Batch: B1

Roll Number: 16010420133 **Experiment Number: 2**

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Title of the Experiment: Virtual Lab on Fabrication of cables in Computer Networks

Theory**: A twisted pair consists of two insulated conductors twisted together in the shape of a spiral. It can be shielded or unshielded. The unshielded twisted pair cables are very cheap and easy to install. But they are very badly affected by the electromagnetic noise interference. Twisting of wires will reduce the effect of noise or external interference. The induced emf into the two wires due to interference tends to cancel each other due to twisting. Number of twists per unit length will determine the quality of cable. More twists mean better quality.**

There are 3 types of UTP cables: -

1) Straight-through cable

2) Crossover cable

3) Roll-over cable

A. Straight-through cable

Straight-Through refers to cables that have the pin assignments on each end of the cable. In other words, pin 1 connector A goes to Pin 1 on connector B, Pin 2 to Pin 2 ect. Straight-Through wired cables are most commonly used to connect a host to client. When we talk about cat5e patch cables, the Straight-Through wired cat5e patch cable is used to connect computers, printers and other network client devices to the router switch or hub (the host device in this instance).

B. Crossover cable

Crossover wired cables (commonly called crossover cables) are very much like Straight-Through cables with the exception that TX and RX lines are crossed (they are at opposite positions on either end of the cable. Using the 568-B standard as an example below you will see that Pin 1 on connector A goes to Pin 3 on connector B. Pin 2 on connector A goes to Pin 6 on connector B etc. Crossover cables are most commonly used to connect two hosts directly. Examples would be connecting a computer directly to another computer, connecting a switch directly to another switch, or connecting a router to a router. Note: While in the past when connecting two host devices directly a crossover cable was required. Now days most devices have auto sensing technology that detects the cable and device and crosses pairs when needed.

C. Roll-over cable

Rollover wired cables most commonly called rollover cables, have opposite Pin assignments on each end of the cable or in other words it is "rolled over". Pin 1 of connector A would be connected to Pin 8 of connector B. Pin 2 of connector A would be connected to Pin 7 of connector B and so on. Rollover cables, sometimes referred to as Yost cables are most commonly used to connect to a devices console port to make programming changes to the device. Unlike crossover and straight-wired cables, rollover cables are not intended to carry data but instead create an interface with the device.

Pre-Lab Test:

Pre Test

1) Cross-over cable is used to connect ?
- (●) Similar Devices
- ( ) Dissimilar Devices
- ( ) Router to Computer
- ( ) Router to Switch

2) What is the speed of the CAT 5 UTP Cale ?
- ( ) Upto 10 Mbps
- ( ) Upto 20 Mbps
- (●) Upto 100 Mbps
- ( ) Upto 600 Mbps

3) Roll-over cable is used to connect ?
- ( ) Similar Devices
- ( ) Dissimilar Devices
- (●) Router to Computer
- ( ) Router to Switch

Evaluate

1) Correct

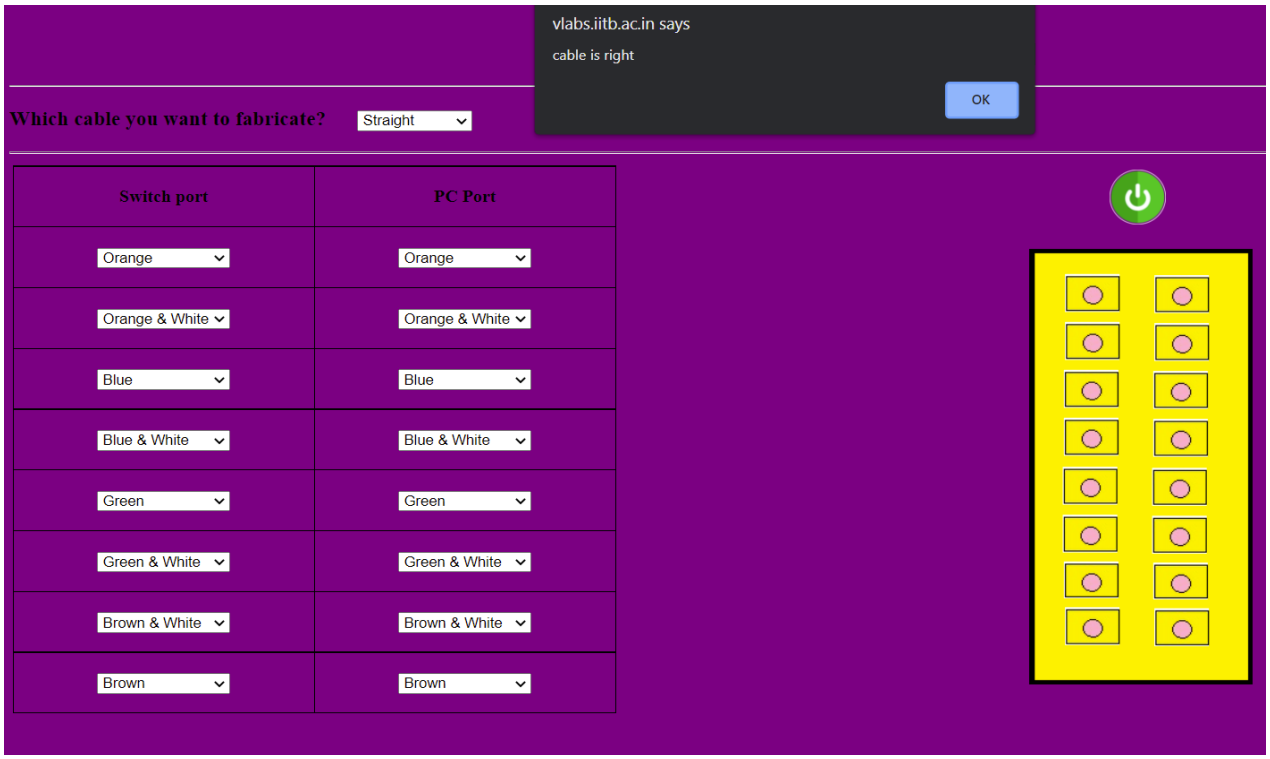
2) Correct

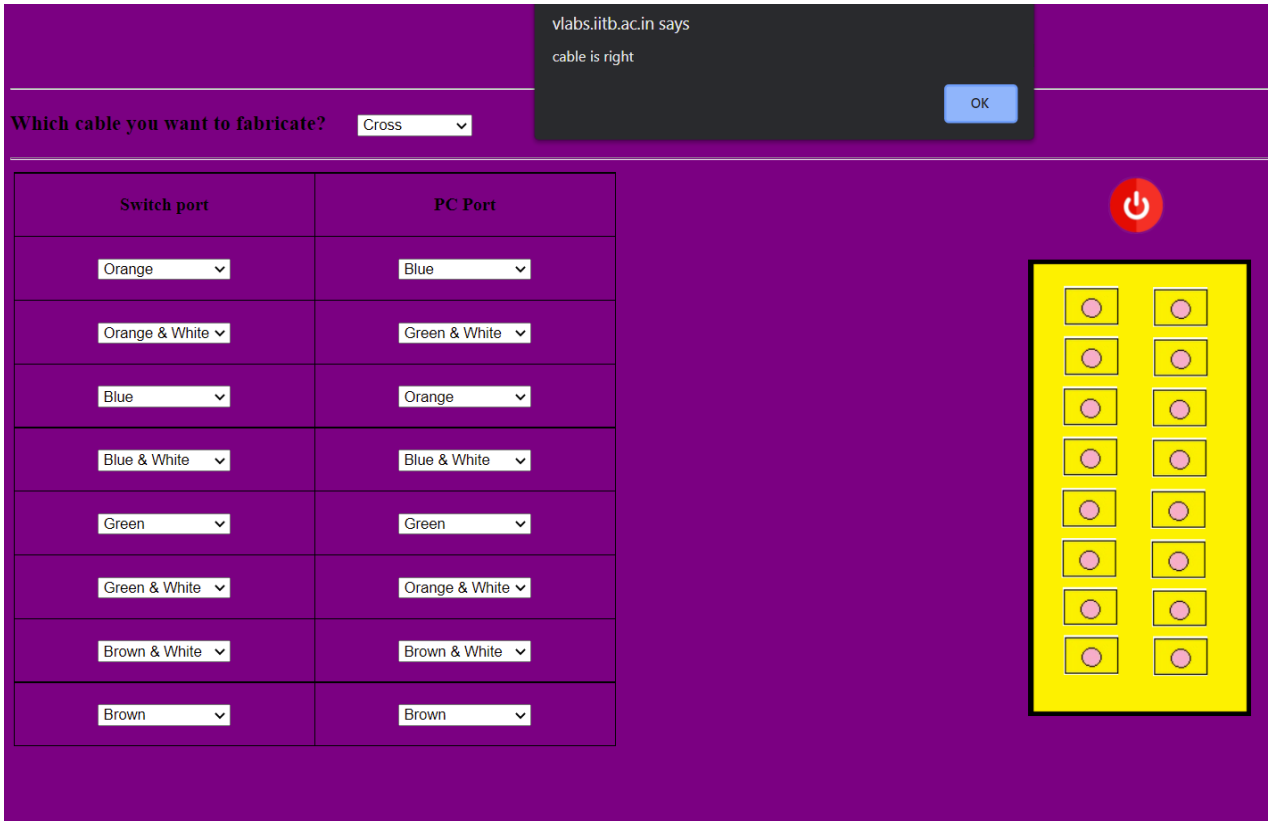
3) Correct

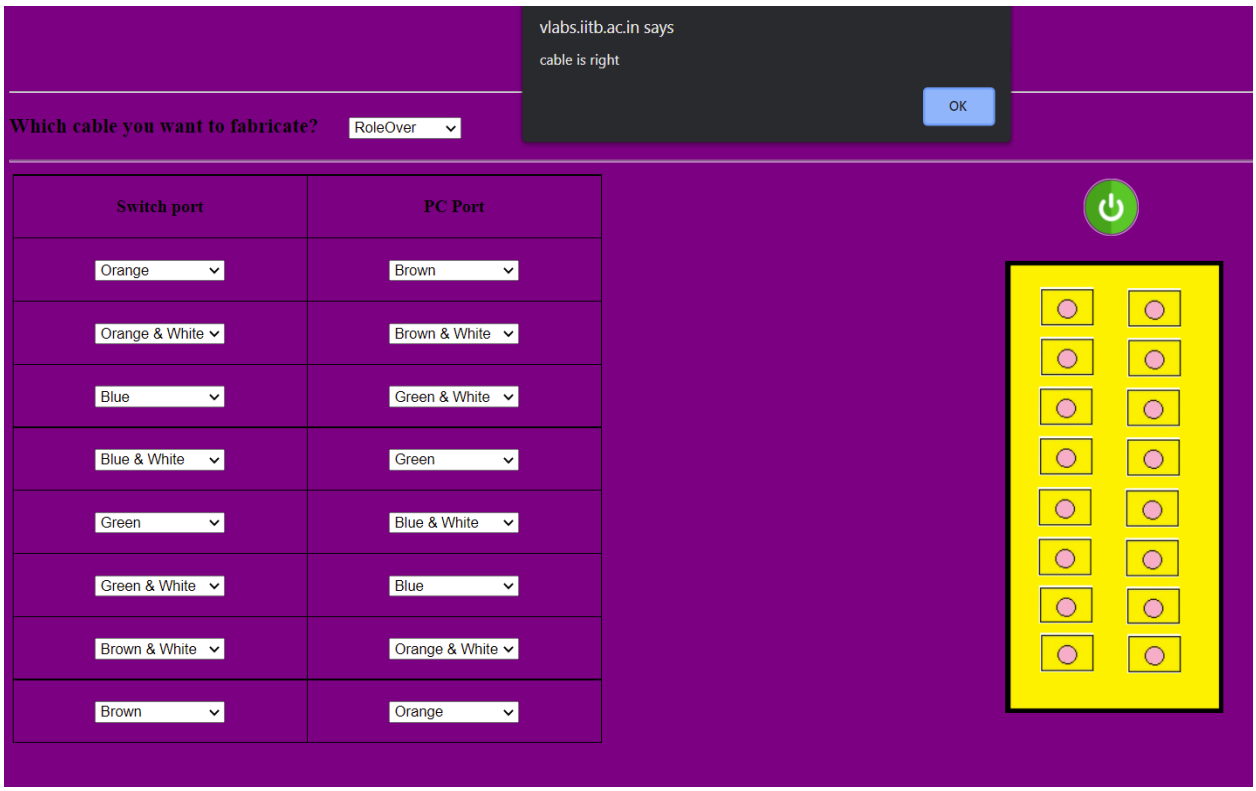
Procedure:

1) The aim is to Fabricate a UTP Cable.
2) To perform the experiment follow the below steps
3) A choice list would be given that which type of cable is to be fabricated
4) Select the choice out of the three choices given
5) Once a selection is done then the user have to make the cable ready
6) In-order to do so select the colour codes on both the sides i.e. Switch port and PC port.
7) After assigning the colour codes click on the Start button to observe that the cable made is correct or not.
8) Based on the observations made select if cable made is correct or not.

Outputs:


vlabs.iitb.ac.in says
cable is right
OK
Which cable you want to fabricate?
Straight
Switch port
PC Port
Orange
Orange & White
Blue
Blue & White
Green
Green & White
Brown & White
Brown


vlabs.iitb.ac.in says
cable is right
OK
Which cable you want to fabricate?
Cross
Switch port
PC Port
Orange
Blue
Orange & White
Green & White
Blue
Orange
Blue & White
Green
Green & White
Orange & White
Brown & White
Brown



Post Lab Question- Answers (If Any):

Post Test

1) Which connector is used to crimp a UTP cable

- ○ BNC
- ○ SC
- ○ ST
- ◉ RJ-45

2) Straight-through cable is used to connect ?

- ○ Similar Devices
- ◉ Dissimilar Devices
- ○ Router to Computer
- ○ Router to Switch

Evaluate

1) Correct

2) Correct

Q1. The slowest transmission speeds are those of _____

a. Twisted-pair wire

b. Coaxial cable

c. Fiber-optic cable

d. Microwaves

Answer: a. Twisted-pair wire

Q2. Which of the following device is used to connect two systems with different protocols?

a. Hub

b. Gateway

c. Repeater

d. None of the above

Answer: b. Gateway

Q3. The ST connector is used for transmission media

a. Twisted pair cable

b. Co-axial cable

c. Optical fiber

d. Air

Answer: a. Twisted pair cable

CO: Understand the data communication systems, network topologies and network devices.

Conclusion:

Successfully learned and implemented colour code of three different types of cables and their uses.

Resources needed:

http://vlabs.iitb.ac.in/vlabs-dev/labs_local/computer-networks/labs/exp1/simulation.php