DATE : 23.07.24 STUDY OF NETWORK
EX: 02 CABLES

Aim:

Study of different types of Network cables.

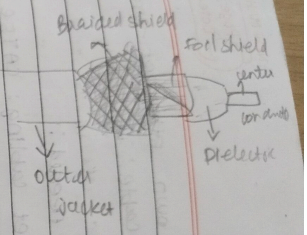
a) understanding different types of network cable.

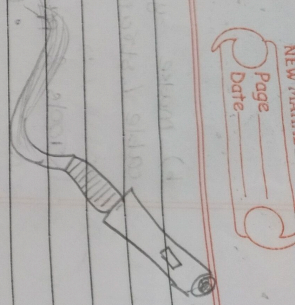
Different types of cable used in networking are:

1. unshielded twisted pair (UTP) cable
2. shielded twisted pair (STP) cable
3. coaxial cable
4. Fibre optical cable.

CABLE TYPE	CATEGORY	MAXIMUM DATA TRANSMISSION	ADV / DISADVANTAGE	Application/use	Image
UTP	category-3	10 bps	Advantage - cheaper in cost - easy to install as they have smaller overall diameter Disadvantages - more prone to (EMI) Electromagnetic interference and noise	10 Base-T Ethernet Fast Ethernet, Gigabit Ethernet Fast Ethernet, Gigabit Ethernet	
	category-5	upto 100 mbps			
	category-5e	1 Gbps			
STP	category-6 & 6a	10 Gbps	Advantages: - shielded - faster than UTP - less susceptible to noise & Interference	Gigabit Ethernet, 10G Ethernet, (55 m) widely used in data centers	
	category-7	10 Gbps			
SSTP			Disadvantage: - Expensive - Increase installation effort	Gigabit Ethernet, 10 G Ethernet (100m)	

		10Gbps		
STP			Disadvantage: - Expensive - Curbails installation effort	Gigabit Ethernet, 10 GI Ethernet (100m)
Coaxial cable	RG 6 RG 59 RG 11	10-100 Mbps	Advantage: - High bandwidth - Immune to interference - low loss bandwidth - versatile. Disadvantage: - Limited distance - cost - size is bulky.	speed of signal is 500m television network high speed internet connection.
fibre optics cable	single mode multi mode	100 Gbps	Advantages: - High speed - High bandwidth - High security - long distance Disadvantages: - Expensive - Requires skilled installers	Maximum distance of fibre optics cable is around 100 meters.





6) make your own Ethernet UTP RJ-45 over cable / straight cable:

Tools & 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.

steps to be followed:

1) To start construction of the device, begin by threading shields onto the cable.
2) Next, strip approximately 1.5 cm of cable shielding from both ends. The crimping tool has a round area to complete this task.
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.
4) Once the order is correct, bunch them togethes in a line,

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and if there are any that stick out farther than ~~objects~~ others, snip them back to create an even level. The difficult aspect is placing these into RJ45 plug without messing up the order. To do so, hold up the plug with the clip side facing away from you and have the gold pins facing toward you, as shown.

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.

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

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.

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student observation:

1. what is differend between cross cable & straight cable?

straight cables	cross cable
used to connect different types of device	used to connect similiar devices directly.
wiring is same on both ends	wiring is crossed over between ends
eg: pc to router	eg: pc to pc

2. which ~~is the~~ type of cable is used to connect two pc?

cross cable

3. which cable is used to connect router/switch to pc?

straight cable.

4. Find out the category of twisted pair cable used in your lab to connect the pc to network socket?

5. write do... based ... making ...

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5. write down your understanding, challenges faced and output received while making a twisted pair cross/ straight cable?
understanding : cable structure, pinouts
challenges : wiring, testing
output : working cable.

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Result:
The types of network cables and making cross-wired cable & straight through cable using clamping/ crimping tool.