

CO-223

LABORATORY SESSION 4

NAME : WIMALASIRI KPGP
REG NO : E/14/403
SEMESTER : 3RD
GROUP : 15
DATE : 24/04/2017

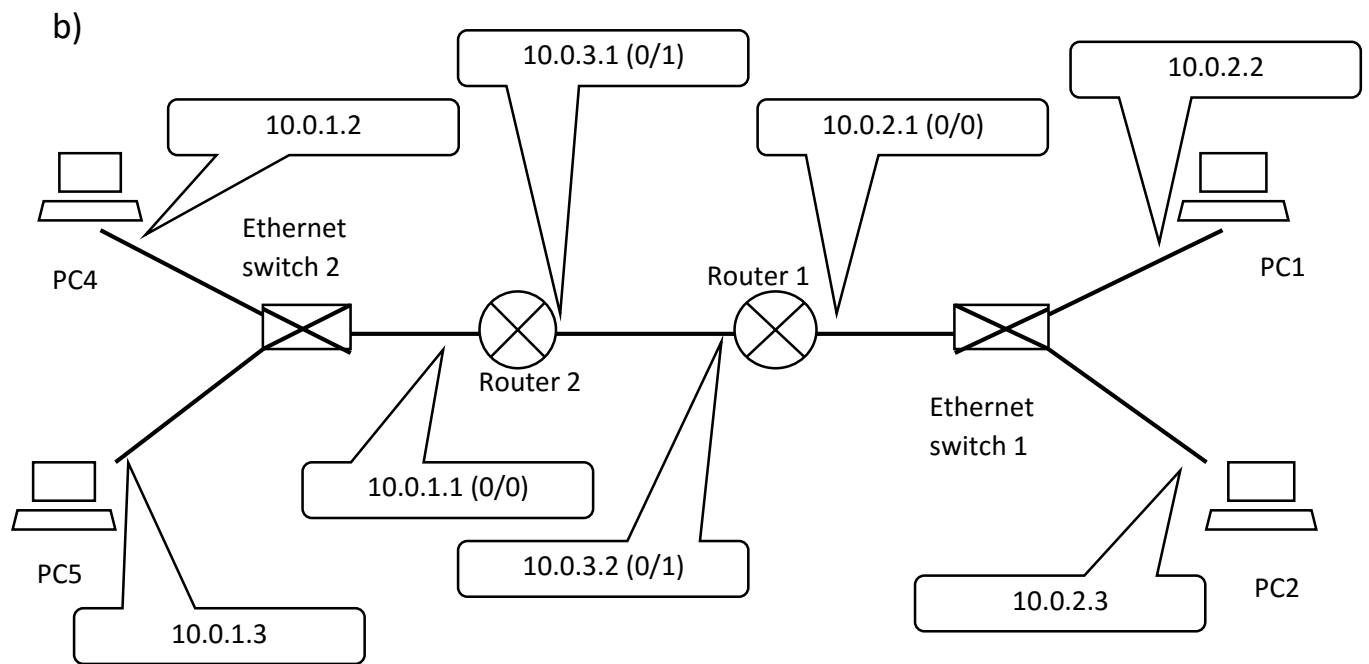


Fig. 1 : A two-router network

- i) First, remove the IP addresses assigned to PCs in EE department. Then open network and sharing center and set those PCs to automatically receive addresses.

Then open putty and enter **enable** and enter to the privileged EXEC mode. After that enter **conf t** and enter into the configuration mode. Then type **ip dhcp pool pool_name** in order to enter the dhcp configure mode. The subnet id of the subnet which is going to have auto assigned addresses should be given to the router as follows. In commad-line interface type **network 10.0.1.0 /24**.

After this step the default router has to be set. In this case R1 has to be set as the domain server. Therefore, the command should be **default-router 10.0.3.2**. Domain name should be given by **domain-name domain_name** command. Domain name server also have to be introduced to the router here by giving the command **dns-server 10.0.1.5**. Then the lease time should be given as follows. **lease 0 4**. Then type exit and return to the configuration mode. Finally, address excluding should be done. The command used there is **ip dhcp excluded-address 10.0.1.5 10.0.1.15**. Here first IP address is the start of the range and the second is the end of the IP range. Type **write mem** in order to save the configuration settings to the router.

1.

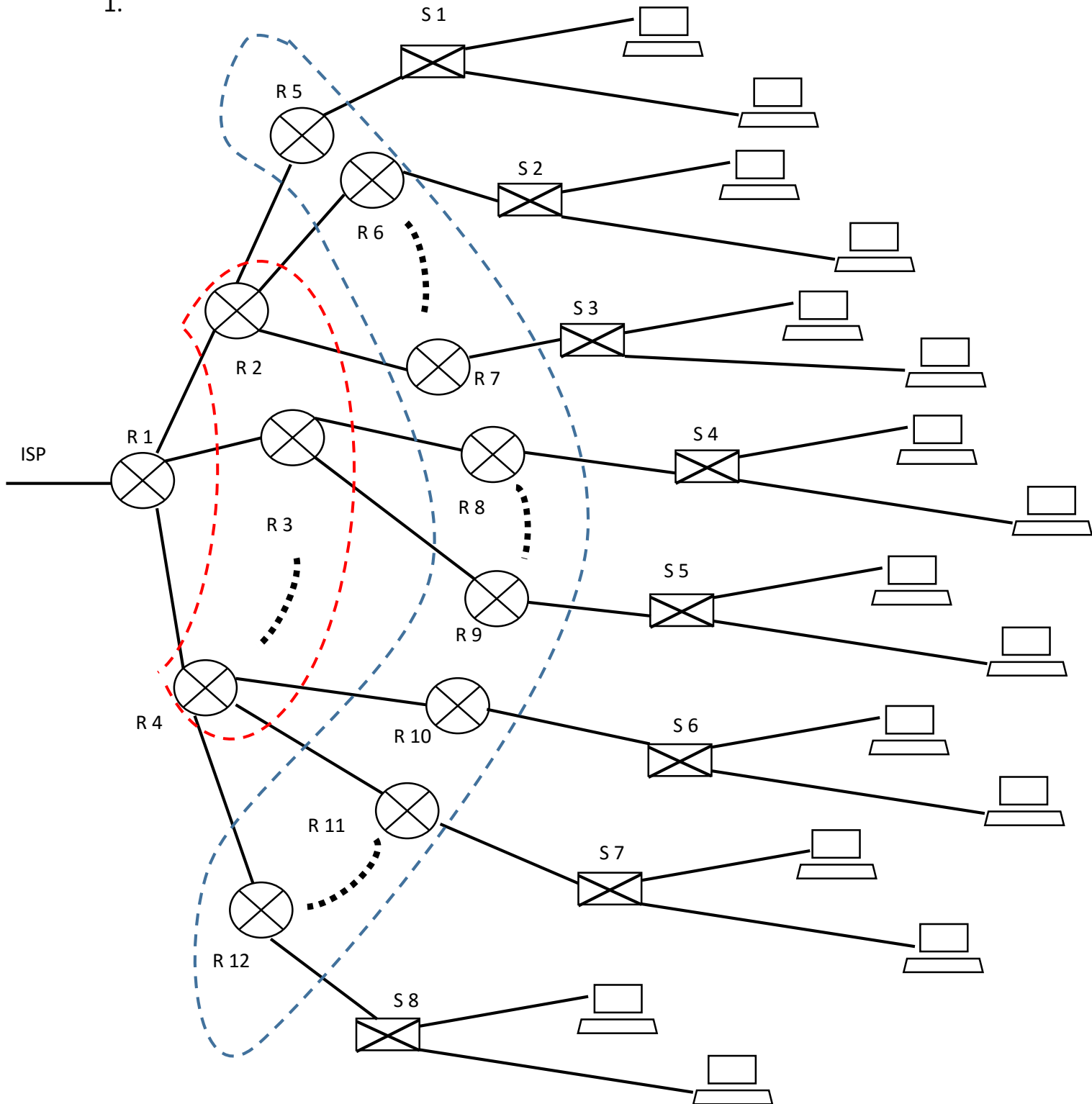


Fig. 2 : The University Network

As given in Fig. 2, network within the university is implemented in a same model. R 1 router is the one which connected to the ISP and is connected to routers R2, R3, R4 and etc. R2, R3, R4 routes are in each faculty in order to receive packets from R1 and direct those within the faculty. R5, R6, R7 and etc. routers are the one's which are direct packets to different departments within the same faculty.

R1 router's interfaces should be connected to the connection from ISP and to the faculty routers. (2nd level / R2, R3, R4 and etc. All 2nd level routers (R2, R3, R4 and etc.) should have the same subnet ID. And each router at level 2 is connected to another router in order to divide the connection between departments of each faculty. The set of routers those are connected to each 2nd level router have same subnet. (Each department has a unique subnet ID.) 3rd level routers may have connected to number of switches and each switch is connected to a number of end devices. Subnet connected to the 3rd level router also have the same subnet ID.

2. It is not practical to implement isolated networks, physically for students and the staff because of the huge cost. Then the isolation should be done within the same network. But, same end devices can be used by both students and the staff. Therefore, classifying devices is also not going to work in this scenario. This problem can be addressed through packet encapsulation. If in the application layer there are different port numbers for student and staff applications, according to the port number datagrams can be differentiate within the same network.
3. Cisco IOS CLI commands are used to interact with cisco devices. Cisco IOS commands are divided into different modes for configuration, maintenance, monitoring of router and network operations.

User EXEC mode is a mode type which the user enter when a session on a router starts. User EXEC is a subset of EXEC command set which is a limited one for security purposes. This mode can only determine router status but altering configurations are restricted. In this mode router will show **Router>**. To exit from this mode use **logout** command.

In order to access the Privileged EXEC mode **enable** command should be entered. In most cases system will ask for a password. After entering into the Privileged EXEC mode command-line will display **Router#**. In this mode user can change configurations and settings, but will not save after rebooting the router. To exit to user EXEC mode enter **disable**.

If the user needs to configure the interfaces or protocols (specific elements) entering to the Global Configuration mode is necessary. In order to enter this mode from Privileged mode **configure terminal** command should be entered. After entering to the Global Configuration mode command-line should be **Router(config)#** In order to exit this mode **end** command should be entered.

Interface Configuration mode is used to specify the interface to be configured. Command **Interface interface_type interface_number** should be entered to enter this mode and to configure a specified interface. After entering to this mode command-line display would be **Router(config-if)#** Returning to the Global Configuration mode can be done by entering **exit**.

4. Console port of a router is used to connect the router through a cable which has a RJ-45 end to connect to the router and the other end is a serial port which is connected to the computer. Configuring and troubleshooting also can be done using CLI (Command Line Interface) through the computer.

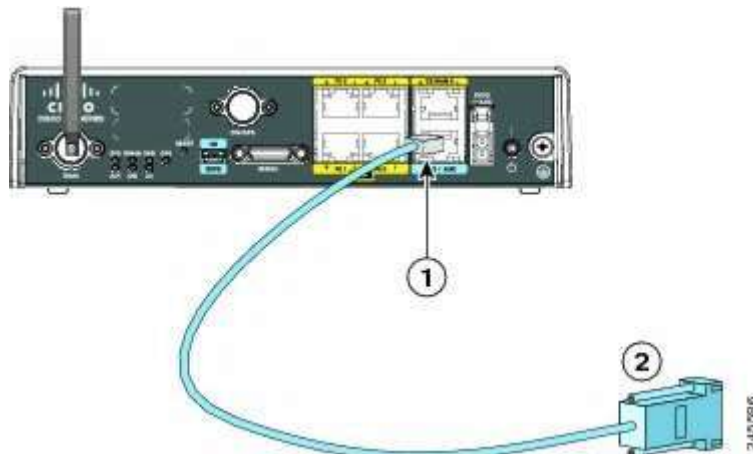


Fig. 3 : Connecting Console port

Auxiliary port of a router is used to connect an external modem. This is much more like the console port. In this port the same cable which was used for the console port is used to connect with the modem. In some places this port is labelled as “MODEM”.



Fig. 4 : AUX port

Management (MGMT) port is also referred as GigabitEthernet0/0 port. It is actually an Ethernet port which can connect to a PC. This port can be used instead of console port too.

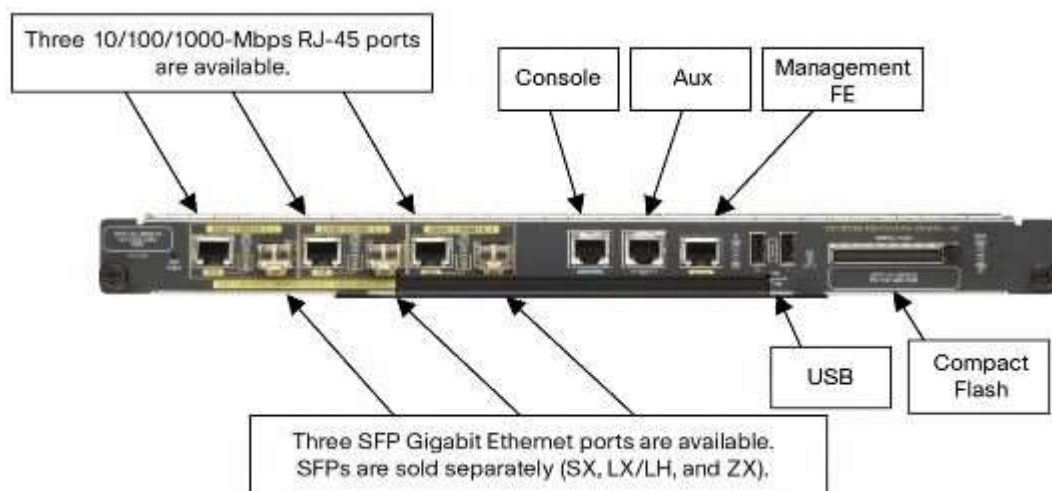


Fig. 5 : Ports in a router

USB port in router can be used to input configuration settings and IOS of a router easily. Using USB flash disk configuration settings or the IOS of router can be easily copied and can be implemented to another router too.

5.

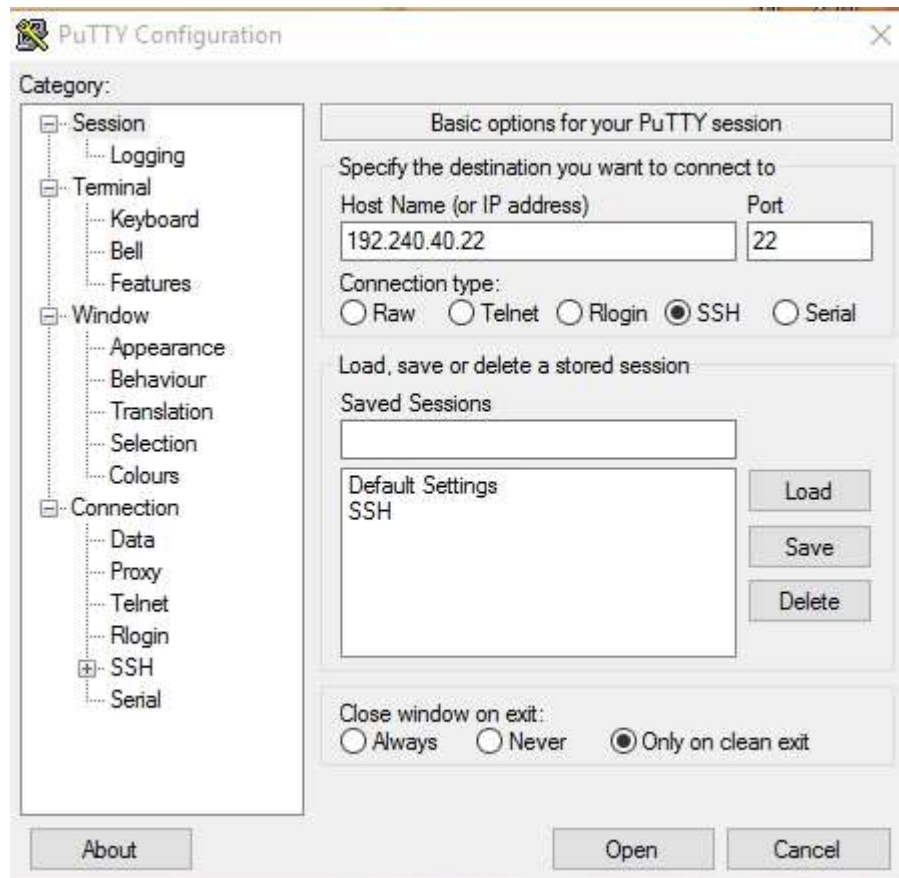


Fig. 6 : Putty configuration

Open putty and set host IP (destination IP) port no. (destination port no.) and the connection type radio button to SSH and then open. You will see a command line interface and it will display Router> if connection is established.

REFERENCE

1. www.cisco.com/c/en/ustd/docs/ios/12_2/configfun/configuration/guide/ffun_c/fcf001.html
2. www.cisco.com/c/en/ustd/docs/routers/access/800/hardware/installtion/guide/800HIG/connecting.html
3. Learningnetwork.cisco.com/thread/37964
4. www.cisco.com/en/US/docs/switches/lan/catalyst3850/software/release/3.2_0_se/multibook/configuration_guide/b_consolidated_config_guide_3850_chapter_010101.html