National University of Computer and Emerging Sciences



**Laboratory Manuals**

*for*

**Computer Networks**

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Lab Manual 13

# Objective:

* Configuring Router using CLI of the Router
* Configuring DHCP for different networks attached to a single router

# In lab Statement 1: [20]

\*\*\*\*\*\*This lab statement is on same concept given in Lab 11. Only difference is that now you will have to configure your computers using DHCP configuration from the router. Also you will have to configure the RIP and all the serial/Ethernet interfaces of the router using CLI of the router. Dummy code is given at the end of the lab statement in which a router having three Ethernet interfaces and two serial interfaces is configured using CLI of the router. The given code also depicts how you can configure Routing table using RIPv2 for classless addressing and how to configure DHCP using router for two different networks connected to same router. Just go through the code given, understand it and try to implement the topology given\*\*\*\*\*\*\*

You have to design a network solution for the Fast-NU three Labs, Staff and Faculty members. All the three Labs, Staff and faculty members should be on different Sub networks. There are total 15 computers divided in this way Staff 3, Faculty 3, Lab-1 3, Lab-2 3 and Lab-3 3.

Assume that FAST-NU is given a Network Class C address having first three octets of IP address fixed as **210.17.44.X\24**. You can change the last octet in order to make desired number of subnets and desired number of hosts in each subnet for the above given topology. Make sure that you optimally design the network considering the number of devices (switches, routers etc.) used and how you are assigning the IP addresses to different subnets in your design. (You can consult the slides for sub netting provided to you in case you have no idea about sub netting or you have forgotten it)

1. Use wires (straight through and cross over where necessary and applicable) – no wireless LAN is required for this submission.
2. Use 2911 Router and 2950-24 switches.
3. You can connect a maximum of two Ethernet and two serial interfaces to a router
4. You have to assign IPs to the machines using dhcp configuration from the CLI of the router
5. Use ping from the command prompt of computers to check your network design is working.
6. Make your design as neat as possible and properly add the IPs of all the PCs and router interfaces using comments in your design to get the full credit. (You can insert comments in the design area using a sticky note sign in the right sidebar of Cisco Packet Tracer)

**Configuring Router using CLI of Router (DEMO EXAMPLE):**

To configure the router using CLI there are many commands but what you need to know are some basic commands using which you should be able to configure the Interfaces of the router, configure RIP in the router and configure DHCP using server. Below given are some commands to configure the router interfaces. You must see all these commands carefully and try to implement your system using CLI of the router. Commands are simple and you will interpret what each command says once you have read it thoroughly.

**Note: You can use TAB in CLI to write the incomplete word after writing one or two letters e.g., if you write “interface fa” and press tab CLI will automatically make it “interface fastEthernet”.**

--- System Configuration Dialog ---

Continue with configuration dialog? [yes/no]: no

Press RETURN to get started!

**//Configuring Interface gigabitethernet 0/0**

Router>enable //enable configuration mode

Router#configure terminal //enter configuration terminal

Enter configuration commands, one per line. End with CNTL/Z.

Router(config)#interface gigabitEthernet 0/0 //select router interface to assign IP and mask

Router(config-if)#ip address 192.168.1.1 255.255.255.0

Router(config-if)#no shutdown //make the interface port status on

%LINK-5-CHANGED: Interface GigabitEthernet0/0, changed state to up

Router(config-if)#exit //exit the current interface

**//Configuring Interface gigabitethernet 0/1**

Router(config)#interface gigabitEthernet 0/1 //select another interface

Router(config-if)#ip address 192.168.2.1 255.255.255.0 //assign ip and mask

Router(config-if)#no shutdown //make interface port status on

%LINK-5-CHANGED: Interface GigabitEthernet0/1, changed state to up

Router(config-if)#exit //exit current interface

**//Configuring Interface gigabitethernet 0/2**

Router(config)#interface gigabitEthernet 0/2

Router(config-if)#ip address 192.168.3.1 255.255.255.0

Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface GigabitEthernet0/2, changed state to up

Router(config-if)#exit

**//Configuring Interface serial 0/0/0**

Router(config)#interface serial 0/0/0

Router(config-if)#ip address 192.168.4.1 255.255.255.0

Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/0, changed state to down

Router(config-if)#exit

**//Configuring Interface serial 0/0/1**

Router(config)#interface serial 0/0/1

Router(config-if)#ip address 192.168.5.1 255.255.255.0

Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0/1, changed state to down

Router(config-if)#exit

**//Configuring Networks in RIP**

Router(config)#router rip //Configure Routing table in router

Router(config-router)#version 2 //RIPv2

Router(config-router)#no auto-summary //Make classless routing enable

Router(config-router)#network 192.168.1.0 //Assign all the networks connected with router

Router(config-router)#network 192.168.2.0

Router(config-router)#network 192.168.3.0

Router(config-router)#network 192.168.4.0

Router(config-router)#network 192.168.5.0

Router(config-router)#exit

**//Configuring DHCP in Router**

Router(config)#ip dhcp pool NetA //Configure DHCP using router for One Subnet

Router(dhcp-config)#network 192.168.1.0 255.255.255.0 //Give network and mask

Router(dhcp-config)#default-router 192.168.1.1 //Give default gateway for NetA

Router(dhcp-config)#exit //exit the NetA config

Router(config)#ip dhcp pool NetB // Configure DHCP using router for Other Subnet

Router(dhcp-config)#network 192.168.10.0 255.255.255.0 //Network and Mask

Router(dhcp-config)#default-router 192.168.10.1 //Give Default Gateway

Router(dhcp-config)#exit //exit the NetB config

//exclude certain specific addresses if you want

Router(config)#ip dhcp excluded-address 192.168.1.4 192.168.1.7

Router(config)#ip dhcp excluded-address 192.168.10.2 192.168.10.9

Router(config)#exit

Router#exit