FACULTY OF ENGINEERING & TECHNOLOGY

Brajesh Mishra
Assistant Professor
Department of Computer Science & Engineering

Topics Covered

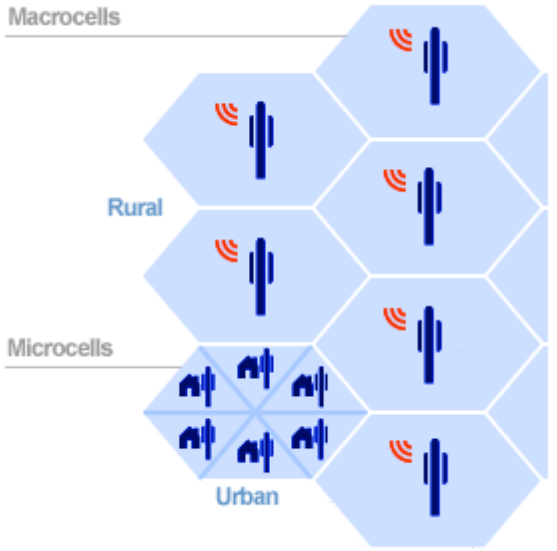
Mobile phone networks
Wireless sensor networks
Satellite communication networks
Terrestrial microwave networks

Mobile phone networks

A mobile phone network or cellular phone network as it is also known, is made up of a large number of signal areas called cells. These cells join or overlap each other to form a large coverage area. Users on the network can cross into different cells without loosing connection. Within each cell you will find a base station or mobile phone tower, which sends and receives the mobile transmissions. A mobile device will connect to the nearest or least congested base station. The base stations are connected to a digital exchange where the communication is sent to other telephone or data networks.

Mobile phone networks

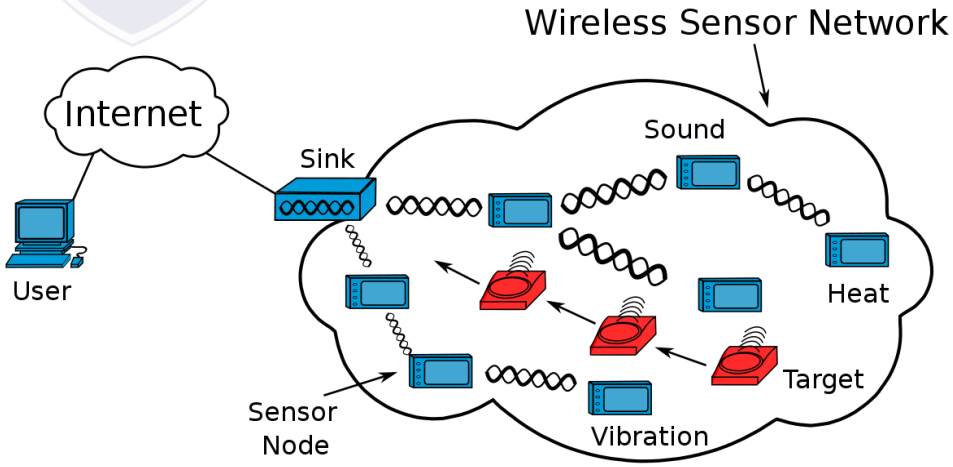
Cells will often be smaller in size throughout large towns and cities due to the number of users in the area. The higher the population density the more base stations are needed.
Communication over the mobile network can be made up of voice, data, images and text messages.



Wireless sensor networks

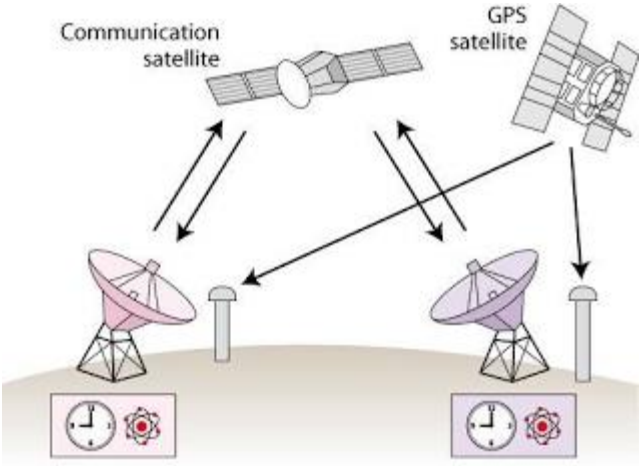
Wireless Sensor Networks (WSNs) can be defined as a self-configured and infrastructure-less wireless networks to monitor physical or environmental conditions, such as temperature, sound, vibration, pressure, motion or pollutants and to cooperatively pass their data through the network to a main location or sink where the data can be observed and analysed.

A sink or base station acts like an interface between users and the network. One can retrieve required information from the network by injecting queries and gathering results from the sink.



Satellite communication networks

A **communications satellite** is an artificial satellite that relays and amplifies radio telecommunications signals via a transponder; it creates a communication channel between a source transmitter and a receiver at different locations on Earth. Communications satellites are used for television, telephone, radio, internet, and military applications. There are about 2,000 communications satellites in Earth's orbit, used by both private and government organizations.[1] Many are in geostationary orbit 22,236 miles (35,785 km) above the equator, so that the satellite appears stationary at the same point in the sky, so the satellite dish antennas of ground stations can be aimed permanently at that spot and do not have to move to track it.



Terrestrial microwave networks

Terrestrial microwave communication employs Earth-based transmitters and receivers. The frequencies used are in the low-gigahertz range, which limits all communications to line-of-sight. You probably have seen terrestrial microwave equipment in the form of telephone relay towers, which are placed every few miles to relay telephone signals crosscountry.

Microwave transmissions typically use a parabolic antenna that produces a narrow, highly directional signal. A similar antenna at the receiving site is sensitive to signals only within a narrow focus. Because the transmitter and receiver are highly focused, they must be adjusted carefully so that the transmitted signal is aligned with the receiver.

A microwave link frequently is used to transmit signals in instances in which it would be impractical to run cables. If you need to connect two networks separated by a public road, for example, you might find that regulations restrict you from running cables above or below the road. In such a case, a microwave link is an ideal solution.

Some LANs operate at microwave frequencies at low power and use nondirectional transmitters and receivers. Network hubs can be placed strategically throughout an organization, and workstations can be mobile or fixed. This approach is one way to enable mobile workstations in an office setting.