ST. LAWRENCE HIGH SCHOOL

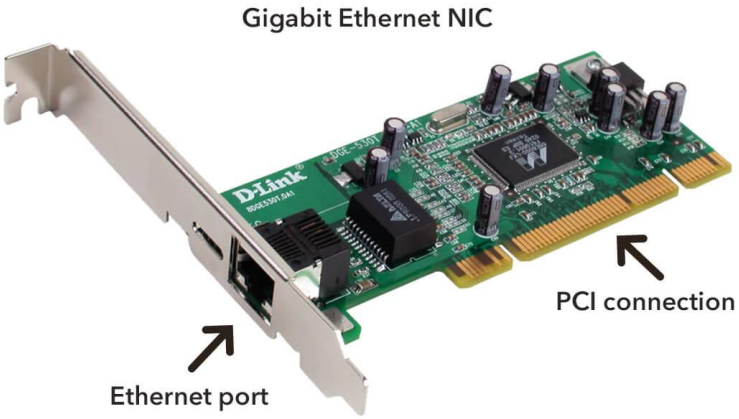
A JESUIT CHRISTIAN MINORITY INSTITUTION

STUDY MATERIAL – 4
TOPIC – NETWORKING

SUBJECT: COMPUTER APPLICATION **CLASS: XII**
F.M.:15 **DATE: 09.07.2020**

Network Interface Unit(NIU)

- The network interface unit functions as an interface between the computer and the network communication media. It is through the NIU, a computer connects to the external network.
- Earlier an NIU was available as a separate peripheral card and hence called a Network Interface Card(NIC) or Network Adapter, but nowadays it is inbuilt into the computer motherboard.
- Specialised port, like RJ - 45 connects the NIU to the network media.



➢ Functions of NIU

- Data flow control
- Data packaging
- Data flow conversion
- Data buffering
- Signal generation
- Speed of data transfer

Guided Media(Cable wiring)

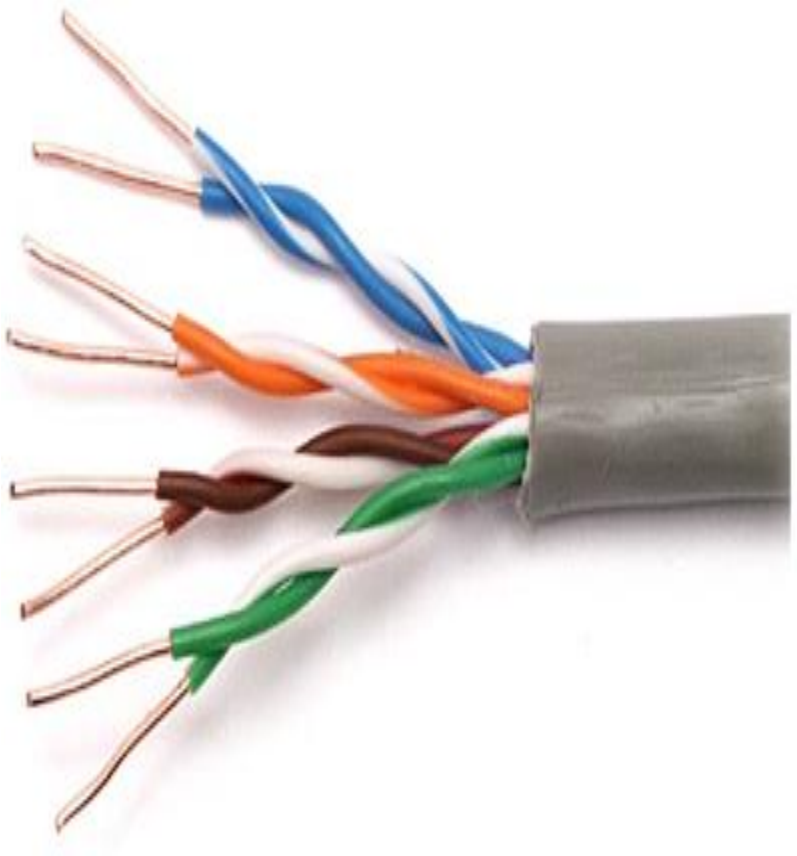
Cables physically connect the different network devices through the NIU. The primary network cables are:

- ❑ Twisted pair Cable
  - ✓ Unshielded Twisted Pair(UTP)
  - ✓ Shielded Twisted Pair(STP)
- ❑ Coaxial Cable
- ❑ Optical – Fiber Cable

❖ Twisted pair Cable

➢ Unshielded Twisted Pair(UTP):

- ❑ UTP cable has usually four pairs of insulated copper wires inside an outer jacket and each pair of wire is again twisted around each other.
- ❑ The copper wires carry the signal and are twisted in pairs to reduce the effects of external electrical noise signals.
- ❑ Different categories of UTP include CAT3, CAT5 and CAT6.
- ❑ RJ – 45 Connectors are used to connect a CAT5 of CAT6 cable to the network interface port



❑ Use:

In network communication UTP cables are usually used in a star topology of ethernet LAN

❑ Advantages:

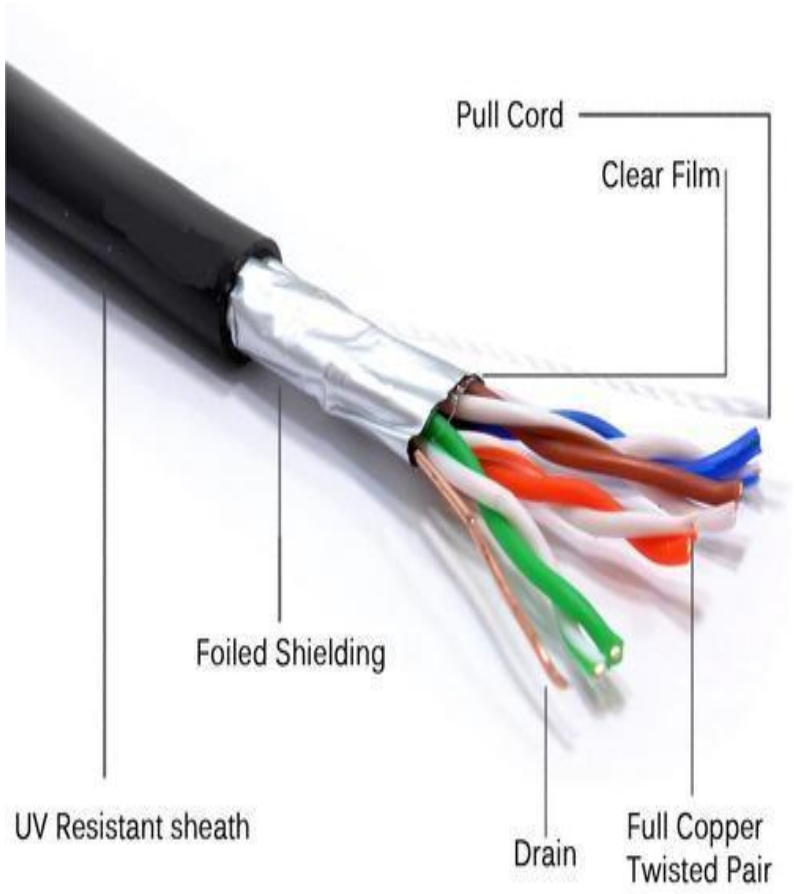
- ✓ UTP costs less than any other type of LAN cable
- ✓ It can support bandwidth of 10 MBPS to 1 gbps
- ✓ The design is sleek and flexible enough to easily pass through cable ducts

❑ Disadvantages:

- ✓ The absence of any shield makes this cables prone to external electrical noise signals
- ✓ To minimise the effects of electrical noise these cables are not used for more than hundred metre

➢ Shielded Twisted Pair(STP):

- ❑ STP cable has usually 2 to 4 pairs of twisted copper wires. Each pair is again wrapped or shielded by foil.
- ❑ A woven copper net shield overall outer foil. An outer PVC insulation covers the entire cable
- ❑ The twisting and double shielding makes this more resistance to outer electrical noise
- ❑ STP cable is used with special IBM data connectors also called D - connectors



❑ Use:

STP cable is mainly used for IBM's Token Ring LAN specifications.

❑ Advantages:

- ✓ STP cables reduce both internal and external electrical noise.
- ✓ It offers better electrical characteristics than unshielded cables.
- ✓ It can be easily terminated with modular connector.

❑ Disadvantages:

- ✓ Shielding increases overall diameter and weight of the cable. Hence it is more difficult to install compare to UTP cables. The larger thickness make them unfit for narrow cable ducts.
- ✓ It has higher cost per foot of wire.
- ✓ Shield of STP cables must be grounded properly otherwise it acts like an antenna and picks up unwanted signals.

❖ Coaxial Cable

- ❑ In this cable there is a central copper conductor with thick and white PVC insulation. A copper net is woven over the PVC insulation to shield the central conductor from external electrical noise.
- ❑ The central copper core carries the signal and the outside copper net provides the returning part of the signal.
- ❑ The common type of connector used in coaxial cable is Bayone Neill Concelman(BNC) connector.

❑ Use:

Coaxial cable is used as a transmission line for radio frequency signals. Its applications include feedlines connecting radio transmitters and receivers to their antennas, computer network (e.g., Ethernet) connections and distribution of cable television signals.

❑ Advantages:

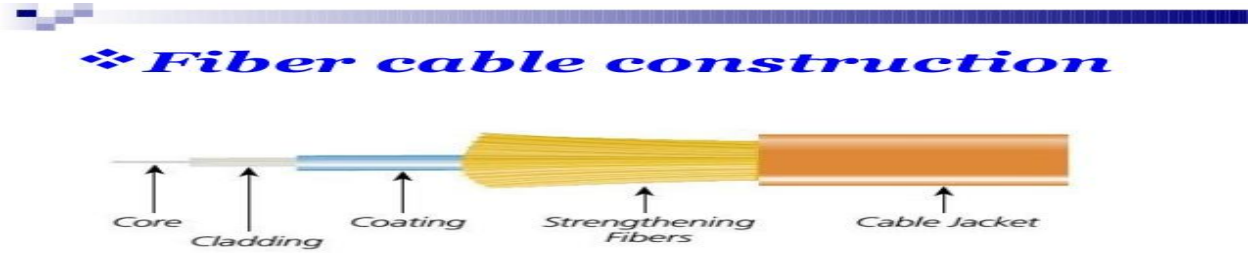
- ✓ It is less susceptible to noise or interference (EMI or RFI) compare to twisted pair cable.
- ✓ It supports high bandwidth signal transmission compare to twisted pair.

❑ Disadvantages:

- ✓ Costlier than UTP cables.
- ✓ Since bulky and less flexible, difficult to put them through cable ducts.

❖ Optical – Fiber Cable:

- ❑ The cable consists of a central glass fibre called core and surrounded by a layer of pure silica called cladding. To protect the inner glass fibre the cladding is surrounded with Kevlar fibres for strength. The cable finally has an outer jacket made of teflon or PVC.
- ❑ The principle of total internal reflection of light is used to transmit light signals through the glass fibre. An LED may be used to transmit the signal and a photodiode is used to receive it.
- ❑ The connector used: Subscriber Channel(SC) & Straight Tip(ST).



❑ Use:

Optical fiber is used as a medium for telecommunication and computer networking because it is flexible and can be bundled as cables. It is used in FDDI networks as backbone cable.

❑ Advantages:

- ✓ Since data travels in the form of light pulses, these cables are totally immune to outside electrical noise and hence can be used for longer distances as compared to other cables.
- ✓ Bandwidth supported is up to 100 gbps.
- ✓ A fiber optic cable is very flexible, easily bends, and opposes most acidic elements that hit the copper wire.
- ✓ The optical fiber cable is very hard to tap because they don't produce electromagnetic energy. These cables are very secure while carrying or transmitting data.

❑ Disadvantages:

- ✓ These cables are more delicate than copper wires.
- ✓ They are the most expensive of all cables.
- ✓ It is difficult to join and terminate such cables.

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