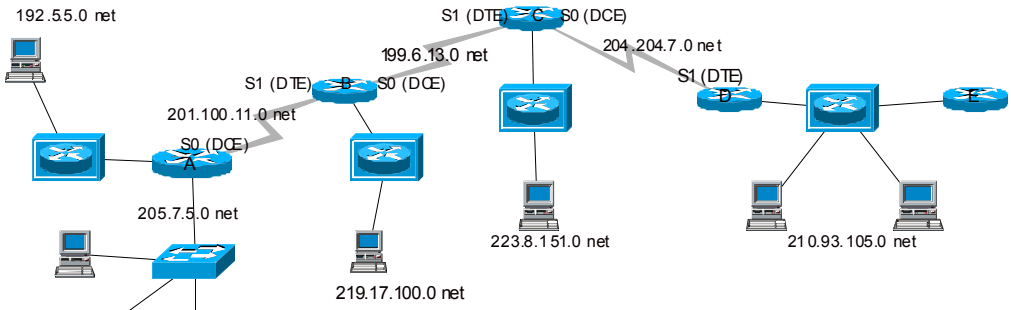
Semester 3 Switch CLI labs
Basic switch management

Lab 2.3.10.2cli Switch port options



Router name: Adelaide Router type: 2514 E0 = 192.5.5.1 E1 = 205.7.5.1 S0 = 201.100.11.1 S1 = SM = 255.255.255.0	Router name: Chicago Router type: 1601 / 2501 E0 = 223.8.151.1 S0 = 204.204.7.1 S1 = 199.6.13.2 SM = 255.255.255.0	Router name: Edinburgh Router type: 1601 / 2501 E0 = 210.93.105.2 S0 = S1 =
Router name: Birmingham Router type: 1601 / 2501 E0 = 219.17.100.1 S0 = 199.6.13.1 S1 = 201.100.11.2 SM 255.255.255.0	Router name: Detroit Router type: 1601 / 2501 E0 = 210.93.105.1 S0 = S1 = 204.204.7.2 SM = 255.255.255.0	Switch 1912 hostname: Alaska Switch 1924 hostname: Alabama

Estimated time: 40 min.

Objectives:

- Work with the Management Console User Interface Menus to determine the switch model number, MAC address and firmware revision
- Use the CLI to configure Fragment Free operation
- Use the Port configuration menu to enable Full-Duplex operation
- Use the Port configuration menu to enable Port Fast operation

Background:

In this lab you will work with the Command line interface to configure a switch to operate in Fragment-Free switching mode. You will also configure a port to enable FULL DUPLEX and Port Fast operation. Most switches can be configured with these options.

Fragment-Free Operation
There are 3 modes switches can operate in; 1) Cut-through or Fast-Forward, 2) Store-and-Forward and 3) Fragment-Free. In Fast-Forward mode, the switch only reads the destination MAC address of the Frame header and then immediately forwards the frame. This mode is the fastest but can also forward collision fragments of less than 64 bytes (a runt). Store-and forward waits for the entire frame to be received (up to 1,518 bytes) before forwarding the frame. It is the slowest switching mode but results in the fewest errors. Fragment-free mode reduces delay by making the forwarding decision after the first 64 bytes have been received. This means that no runts will be

forwarded which is the most common type of bad Ethernet frame. Fragment-free is the best compromise between speed and errors. Cisco switches can be set to operate in Store-and forward, Fragment-free or Fast Forward modes depending on the model.

Full Duplex Operation
When Full Duplex is enabled on a port it can double the bandwidth by allowing it to simultaneously transmit and receive. This means that a 10Mbps Ethernet port can operate at 20Mbps as long as the network interface of the attached device (NIC or router interface) can also support Full Duplex operation. Since a switch provides virtual circuit to the device with no collisions, this is dedicated bandwidth to the device. A 100Mbps Fast Ethernet port can operate at 200Mbps dedicated bandwidth. Full Duplex operation must be set for each port.

Port Fast Operation
When a switch port comes up it normally goes thru the normal 802.1d Spanning Tree states of Blocking, Listening, Learning, and then Forwarding. This process can take from up to 45 seconds to occur. When Port fast mode (spanning tree) is enabled, the Spanning Tree Protocol (STP) can transition the port's state from Blocking to Forwarding without going through the intermediate states of Listening and Learning. This can be beneficial especially in Novell Network IPX environments where the client request can sometimes timeout due to the time it takes for a switch port to respond.

Tools / Preparation:

Prior to starting the lab, the teacher or lab assistant should have a switch available with the default VLAN settings. A workstation with HyperTerminal should be available to console into the switch and an Ethernet connection should be available to Telnet into the switch. 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 -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 (configured for console connection to switch)
- Cisco Switch (19xx or 28xx model) with Enterprise Edition IOS
- Console Cable (roll-over)
- Straight-through CAT 5 Ethernet Cable from the workstation to a switch Ethernet port

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

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- Cisco switch clustering technology

Notes:

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Step 1 – connect the workstation to the switch console port and turn the switch on.

Wait a few minutes for the switch to "boot up" and it will display a menu of options. During the boot up process all port lights will turn green while it undertakes a self-test, these will then remain green if there is a connection and it is "good"

On "boot up" the switch will display a "User Interface Menu" select "K" to select the Command line interface.

1 - What is the model number for the switch?

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2 - What is the Ethernet Address (Layer 2 MAC address) of the switch?

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3 - What is the switch firmware revision type?

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4 – What is the switching mode set to?

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Step 2 – Configure the switch interfaces.

To configure the 10BaseT interfaces.

1 - Type in the following:

>**enable**
#**config t**
(config)#**int Ethernet 0/1**
(config-if)#**?**

The example above will configure port 1 on the switch and would need to be repeated for each port you wish to modify. If it is a 12 port switch (i.e. 1912) you have ports 1-12 whilst a 24 port switch (i.e. 1924) will have ports 1-24.

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2 – What options are available to you and what do they do? List them in alphabetical order

3 – Make ports 1 – 4 full duplex ports.

Write out the command you need to use to make each port listed above full duplex.
(config-if)# _____

How would a port be returned to half duplex if required?

Ports 1-4 are going to be used by finance and need to be given descriptions. Type in the commands as illustrated for port Ethernet 0/1 and repeat it for ports 2 – 4.

Alaska(config)#**interface Ethernet 0/1**
Alaska(config-if)#**description Finance**
Alaska(config-if)#**exit**

What information are you given if you use the **sh int e0/1** and the **sh run** commands?

Sh int e0/1	**Sh run**

To configure fast Ethernet ports. The 1900 switches have two fast Ethernet ports and given the port numbers 26 and 27 irrespective of whether it is a 12 or 24 port switch.

Alaska(config)#**interface fastEthernet 0/26**
Alaska(config-if)#**duplex full-flow-control**

Alaska(config-if)#**description trunk_to_Alabama** (if working on switch Alabama then command should relate to Alaska
Alaska(config-if)#**interface fast 0/27**
Alaska(config-if)#**duplex full**
Alaska(config-if)# **exit**

Step 3 – Verifying connectivity with workstations and router.

1 – Type the following commands:

Alaska#**ping 205.7.5.1**
Alaska#**ping (IP address of workstation – ensure it is suitable for network)**
Alaska#**telnet 205.7.5.1**

2 – What happened when you tried to telnet into the router?

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Although you can telnet into a 1900 switch you are unable to telnet out of a 1900 series switch.