

Simplex, Half Duplex, Full Duplex Communication Channel

A communications channel can be defined as a pathway over which information can be conveyed. A channel can be defined by a physical wire that connects communicating devices, or by a radio, laser, or other radiated energy source that has no obvious physical presence. The required data for transmission should be sent through a communications channel has a source from which the information originates, and a destination to which the information is delivered, the source is called as the transmitter and the destination is called as the receiver. In between the transmitter and thereceiver, the transmission medium of the data, this is usually called as the channel of acommunication system. Although the required information for transmission originates from a single source, there may be more than one destination (more than one receiver), depending upon how many receive stations are linked to the channel and how much energy the transmitted signal possesses. If the channel length (transmission distance) is more and the transmission power is less, the receiversituated at a long distance cannot receive the data properly.

In a digital communications channel, the information can be represented by individual data bits that are encapsulated into multi bit message units. An example of a message unit that may be conveyed through a digital communications channel is a byte, which consists of eight bits. A collection of bytes can be grouped to form a frame or other higher-level message unit. These types of multiple levels of encapsulation facilitate the handling of messages in a complex data communications network.

If we consider any communications channel, it has a direction associated:

Simplex Channel: We know that the message source is the transmitter, and the destination is the receiver. A channel whose direction of transmission is unchanging is called as a simplex channel. In other words, a type of data transmission, which is taken place only in one direction (from one antenna to the other only), for example, a radio station is a simplex channel because it always transmits the signal to its listeners and never allows them to transmit back. A television set up can also be considered as the simplex type. The advantage of simplex mode of transmission is, since the data can be transmitted only in one direction, the entire band width can be used.

Half Duplex Channel: A half-duplex channel can be considered as a single physical channel in which the direction may be reversed. Messages can flow in two directions in a half-duplex type, but never at the same time. In other words it can be said that at a single time, the transmission of data are done in only one direction. For example, in a telephone call, one party speaks while the other listens. After a pause (when one party stops his speech), the other party speaks and the first party listens. Speaking simultaneously will result in a garbled sound that cannot be understood. The main difficulty of half-duplex mode of transmission is since two channels are used, the band width of the channel should be decreased.

Full Duplex Channel: A full-duplex channel can be used for transmitting

simultaneous message exchange in both directions. It consists of two simplex channels, a forward channel and a backward (reverse) channel, linking at the same points. The transmission rate of the reverse channel will be very slow if it is used only for flow control of the forward channel. The main problem of the full duplex mode of transmission is, since we are using two channels, the band width should be decreased.

Source:

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