CS23532-COMPUTER NETWORKS-LAB MANUAL

Practical-2

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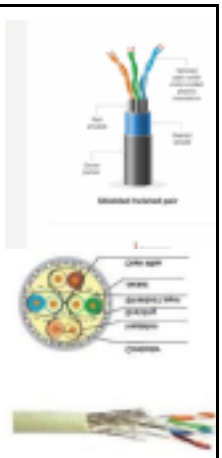
Aim: Study of different types of Network cables.

a) Understand different types of network cable.

Different type of cables used in networking are:

1. Unshielded Twisted Pair (UTP) Cable
2. Shielded Twisted Pair (STP) Cable
3. Coaxial Cable
4. Fibre Optic Cable

Cable type	**Category**	**Maximum Data Transmission**	**Advantages/ Disadvantages**	**Application/ Use**	**Image**
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 Fast Ethernet, Gigabit Ethernet	
	Category 5	Up to 100 Mbps			
	Category 5e	1Gbps			

STP SSTP	Category6, 6a Category 7	10Gbps 10Gbps	**Advantages** · Shielded. · Faster than UTP. · Lesssusceptible to noise and interference **Disadvantages** · Expensive · Greater installation effort	Gigabit Ethernet, 10 G Ethernet (55m) Widely used in data centres Gigabit Ethernet, 10G Ethernet (100m)	

Coaxial cable	RG-6 RG-59 RG-11	10-100Mbps	· High bandwidth · Immune to interference · Low loss bandwidth · Versatile · **Disadvantages** · Limited distance · Cost · Size is bulky	Speed ofsignal is 500m Television network High speed internet connections	
fibre optics cable	Single mode Multi mode	100Gbps	**Advantages** · High speed · High bandwidth · High security · Long distance **Disadvantages** · Expensive · Requiresskilled installers	· Maximum distance of fibre optics cable is around 100meters	

b) <u>Make Your Own Ethernet Cross-Over Cable/ Straight cable</u>

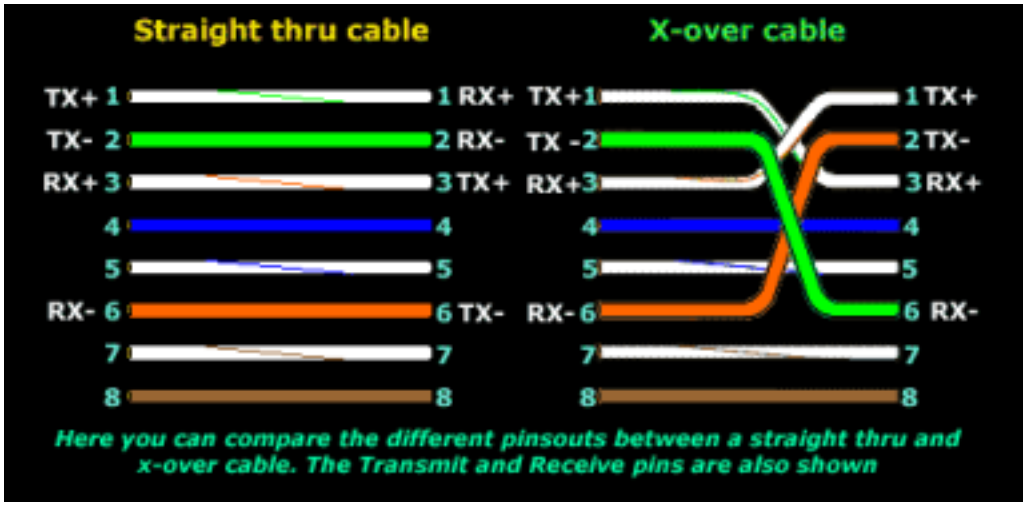
Tools and parts needed:

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

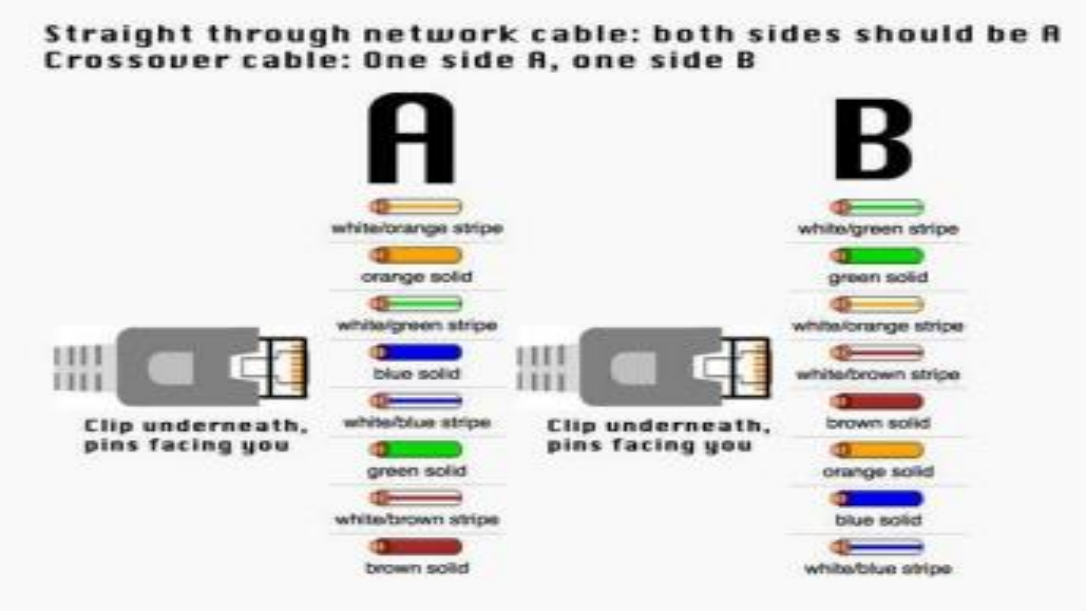
· A crimping tool. This is an all-in-one networking tool shaped to push down the pins in the plug and strip and cut the shielding off the cables.

· Two RJ45 plugs.

· Optional two plug shields.

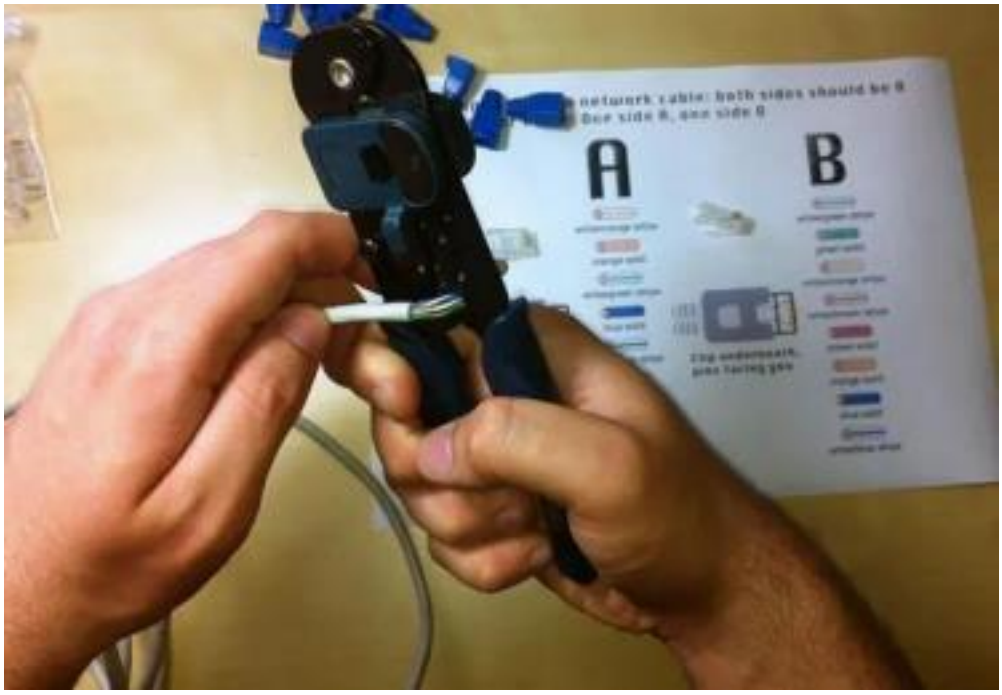


Difference between crossover cable and straight cable

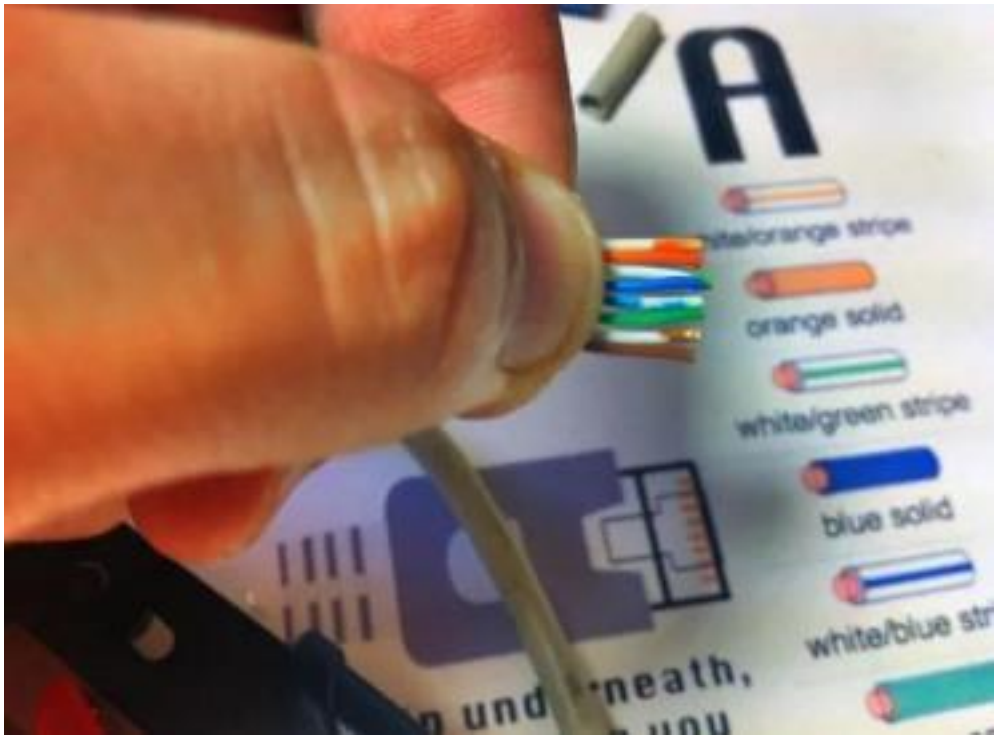


Step 1: To start construction of the device, begin by threading shields onto the cable.

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.

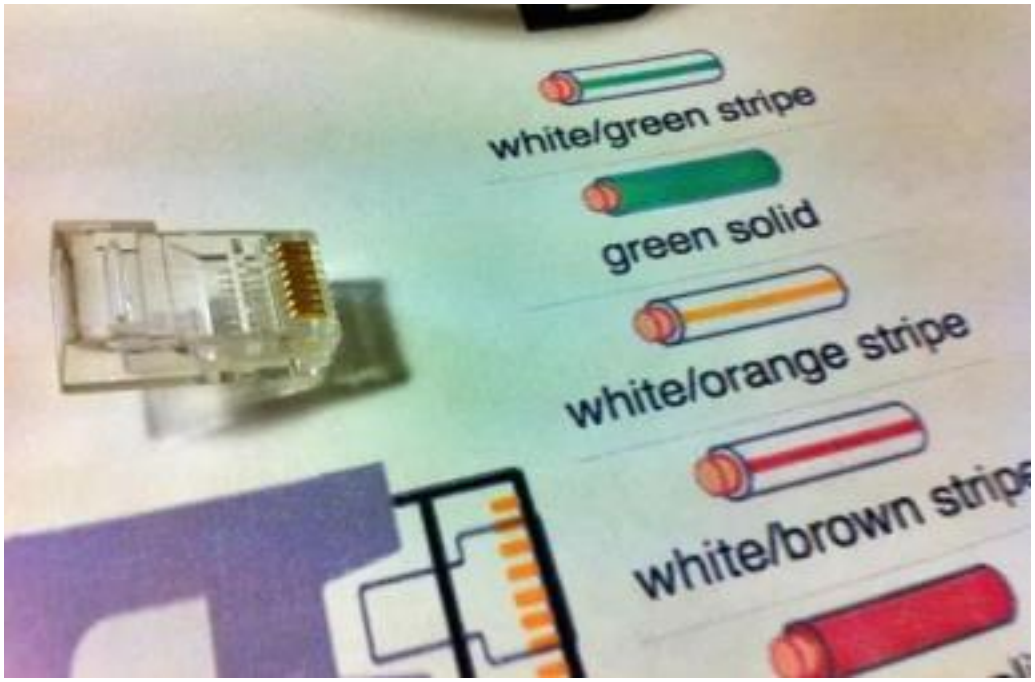


Step 3: After, you will need to untangle the wires; there should be four "twisted pairs." Referencing back to the sheet, arrange them from top to bottom. One end should be in arrangement A and the other in B.

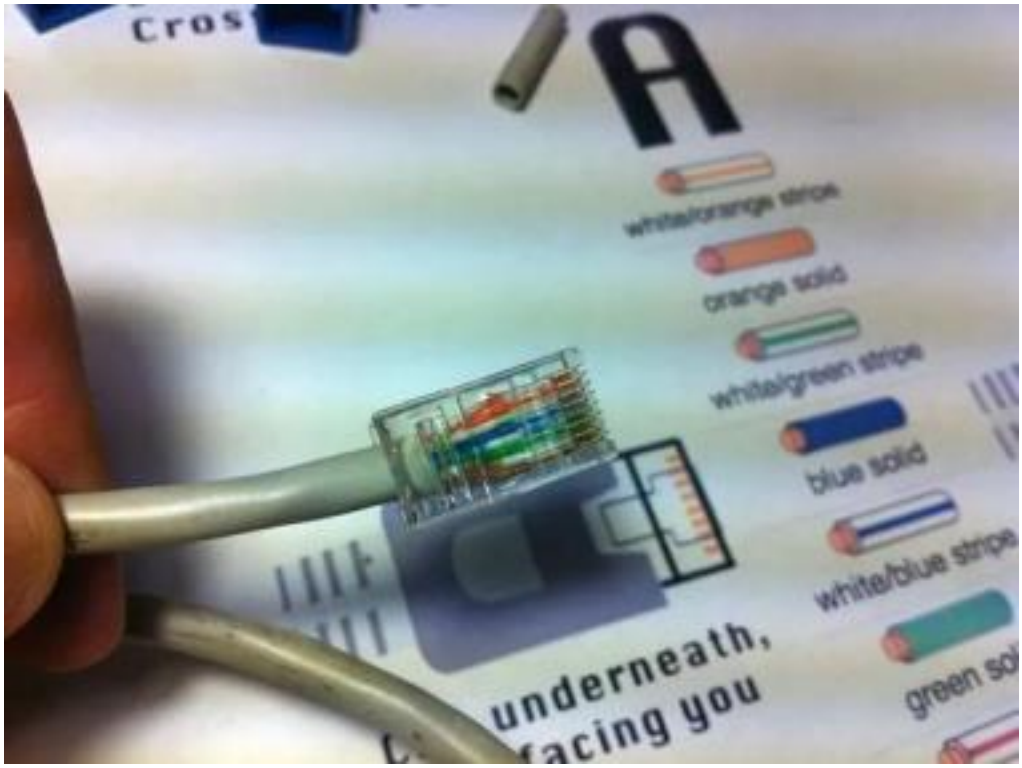


Step 4: Once the order is correct, bunch them together in a line, and if there are any that stick out farther than others, snip them back to create an even level. The difficult aspect is placing these into the RJ45 plug without messing up the order. To do so, hold the plug with the clip side facing away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

shown.



Step 5: Next, push the cable right in. The notch at the end of the plug needs to be just over the cable shielding, and if it isn't, that means that you stripped off too much shielding. Simply snip the cables back a little more.



Step 6: After the wires are securely sitting inside the plug, insert it into the crimping tool and push down.

It should be shaped correctly, but pushing too hard can crack the fragile plastic plug.

Step 7: Lastly, repeat for the other end using diagram B (to make a crossover cables)/ using diagram A (to make a straight through cable)

To test it, plug it in and attempt to connect two devices directly.

Student observation:-

1.What is the difference between cross cable and straight cable?

A **straight cable** connects different devices (like PC to switch), while a **cross cable** connects similar devices (like PC to PC).
The main difference lies in the wiring sequence of the transmit and receive pairs.

2. Which type of cable is used to connect two PC?(straight/Cross cable)

A cross cable is used to directly connect two PCs.
It swaps the transmit and receive wires to enable communication.

3. Which type cable is used to connect a router/switch to your PC? (straight/Cross cable)

A **straight cable** is used to connect a router or switch to a PC.
It follows the same pin configuration on both ends (T568A–T568A or T568B–T568B).

4. Find out the category of twisted pair cable used in your la to connect the PC to the network socket.

Generally, **Cat5e** or **Cat6** twisted pair cables are used in labs for network connections.
They support high-speed Ethernet communication and reduce interference.

5. Write down your understanding, challengesfaced and output received while making a twisted pair cross/straight cable.
I learned how to arrange color codes correctly and crimp RJ45 connectors securely.
The main challenge was maintaining wire order; successful testing showed proper connectivity and data transfer.

RESULT:
Thus the different types of network cables has been studied successfully.