

Experiment number :(1)

Ethernet Cabling

Introduction:-

The EIA/TIA (Electronic Industries Association and the newer Telecommunications Industry Alliance) is the standards body that creates the Physical layer specifications for Ethernet. The EIA/TIA specifies that Ethernet uses a registered jack (RJ) connector with a 45 wiring sequence on unshielded twisted-pair (UTP) and unshielded twisted-pair (STP) cabling (RJ-45). However, the industry is moving toward calling this just an 8-pin modular connector.

Each Ethernet cable type that is specified by the EIA/TIA has inherent attenuation, which is defined as the loss of signal strength as it travels the length of a cable and is measured in decibels (dB).

Ethernet cabling is an important discussion, especially if you are planning on taking the network.

Type of cable

- 1- Twisted pair cable
- 2- Coaxial
- 3- Fiber Optic
- 4- The types of connection Ethernet cables available for Twisted pair cable are:

- 1- Straight-through cable
- 2- Crossover cable
- 3- Rolled cable

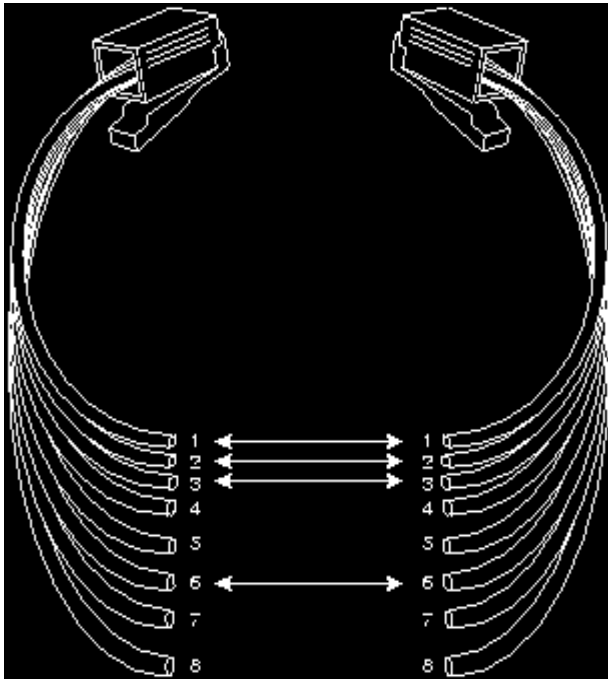
We will look at each in the following sections.

Straight-Through Cable

The straight-through cable is used to connect

- a- Host to switch or hub
- b- Router to switch or hub

Figure 1.1 Straight-Through Cable



Pin	Color
1	Org
2	Org/Wht
3	Wht/Grn
4	Blu
5	Wht/Blu
6	Grn
7	Wht/Brn
8	Brn

Notice that only pins 1, 2, 3, and 6 are used. Just connect 1 to 1, 2 to 2, 3 to 3, and 6 to 6, and you'll be up and networking in no time. However, remember that this would be an Ethernet-only cable and wouldn't work with Voice, Token Ring, ISDN, etc.

Crossover Cable

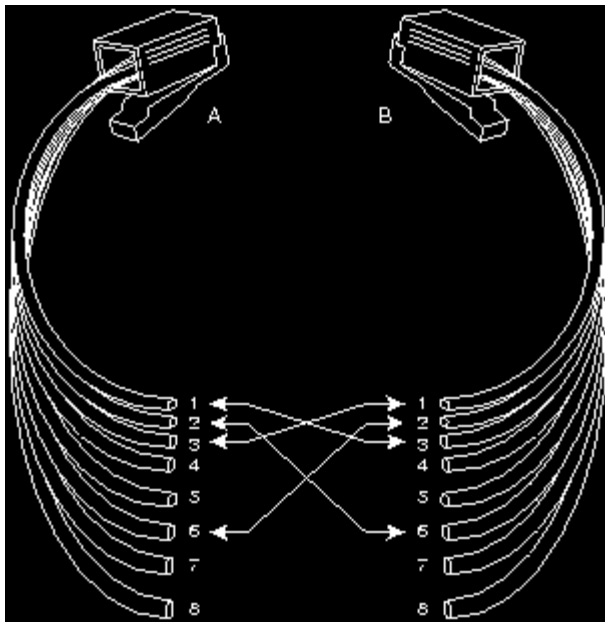
The crossover cable can be used to connect

- 1- Switch to switch
- 2- Hub to hub
- 3- Host to host
- 4- Hub to switch

5-Router direct to host

The same four wires are used in this cable as in the straight-through cable; we just connect different pins together. Figure 1.2 shows how the four wires are used in a crossover Ethernet cable. Notice that instead of connecting 1 to 1, etc., here we connect pins 1 to 3 and 2 to 6 on each side of the cable.

Figure 1.2 Crossover Cable



Pin	Color
1	Wht/Grn
2	Grn
3	Wht/Org
4	Blu
5	Wht/Blu
6	Org
7	Wht/Brn
8	Brn

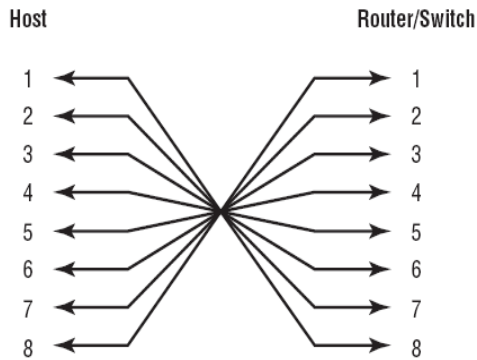
Rolled Cable:-

Although rolled cable isn't used to connect any Ethernet connections together, you can use a rolled Ethernet cable to connect a host to a router console serial communication (com) port.

If you have a Cisco router or switch, you would use this cable to connect your PC running HyperTerminal to any coaxial cable. Eight wires are used in this cable to connect serial devices, although not all eight are used to send

information, just as in Ethernet networking. Figure 1.3 shows the eight wires used in a rolled cable

FIGURE 1. 2 Rolled Ethernet cable



These are probably the easiest cables to make, because you just cut the end off on one side of a straight-through cable and reverse the end. Once you have the correct cable connected from your PC to the Cisco router or switch, you can start HyperTerminal to create a console connection and configure the device.

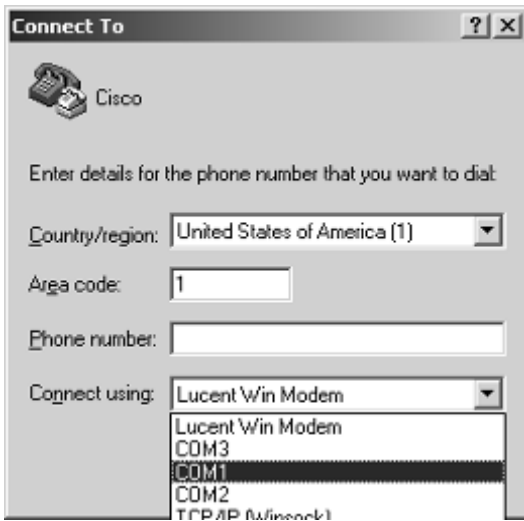
DB-9 to RJ-45 Adapter Pin-Out		
RJ-45	Color Code	DB-9
1	Blue	8
2	Orange	6
3	Black	2
4	Red	5
5	Green	N.C.
6	Yellow	3
7	Brown	4
8	White/Gray	7

Set the configuration as follows:

1. Open HyperTerminal and enter a name for the connection. It is irrelevant what you name it then click OK.

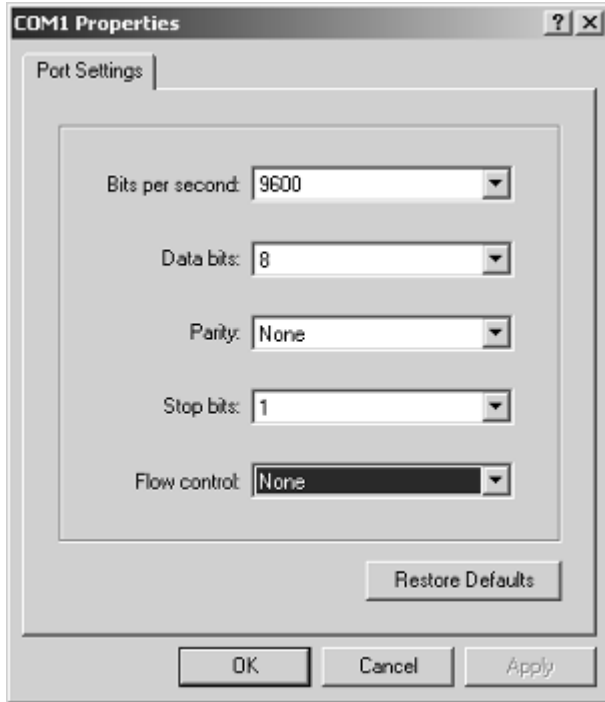


2. Choose the communications port-either COM1 or COM2, whichever is open on your PC.



3. Now set the port settings. The default values (2400bps and no flow control hardware) will not work; you must set the port settings as shown in Figure 1.2

FIGURE 1. 2 Port settings for a rolled cable connection



Notice that the bit rate is now set to 9600 and the flow control is set to none. At this point, you can click OK and press the Enter key