Course Name: A Level (2nd Sem) Subject: DCN

Topic: Channelization [FDMA] Date: 14-05-20

Channelization is a **multiple-access** method in which the available bandwidth of a link is shared in time, frequency, or through code, between different stations.

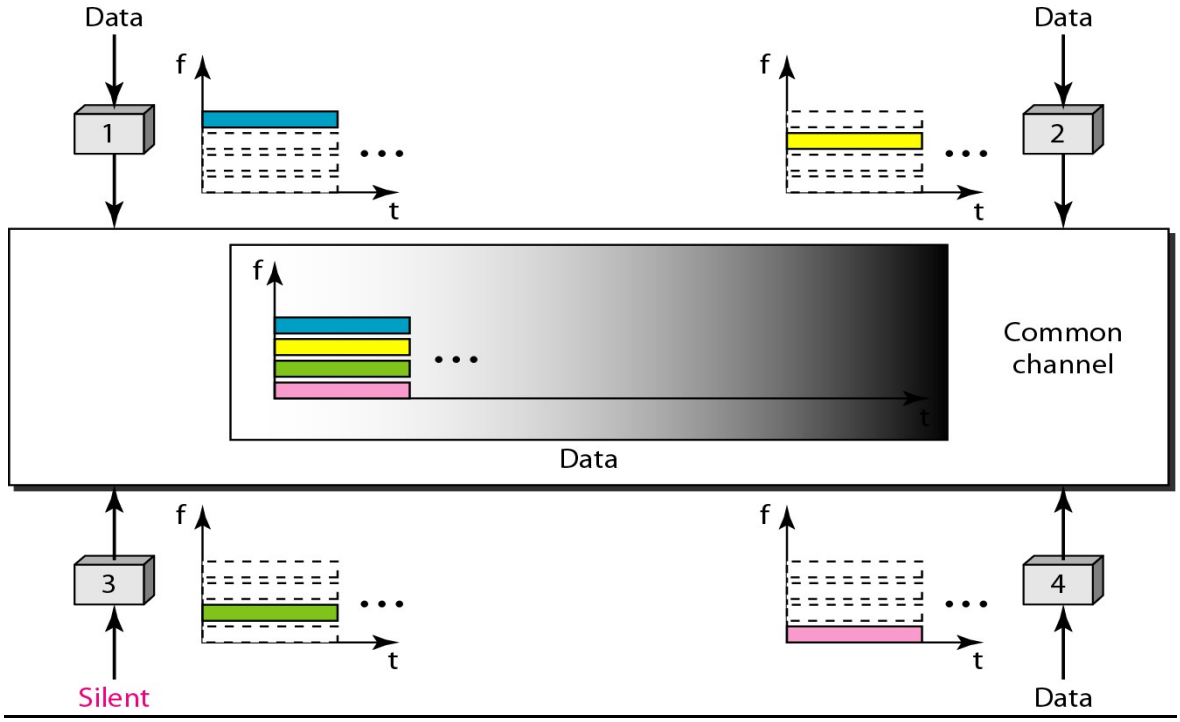
Types of Channelization Techniques:

The **three** Channelization methods are:

1. **Frequency-Division Multiple Access (FDMA)**
2. **Time-Division Multiple Access (TDMA)**
3. **Code-Division Multiple Access (CDMA)**

1. Frequency-Division Multiple Access (FDMA)

In frequency-division multiple access (FDMA), the available bandwidth is divided into frequency bands. Each station is allocated a band to send its data. In other words, each band is reserved for a specific station, and it belongs to the station all the time. Each station also uses a bandpass filter to confine the transmitter frequencies. To prevent station interferences, the allocated bands are separated from one another by small **guard bands**. Figure shows the idea of FDMA.



FDMA specifies a predetermined frequency band for the entire period of communication. This means that stream data (a continuous flow of data that may not be packetized) can easily be used with FDMA. This feature can be used in cellular telephone systems.

Although **FDMA** and **FDM** conceptually seem similar, there are **differences** between them. **FDM** is a physical layer technique that combines the loads from low-bandwidth channels and transmits them by using a high-bandwidth channel. The channels that are combined are low-pass. The multiplexer modulates the signals, combines them, and creates a bandpass signal. The bandwidth of each channel is shifted by the multiplexer.

FDMA, on the other hand, is an access method in the data link layer. The data link layer in each station tells its physical layer to make a bandpass signal from the data passed to it. The signal must be created in the allocated band. There is no physical multiplexer at the physical layer. The signals created at each station are automatically bandpass-filtered. They are mixed when they are sent to the common channel.

Exercises:

1. **Define Channelization and list the three protocols in this category.**
2. **What is FDMA? Compare and contrast FDMA with FDM.**