Twisted-Pair Operation

4.4.1

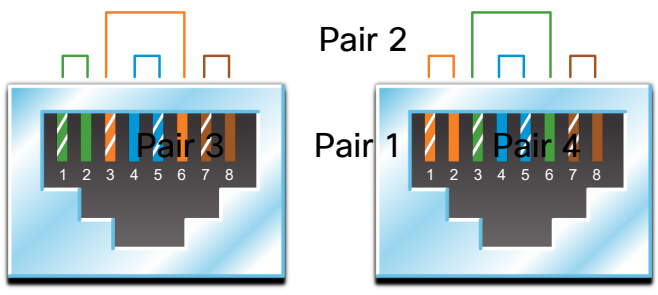
Twisted-Pair Wiring Schemes

Have you ever looked closely at the plastic RJ-45 connector at the end of an Ethernet patch cable? Did you ever wonder why each of the wires terminating in the connector has a specific color or pattern? The color coding of the wire pairs in an UTP cable is determined by the type of standard that is used to make the cable. Different standards have different purposes and are closely governed by the standards organizations.

For typical Ethernet installations, there are two standards that are widely implemented. The TIA/EIA organization defines two different patterns, or wiring schemes, called T568A and T568B, as shown in the figure. Each wiring scheme defines the pinout or

schemes (T568A or T568B) should be chosen and followed. It is important that the same wiring scheme is used for every termination in that project.

T568A and T568B Standards



4.4.2

Twisted-Pair Transmit and Receive Pairs

T568A

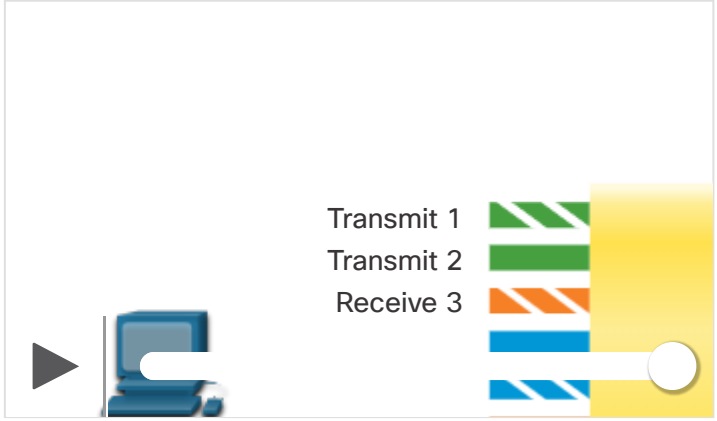
Ethernet NICs and the ports on networking devices are designed to send data over UTP cables. Specific pins on the connector are associated with a transmit function and a receive function. The interfaces on each device are designed to transmit and receive data on designated wires within the cable.

When two devices are directly connected using an UTP Ethernet cable, it is important that the transmit function and the receive function on each end of the cable are reversed. One device sends data on a specific set of wires and the device on the other end of the cable listens for the data on the same wires.

Two devices that use different wires for transmit and receive are known as unlike devices. They require a straight-through cable to exchange data. Straight-through cables have the same color patterns on both ends of the cable.

Click Play in the figure to view transmission across a straight-through cable.

Devices that are directly connected and use the same pins for transmit and receive, are known as like devices. They require the use of a crossover cable in order to reverse the transmit function and receive function so that the devices can exchange data.



4.4.3

Check Your Understanding - Twisted-Pair Operation

Check your understanding of twisted-pair operation by choosing the correct answer to the following questions.

1. Which organization defines the two different patterns, or wiring schemes, called T568A and T568B?

- ◯ TIA/EIA
- ◯ TCP/IP
- ◯ IEEE
- ◯ IETF

2. Directly connecting like-devices, such as two computers, requires what type of UTP Ethernet cable?

- ◯ crossover
- ◯ straight-through
- ◯ STP
- ◯ CAT 3

3. Connecting a unlike-devices, such as a computers to an Ethernet switch, requires what type of UTP Ethernet cable?

- ◯ crossover
- ◯ straight-through
- ◯ STP
- ◯ CAT 3

Check

Show Me

Reset

Reset

4.3 Coaxial and Fiber...
4.5 Verify Connectivity