

## CN101.3 Data Communication and Networks

Academic Year: 2017

### Experiment 1: Making an Unshielded Twisted Pair (UTP) Crossover Cable

#### Equipment Required:

1 x 2m Unshielded Twisted Pair (UTP) cable

1 x crimping tool

2 x RJ45 socket

#### Introduction:

##### What is a cross-over cable and why do we need one?

Consider data communication between two PCs. One PC is sending (transmitting or TX for short) data and the other PC is receiving (RX for short) that data. Therefore, the transmitting pins of the transmitter has to be connected to the receiving pins of the receiver. This is exactly the purpose of using a cross-over cable.

The following diagrams illustrates the function of a cross-over cable:

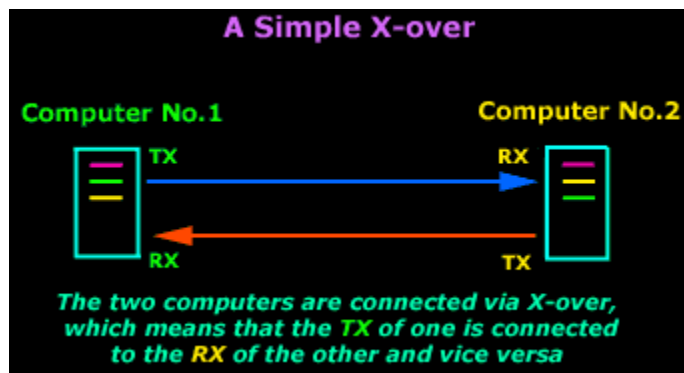


Fig. 1 (extracted from Reference 1)

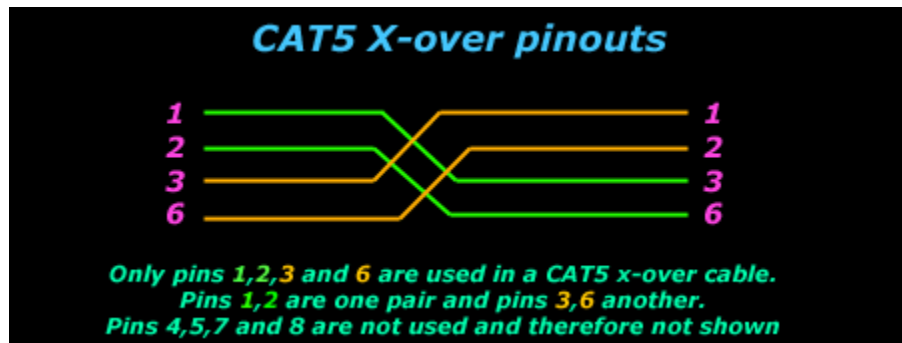


Fig. 2 (extracted from Reference 1)

Only four pins (1, 2, 3 and 6) are needed for a cross over cable, even though each cross over cable has eight pins. The unused pins (4, 5, 7, and 8) are just connected, without any use in data communication as shown in Fig. 3.

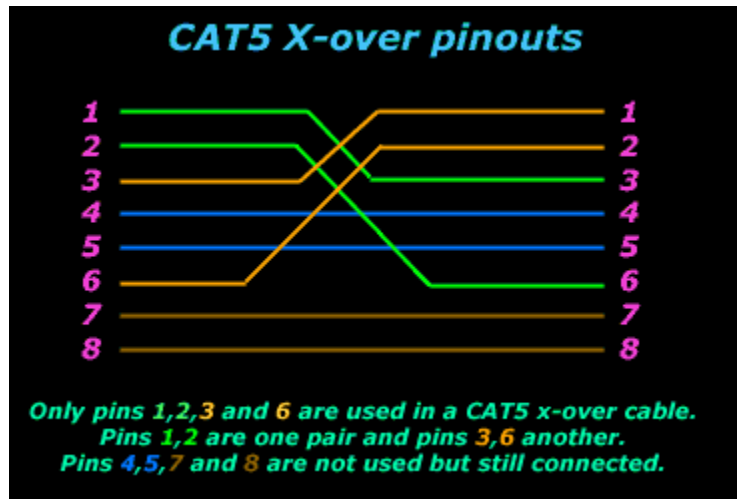


Fig. 3 (extracted from Reference 1)

#### Instructions:

Students are expected to work in groups of two. Each group should have the above equipment with them in order to successfully complete this laboratory.

#### Procedure:

- **Activity for both students:**
- Watch the short video shown [2] at the beginning of the class. Available at: <https://www.youtube.com/watch?v=Uw8FSXx4dnU>
- **Activities for Student 1:**
- Arrange the eight wires at one end of the cable according to their colours as:
  1. White and Green
  2. Green
  3. White and Orange
  4. Blue
  5. White and Blue
  6. Orange
  7. White and Brown
  8. Brown
- Connect the RJ45 connector as shown in video.

- **Activities for Student 2:**
- Arrange the eight wires at the other end of the cable according to their colours as:
  1. White and Orange
  2. Orange
  3. White and Green
  4. Blue
  5. White and Blue
  6. Green
  7. White and Brown
  8. Brown
- Connect the RJ45 connector as shown in video.
- **Activity for both students:**
- Use the network cable tester to test the cable as shown in video [3].

#### References:

- [1] <http://searchnetworking.techtarget.com/tutorial/CAT5-UTP-crossover-cable-Cabling-tips-for-network-professionals-lesson-3>, last accessed on 24 February 2017.
- [2] <https://www.youtube.com/watch?v=Uw8FSXx4dnU>, last accessed on 24 February 2017.
- [3] [https://www.youtube.com/watch?v=z\\_7LKgiWrdk](https://www.youtube.com/watch?v=z_7LKgiWrdk), last accessed on 24 February 2017.

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