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THAPAR INSTITUTE
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Course: Computer and Communication Networks

Topic: Satellite Network

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Outline of the lecture

- Digital Subscriber Line

- Asymmetric digital subscriber line (ADSL)

- Other types of DSL

- Traditional Cable TV network

- Hybrid fiber-coaxial network (HFC)

- Cable Modem

SATELLITE NETWORKS
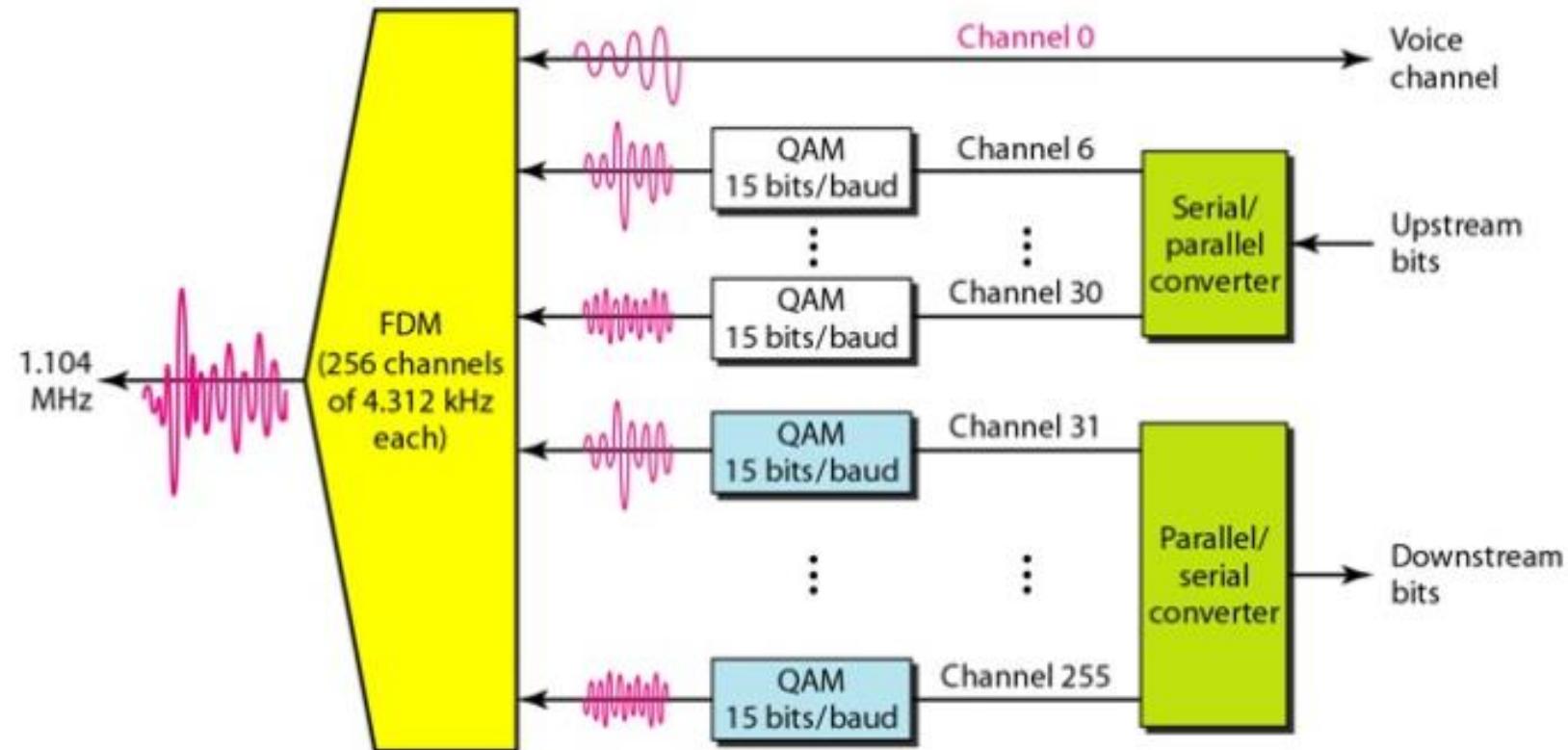
- A satellite network is a combination of nodes, some of which are satellites, that provides communication from one point on the Earth to another. A node in the network can be a satellite, an Earth station, or an end-user terminal or telephone.

Reference: 1. Ferouzan, Behrouz A., Data Communications and Networking,

# Asymmetric digital subscriber line (ADSL)
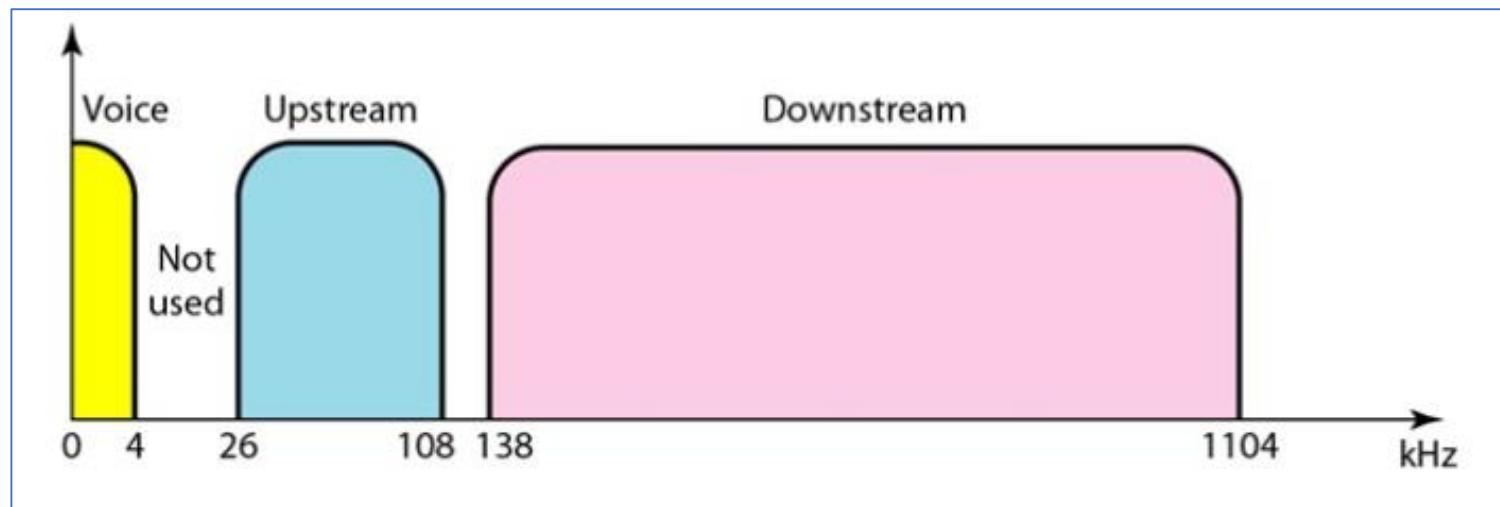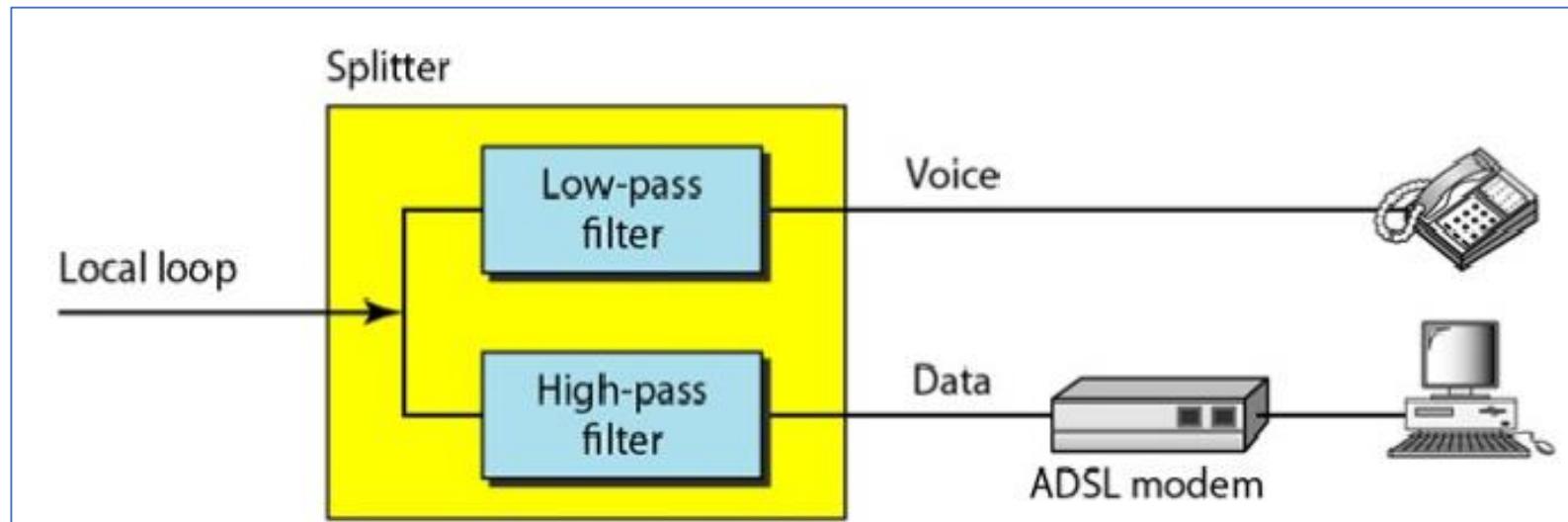
- **Asymmetric** : *data can flow faster in one direction.*
- **Digital**: *All data is purely digital, only at one end , modulated to be carried over the line.*
- **Subscriber line**: *Data is carried over a single twisted over the line.*
- It is a type of broadband communications technology that transmits digital data at a high bandwidth over existing phone lines to homes and businesses.
- The bandwidth and bitrates are greater toward the customer premises (downstream) than the reverse (upstream).
- Most homes and small business users typically use ADSL. The transfer of data from the internet to PC is much faster than PC to internet.
- It is used for gamers, streaming multimedia and downloading for large files.
- DSL uses analog sinusoidal carrier waves for data transmission. The waves are modulated and demodulated at the customer premises with ADSL modems.
- There must be pair of ADSL modem, one of the subscriber and other at the network operator.
- ADSL is an adaptive technology. The system uses a data rate based on the condition of the local loop line.
- During internet, two modems converting sifnal to a format and data can be transfferef over telephone line.

Reference: 1. Ferouzan, Behrouz A., Data Communications and Networking,

Discrete Multitone Technique

Reference: 1. Forouzan, Behrouz A., Data Communications and Networking
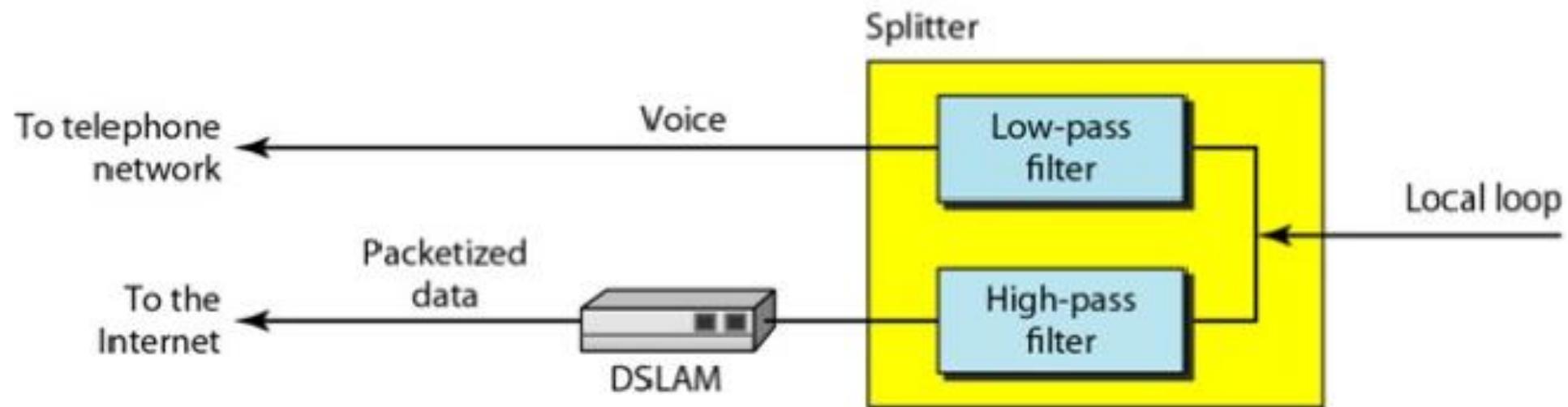
ADSL Bandwidth Division and Modem

Reference: 1. Ferouzan, Behrouz A., Data Communications and Networking,

Digital subscriber line access multiplexer(DSLAM)

DSLAM separates voice from data and data is sent to ISP after it packetized.

Reference: 1. Ferouzan, Behrouz A., Data Communications and Networking,

Other types of DSL
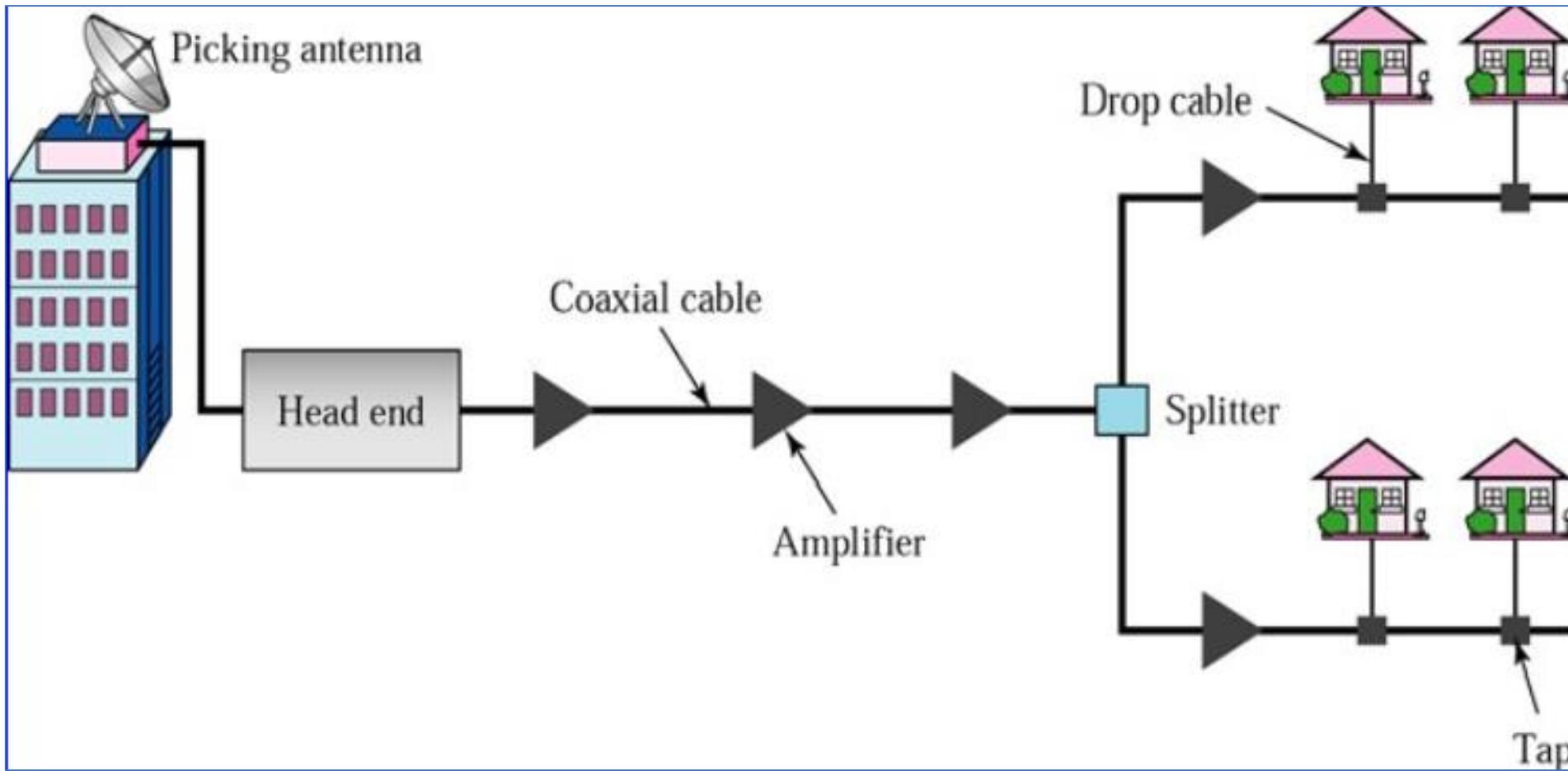
- SDSL:

✓ Symmetrical DSL, meaning the bandwidth toward the customer premises (downstream) is identical to the reverse (upstream). SDSL is not very common.

✓ It is a one twisted-pair version of HDSL. It provides full-duplex   symmetric communication supporting up to 768 kbps in each direction.

- VDSL:
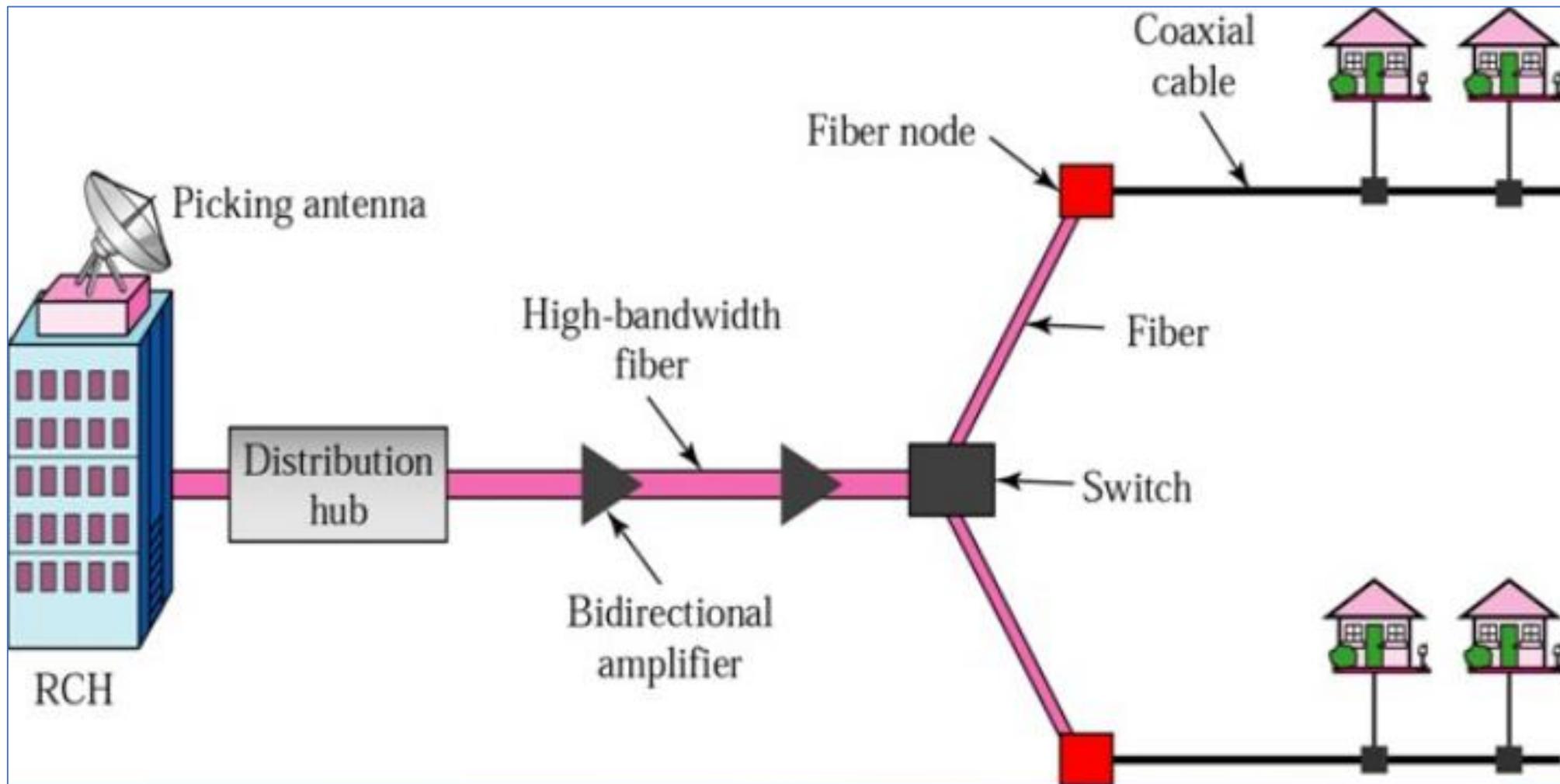
✓ Very-high-bit-rate DSL which uses up to seven frequency bands, so one can allocate the data rate between upstream and downstream differently depending on the service offering and spectrum regulations.

✓ It provides a range of bit rates (25 to 55 Mbps) for upstream communication at distances of 3000 to 10,000 ft.

✓ The downstream rate is normally 3.2 Mbps.

Reference: 1. Ferouzan, Behrouz A., Data Communications and Networking,

Traditional Cable TV network

Reference: 1. Ferouzan, Behrouz A., Data Communications and Networking,

Hybrid fiber-coaxial network (HFC)

Reference: 1. Ferouzan, Behrouz A., Data Communications and Networking,
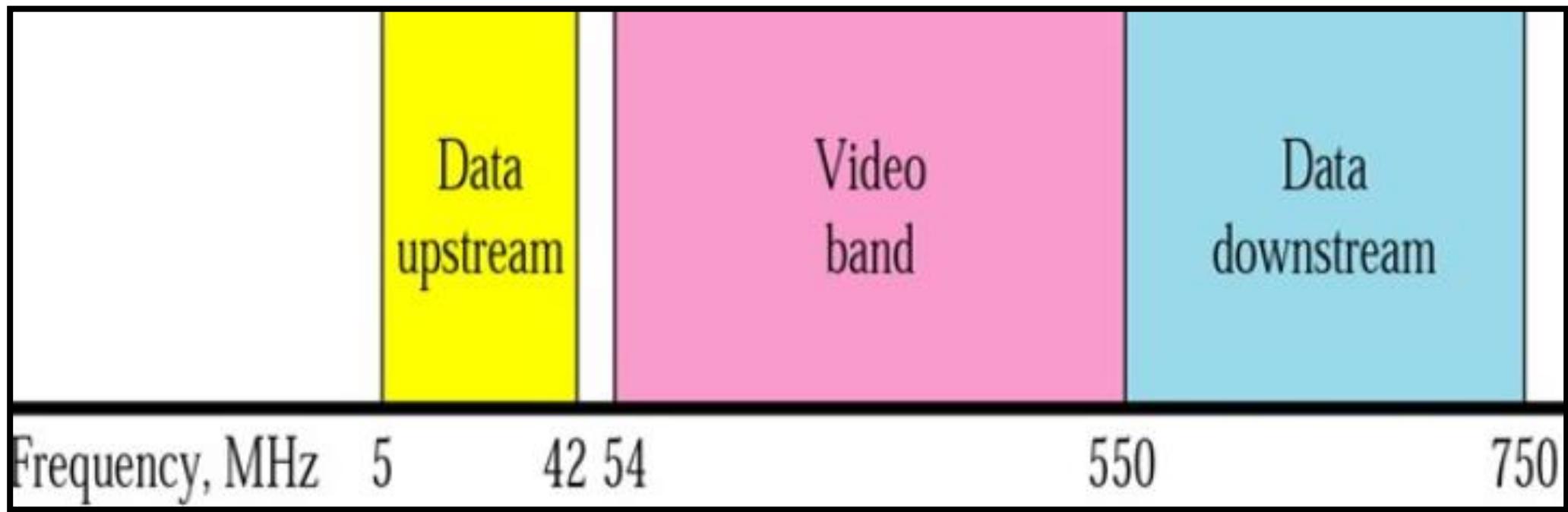
Cable TV bandwidth allocation

Reference: 1. Ferouzan, Behrouz A., Data Communications and Networking,
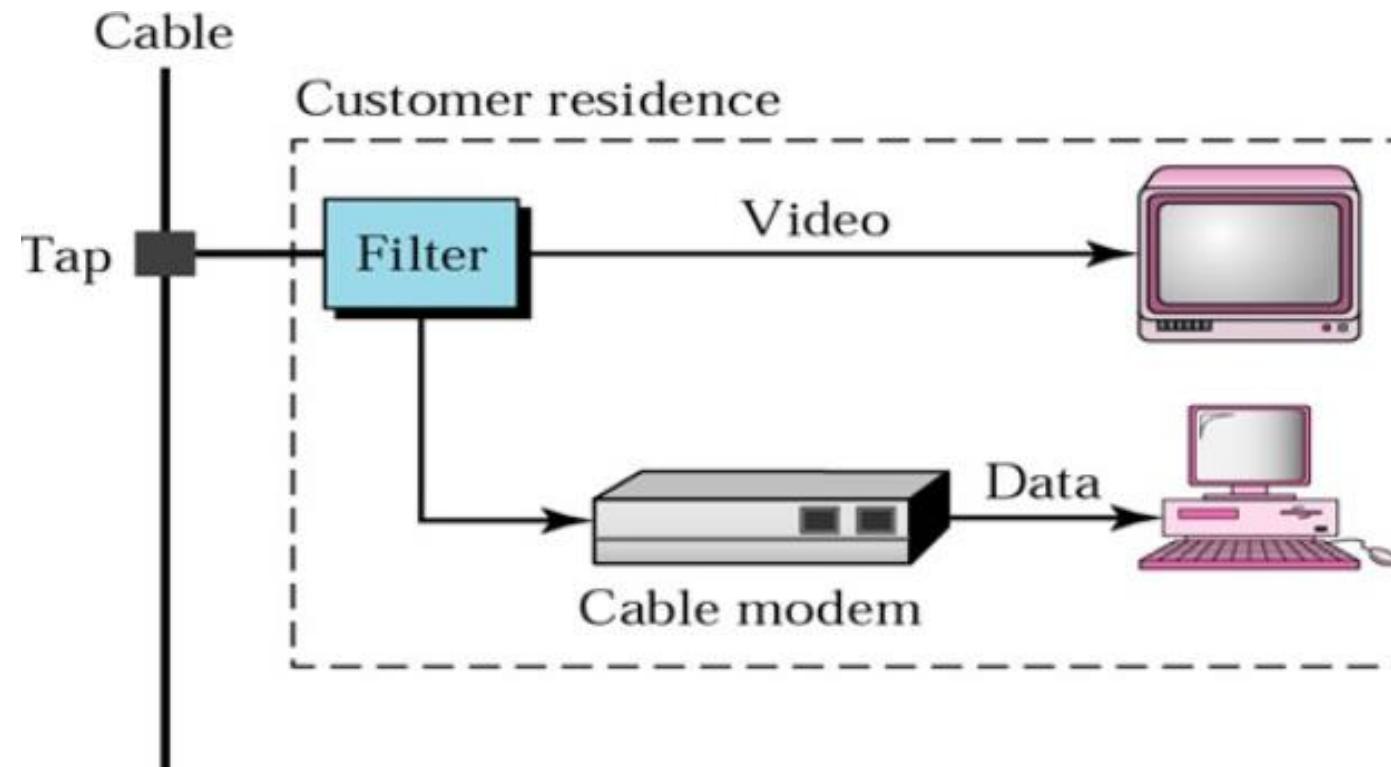
Cable Modem

✓ a cable modem(CM)

✓ cable modem transmission system (CMTS)

Reference: 1. Ferouzan, Behrouz A., Data Communications and Networking,
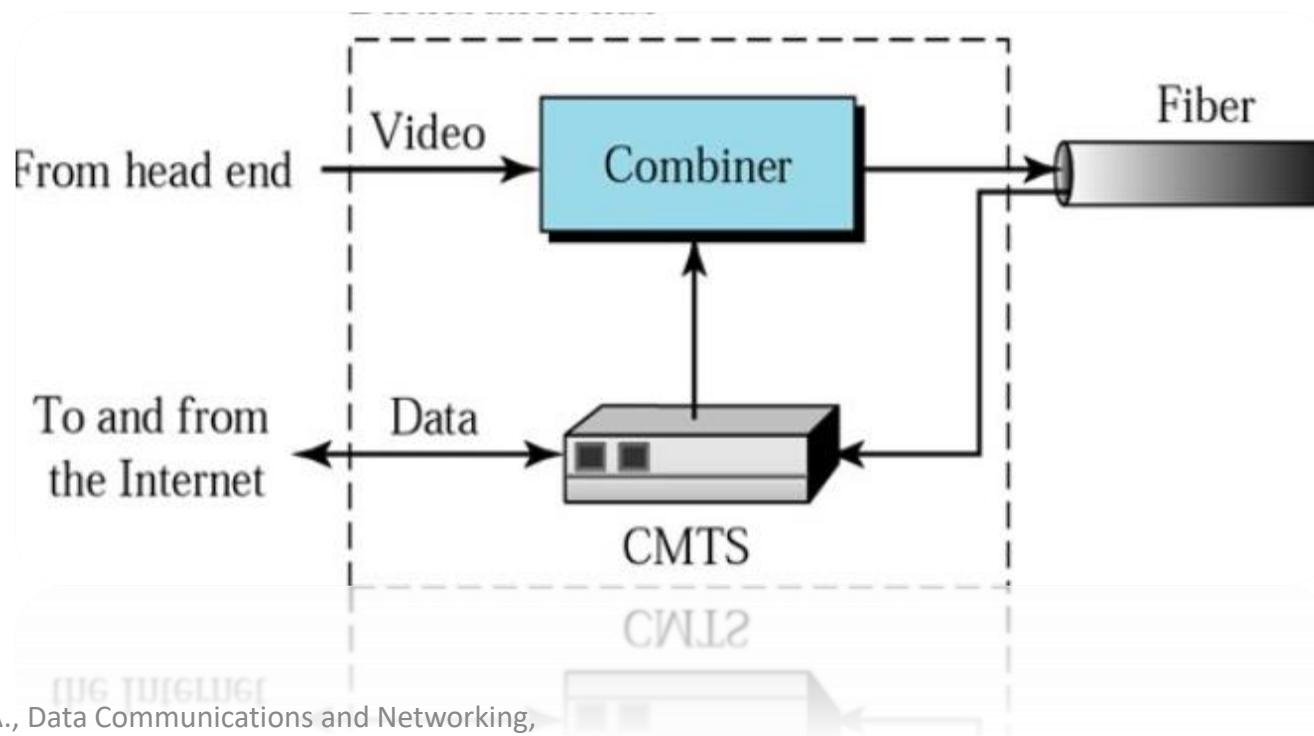
Cable Modem (CM)

- It is installed on the subscriber premises. It is similar to an ADSL,

Reference: 1. Ferouzan, Behrouz A., Data Communications and Networking,

Cable Modem Transmission System (CMTS)

- It is installed inside the distribution hub by the cable company. It receives data from the Internet and passes them to the combiner, which sends them to the subscriber.

Reference: 1. Ferouzan, Behrouz A., Data Communications and Networking,