- Lab 8 : Routing and switching
- Lecturer : Prof. Oumaima FADI
- T.A: Prof. Abdoulghaniyu HARAZEEM

Lab 8 – Routing and switching

Objective:

The general objective of this lab is to understand and master static routing configuration to ensure network connectivity between multiple subnets, while guaranteeing network efficiency, security, and reliability.

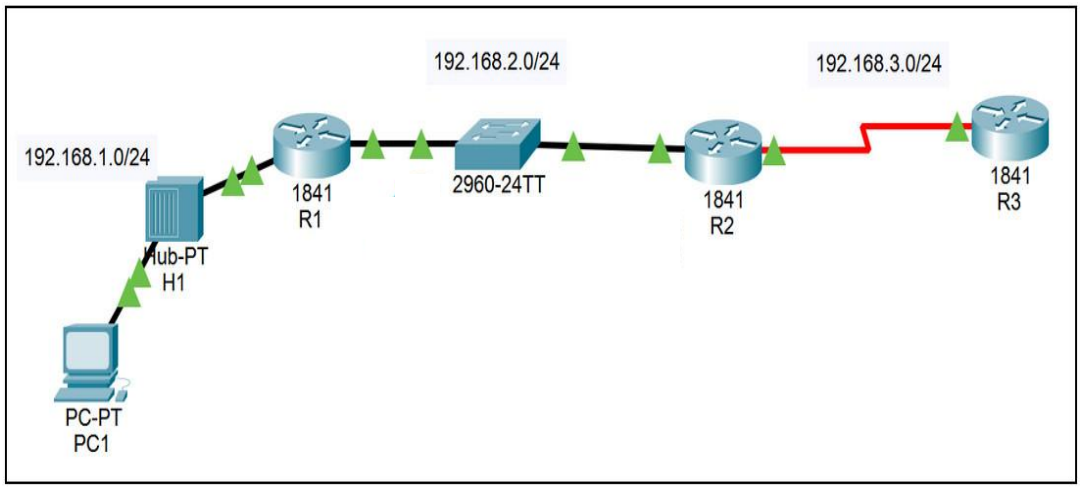
At the end of this lab, you will be able to:

- Describe the function of the routing table.
- Describe how a routing table can contain and use static routes.

Instructions:

1. The lab report must be submitted one week after the session in electronic format to Moodle platform
2. The lab must be done in class in groups of maximum 2 students.
3. Groups should remain the same for both reports and upcoming labs.

IP Table and Topology



Device	Interface	IP Address	Subnet	Gateway
PC1	NIC	192.168.1.10	/24	192.168.1.1
R1	Fa0/0	192.168.1.1	/24	N/A
R1	Fa0/1	192.168.2.1	/24	N/A
R2	Fa0/0	192.168.2.2	/24	N/A
R2	Fa0/1	192.168.3.1	/24	N/A
R3	Fa0/0	192.168.3.2	/24	N/A

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Task 1:

Enter a static route on R3 to reach R1's LAN. All of the interfaces on the router are configured and are functional. However, it is not possible to reach R1's LAN from R3. Follow the steps below to enter a static route on R3 to reach R1's LAN:

Step 1 – Configuring a static route on R3

From the **CLI** (command line interface) type the following commands:

```
R3>enable
R3# show ip route
```

(**Note:** The routing table shows directly connected routes, but there are no static routes to remote networks in the routing table.)

```
R3# configure terminal
R3(config)# ip route 192.168.1.0 255.255.255.0 192.168.3.1
R3(config)# end
```

Step 2 – Examine the routing table on R3

From the **CLI** type the following commands:

```
R3# show ip route
```

Are there any static routes in the routing table? If so, list the route(s) below:

If there are no routes in the routing table, retrace your steps and troubleshoot the problem.

Step 3 – Ping from R3 to PC1

Click R3 in the workspace.

Select the **CLI** tab.
From the **CLI** type the following commands:

```
R3#ping 192.168.1.10
```

Was the ping successful? (If the ping is not successful, it is because there is no route on R1 to reach R3.)

Task 2:

Enter a static route on R1 to reach R3

Follow the steps below to enter a static route on R1 to reach R3:

Step 1 – Configuring a static route on R1

From the **CLI** type the following commands:

```
R1>enable
R1# show ip route
```

(**Note:** The routing table shows directly connected routes, but there are no static routes to remote networks in the routing table.)

```
R1# configure terminal
R1(config)# ip route 192.168.3.0 255.255.255.0 192.168.2.2
R1(config)# end
```

Step 2 – Examine the routing table on R1

From the **CLI** type the following commands:

```
R1# show ip route
```

Are there any static routes in the routing table? If so, list the route(s) below:

If there are no routes in the routing table, retrace your steps and troubleshoot the problem.

Step 3 – Ping from R3 to PC1

Click R3 in the workspace.

Select the **CLI** tab.
From the **CLI** type the following commands:

```
R3# ping 192.168.1.10
```

Was the ping successful? (Hint: If the ping is not successful, check the routing tables on all three routers to determine the problem.)

Task 3:

Enter a static route on R2 to reach R1's LAN

Follow the steps below to enter a static route on R2 to reach R1's LAN:

Step 1 – Configuring a static route on R2

From the **CLI** type the following commands:

```
R2>enable
R2# show ip route
```

(**Note:** The routing table shows directly connected routes, but there are no static routes to remote networks in the routing table.)

```
R2# Configure terminal
R2(config)# ip route 192.168.1.0 255.255.255.0 192.168.2.1
R2(config)# end
```

Step 2 – Examine the routing table on R2

From the **CLI** type the following commands:

```
R2# show ip route
```

Are there any static routes in the routing table? If so, list the route(s) below:

_____

If there are no routes in the routing table, retrace your steps and troubleshoot the problem.

Step 3 – Ping from R3 to PC1

Click R3 in the workspace.

Select the **CLI** tab.
From the **CLI** type the following commands:

```
R3# ping 192.168.1.10
```

Was the ping successful? (Hint: This ping should be successful. If the ping is not successful, check the routing tables on all three routers to determine the problem.)