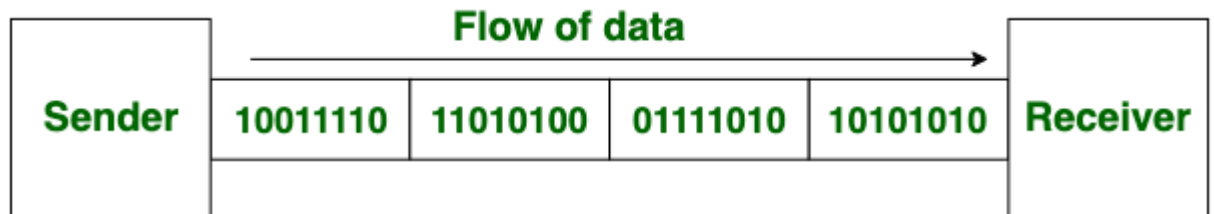


Synchronous and Asynchronous Transmission

Synchronous Transmission: In Synchronous Transmission, data is sent in form of blocks or frames. This transmission is the full-duplex type. Between sender and receiver, synchronization is compulsory. In Synchronous transmission, There is no gap present between data. It is more efficient and more reliable than asynchronous transmission to transfer a large amount of data.

Example:

- Chat Rooms
- Telephonic Conversations
- Video Conferencing



Synchronous Transmission

Advantages

1. It aids the user in transferring a huge amount of data.
2. Every byte is sent without a pause before the next.
3. It also helps to reduce timing errors.
4. It allows connected devices to communicate in real-time.

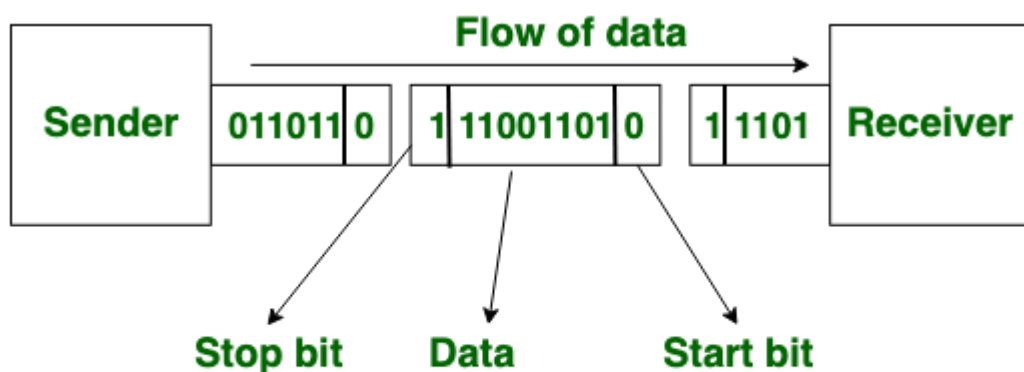
Disadvantages

1. The sender and receiver must operate at the same clock frequency simultaneously.
2. The accuracy of the received data is determined by the receiver's capacity to count the received bits precisely.

Asynchronous Transmission: In Asynchronous Transmission, data is sent in form of byte or character. This transmission is the half-duplex type transmission. In this transmission start bits and stop bits are added with data. It does not require synchronization.

Example:

- Email
- Forums
- Letters



Asynchronous Transmission

Advantages

1. It doesn't require synchronizing the receiver and transmitter.
2. It is a very flexible technique of data transmission.
3. This kind of transmission is simple to implement.
4. It allows users to send signals from sources with varying bit rates.
5. When the data byte transmission is complete, the data transmission may be resumed.

Disadvantages

1. The timing errors may occur because synchronization is difficult to determine.
2. These bits could be mistakenly recognized due to the noise on the channel.
3. The start and stop bits are extra bits that must be utilized in asynchronous transmission.
4. It transmits information at a slower rate.

Synchronous Transmission	Asynchronous Transmission	
1.	In Synchronous transmission , data is sent in form of blocks or frames.	In Asynchronous transmission , data is sent in form of bytes or characters.
2.	Synchronous transmission is fast.	Asynchronous transmission is slow.
3.	Synchronous transmission is costly.	Asynchronous transmission is economical.
4.	In Synchronous transmission, the time interval of transmission is constant.	In Asynchronous transmission, the time interval of transmission is not constant, it is random.
6.	In Synchronous transmission, there is no gap present between data.	In Asynchronous transmission, there is a gap present between data.
7.	Efficient use of transmission lines is done in synchronous transmission.	While in Asynchronous transmission, the transmission line remains empty during a gap in character transmission.
8.	The start and stop bits are not used in transmitting data.	The start and stop bits are used in transmitting data that imposes extra overhead.
10.	Errors are detected and corrected in real time.	Errors are detected and corrected when the data is received.
11.	Low latency due to real-time communication.	High latency due to processing time and waiting for data to become available.
12.	Examples: Telephonic conversations, Video conferencing, Online gaming.	Examples: Email, File transfer, Online forms.

**Synchronous
Transmission**

**Asynchronous
Transmission**