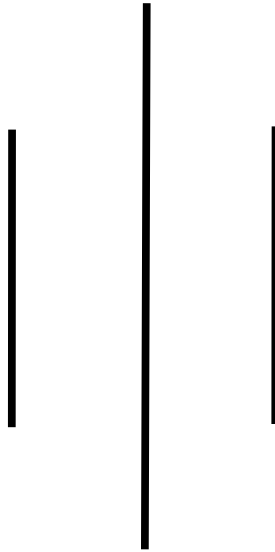# Deerwalk Institute Of Technology
Internet Technology

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Standards:

Networking cables are wires used to connect one network device to other network devices. Different types of network cables like Coaxial cable, Optical fiber cable, Twisted Pair cables are used depending on the network's topology, protocol and size. TIA/EIA-568 [Telecommunications Industry Association (TIA),offshoot of the Electronic Industries Alliance (EIA)] is a set of telecommunications standards that address commercial building cabling for telecommunications products and services.

Color Codes:

Ethernet cables should be properly arranged according to color codes. Modifying Ethernet cables improperly may cause loss of network connectivity.

There are two types of cabling according to color codes.

They are:

1) Straight Through Cables:

Straight-Through wired cables are most commonly used to connect a host to client which are different machines. It is used to connect computers, printers and other network client devices to the router, switch or hub.

The TIA/EIA 568-A standard which was ratified in 1995, was replaced by the TIA/EIA 568-B standard in 2002 and has been updated since. Both standards define the T-568A and T-568B pin-outs for using Unshielded Twisted Pair cable and RJ-45 connectors for Ethernet connectivity. The standards and pin-out specification appear to be related and interchangeable, but are not the same and should not be used interchangeably.
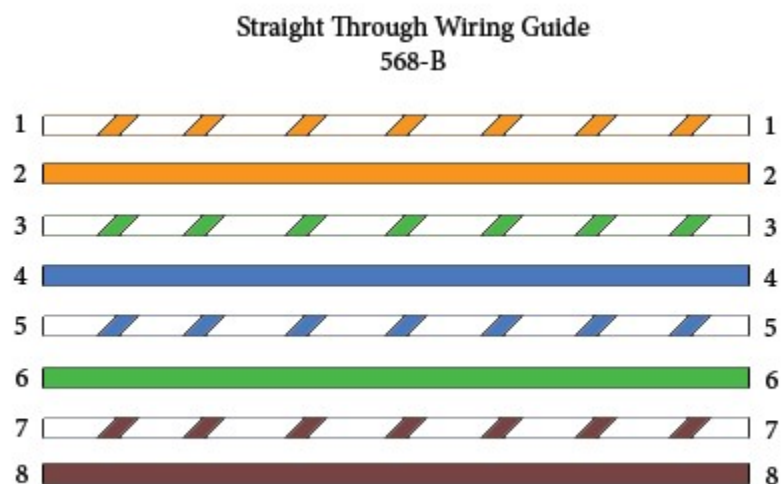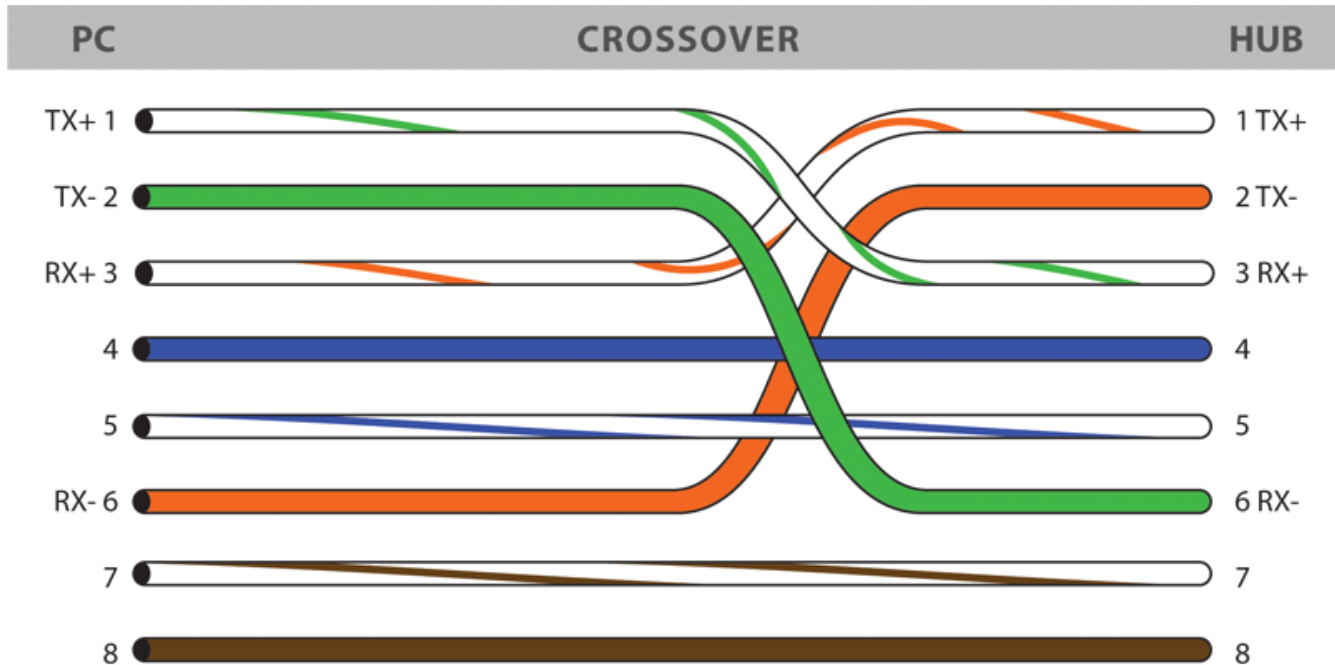

Straight through cable color code

2) Cross Over Cables:

Crossover cables are most commonly used to connect two hosts directly. Eg: connecting a computer directly to another computer, connecting a switch directly to another switch, or connecting a router to a router. Usually same devices.

Crossover cable color code

Wire one end using the T-568A standard and the other end using the T-568B standard. Another way of remembering the color coding is to simply switch the Green set of wires in place with the Orange set of wires. Specifically, switch the solid Green (G) with the solid Orange, and switch the green/white with the orange/white.

The Major Categories of Ethernet Cables

The various categories of Ethernet cables are:

Category 3 (CAT3)

- It is an unshielded twisted pair (UTP) cable
- Is capable of carrying 10 megabits per second (Mbps) of data or voice transmissions.
- Its maximum possible bandwidth is 16 MHz.

Category 5 (CAT 5)

- Is a UTP cable, but it is able to carry data at a higher transfer rate.
- It can support either 10 to 100 Mbps speeds.
- A 100 Mbps speed is also known as Fast Ethernet, and Cat 5 cables were the first Fast Ethernet-capable cables to be introduced.
- They also can be used for telephone signals and video, in addition to Ethernet data.

Category 5e

- This standard is an enhanced version of Cat 5 cable.
- This category works for 10/100 Mbps and 1000 Mbps (Gigabit) Ethernet.
- It has become the most widely used category of Ethernet cable available on the market.

Category 6

- Cat 5e cables can handle Gigabit Ethernet speeds, Cat 6 cables are certified to handle Gigabit Ethernet with a bandwidth of up to 250 MHz.
- Cat 6 cables have several improvements, including better insulation and thinner wires.

Category 6a

- It allows 10,000 Mbps data transmission rates and effectively doubling the maximum bandwidth to 500 MHz.
- Category 6a cables are usually available in STP form, and, as a result, must have specialized connectors that ground the cable.

Category 7

- Known as Class F.
- Is a fully shielded cable that supports speeds of up to 10 Gbps (10,000 Mbps) and bandwidths of up to 600 Mhz.
- Cat 7 cables consist of a screened, shielded twisted pair (SSTP) of wires, and the layers of insulation and shielding contained within them are even more extensive than that of Cat 6 cables.
- Because of this shielding, they are thicker, more bulky, and more difficult to bend.

The summary of the above mentioned categories is given below:

Category	Cable Type	Maximum Data Transmission Speed	Maximum Bandwidth
Category 3	UTP	10 Mbps	16 MHz
Category 5	UTP	10/100 Mbps	100 MHz
Category 5 e	UTP	1000 Mbps	100 MHz
Category 6	UTP or STP	1000 Mbps	250 MHz
Category 6 a	STP	10,000 Mbps	500 MHz
Category 7	SSTP	10,000 Mbps	600 MHz