Computer Networks

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S.No.	Date	Title	Page No.	Teacher's Sign/ Remarks
1	16/7/24	Study of various network commands used in Linux and windows		
2	23/7/24	Study of Network cables.		
3	30/7/24	Experiments of CISCO POCKET TRACER (simulation tools).		
4	06/8/24	Setup and configure a LAN (Local Area network) using a switch and Ethernet cables in your lab.		

02
23/7/24

Practical-2

AIM:-
Study of different types of network cables.

a] understand different types of network cable.

Different type of cables used in networking are:-

1. unshield Twisted pair (UTP) cable
2. shield Twisted pair (STP) cable.
3. Coaxial cable.
4. Fibre optic cable.

Cable Type	category	Maximum Data Transmission	Advantages / Disadvantages	Application/use
UTP	category 3	10 bps	**Advantages** • cheaper in cost. • Easy to install as they have a smaller overall diameter. **Disadvantages** • More prone to (EMI) Electromagnetic interference and noise.	10Base-T Ethernet Fast Ethernet Gigabit Ethernet
	category 5	up to 100 Mbps		
	category 5e	1 Gbps		
STP	category 6, 6a	10Gbps.	**Advantages:** • Shielded. • Faster than UTP • Less susceptible to noise and interference. **Disadvantages:** • Expensive. • Greater installation effort.	Gigabit Ethernet, 10G Ethernet (55m) widely used data centers. Gigabit Ethernet 10G Ethernet (100m).
SSTP	category 7	10Gbps		

Coaxial cable	RG-6 RG-59 RG-11	10-100 MbPS	Advantages: • High bandwidth • Immune to interference • Low Loss bandwidth. • versatile. Disadvantages:- • Limited Disadvantage • cost • Size is bulky.	Speed of signal is 500m. Television network High Speed internet connection
Fibre Optics Cable	Single mode Multi mode	10GbPS	Advantages: • High speed • High bandwidth • High security. • Long distance. Disadvantage • Expensive • Requires skilled installers	• Maximum distance of fibre optics cable is a around 100 meters.

b] Make your own Ethernet cross over cable / Straight cable:-

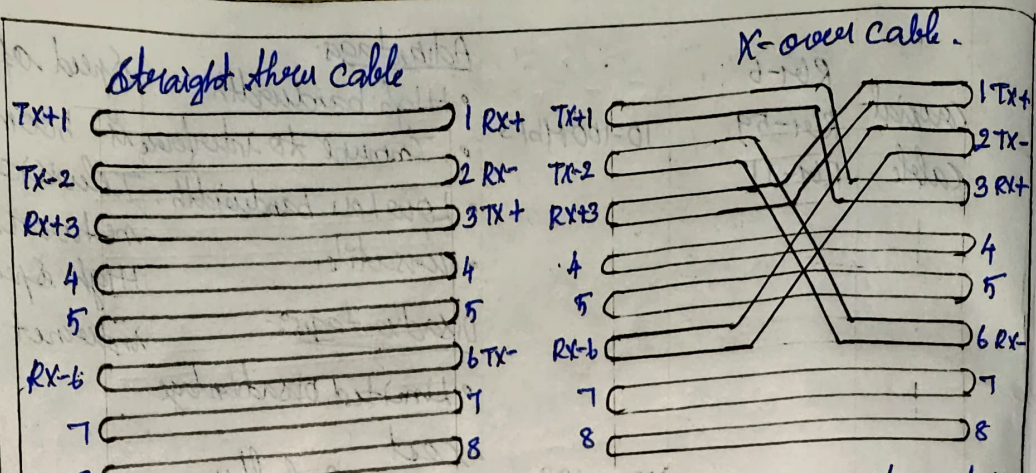
Tools and parts needed.

• Ethernet cabling: CAT5e is certified for gigabit support, but CAT5 cabling works as well just over a shorter distances.

• A crimping Tool. This is an all-in-one networking tool shaped to push down the pins in the plugs and strip and cut the shielding off the cables.

• Two RJ45 plugs.

• Optional Two plug shields.



Here you can compare different pinouts between a straight thru and X-over cable The Transmit and Receive pins.

straight through network cable: both sides should be A
crossover cable: one side A, one side B

Step 1: To start connection of the device, begin by threading shields onto the cable.

Step 2: Next, strip approximately 1.5 cm of cable shielding from both ends. The crimping tool has a round area to complete this task.

Step 3: After you will need to untangle the wires, there should be four "twisted pairs" Referencing back to the sheet, arrange them from top to bottom. one end should be in arrangement A and other in B.

Step 4: once the order is correct bunch them together in a line, and if there are any of stick out than others. Snip them back to create an even level. The difficult aspect is placing these into the RJ45 plugs without messing up the order. To do so, hold the plug with the clip side facing away from you and have the gold pins facing towards you as.

Step 5: Next, push the cable right in. The notch at end of plug needs to be Just over cable if isn't means that you stripped off too much shielding.

Step6: After the wires are securely sitting inside the plug, insert it into the crimping tools and push down.

Step7: Lastly, repeat for the other end using diagram A (to make a crossover cables) / using diagram B (to make a straight through cable).

Student observation:-

1] What is the difference between cross cable and straight cable?
Straight through cables are used to connect the devices that operate at different layers of the network model where as cross over cables are utilised to link devices operating and same layers.

2] Which type of cables is used to connect two PC?
Ethernet crossover cable.

3] Which type cable is used to connect a router/ switch to your PC?
Straight-through cable.

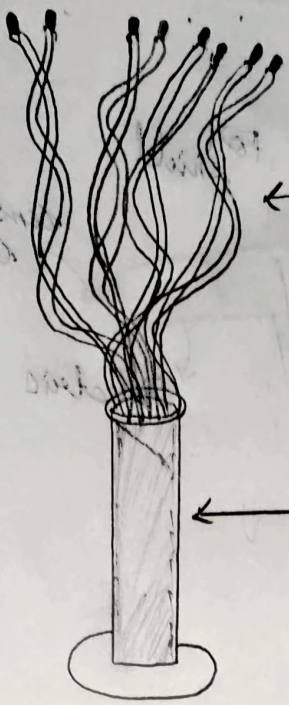
4] Find out the category of twisted pair cable used in your lab to connect PC to the network socket?
RS-45 (UTP).

5] Write down your understandings, challenges faced and output received while making twisted pair cross / straight cable?
The crimping machine should be a perfect to cut the cable.

23/7/24

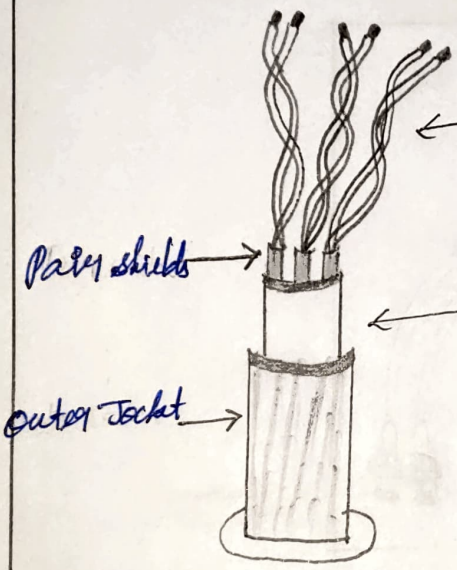
RESULT.
Thus, the different types of network cables are studied and connected successfully

UTP



Twisted pairs with color coded plastic insulation

outer Jacket



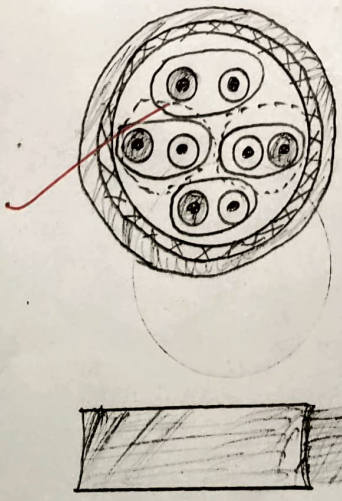
Twisted pairs with color coded plastic insulation

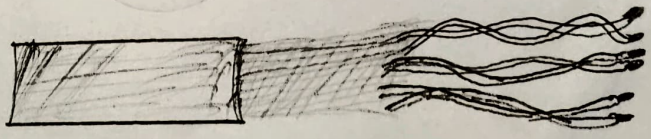
Pairs shields

overall shield.

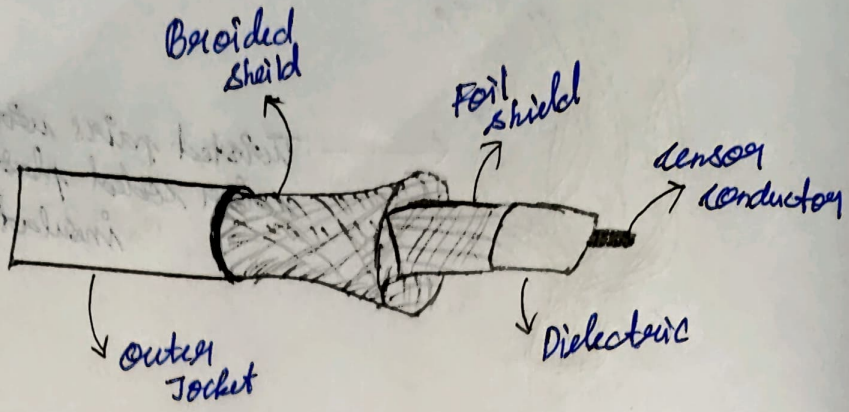
outer Jacket

STP

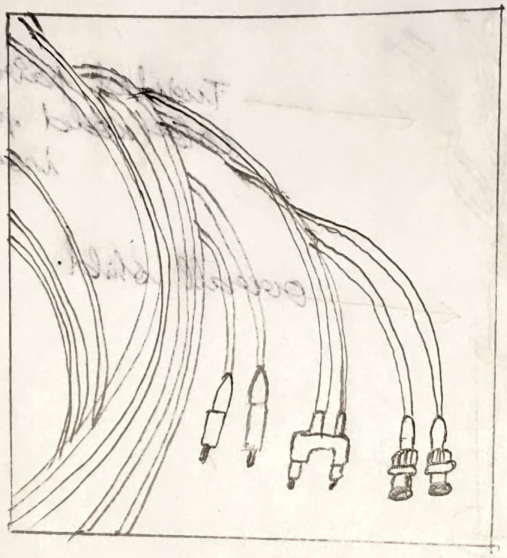




SSTP.



coaxial cable.



Fibre optics cable.