

Computer Networks

Lab: 1

Preparation of Network Cables

Objectives:

- ❖ To be familiar with UTP cable, RJ-45 connector, Crimping tool and color coding of UTP network cable
- ❖ To be familiar with preparation of straight through and crossover cables and their uses

Requirements:

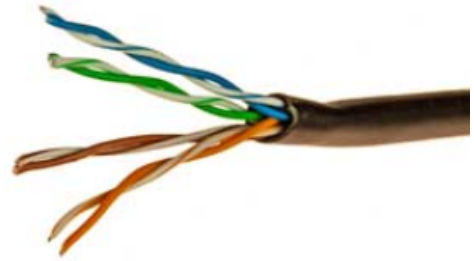
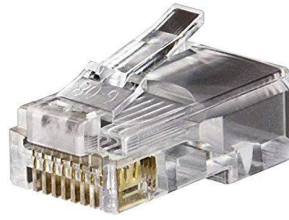
- ❖ Piece of UTP (Ethernet) cable
- ❖ RJ-45 jacks
- ❖ RJ-45 crimper
- ❖ LAN tester
- ❖ PCs
- ❖ Hub/Switch

Copper Cables:

- ❖ Ethernet cable types:
 - 10BASE2
 - 10BASE5
 - 10BASE-T
 - 100BASE-T
 - 1000BASE-T
- ❖ 10BASE5 refers to:
 - The speed of transmission at 10 Mbps
 - The type of transmission is baseband
 - The 5 indicates that a signal can travel for up to 500 meters before attenuation could disrupt the ability of the receiver to interpret the signal
- ❖ Similarly in 10BASE-T, T refers to the Twisted Pair
- ❖ Though the consumer electronics keep going increasingly wireless, many LANs still rely heavily on UTP cables to interconnect devices for transmitting data
- ❖ Different categories of UTP cables are: CAT3, CAT5, CAT6 etc.

LAN Cabling using UTP

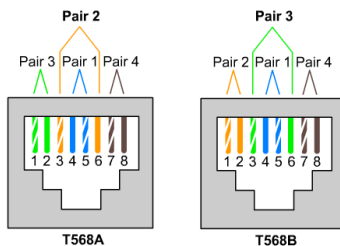
- ❖ EIA/TIA specifies an RJ-45 connector for UTP cable
- ❖ For proper electrical connection between the connector and the jack, the order of the wires must follow standards i.e. T568A or T568B color code



- ❖ Registered jack (RJ) is a standardized physical network interface for connecting telecommunications or data equipment
- ❖ The RJ-45 transparent end connector shows eight colored wires
- ❖ An 8-pin plug or jack is commonly used to connect computers onto Ethernet-based local area networks (LAN)



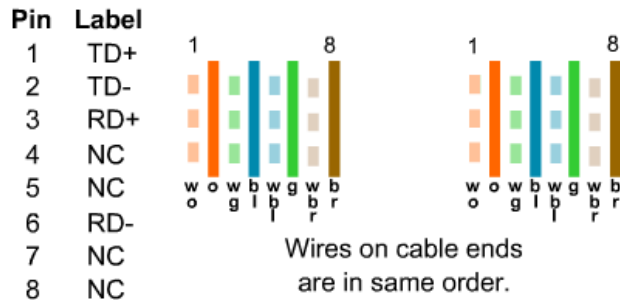
RJ-45 Patch Cables



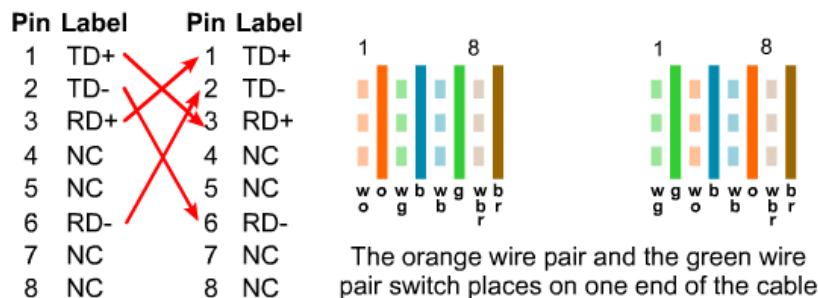
T568A and T568B Color Code

| RJ-45 PINOUT & WIRING | | |
|-----------------------|--------------------------|--------------------------|
| PIN | T568A | T568B |
| 1 | White with green stripe | White with orange stripe |
| 2 | Green | Orange |
| 3 | White with orange stripe | White with green stripe |
| 4 | Blue | Blue |
| 5 | White with blue stripe | White with blue stripe |
| 6 | Orange | Green |
| 7 | White with brown stripe | White with brown stripe |
| 8 | Brown | Brown |

- ❖ **Straight-through Cable:** When two RJ-45 connectors of a cable are held side by side in the same orientation
- ❖ **Crossover cable:** When the RJ-45 connectors on both ends show that some of the wires are connected to different pins on each side of the cable i.e. the pins **1 and 2** on one connector connect to pins **3 and 6** on the other and vice versa



Straight-through Cable Connection



Crossover Cable Connection

Activities:

- ❖ Preparation of straight-through / cross-over cable and test it.

Exercises:

1. Why is the use of color coding recommended while preparing a network cable? Explain the color coding standards of UTP cable.
2. Where do you need straight-through and crossover cable? Discuss briefly.
3. Which cable have you prepared during your lab session? How was that tested? Discuss each step.
