CO513 - Lab 02
Static Routing

Static Routing

Routers forward packets using either route information from routing table entries that is manually configured or the route information that is calculated using dynamic routing algorithms. Static routes, which define the explicit paths between two routers, cannot be automatically updated; you must manually reconfigure static routes when network changes occur. Static routes use less bandwidth than dynamic routes. No CPU cycles are used to calculate and analyze routing updates. You can supplement dynamic routes with static routes where appropriate. You can redistribute static routes into dynamic routing algorithms, however, redistribution of routing information calculated by dynamic routing algorithms into the static routing table is not possible.

You should use static routes in environments where network traffic is predictable and the network design is simple. You should not use static routes in a large, constantly changing network because static routes cannot react to network changes. Most networks use dynamic routes to communicate between routers whereas they might have one or two static routes configured for special cases. Static routes are also useful for specifying a gateway of last resort (a default router to which all unrouteable packets are sent).

Lab Exercise

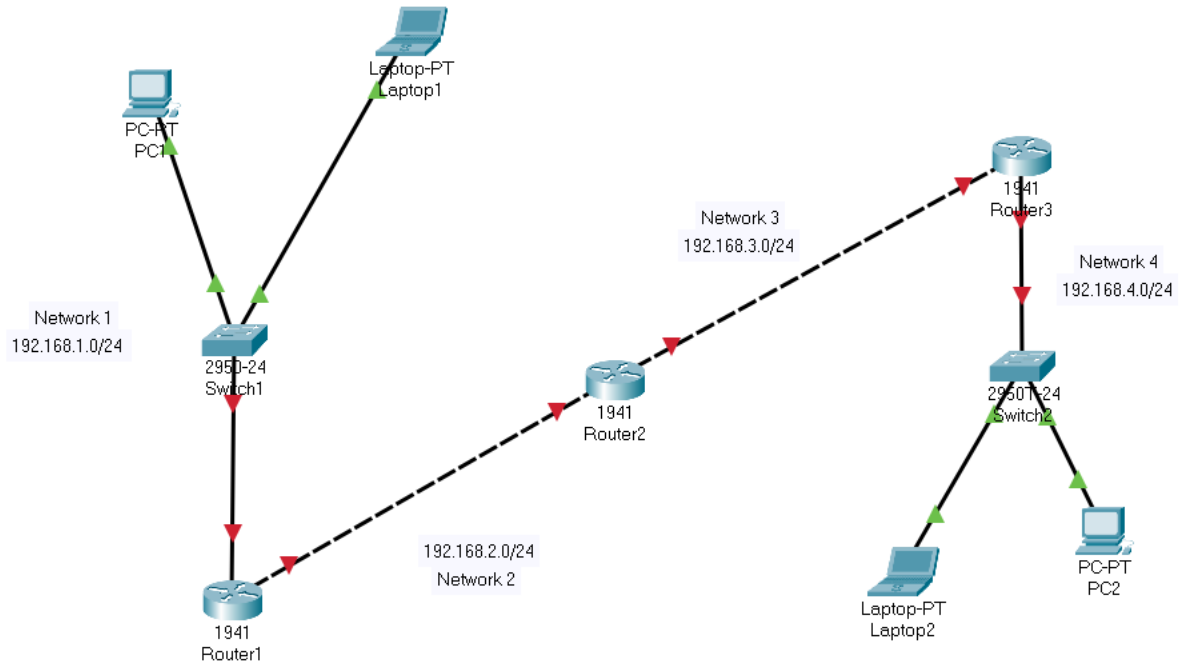

Figure 01

There are 4 networks connected via three routers as shown in Figure 01.

You have to transmit data between the devices in network 1 and network 4 using static routing. In order to perform this task, download and install Cisco Packet Tracer Software.

Basic Configuration

The network configurations related to the above topology can be indicated in Table 01 below.

Table 01

Network	Network Address	Subset Mask
1	192.168.1.0/24	255.255.255.0
2	192.168.2.0/24	255.255.255.0
3	192.168.3.0/24	255.255.255.0
4	192.168.4.0/24	255.255.255.0

1. Draw the network topology in cisco packet tracer using appropriate devices; routers, switches and end devices as indicated in Figure 01.
2. Assign the end devices and router ports with appropriate IP addresses.
3. Use built in show commands in Cisco IOS to visualize IP configurations in each of the routers.
4. Try to ping from one of the devices in network 1 to another device in network 4. Perform the ping operation under both Realtime and simulation modes. Identify and explain the issues met under this step.

Static Route Configurations

5. Configure Router 1 and Router 2 with appropriate static routes only to the network 4. Perform the ping operation again from a device in network 1 to network 4.
6. Identify the issues related with the above ping operation and compare it with the previous error you got under the prior ping operation in the above section.
7. Observe the routing tables of each of the routers.
8. Configure the Router 2 and Router 3 with static route information to network 1.
9. Perform the ping operation again and observe the command prompt output and final routing tables of each of the routers.

Submission

Create a report renamed as **E16XXX_report.pdf** (XXX is your E Number) including the **screenshots for your observations, simulations, CLIs (Show Command Outputs and Necessary Configurations), and answers** related to each of the steps.

- Submit a zip file **E16XXX_Lab02.zip** (XXX is your E Number) which contains the following.
    - **E16XXX_report.pdf**
    - **E16XXX.pkt** (Packet Tracer Activity File)

Note: Make sure that you have copied your running configuration to startup configurations before submitting the .pkt file (i.e. save your configurations correctly before submission).