

CO223 – Computer Communication Networks I

Semester-3, 2017

Laboratory Session 1

Network components and the different pieces of the Internet: Introduction

Instructions:

- You are required to do each step as instructed below.
 - You are advised to discuss with the Instructors if you are not clear about any issues.
 - You are required to write a report and submit within a week from your practical session. In your report, each problem/question should be addressed.
 - Time: 2 hours.
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a. Links

Get familiar with different types of network cables such as twisted pair, coaxial, and optical fibers.

- Find the categories of twisted pair such as UTP and STP, specific types such as Cat5, Cat6, Cat7, etc., and connectors such as Registered Jack 45 (RJ-45).
- Identify the different pairs of conductors in the twisted pair cable, their usage, and the color codes.
- Identify the difference and the usage of straight through- and crossover- cables.
- Search and find about 'Auto-MDIX' and briefly describe about how the cables are used in this case [homework].
- Find about single-mode and multi-mode optical fibers, associated transceivers such as SFP, and connectors such as LC connectors.
- Discuss with the Instructors and get to know about 'wireless-links'.

b. Systems/nodes

- Get familiar with network devices other than computers/PCs (end systems) such as routers, Ethernet switches, and hubs.
 - o Find out about different interfaces/ports such as Ethernet interfaces, SFP ports, serial interfaces, and other wide-area network interfaces in the devices, and the associated cables and connectors.
 - o Identify the console port/interface and get to know about how this port is used.
- Discuss and get to know about non-computer based end systems ('Things') such as 'sensors' that could be connected to a network (Network of 'Things' or Internet of Things- IoT).

c. *A network*

- See how PCs, Ethernet switches, and routers (systems/nodes) are connected with network cables (links) to form a 'network' as shown below.

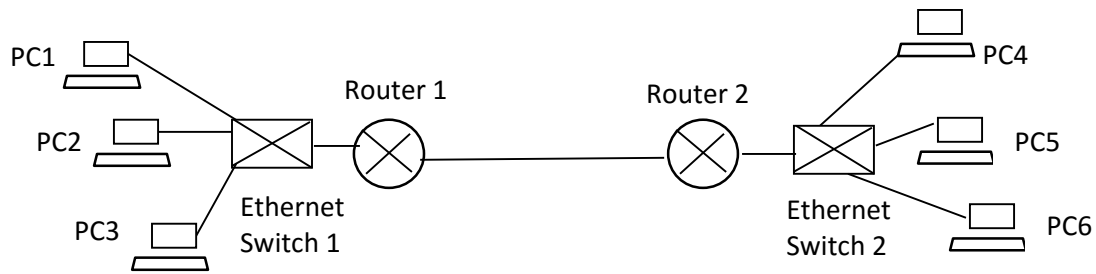


Fig. 1 A network

- Check the network by running a network application such as downloading webpage contents from a server (e.g., PC4) to a client (e.g., PC1).
- See how a 'sensor' could be connected to the network shown above and used.
- Discuss with the Instructors and get to know about how a 'wireless access point' could be attached to the above network and create a 'Wi-Fi network' (a wireless network).

d. *Addresses to interfaces in the network*

- Discuss with the Instructors and get to know about 'addresses' in networks.
- Observe how 'addresses' have been assigned to network interfaces (of PCs and routers). In Fig.1, label/mark the addresses assigned to interfaces.

e. *The department network*

- Have a close look on the Ethernet switch installed in the switch-rack at the laboratory, which connects to the rest of the department network (and the university network).
- Identify the different cables connected to it, associated connectors, and transceivers (if any).
- Visit each floor (of the Computer Engineering Department) and identify the network switches, links, wireless networks, etc.
- Discuss with the Instructors and draw the diagram of the entire department network:
 - o Label the nodes with the type of node and model (e.g., Ethernet switch, Cisco abcd 1234).
 - o Label the link type, specific category, and other details (e.g., 'Twisted pair, Cat5, connector-type' or 'optical fiber, multi-mode/single-mode, connector-type, transceiver')
 - o Show where Wi-Fi hotspots are.
 - o Show how (and what) end-systems are connected to the network.

f. *The university network and the Internet*

- Discuss with the Instructors on how the department network is connected to other switches and routers in the University.
- Get to know about the overall university network. Provide a diagram of the university network. Label/mark the devices and cable-types in your diagram.
- Discuss with the Instructors and describe how the university network is connected to the Internet or how the university network becomes part of the Internet.