CONSTRUCTING A NETWORK CABLE

OBJECTIVES

Build a Category 5 UTP patch cable

HARDWARE, SOFTWARE, AND COMMUNICATIONS REQUIREMENTS FOR THIS LAB

- 2 PCs.
- One meter section of CAT 5 unshielded twisted pair (UTP) cable
- Two RJ 45 connectors
- One cable-end crimping tool
- One cable tester

Introduction

Most organizations hire wiring contractors to design and install the cabling systems required for their internal networks. For new construction special unshielded twisted pair cabling is typically used for this purpose. This cabling is composed of four wire pairs (8 separate insulated wires) wrapped in plastic sheathing to create a wire bundle. The cabling can be purchased in bulk, cut to the desired lengths, and then terminated by installing special connectors to the ends of the cable. This process involves inserting individual wires in the bundle into slots in specially designed connectors. Wiring patterns defined by the Telecommunications Industry Association specify the alignment of the wires in the connectors (Figure 1).

In this lab you will build and test your own network cable to gain a better understanding of the procedures required and problems encountered during this process.

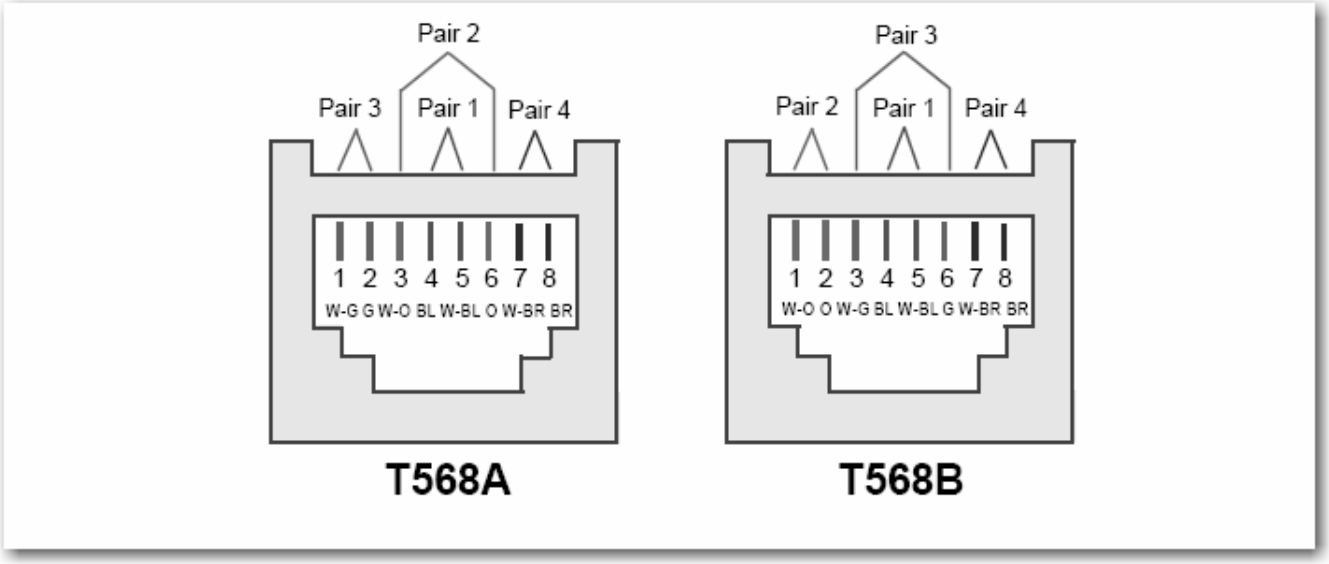

Figure 1: 8-Position modular jack wire pair assignments for UTP

Building a Cable

Tools and Materials Required

The following is a list of tools and materials that are needed to build a short Category 5e (CAT 5e) network cable.

- One meter section of CAT 5 unshielded twisted pair (UTP) cable (Figure 2)
- Two RJ 45 connectors (Figure 3)
- One wire stripping tool (Figure 4)
- One cable-end crimping tool (Figure 4)

🎬 One cable tester (Figure 5)

A Category 5e cable meets the requirements for transmitting data on an IEEE 802.3 computer network at speeds of 1000 Mbps or less. According to specifications published by the Telecommunications Industry Association (TIA) these cables may vary in length from a minimum of about 1 meter to a maximum of 100 meters .

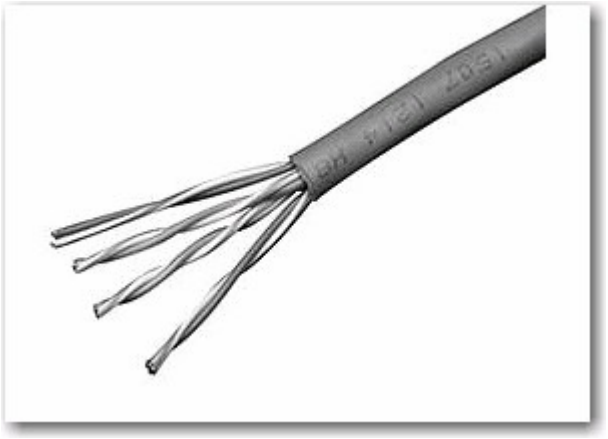

Figure 2: A short section of CAT 5 cable

Figure 3: An RJ-45 connector

Follow the steps shown below to build your cable:

1. Strip about 3 cm of cable housing off of each end of a section of CAT 5 cable.
2. Align the individual wires in the correct pattern according to the T568B standard.
3. Insert the cable ends into the connector.
4. Check the alignment of the individual cables to determine if the color pattern is in accordance with the standard.
5. Crimp the connector ends using the cable-end crimping tool.
6. Pull on the cable to determine that the connectors are firmly crimped. Crimp loose ends again if necessary.
7. Test your cable to determine if it functions properly.
8. Connect two PCs with the cable, assign static IP addresses to both machines, and test the connectivity and document your results.

Figure 4: A combination wire stripping/crimping tool

Figure 5: Cable testers