6.3.4 Twisted Pair Connector Facts

Twisted pair cables remain one of the primary ways that computers connect to a network.

The table below illustrates both patch (also called straight through) and crossover cable configurations:

Cable	Description
 Patch	Computers connect to the network through a hub or switch with a patch cable. Patch cables use the same wire configuration on each connector end. The following are the two most commonly used wiring configurations: ▪ T568A Wires are arranged from pins 1 to 8 in each connector in the following order: GW, G, OW, B, BW, O, BrW, Br. ▪ T568B Wires are arranged from pins 1 to 8 in each connector in the following order: OW, O, GW, B, BW, G, BrW, Br. It doesn't matter which standard is used as long as all cables use the same standard. This helps prevent confusion during troubleshooting.
 Crossover	Computers can connect directly to one another using a crossover cable. The easiest way to create a crossover cable is to arrange the wires in the first connector using the T568A standard and arrange the wires in the second connector using the T568B standard.

Ethernet specifications use the following pins for communication:

- Cat 5 Ethernet (100BASE-T) and below (Tx is a pin used for transmitting and Rx is a pin used for receiving):
  - Pin 1: Tx+
  - Pin 2: Tx-
  - Pin 3: Rx+
  - Pin 4: Unused
  - Pin 5: Unused
  - Pin 6: Rx-
  - Pin 7: Unused
  - Pin 8: Unused
- Cat 5e (1000BASE-T) and above (Bi indicates the pin is used for both transmitting and receiving):
  - Pin 1: Bi+ D0
  - Pin 2: Bi- D0
  - Pin 3: Bi+ D1
  - Pin 4: Bi+ D2
  - Pin 5: Bi- D2
  - Pin 6: Bi- D1
  - Pin 7: Bi+ D3
  - Pin 8: Bi- D3

Be aware of the following when making cables for Ethernet:

- Use a crimping tool designed for RJ45 connectors to attach connectors to UTP cable. Most crimping tools include an integrated wire stripper that you can use to remove the outer sheath from the cable so you can access the individual wires.
- Cat 5/5e/6/6a cables come with wires that have solid cores or stranded cores. Use solid core cables for longer runs inside walls or the ceiling; use stranded wires for drop cables where flexibility and frequent movement occurs.
- There are different connectors rated for solid or stranded core wires; be sure to use the correct connector type.
- To reduce crosstalk, keep the pairs twisted as much as possible right up to the connector.
- Making Cat 6 compliant cables is difficult; if you do not add the connectors exactly right, the cable will be capable of only 100 Mbps speeds. In most cases, it would be easier to buy cables of the correct length than to try and make your own.

- Be sure you use the appropriate punch-down tool when connecting UTP cabling to a punch-down block. To use a punch-down tool, position the UTP wire into a slotted post in the punch-down block. Then press down on the top of the wire over the post with the punch-down tool.

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