Creating a Local Area Network (LAN) using Hub/Switch/Router

1. Objectives

- To connect hosts in different networks using a Router in **Packet Tracer.**
- Configure **router interfaces** and learn other **basic router configuration settings.**
- Save the **router configuration file.**

2. Instructions: Using a Router to connect two different groups/subnets

2a. Instructions [See "Basic Router Configuration - Knowledge base" doc for details]

Task 1: Physical Connections

Create 2 groups (subnets – network address will be different) of PCs and connect all PCs in a group with hub/switch. Then connect 2 groups/subnets with a router.

Task 2: Configure a Router

Step 1: Use the privileged mode and configuration modes.

There are **four (4) IOS modes**: 1) **User**, 2) **Privileged**, 3) **Global Configuration**, and 4) **Interface mode**.

- ✓ To enter privileged mode, use command: **enable** from user mode.
- ✓ To enter **global configuration mode**, enter command: **configuration terminal (config t)** at privileged mode.
- ✓ There are commands that may be used to exit the current configuration mode: **exit** (to go one step up) and **end** (to go to **privileged mode** directly).

Task 3: Configure the Router Interfaces

Write down your IP address and mask of first network (Fa0/0): _____

Write down your IP address and mask of first network (Fa0/1): _____

Step 1: Configure the router fa0/0 interface.

```
Router1(config)# interface fa0/0
Router1(config-if)# description Connection to Host1 with crossover cable
Router1(config-if)# ip address address mask
Router1(config-if)# no shutdown
Router1(config-if)# end
Router1#
```

Step 2: Configure the router fa0/1 interface.

```
Router1(config)# interface fa0/1
Router1(config-if)# description Connect to switch with straight-through cable
Router1(config-if)# ip address address mask
Router1(config-if)# no shutdown
Router1(config-if)# end
Router1#
```

[Note: Observe how the router interface state changes after giving the **"no shutdown"** command. **]**

Step 3: Configure the host computers.

Configure the host computers for LAN. Fill in the following fields for **network 1 (connected with Fa0/0):**

IP Address: The first host address _____

Subnet Mask: _____

Default Gateway: Router's IP Address _____

Fill in the following fields for **network 2 (connected with Fa0/1)**:

IP Address: The first host address _____ **Subnet Mask:** _____

IP Address: The second host address _____ **Subnet Mask:** _____

Default Gateway: Router's IP Address _____

Step 4: Verify network connectivity.

Use the **ping** command to verify network connectivity with the router. If ping replies are not successful troubleshoot the connection:

Task 4: Save the Router Configuration File.

Cisco IOS refers to RAM configuration storage as **running-configuration**, and NVRAM configuration storage as **startup-configuration**. For configurations to survive rebooting or power restarts, the RAM configuration must be copied into non-volatile RAM (NVRAM). This does not occur automatically, NVRAM must be manually updated after any changes are made.

Step 1: Compare router RAM and NVRAM configurations.

Use the Cisco IOS **show** command to view RAM and NVRAM configurations. The configuration is displayed one screen at a time. A line containing " **-- more --** " indicates that there is additional information to display. The following list describes acceptable key responses:

Display the contents of NVRAM. If no output for NVRAM is shown, it is because there is no saved configuration:

```
Router1# show startup-config
startup-config is not present
Router1#
```

Display the contents of RAM.

```
Router1#show running-config
```

Step 2: Save RAM configuration to NVRAM.

For a configuration to be used the next time the router is powered on or reloaded, it must be manually saved in NVRAM. Save the RAM configuration to NVRAM:

```
Router1# copy running-config startup-config
Destination filename [startup-config]? <ENTER>
Building configuration...
[OK]
```

Answer the following:

1. What are the **four primitive modes** of **Router IOS**? What are the **purposes of each mode**?

2. Why we use **TAB** and **?** symbol during router configuration?

3. What is the **basic difference** between "**startup configuration**" file and "**running configuration**" file?

4. What is the output of "**show run**" command?

5. **Why** and in **which mode** "**copy run start**" command is used?

6. **Why** "**no shutdown**" command is used?

Demonstrate your work to the instructors and submit lab report.