

Bandwidth: Difference between max and min frequency range.

Frequency: No of cycles per second (of the signal being transmitted).

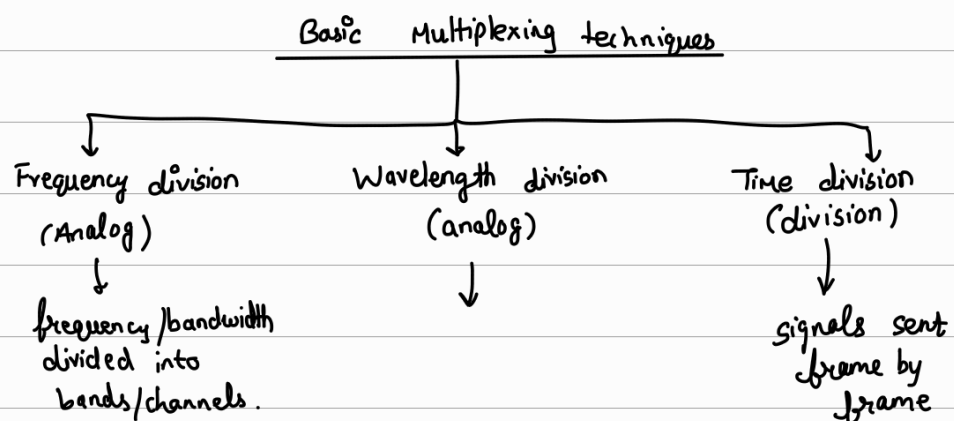
Optimal: (most?) appropriate usage of resources.

Bandwidth utilization

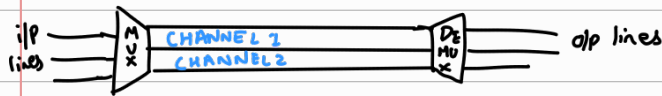
- wise use of available bandwidth using multiplexing.

Multiplexing - a set of techniques allowing simultaneous transmission of multiple signals across a single data link.

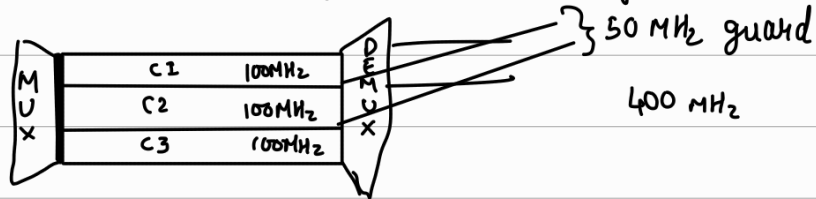
- An efficient system maximizes the utilization of all resources. Bandwidth is one of the most important resources.



Read from PPT \Rightarrow ① Frequency Division Multiplexing



guard bands \Rightarrow unused range to separate signals.



the remaining 100 MHz would be used for guard bands.

- Bandwidth for 1 channel = 4 kHz

- We need to combine 3 channels with bandwidth 12 kHz from 20 kHz to 32 kHz.

channels would be \rightarrow 20 kHz to 24, 24 to 28, 28 to 32 kHz.

Q. 5-channels with 100 kHz requirement, guard band with 10 kHz need.

\therefore required bandwidth = $5 \times 100 \text{ kHz} + 4 \times 10 \text{ kHz}$

$$= 500 + 40$$

$$= 540 \text{ kHz}$$

Time Division Multiplexing:

→ A digital multiplexing technique.

→ Synchronous

Statistical

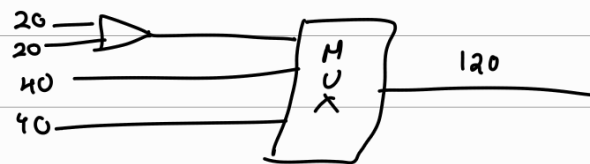
every input source

allotment

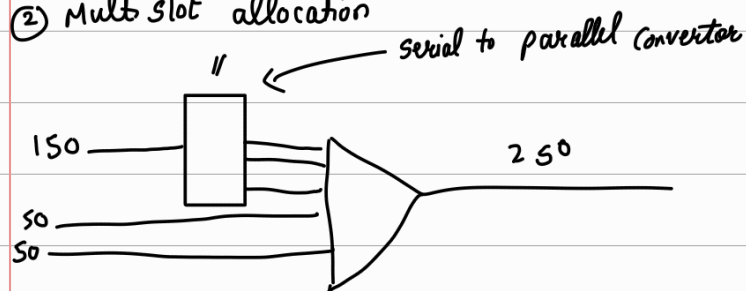
only input sources with data

duration of each slot is T/n , duration of each frame is T .

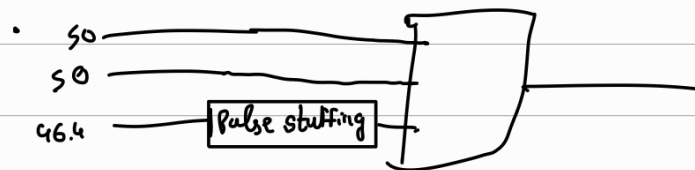
Data Rate Management } → ① Multi level multiplexing



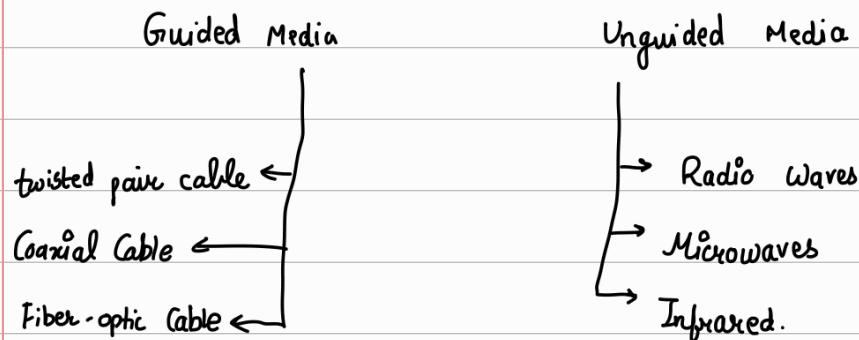
② Multi slot allocation



③ Pulse Stuffing



transmission media



twisted pair cable:

- Two cables twisted around each other, done so to cancel out and balance the noise and cross talk.

DOCSIS

→ Managed by Cable labs

→ Data over cable services internet specification.

→ Allows transmission of high bandwidth data over existing cable TV network.

* DOCSIS Architecture in slides/book

PS

These are my class notes.

Empty pages indicate I was absent or highly confused/sleepy.

Read relevant topics from book for the same.

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