Data Communication and Computer Networks Laboratory Manual
Lab 1

Cabling and file sharing

Experiment 1

Aim:

Study of different types of Network cables and Practically implement the cross-wired cable and straight through cable using crimping tool.

Cont….

Do the following Cabling works in a network

- Cable Crimping
- Standard Cabling and
- Cross Cabling
- Testing the crimped cable using a cable tester.

Apparatus/Tools/Equipments/Component:

- RJ-45 connector
- Crimping Tool,
- Twisted pair Cable,
- Cable Tester.
- Cable Stripper

Cont….

RJ45 connector is a standardized interface which often connects a computer to a local area network (LAN).

Crimping tool

- A crimping tool is a tool designed to crimp or connect a connector to the end of a cable.

Cable Stripper

- It is used to take off the protecting shielding around cables and expose the inner wires.

Standard Cabling:

- 10BaseT and 100BaseT are most common mode of LAN. You can use UTP category-6 cable for both modes.
- A straight through cable is used to connect a different device.
- Use straight-through cables for the following connections:
  - Switch to a router Ethernet port
  - Computer to switch
  - Computer to hub

Cont.....

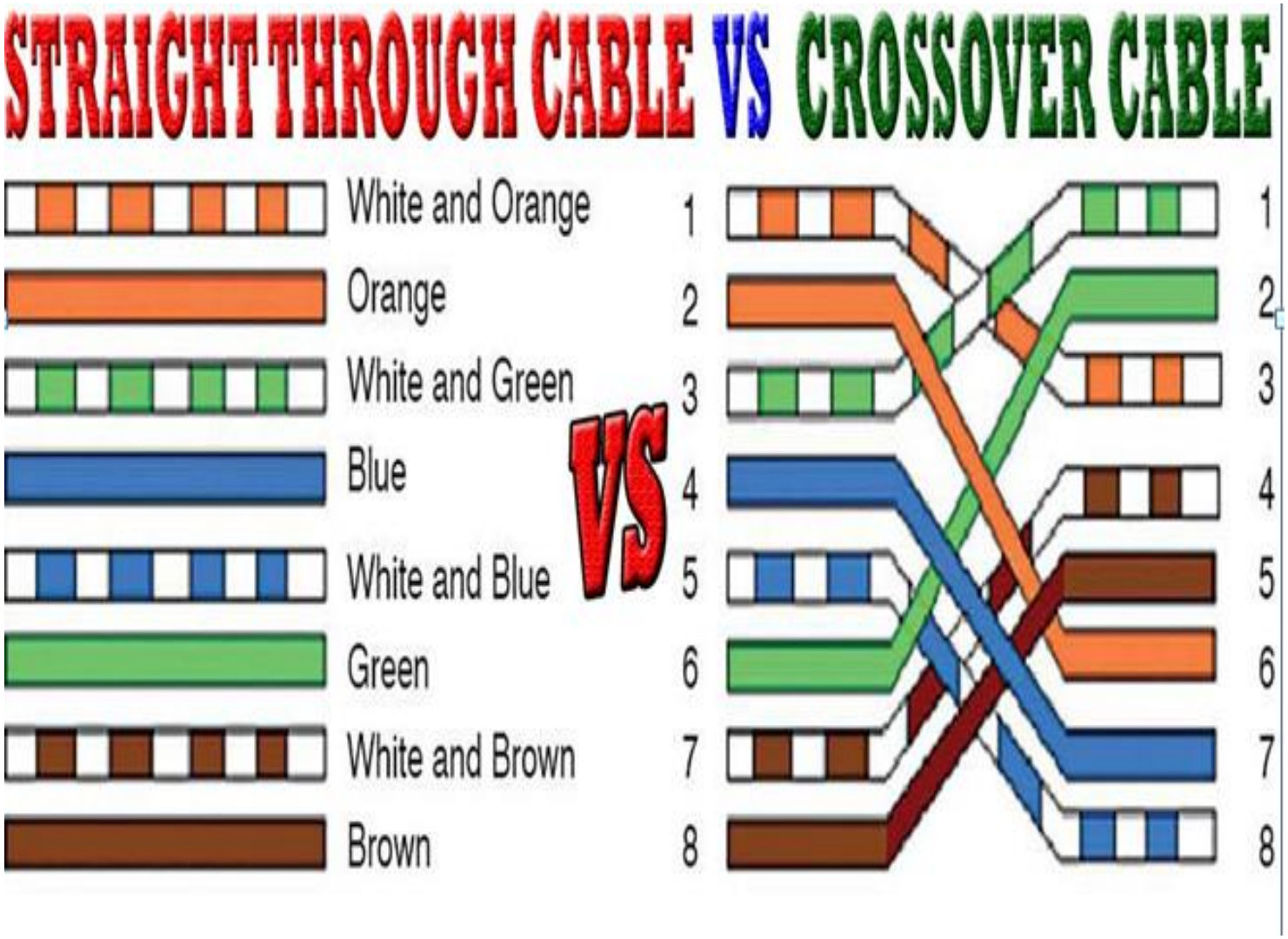
- A crossover cable **(T568A & T568B)** connects two devices of the same type. It is a cable that is used to interconnect two computers by "crossing over" (reversing) their respective pin contacts and Network device to network device, For example, router to router.
- To summarize, crossover cables directly connect the following devices on a LAN:
  - Switch to switch
  - Switch to hub
  - Hub to hub
  - Computer to computer
  - Computer to a router Ethernet port

Diagram shows you how to prepare Cross wired connection

RJ45 Pin # (END 1)	Wire Color	Diagram End #1	RJ45 Pin # (END 2)	Wire Color	Diagram End #2
1	White/Orange		1	White/Green	
2	Orange		2	Green	
3	White/Green		3	White/Orange	
4	Blue		4	White/Brown	
5	White/Blue		5	Brown	
6	Green		6	Orange	
7	White/Brown		7	Blue	
8	Brown		8	White/Blue	

Diagram shows you how to prepare straight through wired connection

RJ45 Pin # (END 1)	Wire Color	Diagram End #1	RJ45 Pin # (END 2)	Wire Color	Diagram End #2
1	White/Orange		1	White/Green	
2	Orange		2	Green	
3	White/Green		3	White/Orange	
4	Blue		4	White/Brown	
5	White/Blue		5	Brown	
6	Green		6	Orange	
7	White/Brown		7	Blue	
8	Brown		8	White/Blue	


STRAIGHT THROUGH CABLE VS CROSSOVER CABLE
White and Orange
Orange
White and Green
Blue
White and Blue
Green
White and Brown
Brown
VS
1
2
3
4
5
6
7
8
1
2
3
4
5
6
7
8

How to Crimp an Ethernet Cable

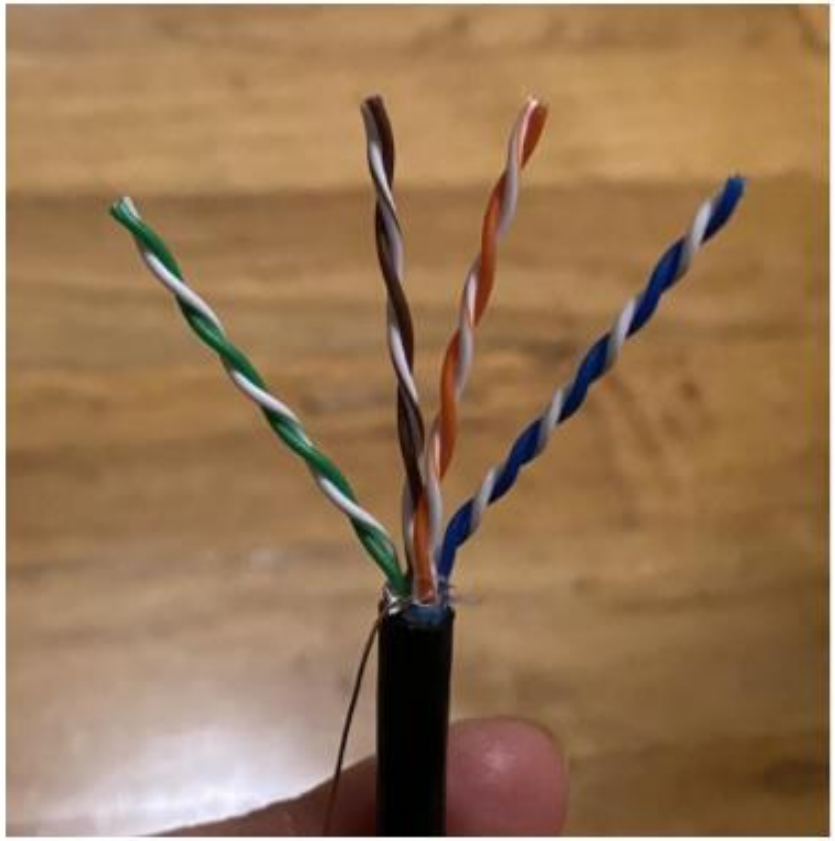
- Step 1: Strip the cable

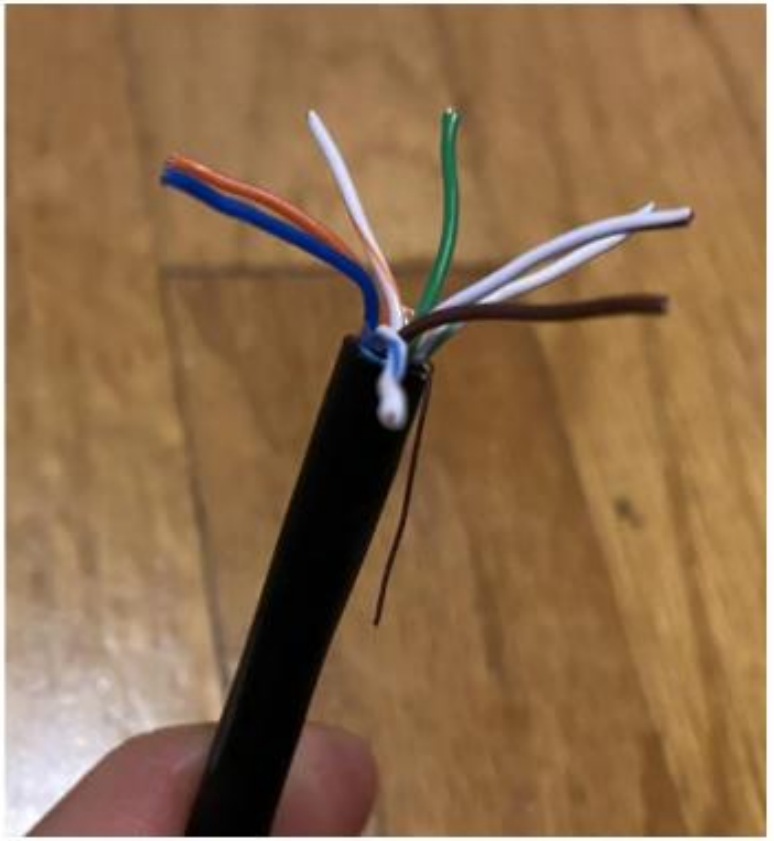
- Push the cable into the razor slot of the strip tool and turn it around the cable to make an even cut around the sheath. Careful not to nick the wires inside!
- Unwrap the blue foil shielding and plastic to uncover the twisted wire pairs.
- Push the copper grounding wire to the side. (Ignore the white string.)

- Step 2: Organize the wires
- In this step, you’ll be taking the 8 colored wires inside the ethernet cable and putting them into the correct ordering of colors.

Cont..

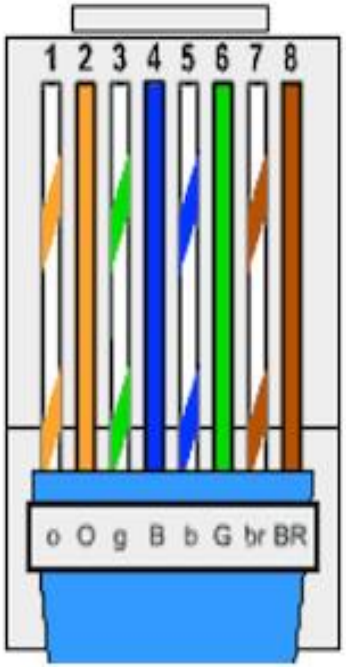
- Step 2.1: Untwist the wires

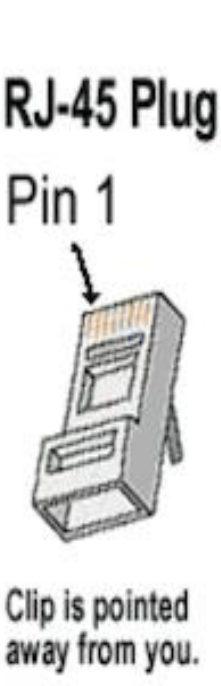




There should be 4 pairs of wires: green, brown, orange, and blue. Each pair has a solid-colored wire and a striped-colored wire. Untwist these pairs and separate them into the 8 wires.

- Step 2.2: Straighten out wires
  Step 2.3: Lay out wires in order





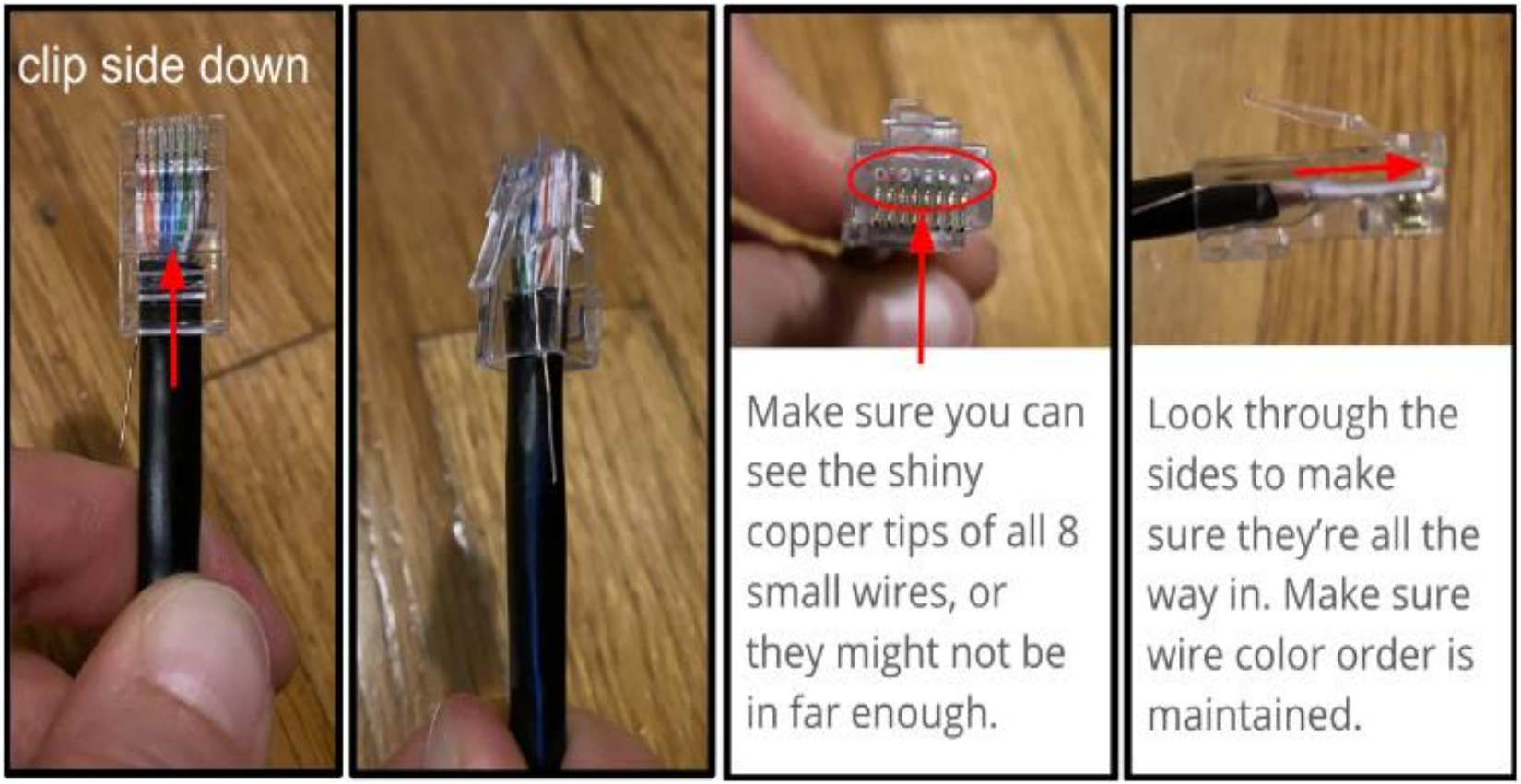
The ordering for these wires is:

1. Striped orange
2. Solid orange
3. Striped green
4. Solid blue
5. Striped blue
6. Solid green
7. Striped brown
8. Solid brown

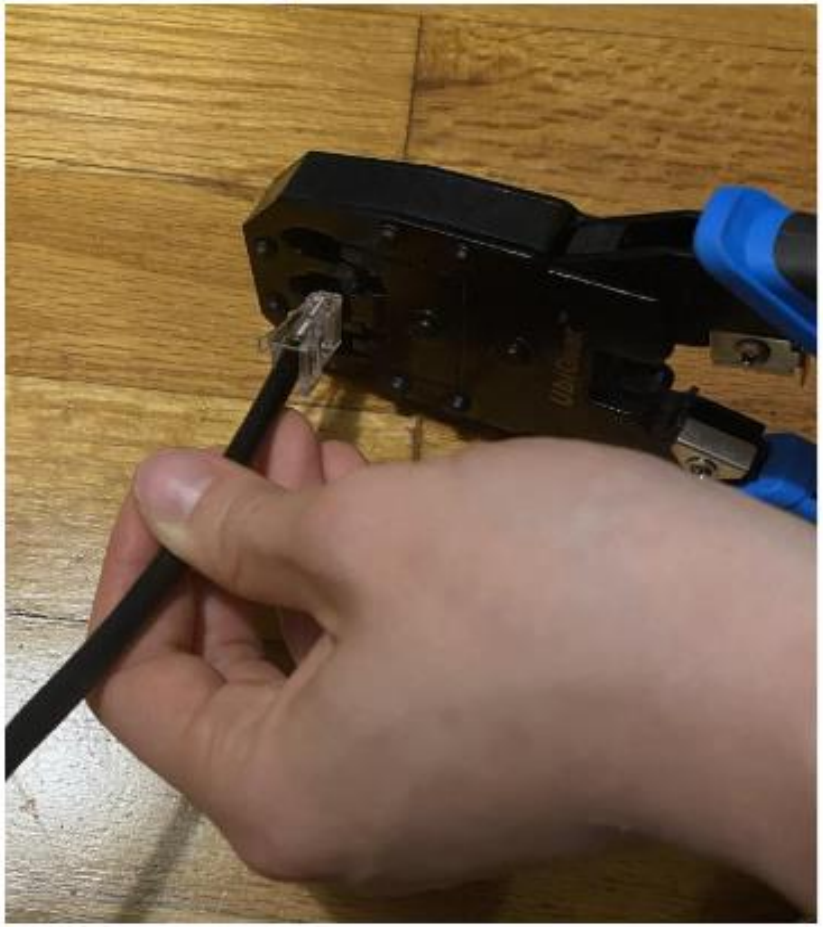
With your straightened out wires, put them into the correct order! Make sure that the wires are all flat and in line with each other.

- Step 2.4: Trim the wires

- Step 3: Slide wires into RJ45 connector



- Step 4: Crimp it



Push the RJ45 connector into the slot of your crimping tool for RJ45 connectors. The slot should be labeled something like “8P” for the 8-pin RJ45 connector that you’re using.