- Lab 4 : Routing and switching
- Lecturer : Prof. Oumaima FADI
- T.A: Prof. Abdoulghaniyu HARAZEEM

Lab 7 – Routing and switching

Objective:

In this exercise, you will practice configuring IPv6 addresses on a router, servers, and clients. You will also practice checking IPv6 addressing.

We will focus on the following:

- Part 1: Configure IPv6 Addressing on the Router
- Part 2: Configure IPv6 Addressing on Servers
- Part 3: Configure IPv6 Addressing on Clients
- Part 4: Test and Verify Network Connectivity

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.

Note: Use Router 1941, if serial is missing, add the WIC-2T or HWIC-2T Network Card

Ip table & topology

Device	Interface	IP Address	Default Gateway
R1	G0/0	2001:db8:1:1::1/64	N/A
		fe80::1	
	G0/1	2001:db8:1:2::1/64	N/A
		fe80::1	
	S0/0/0	2001:db8:1:a001::2/64	N/A
		fe80::1	
Sales	NIC	2001:db8:1:1::2/64	fe80::1
Billing	NIC	2001:db8:1:1::3/64	fe80::1
Accounting	NIC	2001:db8:1:1::4/64	fe80::1
Design	NIC	2001:db8:1:2::2/64	fe80::1
Engineering	NIC	2001:db8:1:2::3/64	fe80::1
CAD	NIC	2001:db8:1:2::4/64	fe80::1
ISP	S0/0/0	2001:db8:1:a001::1	

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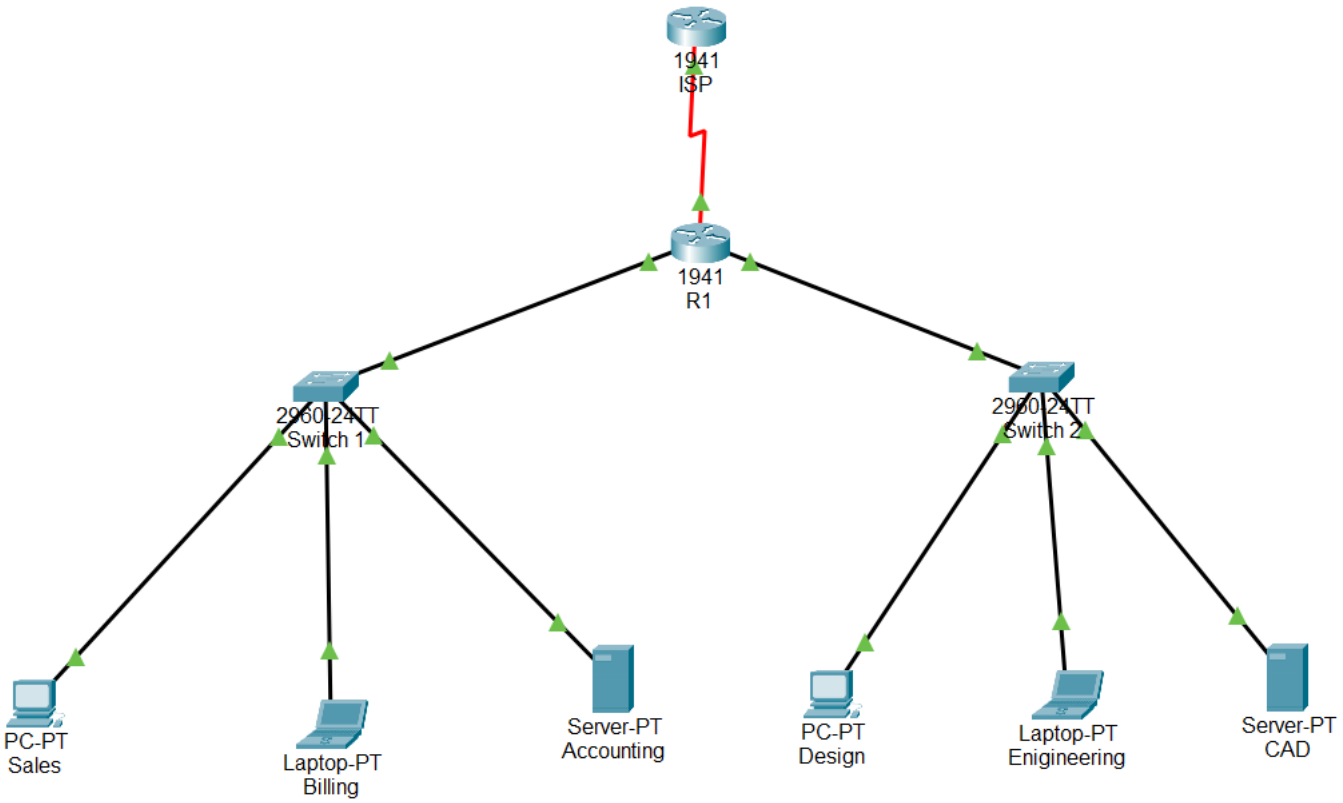

Part 1: Configure IPv6 Addressing on the Router

Step 1: Allow the router to forward IPv6 packets.

a. Click R1, and then click the CLI tab. Press Enter.

b. Switch to privileged execution mode.

c. Enter the ipv6 unicast-routing global configuration command. This command must be entered to allow the router to transmit IPv6 packets.

```
R1(config)# ipv6 unicast-routing
```

Step 2: Configure IPv6 addressing to GigabitEthernet0/0.

a. Enter the necessary commands to enter the interface configuration mode for `GigabiteThernet0/0`.

b. Configure the IPv6 address using the following command:

```
R1(config-if)# ipv6 address 2001:db8:1:1::1/64
```

c. Configure the link-local IPv6 address using the following command:

```
R1(config-if)# ipv6 address fe80::1 link-local
```

d. Enable the interface.

```
R1(config-if)# no shutdown
```

Step 3: Configure IPv6 addressing to GigabitEthernet0/1.

a. Enter the necessary commands to enter the interface configuration mode for GigabiteThernet0/1.

b. Check the address table to determine the IPv6 address.

c. Configure the IPv6 address, link-local address and enable the interface.

Step 4: Configure IPv6 addressing to Serial0/0/0.

a. Enter the necessary commands to enter the interface configuration mode for `Serial0/0/0`.

b. Check the address table to determine the IPv6 address.

c. Configure the IPv6 address, link-local address and enable the interface.

Step 5: Check the IPv6 addressing on R1.

It is recommended that you verify the addressing when it is complete by comparing the configured values with the values in the address table.

a. Exit configuration mode on R1.

b. Verify the configured addressing by running the following command:

```
R1# show ipv6 interface brief
```

c. If any addresses are incorrect, repeat the above steps as necessary to make corrections.

Note: To change addressing with IPv6, you must remove the incorrect address otherwise the correct address and the incorrect address will remain configured on the interface.

Example:

```
R1(config-if)# no ipv6 address 2001:db8:1:5::1/64
```

d. Save the router configuration in NVRAM.

Part 2: Configure IPv6 Addressing on Servers

Step 1: Configure IPv6 addressing on the Accounting server.

a. Click Accounting, and then click the Desktop tab > IP Configuration.

b. Configure the IPv6 address to `2001:db8:1:1::4` with the `/64` prefix.

c. Configure the IPv6 gateway to the `link-local` address, `fe80::1`.

Step 2: Configure IPv6 addressing on the CAD server.

Configure the CAD server with addresses as was done in step 1. Check the address table for which addresses to use.

Part 3: Configure IPv6 Addressing on Clients

Step 1: Configure IPv6 addressing on the Sales and Billing clients.

a. Click Billing and select the Desktop tab, and then select IP Configuration.

b. Configure the IPv6 address to `2001:db8:1:1::3` with the `/64` prefix.

c. Configure the IPv6 gateway to the `link-local` address, `fe80::1`.

d. Repeat steps 1a through 1c for the Sales customer. Check the address table to determine the IPv6 address.

Step 2: Configure IPv6 addressing on the Engineering and Design clients.

a. Click Engineering and select the Desktop tab, and then select IP Configuration.

b. Set the IPv6 address to `2001:db8:1:2::3` with the `/64` prefix.

c. Configure the IPv6 gateway to the `link-local` address, `fe80::1`.

d. Repeat steps 2a through 2c for design. Check the address table to determine the IPv6 address.

Part 4: Test and verify network connectivity

Step 1: Open the server web pages from the clients.

a. Click Sales and click the Desktop tab. Close the IP Configuration window, if applicable.

b. Click Web Browser. Enter `2001:db8:1:1::4` in the URL box and click Go. The Accounting website should appear.

c. Enter `2001:db8:1:1::4` in the URL box and click Go. The CAD website should appear.

d. Repeat steps 1a through 1c for other customers.

Step 2: Ping the ISP

a. Click on any client.

b. Click the Desktop > Command >Prompt tab.

c. Test the connectivity with the ISP by running the following command:

```
PC> ping 2001:db8:1:a001::1
```

d. Repeat the ping command with other clients until full connectivity has been verified.