**Bahria University, Lahore Campus**

Department of Computer Sciences

Lab Journal 05

**(Fall 2023)**

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| Course: | **Digital Communication Network Lab** | Date: 19-10-2023 |
| Course Code: | CSL-320 | Max Marks: 20 |
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**Objective(s):**

To understanding of Command Line Interface of Cisco Packet Tracer. Knowledge of the working of layer 3 devices.

## Tool(s) used:

CISCO Packet Tracer

**Command Line Interface**

After the interface status messages appear and you press Enter, the Switch>or Router>prompt will pop up. This is called user exec mode, or user mode for short, and although it’s mostly used to view statistics. There are three modes each with access to different command sets:

**User exec mode**—this is the first mode a user has access to after logging into the Switch or Router. This mode allows the user to execute only the basic commands, such as those that show the system's status. The system cannot be configured or restarted from this mode.

**Privileged mode**— this mode allows users to view the system configuration, restart the system, and enter configuration mode. It also allows all the commands that are available in user mode. You enter it via the enable command like this:

*Switch>enable*

*Switch#*

Privileged mode can be identified by the # prompt following the router or switch name. You can go back from privileged mode into user mode by using the disable command:

*Switch# disable*

*Switch>*

**Configuration mode**— this mode allows users to modify the running system configuration. To enter configuration mode, enter the command configure terminal from privileged mode.

*Switch# configure terminal*

*Switch(config)#*

Configuration mode has various sub modes, starting with global configuration mode, which can be identified by the (config)# prompt following the router name. As the configuration mode sub modes change depending on what is being configured, the words inside the parentheses change.

**Mode Definition**

User exec mode Limited to basic monitoring commands

Privileged exec mode Provides access to all other router commands

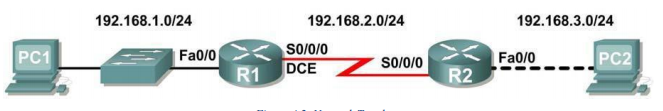
Global configuration mode Commands that affect the entire system

Specific Configuration Commands that affect interfaces/processes Modes only

Setup mode Interactive configuration dialog

**Task 01 Creating the Network**

**Topology Diagram**



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Device** | **Interface** | **IP Address** | **Subnet Mask** | **Default Gateway** |
| **R1** | Fast Ethernet 0/0 | 192.168.1.1 | 255.255.255.0 | NA |
| Serial 0/0/0 | 192.168.2.1 | 255.255.255.0 | NA |
| **R2** | Fast Ethernet 0/0 | 192.168.3.0 | 255.255.255.0 | NA |
| Serail 0/0/0 | 19.168.2.2 | 255.255.255.0 | NA |
| **PC 1** | NA | 192.168.1.10 | 255.255.255.0 | 192.168.1.1 |
| **PC 2** | NA | 192.168.3.10 | 255.255.255.0 | 19.168.3.1 |

**Answer the following questions.**

What type of cable is used to connect the Ethernet interface on a host PC to the Ethernet interface on a switch? \_COPPER STRAIGHT THROUGH\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What type of cable is used to connect the Ethernet interface on a switch to the Ethernet interface on a router? \_ COPPER STRAIGHT THROUGH\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What type of cable is used to connect the Ethernet interface on a router to the Ethernet interface on a host PC? \_\_\_COPPER CROSS OVER\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

What type of cable is used to connect the Serial interface on a router R1 to the Serial interface on a router R2? \_\_\_\_\_SERIAL DTE\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Task 02 Perform basic IOS command line interface operations**

**Step 1** Establish a terminal session to router R1.

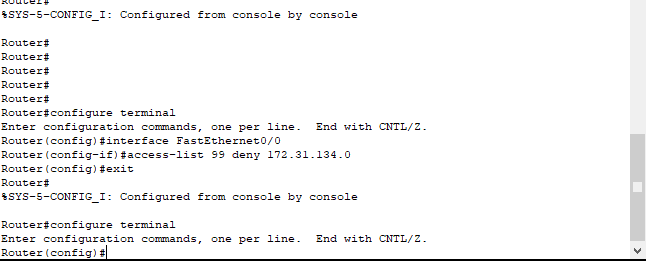
The console port is a management port used to provide out-of-band access to a router. It is used to set up the initial configuration of a router and to monitor it.

A rollover cable and an RJ-45 to DB-9 adapter are used to connect a PC to the console port. As you know from your previous studies, terminal emulation software is used to configure the router over the console connection.

**Step 2** Which command is used to enter privileged EXEC mode?

**Step 3** Enter global configuration mode. Run the following command and write your observations.

***Router# configure terminal***



**Task 03 Perform basic Configuration of Router R1.**

**Step 1** Configure the router name as R1.

Enter the command at the prompt

***Router(config)# hostname R1***

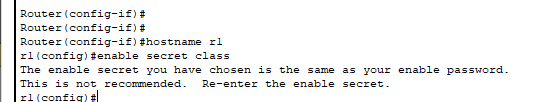
**Step 2** Configure the EXEC mode password.

Configure the EXEC mode password using the following command. Use class for the password.

***R1(config)# enable secret class***

OR

***R1(config)# enable password class***



**Step 3** Configure the console password on the router.

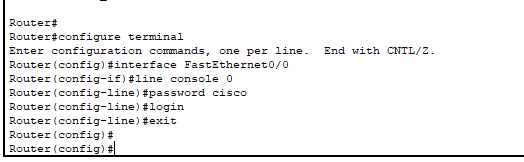
Run following commands to set console password on the router. Use cisco as the password. When you are finished, exit from line configuration mode. Write down your observations.

***R1(config)# line console 0***

***R1(config-line)#password cisco***

***R1(config-line)#login***

***R1(config-line)#exit***



**Step 4** Configure the password for the virtual terminal lines.

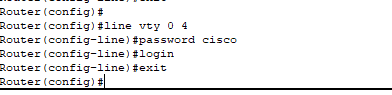
Run following commands to set telnet password on the router. Use cisco as the password. When you are finished, exit from line configuration mode.

***R1(config)#line vty 0 4***

***R1(config-line)#password cisco***

***R1(config-line)#login***

***R1(config-line)#exit***



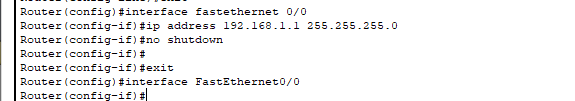
**Step 5** Configure the FastEthernet0/0 interface.

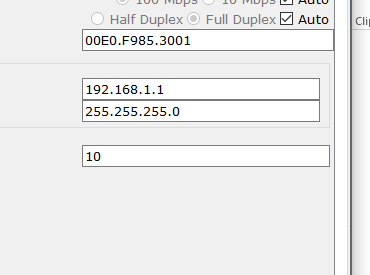
Configure the FastEthernet0/0 interface with the IP address 192.168.1.1/24 by using following commands. Write down your observations

***R1(config)#interface fastethernet 0/0***

***R1(config-if)#ip address 192.168.1.1 255.255.255.0***

***R1(config-if)#no shutdown***





**Step 6** Configure the Serial0/0/0 interface.

Configure the Serial0/0/0 interface with the IP address 192.168.2.1/24. Set the clock rate to 64000.

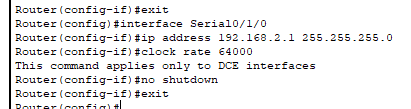
***R1(config-if)#interface serial 0/0/0***

***R1(config-if)#ip address 192.168.2.1 255.255.255.0***

***R1(config-if)#clock rate 64000***

***R1(config-if)#no shutdown***

***R1(config-if)#exit***

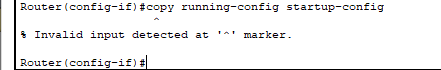


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**Step 7** Save the R1 configuration.

Save the R1 configuration using the following command and write your observations

***R1#copy running-config startup-config***



**Task 3.1 Perform Basic Configuration of Router R2.**

**Step 1** For R2, repeat Steps 1 through 6 from Task 3

**Step 2** Configure the Serial 0/0/0 interface with the IP address 192.168.2.2/24.

Write commands for configuration.

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**Step 3** Configure the FastEthernet0/0 interface with the IP address 192.168.3.1/24. Write commands for configuration.

**Step 4** Save the R2 configuration.

Save the R2 configuration as done in Task 3 step 9.

### Configure IP Addressing on the Host PCs

**Step 1 Configure the host PC1.**

Configure the host PC1 that is attached to R1 with an IP address of 192.168.1.10/24 and a default gateway of 192.168.1.1.

**Step 2 Configure the host PC2.**

Configure the host PC2 that is attached to R2 with an IP address of 192.168.3.10/24 and a default gateway of 192.168.3.1.

Explain the significance of gateway.

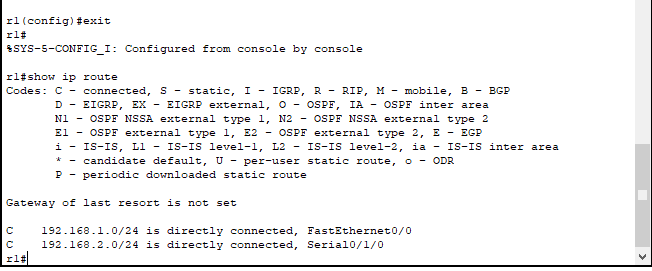
**Task 04 Verify and Test the Configurations.**

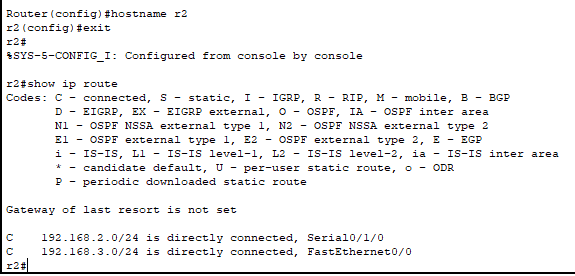
**Step 1** Verify that routing tables have the following routes using the show ip route command.

The show ip route command and output will be thoroughly explored in upcoming labs. For now, you are interested in seeing that both R1 and R2 have two routes. Both routes are designated with a C. These are the directly connected networks that were activated when you configured the interfaces on each router. If you do not see two routes for each router as shown in the following output, proceed to Step 2.

Run the following command on R1 and R2 and write your observations.

***R1#show ip route***

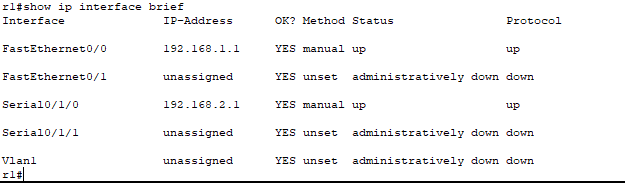




**Step 2** Verify interface configurations.

Another common problem is router interfaces that are not configured correctly or not activated. Use the following command to quickly verify the configuration of each router’s interfaces. Write your observations

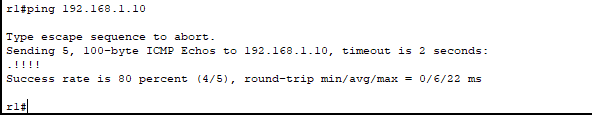
***R1#show ip interface brief***



**Step 3** Test connectivity using ping.

The ping command is a useful tool for troubleshooting Layers 1 through 3 of the OSI model and diagnosing basic network connectivity. This operation can be performed at either the user or privileged EXEC modes. Using ping sends an Internet Control Message Protocol (ICMP) packet to the specified device and then waits for a reply. Pings can be sent from a router or a host PC. Use the ping command to test connectivity between the R1 router and PC1. Write your observation.

***R1#ping 192.168.1.10***



Test connectivity by pinging from each host to the default gateway that has been configured for that

host. From the host attached to R1, is it possible to ping the default gateway?

From the host attached to R2, is it possible to ping the default gateway?