

What is Satellite Communication?

Satellite communication corresponds to the way of exchanging information between two earth-based stations by making use of artificial satellites that orbit the earth. More simply, it can be said that communication between two distant stations through satellite is known as **satellite communication**.

We need satellite communication because ground wave and sky wave propagation fail under certain circumstances as they do not support very long-distance signal transmission (generally supports up to 1500 km). And the reason for this is the curvature of the earth as it acts as an obstruction in signal transmission between two end terminals. Also, the signal attenuates when transmission distance increases. Hence one should make use of repeaters that can provide necessary amplification to the transmitted signal.

Thus, to deal with this, the satellites in space act as repeaters to help transfer signals from one end to another.

Need for Satellite Network

A satellite network plays a crucial role in sending the data from one location to another by using an artificial satellite. It is quite an effective method through which data is broadcasted over a large geographical location. Thus, through satellite communication data can reach remote locations.

We know that the world is progressing towards globalization and satellite network plays a very crucial role to provide affordable and reliable communication. Satellite communication provides high data rate communication services.

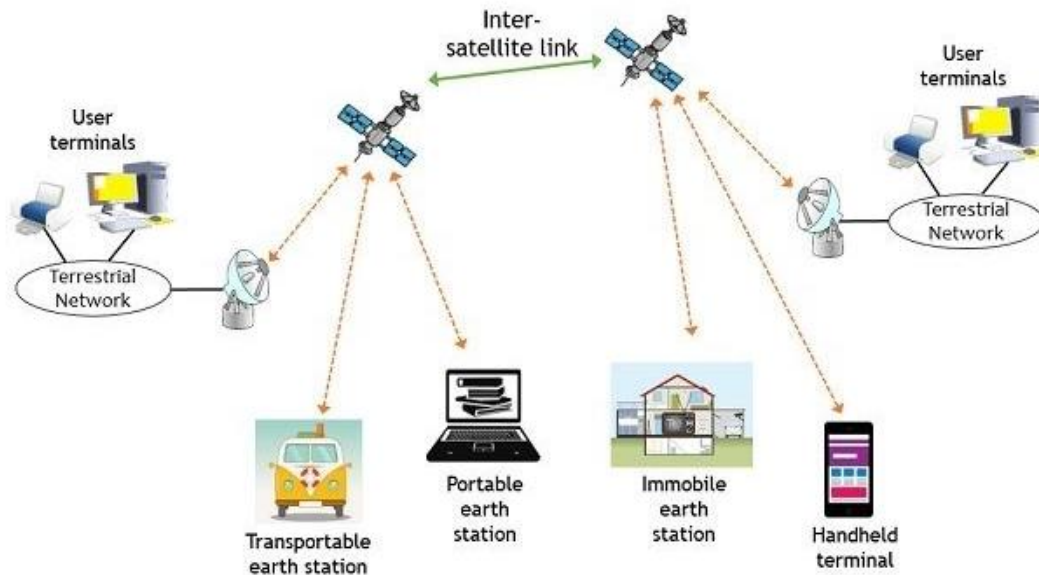


Illustration of Satellite Network

Disadvantages

- Requires line of sight: In order to receive the satellite signals your receiver needs to have a clear view of its target satellite in the sky. Factors which block the path such as clouds or dust caused by weather could disrupt the signals.
- Satellites are expensive: Satellites are not cheap to build. They require expensive components which have to operate in space. A satellite launch can cost anywhere between \$50 million and \$400 million.
- Large signal delays: Since satellites are so far from the earth and the speed of light is still the limiting factor for communication, satellites suffer from large signal delays compared to ground based network which operate over shorter distances. These delays make satellite communication unsuitable for interactive communication such as with video/audio.

IEEE 802 wireless standards

IEEE stands for **Institute of Electrical and Electronics Engineers**. It is a professional association with nonprofit organization with its headquarter in **New York** in **United States of America**. It is composed of engineers, scientists, allied professionals, advancing innovation and technological excellence for the benefit

of humanity. IEEE mainly focuses in the areas **Electrical Engineering, Electronics & Communication Engineering, Computer Engineering, and Information Technology.**

History

IEEE was founded in 1963 by the merger of the two institutes, first is Institute of Radio Engineers (IRE) and second is American Institute of Electrical Engineers (AIEE).

Institute of Radio Engineers (IRE) was founded in 1912 and AIEE is founded in 1884. In the beginning, it had 150,000 members, 140,000 of whom were from the United States. By 2010, it had more than 395000 members in 160 countries.

Why do we need IEEE 802 standards?

Essentially, the IEEE 802 standards **help make sure internet services and technologies follow a set of recommended practices so network devices can all work together smoothly.** IEEE 802 is divided into different parts that cover the physical and data-link aspects of networking.

The number 802 has no significance: it was simply the next number in the sequence that the IEEE used for standards projects.

The services and protocols specified in IEEE 802 map to the lower two layers (data link and physical) of the seven-layer **Open Systems Interconnection (OSI)** networking reference model.

Name	Description
IEEE 802.1	Higher Layer LAN Protocols Working Group
IEEE 802.2	LLC
IEEE 802.3	Ethernet
IEEE 802.4	Token bus
IEEE 802.5	Token Ring MAC layer
IEEE 802.6	MANs (DQDB)
IEEE 802.7	Broadband LAN using Coaxial Cable
IEEE 802.8	Fiber Optic TAG

Cell Switching: The process of packet switching is resembles in cell switching. The difference is the packets length is fixed.

In cell switching, packets are a fixed length of 53 bytes with a 5 byte header.

Cell switching achieves high performance using hardware switches. There is no need to reserve resources in computer networks for a connection since the technology uses virtual rather than physical circuits. And after establishing a virtual circuit, you can achieve higher network throughputs thanks to minimized switching time.

ATM networks use “Packet” or “cell” Switching with virtual circuits. Its design helps in the implementation of high-performance multimedia networking.

ATM Cell Format –

As information is transmitted in ATM in the form of fixed-size units called **cells**. As known already each cell is 53 bytes long which consists of a 5 bytes header and 48 bytes payload.

