Course Name: O Level (2nd Sem) **Subject: ICT**

Topic: Transmission Media Contd. **Date: 18-05-20**

Unguided Media: The media that has no any guided path to travel is known as unguided media. Since EM waves travel in Arial direction, these are all included in unguided media.

The waves in unguided media are as follows:

1. Radio waves.
2. Micro waves.
3. Infrared.

Radio waves: Radio waves are the EM waves of the frequency range: 3 KHz – 100MHz. This low frequency enables these waves to travel Omni-directional, up to long distances with a very high penetration power.
Due to these properties, Radio waves are used extensively in TV and Radio communication.
A dish antenna is needed to receive the signals sent by the sender.

Microwaves: These are the waves of frequency range: 300MHz – 300GHz. This medieval frequency range enables the waves to travel medium distances with a focused behaviour and a medium penetration power. The distance cover is also a little short than Radio waves.
Microwaves are used in Cellular telephony and Bluetooth kind of networks.
Horn antennas are used to receive the Microwave signals.

Infrared: Infrared is the very high frequency wave. The range starts from 300GHz to 400THz. Distance cover is very short (in feet). Propagation is in straight line and penetration power is NIL.
Infrared is used in short-distance device to device communications like Remote to TV etc.
LED (Light Emitting Diode) and LDR (Light Detecting Resistance) are used as antenna in Infrared communication.

Bandwidth: Bandwidth is the capacity of a transmission media. Though this capacity can be measured in many ways; we consider the frequency to be the best metric of bandwidth.
The bandwidth of a media can simply be defined as the range between lowest and highest supported frequencies by that media.
We can calculate the bandwidth as:

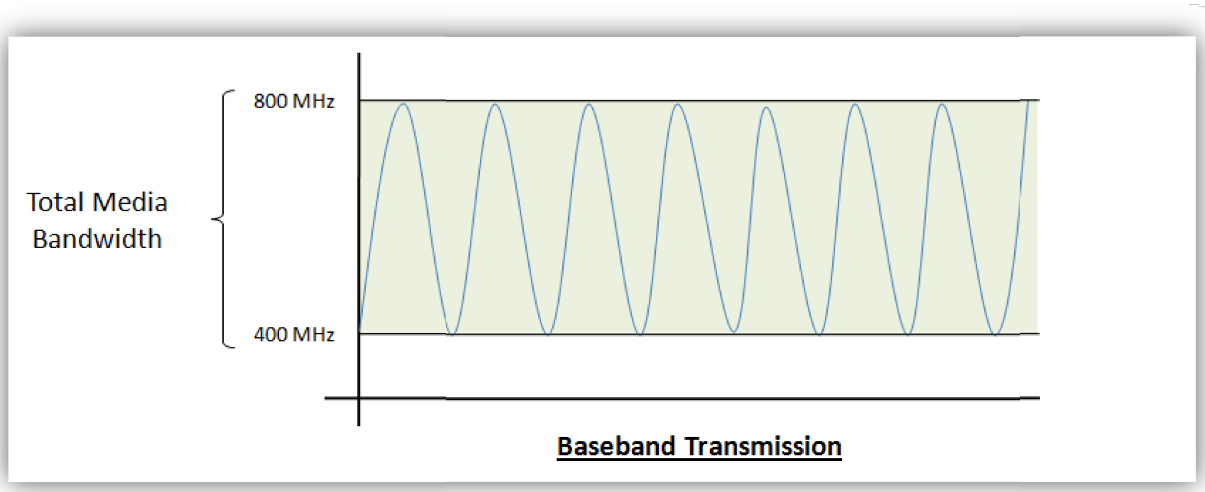
Bandwidth = highest supp. Frequency – lowest supp. Frequency

For example, a media that can carry signals as low as on 100KHz and as high as 400 KHz will have the bandwidth: (400KHz – 100KHz) = 300KHz.

Bandwidth is utilized in any of the following ways:

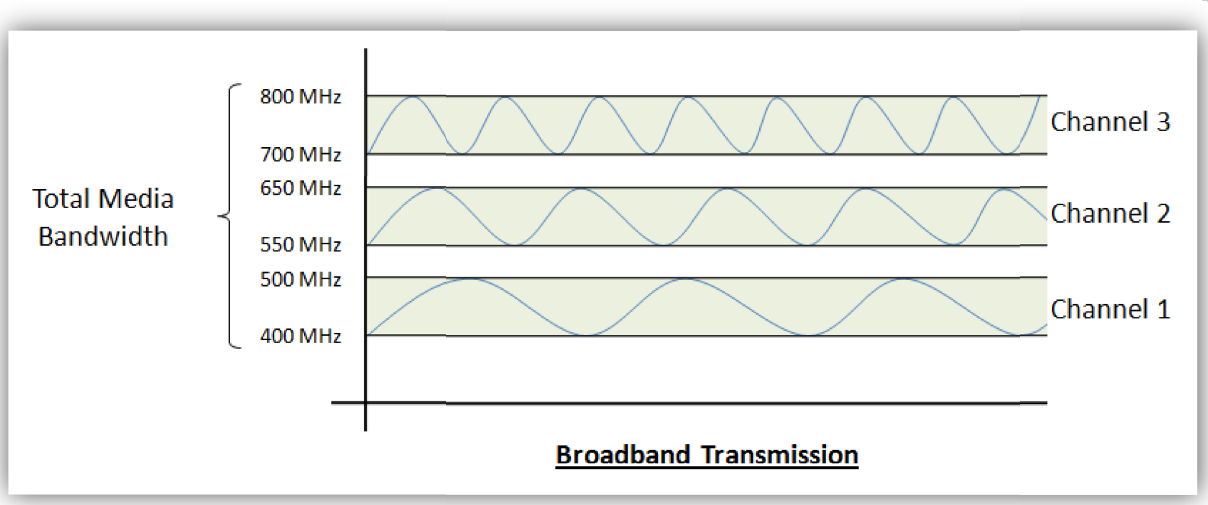
1. Baseband
2. Broadband

Baseband: When entire bandwidth is being used for just one single signal, this transmission is called baseband transmission. For example: Ethernet.



Baseband Transmission

Broadband: In this method, the entire bandwidth is distributed in many channels and every channel carries different signal simultaneously. For, Ex: Mobile communication and TV Channels.



Broadband Transmission

Assignments:

1. In short, define Radio waves and micro waves.
2. What is bandwidth? What will be the bandwidth of a media that has lowest capacity of 600MHz and highest capacity of 850MHz?