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Lab Practical #02:

Study of different types of network cables & connectors and practically implement the cross-wired cable and straight through cable using crimping tool.

Practical Assignment #02:

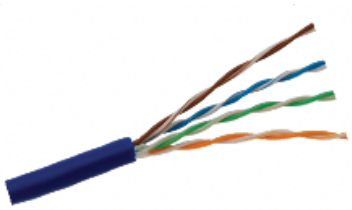
1. List various networks cable and connectors. Also, write short description.
2. Give cross-wired cable and straight through cable diagram (Color Code wise).

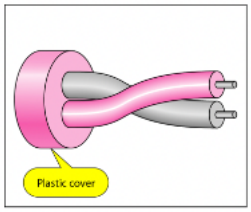
1. List various networks cable and connectors. Also, write short description.

a) Twisted Pair Cable:

- Network Cable Type: Guided
- **Description:**
  - separately insulated.
  - Twisted together.
  - It is widely used in different kind of data and voice infrastructure.
  - The use of two wire twisted together helps to reduce crosstalk and electromagnetic induction
  - Two types of twisted pair cable:

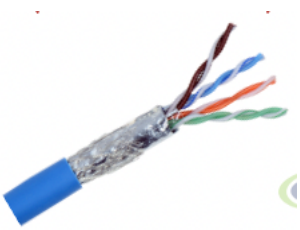
1. UTP (Unshielded twisted pair)

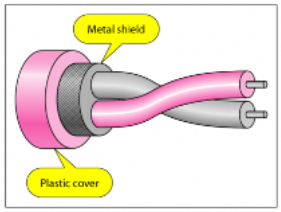




- Ordinary telephone wires
- Less expensive
- We community against noise interferences
- Most use in two categories: Cat-3 & Cat-5
- Used in laboratory

2. STP (shielded twisted pair)





- An extra metallic shield on each pair
- Relatively more expensive
- Better performance then UTP
- Used in exterior network(outside of building)

b) Coaxial Cable:

- Network Cable Type: Guided
- **Description:**

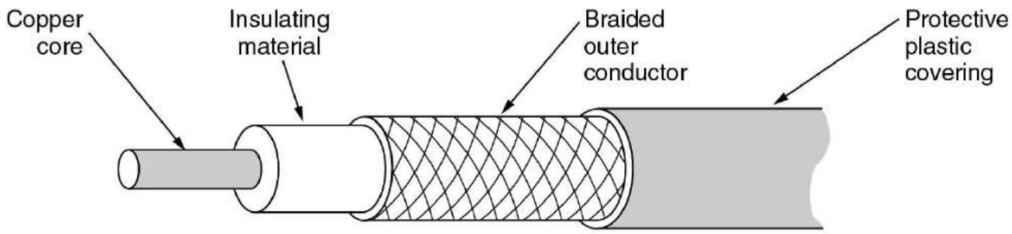
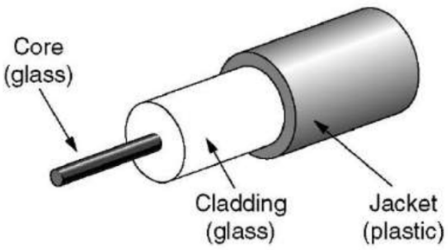


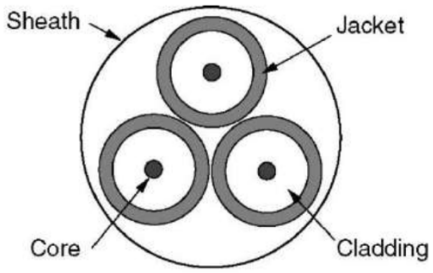
Figure 11: Coaxial Cable

- Open conductor is braided shielded.
- Inner conductor is solid metal.
- Separated by insulating material, and whole covered by plastic cover.
- Used in television, long distance telephone transmission.
- Hi bandwidth an excellent voice immunity.

c) Fiber Optic Cable:

- Network Cable Type: Guided
- **Description:**





- A Fiber-Optic cable is made of glass or plastic and transmit signals in form of lights.
- Light travel in straight line as long as it is moving through a single uniform substance.
- It is surrounded by cladding of less dense glass or plastic so, difference in density of two materials must be such that a beam of light moving through the core is reflected off the cladding instead of being reflected into it.

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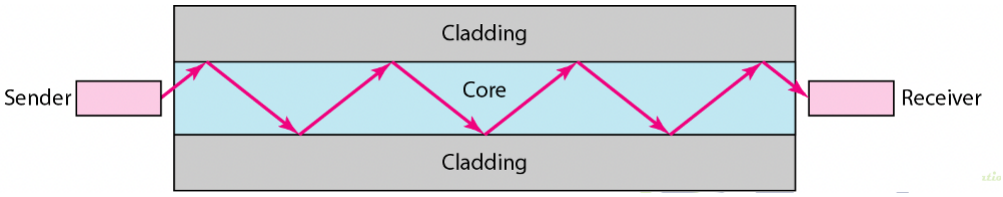
- It is you reflection to guide light through a channel.
- Small size and weight
- Used in high bandwidth network
- I data rate and lower attenuation.



d) RJ45 Connector

- **Description:**

- It is one of the most used networking connector in network world.
- Made by plastic.
- Larger than a classical telephone connector RJ11.
- RJ45 is the connector of UTP and STP type cables.
- With this connectors we can connect the cable between any two network devices, to routers, to switches, firewalls.

e) Coaxial Cable Connectors

- **Description:**
  - Coaxial cable connectors are used to connect cables to other devices and maintain the cable's shielding.
  - There are two distinct connector styles – known as male and female. Male connectors have metals pin which protrude from the centre and female connectors have a recessed hole to receive the pin.
  - Here are some of the most common coaxial connector types and their applications:

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- **BNC Connector:**

  - Bayonet Neil-Concelman (BNC) coaxial connectors are used for quick connection or disconnection in RF equipment, test instruments, radio, television, and video signal.

- **TNC Connector:**

  - The Threaded Neill-Concelman (TNC) connectors are small, weatherproof products which operate up to 12GHz. They're often used in mobile phone and RF/antenna connections.

- **SMB Connector:**

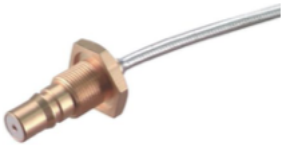
  - Subminiature version B (SMB) connectors are one of the most popular RF/microwave connectors for industrial and telecommunications equipment – offering a simple snap-on coupling design for cables with uncommon connections.

- **7/6 DIN Connector:**

  - The 7/16 DIN (Deutsches Institut für Normung) connector is a threaded RF connector used to connect coaxial cables.

- These connectors are mainly used for applications which require water resistance, as they're robust and durable. They're particularly useful for base stations and broadcast communication systems.

- **QMA Connector:**



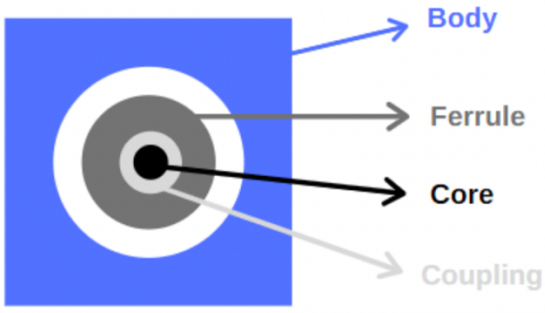
- QMA connectors are coaxial radio frequency connectors. They maintain the shielding barrier in electrical applications and feature snap-on mechanisms. They're ideal for industrial and communications settings.

- **MCX Connector:**

- Micro coaxial (MCX) connectors are ideal for environments restricted in size or space.
- MCX connectors operate between DC and 6GHz in wireless, GPS, TV tuner cards, RF hardware, and digital cellular applications. These connectors also have a snap-on coupling design for easy installation.

f) Fiber Optic Cable Connectors

- There are four common elements of a fiber optic connector. These elements are:
  - **Ferrule**
  - **Body**
  - **Coupling**
  - **Core**



- The Ferrule is the structure that covers the fiber.
- The Body is the cover that protects the fiber.

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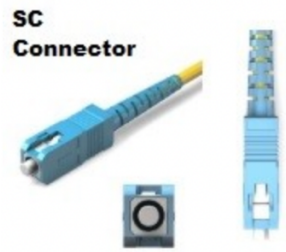
- The Coupling is the cover that prevents signals in the core from escaping.
- The Core is the exact conduit part of the fiber that light passes through.
- Types of Connectors:

1. **SC Connector:**



- SC (Subscriber Connector) is used on MMF or SMF. It is developed by Japon NTT . The mechanism used with SC Connector is push on/off mechanism. It is rerely used in todays network World. Instead of SC Connector, LC and MTP Multi Fiber networking connectors are used.

2. **ST Connector:**

- ST (Straight Tip Connector) is the first connector type used for fiber optic termination at the end of multi mode cables. It is developed by AT&T. ST Connector is used with twist on/off mechanism. It is rerely used in todays network World. Instead of ST Connector, LC and MTP Multi Fiber Connectors are used.

3. **LC Connector:**

- LC (Lucent Connector) is a widely used SFF (Small Form Factor) networking connector used for high-density connections. LC Connector is consist of two fibers connected together at the same time and it is always duplex. It is developed by Lucent Technologies.

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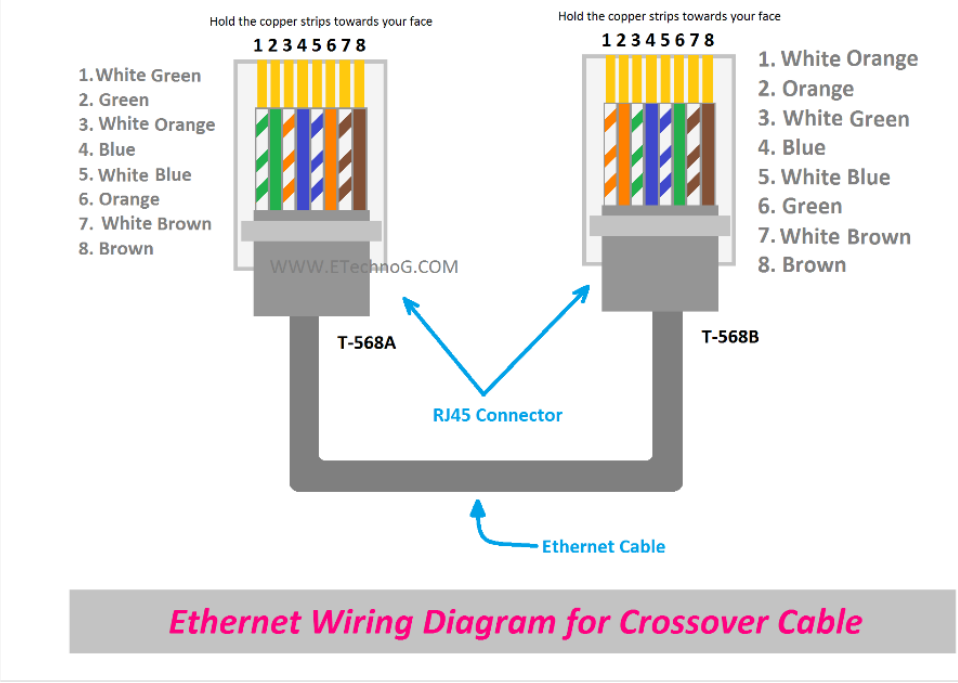
2. Give cross-wired cable and straight through cable diagram (Color Code wise).

a) Cross-wired Cable Diagram (Color Code)



Ethernet Wiring Diagram for Crossover Cable

b) Straight Through Cable Diagram (Color Code)