Make a Crossover Cable

Introduction

You have received a help desk ticket that a client of Nerdify Enterprises is buying another company. Your network is growing! End users, VoIP phones, and printers – Oh My! You have so many wired connections that you require the installation of another switch. To connect these two switches and allow them to communicate with each other, you need to create a crossover cable. Making a crossover cable is a sometimes necessary networking skill. Knowing when to use a crossover versus a straight through cable can save a technician time and frustration.

Objectives

In this project/lab the student will make a crossover cable.

Assignment

- Submit a link to a video of yourself making the cable and that your cable successfully passes standards using the cable tester. (60 points)
- Submit answers to the reflection questions. (40 points)

Equipment/Supplies Needed

- Two RJ-45 Connectors
- Crimping Tool
- Cable strippers/Cutters (Optional)
- Length of Ethernet Cable
- Cable Tester
- Video "Making a Crossover Cable"

Safety

- Exercise caution when working with sharp tools, such as scissors and cable strippers.

Procedure

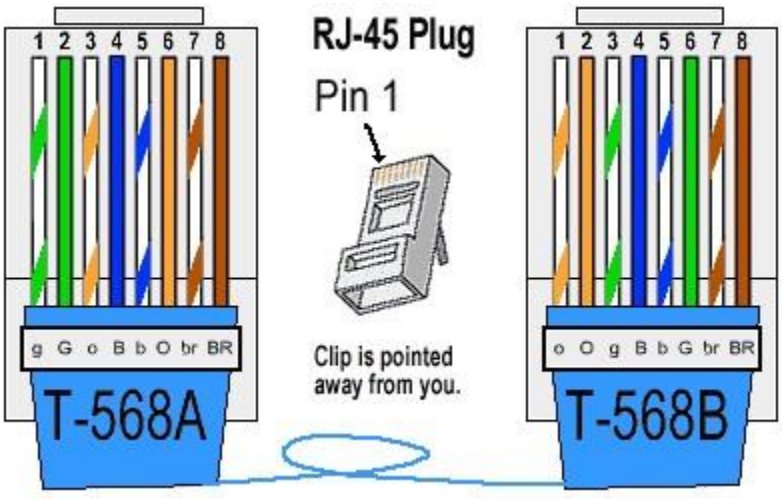
1. Use a cable stripper/cutter tool to remove about 1 ½ inch of the jacket around the outside of the cable.

2. Separate out the cable pairs so that each colored strand of wire is separated from the others.

3. Arrange individual wires to the 568B color order, keeping them as straight as possible. Starting from left to right, the color arrangement should be orange/white, orange, green/white, blue, blue/white, green, brown/white, and brown.

4. Place the RJ-45 connector beside the cut wires. When you crimp the jacket using the crimping tool, it should connect with the jacket of the cable. Determine how much excess wire you need to trim to accomplish this. Make sure your cuts are straight and even to allow the RJ-45 connector to touch all ends of the cable and ensure continuity.

5. Check your color arrangement one more time, then slide the RJ-45 connector onto the wire. The boot or clip that keeps the connector plugged in should be facing the bottom. The orange/white pair should be on the left side.



6. Ensure that when you slid the RJ-45 connector on the wires the color arrangement did not change. Ensure that all of the wires hit the back end of the RJ-45 jack to ensure continuity before you go to the next step.

7. Place the RJ-45 connector in the crimping tool, make sure the wires are slid into the RJ-45 connector as far as possible. Squeeze the handles of the crimper firmly.

8. Remove the cable with the connector from the crimper and ensure it has been crimped tightly.

9. Complete the same steps on the other side of the cable, but this end should use the 568A color arrangement. Starting from left to right, the color arrangement should be green/white, green, orange/white, blue, blue/white, orange, brown/white, and brown.

10. When both sides are complete, test the cable by plugging it into a cable tester and turning it on. A properly functioning crossover cable tests differently than a straight through. When the LED for pin 1 lights up, the LED for pin 3 should light up at the same time. When you flipped the green and orange color configurations on each end of the cable, you changed what the pins are connected to on the other side.

Your LEDs should light up to show the following matches:

Pin 1 to Pin 3	Pin 5 to Pin 5
Pin 2 to Pin 6	Pin 6 to Pin 2
Pin 3 to Pin 1	Pin 7 to Pin 7
Pin 4 to Pin 4	Pin 8 to Pin 8

11. It may take several “cycles” of the tester to determine that your pins match up correctly. If an LED does not light up, it means the tester did not have continuity on that side. Double check your RJ-45 connectors to determine if a wire did not reach its connector, a cable was cut, or

other issues were found. It's common to practice making cables early in your career as it can be a tedious task.

REFLECTION

1. Which pairs in the wire are "crossed-over"? ***The Orange and the green are crossed-over***
2. What are crossover cables used for? ***It is used to connect two host devices directly to each other***
3. What is the difference between a crossover cable and straight through cable? S***traight-through cable connects a computer with a DSL modem, while Crossover cable connects Router to Router and Computer to Computer***.
4. What features in modern switches eliminate the need for crossover cables? ***The uplink port and the auto sense feature as well***

Rubric

Standards for This Competency	EXEMPLARY	ACCOMPLISHED	DEVELOPING
Cable follows 568B standard on one side and 568A standard and tests with full continuity. RJ45 jack is secured on the cable jacket.	*Yes, (60 pt)*	*No,* (0 pt)	*No,* (0 pt)
Reflection Question #1	Answer is correct and fully developed. (10 pt)	Answer is correct and partially developed. (5 pt)	Answer is incorrect. (0 pt)
Reflection Question #2	Answer is correct and fully developed. (10 pt)	Answer is correct and partially developed. (5 pt)	Answer is incorrect. (0 pt)

Reflection Question #3	Answer is correct and fully developed. (10 pt)	Answer is correct and partially developed. (5 pt)	Answer is incorrect. (0 pt)
Reflection Question #4	Answer is correct and fully developed. (10 pt)	Answer is correct and partially developed. (5 pt)	Answer is incorrect. (0 pt)