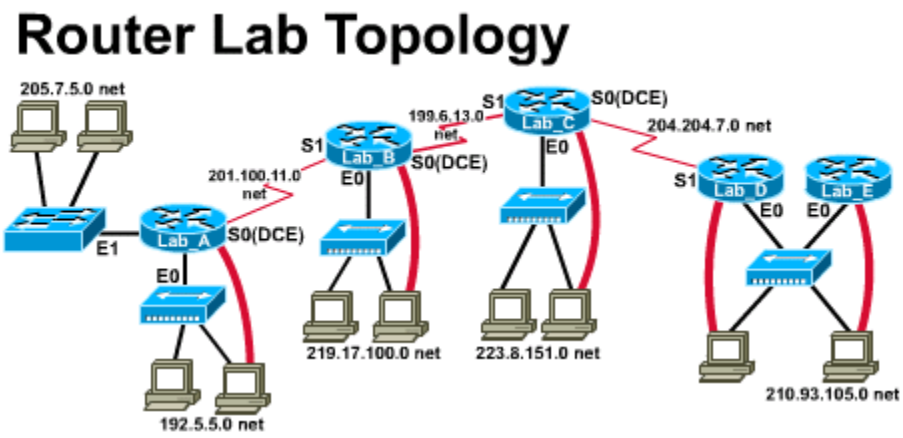
Lab 2.3.7 Switch characteristics - Overview

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Router Name -  Lab_A          Router Name -  Lab_C          Router Name -  Lab_E
Router Type - 2514            Router Type - 2501            Router Type - 2501
E0 = 192.5.5.1                E0 = 223.8.151.1              E0 = 210.93.105.2
E1 = 205.7.5.1                S0 = 204.204.7.1              SM = 255.255.255.0
S0 = 201.100.11.1             S1 = 199.6.13.2
SM = 255.255.255.0            SM = 255.255.255.0

Router Name -  Lab_B          Router Name -  Lab_D
Router Type - 2501            Router Type - 2501
E0 = 219.17.100.1             E0 = 210.93.105.1
S0 = 199.6.13.1               S1 = 204.204.7.2
S1 = 201.100.11.2             SM = 255.255.255.0
SM = 255.255.255.0
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Estimated time: 30 min.

Objectives:

- Determine the model number of an Ethernet switch and what physical interfaces (ports) it has
- Identify the cables, connections and devices that can attach to a switch
- Check and/or modify HyperTerminal configuration parameters
- Connect to the switch through its console using the PC and HyperTerminal

Background:

In this lab you will examine an Ethernet Switch to gather information about its physical characteristics and begin to appreciate the function of switches in a network. You will determine the model number and features of a specific switch including which interfaces are present and to which cabling and devices they are connected.

A switch is a Layer 2 (data link) network device that acts as the concentration point for the attachment of workstations, servers, routers, hubs and other switches. A "hub" is an earlier type of concentration device that provides multiple ports similar to a switch except that with a hub all workstations share the bandwidth (10Mbps with Standard Ethernet) and collisions will occur. Hubs operate at half-duplex (can

only send or receive) since they must be able to detect the collisions. A switch provides a dedicated point-to-point connection (virtual circuit) between two networking devices (such as workstations, servers and routers) so there are no collisions. Since they do not have to detect collisions, they can operate in full-duplex mode (simultaneous send and receive) which effectively doubles throughput. Ethernet switches are available in several speeds including 10Mbps (standard Ethernet), 100Mbps (Fast Ethernet) and 1000Mbps (Gigabit Ethernet).

Switches are sometimes referred to as multi-port bridges and are the newest technology for today's Ethernet star-wired Local Area Networks (LANs). Like routers, switches are dedicated PCs which contain a CPU, RAM and an operating system (IOS). As with a router, a switch can be managed by connecting to the console port to allow you to view and make changes to the configuration. Many of the newer switches have a web (HTTP) server built in and can also be managed via their IP address using a PC and a browser interface such as Netscape or Internet Explorer. The ability to understand and configure switches is essential for network support.

Tools / Preparation:

A switch should be available with a PC workstation, connected as a console, with HyperTerminal installed and properly configured to access the switch. The switch should be exposed with all sides clearly visible so that all physical connections and cables can be inspected. Since there may be only one switch available, the instructor should demonstrate this lab at a minimum and students should work in larger teams to get hands on. While one team is doing switch labs the others could be doing web-based research on switches at the Cisco web site URLs listed below. Before beginning this lab you should read the Networking Academy Second Year Companion Guide, Chapter 2 on LAN Switching. You should also review semester 3 On-line Lesson 2. The following is a list of equipment required.

- Windows PC w/ HyperTerminal installed
- Cisco Switch (19xx or 28xx model) with manuals
- Console Cable (Roll-Over)
- CAT5 Cable from the workstation to the switch

Web Site Resources

- LAN Switching basics
- General information on all Cisco products - (Scroll down to chapter 15 - Switches)
- 1900 / 2820 series Ethernet switches
- 2900 series Fast Ethernet switches
- 3500 series Gigabit Ethernet switches
- Cisco switch clustering technology

Notes:

Step 1 - Examine the LAN switch both front and back.

Answer the following questions. You may want to refer to the Installation and Configuration Guide for the switch you are working with.

NOTE:

Answers will vary depending on the switch model.

1. What is the model number of the switch?
2. What is the system serial number of the switch?
3. Do you see a console port? (Y/N)

   What port is it connected to on the Console terminal (PC workstation)?
4. What type of cable is the console cable (roll-over, cross-connect or straight-through cable)?
5. Do you see an AUI port? (Y/N)

   What does AUI mean and what could this port be used for?
6. What type of cable or adapter could be used with the AUI port?
7. Is there a power ON/OFF switch? (Y/N)

   How do you turn the switch on?
8. What is the total number of ports on the front of the switch for connection of workstations, servers, routers, hubs or other switches?
9. How many ports are 10Mbps Ethernet?
10. Are these crossover ports?

How can you tell?

11. What kind of connector(s) are used?

12. How many ports are 100Mbps Fast Ethernet?

13. Are these crossover ports?

How can you tell?

14. What kind of connector(s) are used?

15. What indicator lights (LEDs) are on the front of the switch?

16. What button is on the front of the switch?

What is it used for?

Step 2 - Review your answers to Step 1 and record interface information.

Use the following table to list and summarize the characteristics of all interfaces (or port connectors) on the switch. If there is no cable attached to a port, identify the cable type / connector that would normally be used.

Switch Interface / Port Identifier	Cable type / Connector	Device and port to which cable is connected

Step 3 - Review the workstation's HyperTerminal configuration.

1. Click on Start/Programs/Accessories/Communications and then HyperTerminal. Right Click on the icon that is defined for console access to the switch and then click Properties. The icon may be named cisco.ht or something similar. If one does not exist you can create it using the settings shown in the answers to the worksheet. On the Properties screen, click the Phone Number Tab and then click on the Configure button. Fill in the following table with the information indicated.

Configuration Option	Current Setting(s)

COM Port	
Bits per second	
Data Bits	
Parity	
Stop Bits	
Flow control	