wireless Devices within a body**
- **Wearables, Body attached, Implants**
- **Also communicate with external devices**



Questions?

