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

Topic: Channelization [TDMA] Date: 15-05-20

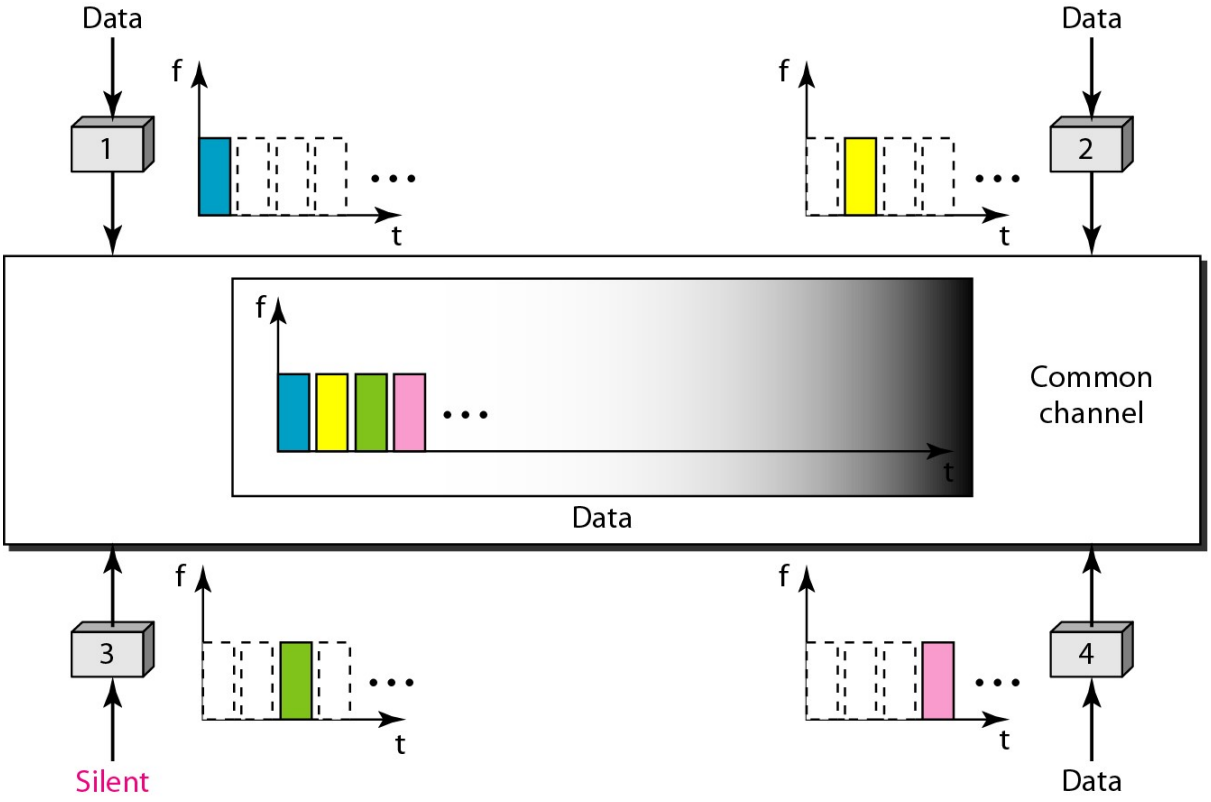
Types of Channelization Techniques:

The **three** Channelization methods are:

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

2. Time-Division Multiple Access (TDMA)

In time-division multiple access (TDMA), the stations share the bandwidth of the channel in time. Each station is allocated a time slot during which it can send data. Each station transmits its data in is assigned time slot. Figure shows the idea behind TDMA.



The main **problem** with TDMA lies in achieving synchronization between the different stations. Each station needs to know the beginning of its slot and the location of its slot. This may be difficult because of propagation delays introduced in the system if the stations are spread over a large area. To compensate for the delays, we can insert **guard times**. **Synchronization** is normally accomplished by having some synchronization bits (normally referred to as preamble bits) at the beginning of each slot.

Although **TDMA** and **TDM** conceptually seem the same, there are **differences** between them. **TDM** is a physical layer technique that combines the data from slower channels and transmits them by using a faster channel. The process uses a physical multiplexer that interleaves data units from each channel.

TDMA, 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 use the allocated time slot. There is no physical multiplexer at the physical layer.

Exercises:

1. **What is TDMA? Compare and contrast TDMA with TDM.**
2. **What is the main problem regarding TDMA and how can it be compensated?**