Lab 4.5.5 Testing UTP Cables

Objectives

- Explore the wire mapping features of a cable meter.
- Explore the Cable Test feature—Pass/Fail features of a cable meter.
- Explore the Cable Length feature of a cable meter.
- Use a cable tester to check for the proper installation of unshielded twisted-pair (UTP) Category 5/5e according to TIA/EIA-568 cabling standards in an Ethernet network.

Background / Preparation

Wire maps can be very helpful in troubleshooting cabling problems with UTP cable. A wire map allows the network technician to verify which pins on one end of the cable are connected to which pins on the other end.

Basic cable tests can be very helpful in troubleshooting cabling problems with UTP. The cabling infrastructure or cable plant in a building is expected to last at least ten years. Cable-related problems are one of the most common causes of network failure. The quality of cabling components used, the routing and installation of the cable, and quality of the connector terminations will be the main factors in determining how trouble-free the cabling will be.

Prior to starting the lab, the teacher or lab assistant should have several correctly-wired Category 5 cables to test. The cables should include both straight-through and crossover. There should also be several Category 5 cables created with problems such as poor connections and split pairs to be used in testing. Cables should be numbered to simplify the testing process and to maintain consistency. A cable tester should be available that can test at least continuity, cable length, and wire map. This lab can be performed individually, in pairs, or in groups.

The following resources are required:

- Good Category 5 straight-through cables of different colors
- Good Category 5 crossover cables (T568A on one end and T568B on the other end)
- Category 5 straight-through cables of different colors and different lengths with open connections in the middle, or one or more conductors shorted at one end
- Category 5 straight-through cable with a split pair mis-wire
- A cable meter to test cable length, continuity, and wire map

Step 1: Set up the cable meter

a. On the cable meter, select the WIRE MAP function of the cable tester.

b. Change the setup options of the cable tester until the tester is set to the following cabling settings:

Tester Option	Desired Setting - UTP
CABLE:	UTP
WIRING:	10BASE-T OR EIA/TIA 4PR
CATEGORY:	CATEGORY 5
WIRE SIZE:	AWG 24
CAL TO CABLE?	NO
BEEPING:	ON or OFF
LCD CONTRAST:	From 1 through 10 (brightest)

c. Once the meter is set up, exit the setup mode.

Step 2: Test Cabling Procedure

a. For each cable to be tested use the following procedure. Place one end of the cable into the RJ-45 jack labeled UTP/FTP on the tester. Place the other end of the cable into the RJ-45 female coupler, and then insert the cable identifier into the other side of the coupler. The coupler and the cable identifier are accessories that come with many cable meters.

Step 3: Use the Wire Map meter function

a. The Wire Map function and a Cable ID Unit can be used to determine the wiring of both the near and far end of the cable. One set of numbers displayed on the LCD screen is the near end, and the other set is the far end. Perform a Wire Map test on each of the cables provided. Fill in the following table

based on the testing results for each Category 5 cable. For each cable, write down the identifying number of the cable and the cable color. Also write down whether the cable is straight-through or crossover, the tester screen test results, and a description of the problem.

Cable No.	Cable Color	Straight-through or Crossover	Displayed Test Results (Note: Refer to the meter manual for detailed description of test results for the wire map test.)	Problem/Description
			Top: Bot:	
			Top: Bot:	
			Top: Bot:	
			Top: Bot:	
			Top: Bot:	

Answers will vary depending upon the type of cable used for testing and type of problem

Step 4: Use the Length meter function

a. Using the tester LENGTH function, perform a basic cable test on the same cables used previously. Fill in the additional information for each cable.

Cable No.	Cable Length	Tester Test Results (Pass/Fail)

Step 5: Test data jack and patch panel terminations for wire map, length and mis-wire (optional)

a. Using the data jack and patch panel cable from the previous lab, connect one end of one of the straight-through Ethernet patch cables to the data jack outlet and one end of the other straight-through cable to the jack at the patch panel.

b. Insert the opposite end of one of the cables into the cable meter and the other into the coupler and cable identifier. Check for wire map, length and mis-wire from end to end through the patch cables, the data jack, and the patch panel. Did the cable run test good from end to end? What were the results?

Wire map: _____

Total cable run length: _____

Any mis-wires? _____

_____

Step 6: Reflection

a. If you were on a job and did not have a cable meter to test, what other methods can be used?

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