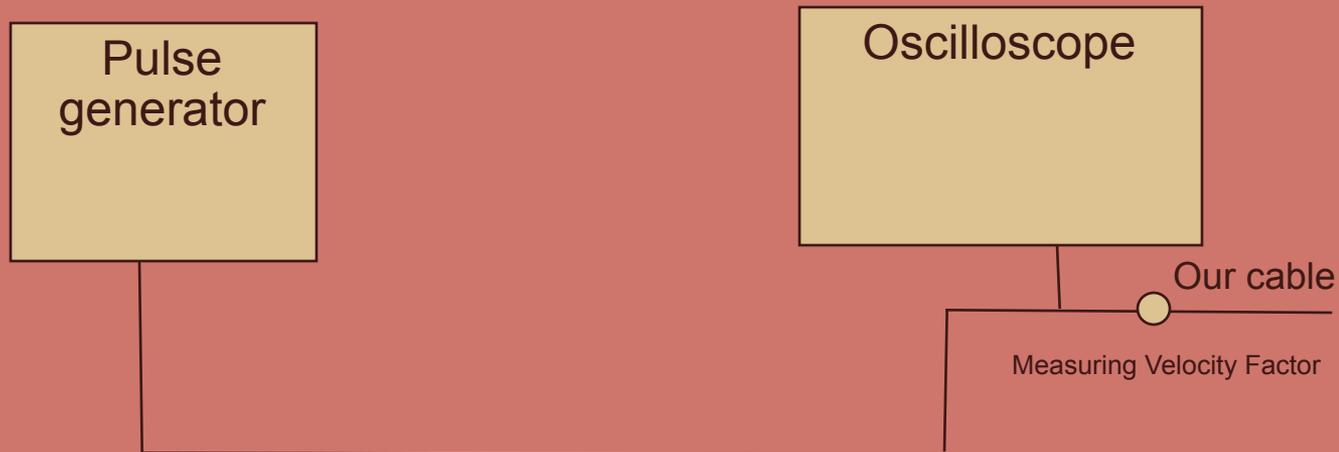# Report on the experiments in the laboratory
Group3

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Cable Measurement

- To find Velocity factor

Pulse generator		Oscilloscope

Our cable

Measuring Velocity Factor

$$\text{Velocity in Cable} = \frac{2L}{t}$$

$$\text{Velocity Factor} = \frac{c \times t}{2L}$$

1. We have soldered an N-type female connector to one side and an N-type male connector to the other side of the given cable.

Length of cable = 252 cm

Velocity factor = 0.735

2. With the velocity factor known, we were given two values of unknown resistances to find the value of each of them with the same setup and terminating the cable with Each of these resistors in turn, we made the measurements and calculated the values as

R1= 27 ohms

R2 = 45 ohms

Experiment on building an antenna for wireless

We built a linear antenna for wireless applications as per the instructions given, and measured the SWR of the same using a spectrum analyser and directional coupler.

The frequency of operation may be assessed as the Portion of the curve where we get the lowest value of SWR.

Frequency of our antenna = 2.46 GHz

Points noted

1. Change of antenna thickness has effect on the antenna gain

2. The greater the thickness, the lower the gain.

3. Also, it was confirmed that the different elements of the antenna has specific frequencies and that when the length of the antenna is changed, the frequency is affected.

Setting up of wireless LAN

- To setup a Bridge of NetGear so that it communicates with the Access Point (AP) of Group 2.

- To setup a local network from this PC

- Perform all the necessary tests to ensure that the local network is routed properly to the host PC and the bridge is communicating with Access Point
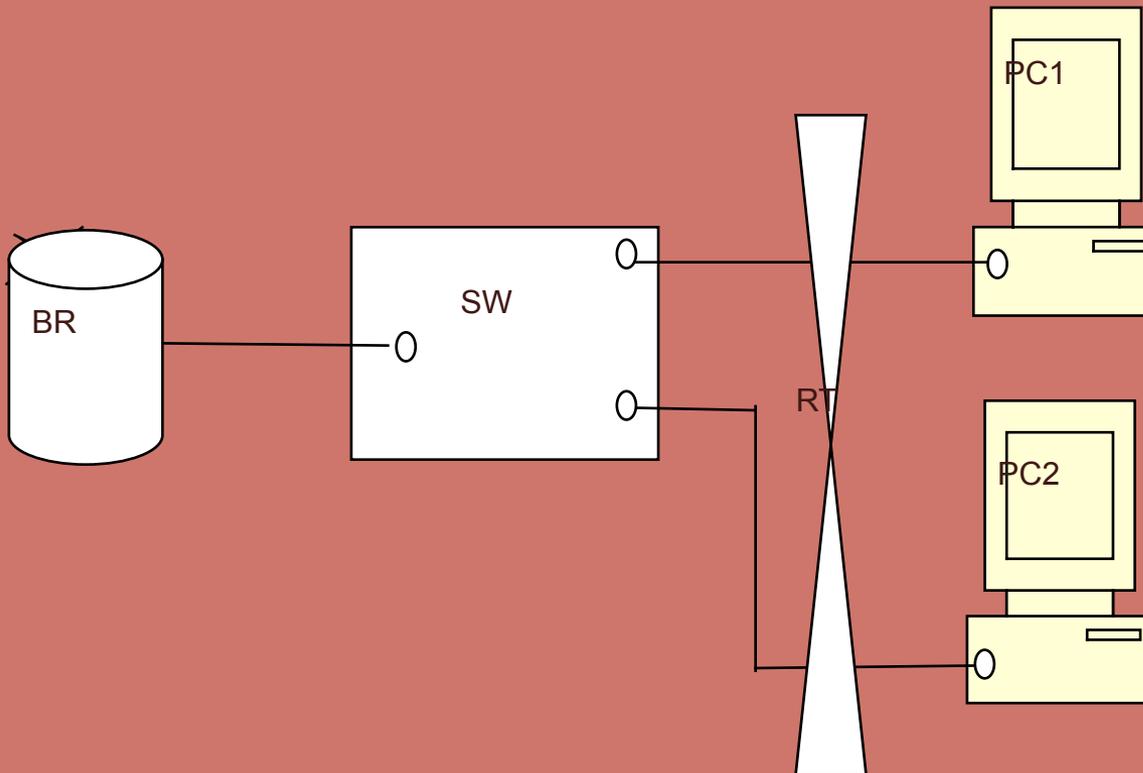
Equipments and software used

- Bridge (NetGear wge101)
- Switch (DLINK DES 1005D)
- 2 PCs (aghlab-24 and aghlab-25)
- UTP cables
- Slackware v 9.1

Solution
Block Diagram

BR

SW

PC1

PC2

RT

Steps

- Configure the PC1 using *netconfig* with IP address as 192.168.0.10;
    - Subnetmask 255.255.255.0;
    - Gateway 192.168.1.254
- Configure the Bridge BR in PC1
- IP address of Bridge : 192.168.0.201 ---default of Bridge –NetGear site link
- Reconfigure to IP address 192.168.1.2;
    - Subnetmask 255.255.255.0;
- Gateway 192.168.1.254
- Using ifconfig change the IP address of PC1 to 192.168.1.33;
- Subnetmask 255.255.255.0;
- Gateway 10.0.0.1 (for routing)
- Using netconfig, set the IP address of PC2 as 10.0.0.2;
- Subnetmask 255.255.255.0;
- Gateway 10.0.0.1
- Try pinging 10.0.0.2 from PC1 and pinging 10.0.0.1 from PC2, to ensure that the local network is working alright.

- For the wireless connection of the PC1 via Bridge to the Access Point, change the settings in the Netgear Bridge site as,
- Group : ictp
- Mode : Infrastructure
- Wap data encryption with key1 = 2482231622
- Bridge name : wge101
- (The Access point of group2 , named ictp, is given the
- IP address 192.168.1.227
- default gateway 192.168.1.254
- Configured in Channel 1 in adhoc mode)
- Ping 192.168.1.227 from PC1 and 192.168.1.33 from the PC connected to AP of group 2.
- The wired connection to Internet is given to Group 2. To access from our PC1, configure the web browser with proxy server proxy.ictp.trieste.it

Problems faced and solution

- Were not able to access the Access Point from the Bridge, nor the Bridge from the Access Point of Group2. Group 5, configured similarly like our group, also were not able to access the AP. The AP was responding to transmission from the PC connected to it.

- Tried to access the Bridge of Group5 from our Bridge – successful

Solution :

- While configuring the Bridge initially, we had given the option : *No Encryption.* It was found after a long experimentation and websearch that it had a bug, and so had to be encrypted for accessing an Access Point.

- After the wired connection given to the AP, we were not able to access the web browser.

Solution:

- In web browser, we had set the proxy server to be automatic. This is to be defined in the Browser settings as

- Net ExploreràEdITàPreferencesàAdvancedàProxiesàManual setting (proxy.ictp.trieste.it at port 3128)

What we learned

- Making use of tools for making measuring signals

- Using our hands instead of computers

- Learning the theory and immediately doing the practicals

- How to set up wireless networks in our home centres