

Capacity of a channel in Computer Network

By capacity of a channel, it means the capacity of the **transmission medium (wire or link)**. Capacity is the number of bits the transmission medium can hold. So basically there are 2 types of channels – Full duplex and half duplex.

1. **Half duplex** – the transmission can happen in one direction at a time.
2. **Full duplex** – the transmission can happen in both the direction simultaneously.

For example, the transmission medium is operating in its maximum capacity then at that time the number of bits it is holding is called capacity of the transmission medium. **But how can we find the capacity mathematically?**

- If the length of the transmission medium is longer than its capacity will be higher.
- It also depends on the area of cross section of the medium.
- If the bandwidth is 1 bps, then every second it can take 1 bit. After every second it will move forward so that next bit could occupy the space. Therefore the final time in which it will occupy all the bits will be its propagation delay.

The capacity of the channel depends on two things:

1. Bandwidth
2. Propagation delay

Capacity = bandwidth * propagation delay

(in case of half duplex)

Capacity = 2 * bandwidth * propagation delay

(in case of full duplex)