

Experiment 4

Aim: To implement the inter VLAN Routing using Cisco Packet Tracer.

Theory: Inter-VLAN routing is necessary for enabling communication between devices in different VLANs. In this setup, two VLANs have been configured: VLAN hIYAA (VLAN 10) and VLAN hIYAA2 (VLAN 20). Devices in VLAN hIYAA have IP addresses in the subnet **1.1.1.0/24**, while devices in VLAN hIYAA2 use the subnet **2.1.1.0/24**. To enable communication between these VLANs, a router is connected to a switch using a single trunk link, following the "Router-on-a-Stick" method.

1. VLAN Creation on the Switch:

- VLAN 10 (hIYAA) and VLAN 20 (hIYAA2) are created on the switch.
- The switch ports connected to the devices in VLAN hIYAA are assigned to VLAN 10 using the **switchport access vlan 10** command. Similarly, ports connected to devices in VLAN hIYAA2 are assigned to VLAN 20.

2. Router Configuration for Inter-VLAN Routing:

- A single physical interface on the router is used for both VLANs by creating sub-interfaces.
- Sub-interface **Fa0/0.10** is created for VLAN 10 with the command **encapsulation dot1Q 10** and is assigned the IP address **1.1.1.1**.
- Sub-interface **Fa0/0.20** is created for VLAN 20 with **encapsulation dot1Q 20** and is assigned the IP address **2.1.1.1**.
- These IP addresses act as the default gateways for the respective VLANs.

3. IP Address Assignment for End Devices:

- Devices in VLAN hIYAA are assigned IP addresses **1.1.1.2** and **1.1.1.3**, with the default gateway set to **1.1.1.1**.
- Devices in VLAN hIYAA2 are assigned IP addresses **2.1.1.4** and **2.1.1.5**, with the default gateway set to **2.1.1.1**.

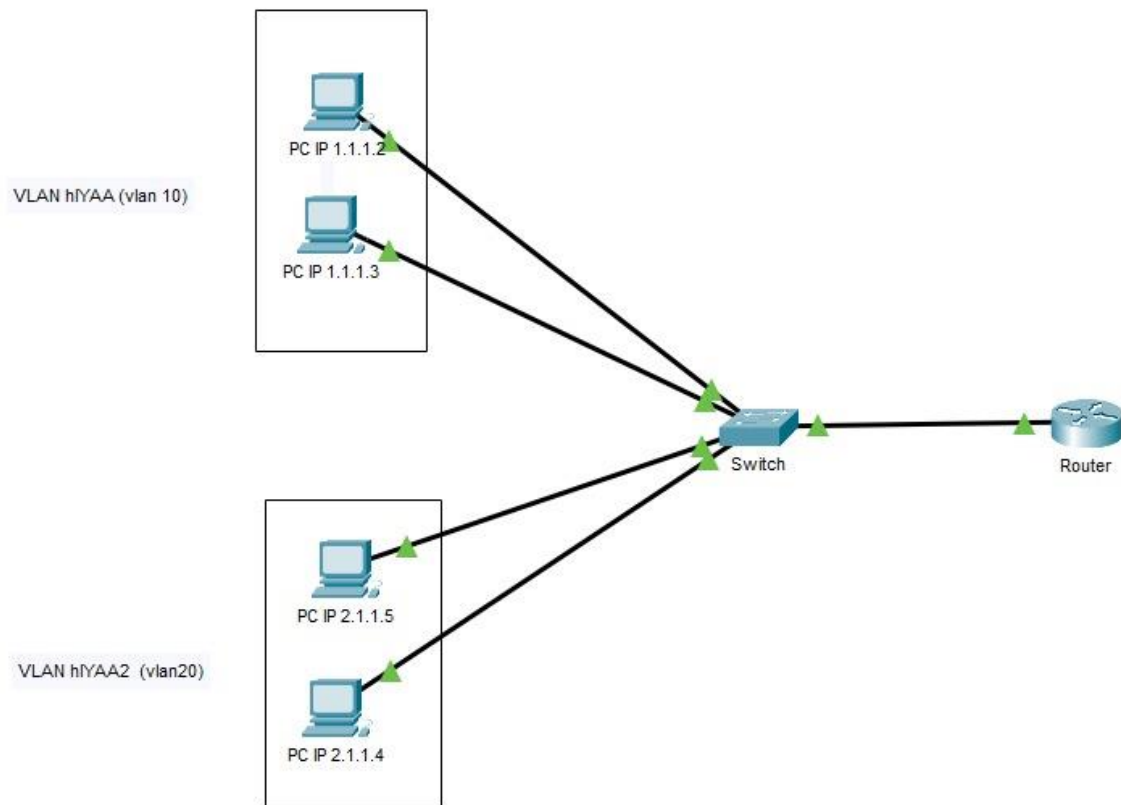
4. Trunk Configuration on the Switch:

- The switch port connected to the router is configured as a trunk port using the **switchport mode trunk** command. This ensures that traffic from both VLANs is tagged and sent to the router.

5. Testing Connectivity:

- After configuration, connectivity is tested by using the **ping** command. Devices in VLAN 10 should be able to communicate with devices in VLAN 20 through the router.

Observations:



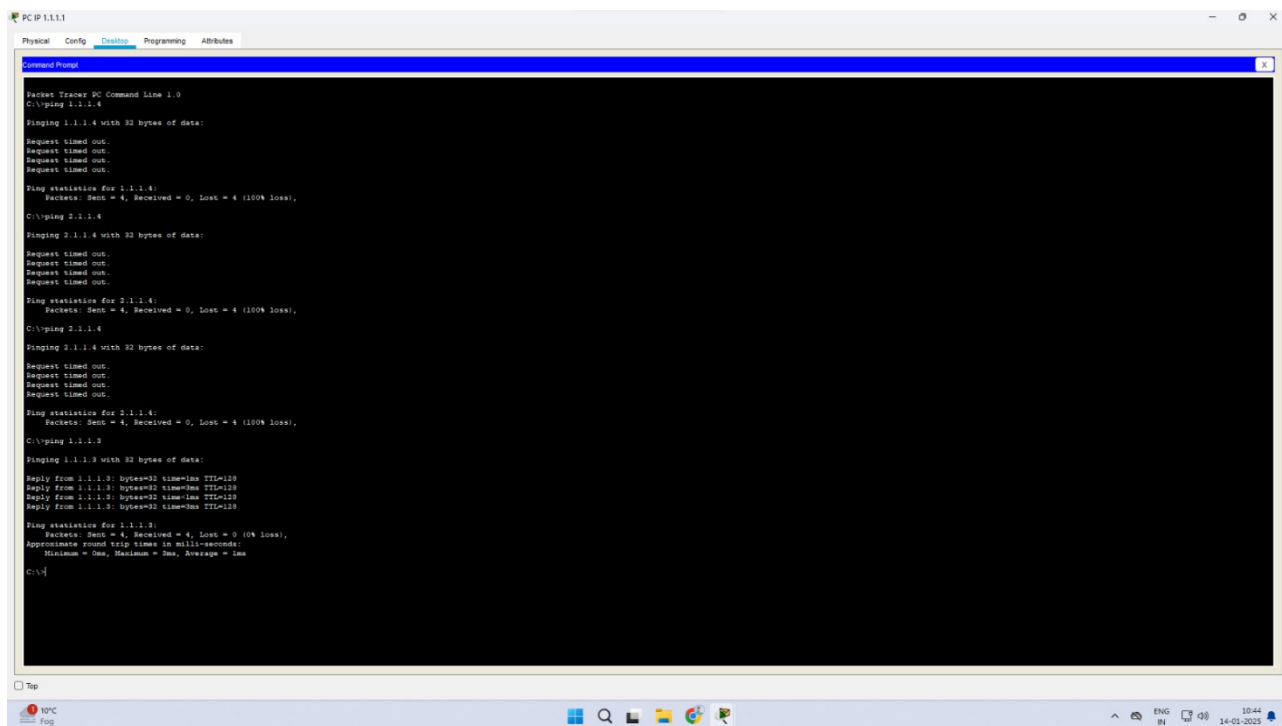
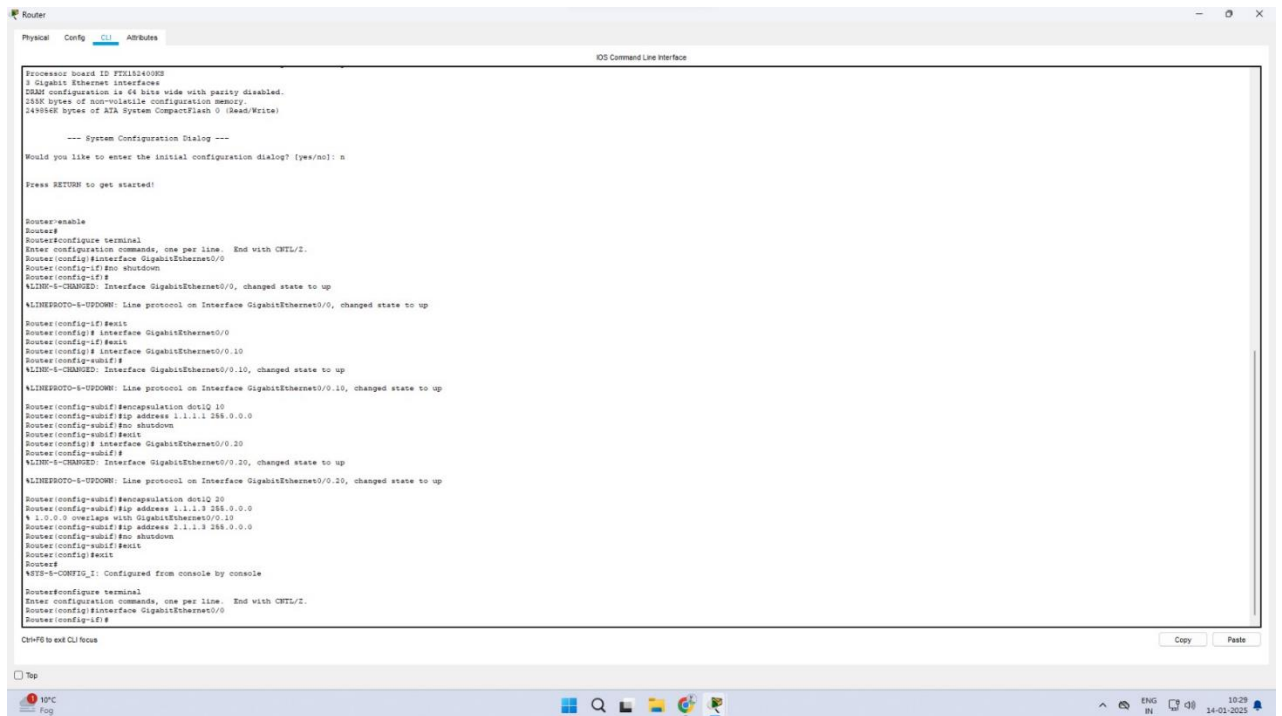
```
Switch
Physical Config CLI Attributes
IOS Command Line Interface

VLINE-3-UPDOWN: Interface FastEthernet0/5, changed state to down
VLINEPROTO-3-UPDOWN: Line protocol on Interface FastEthernet0/5, changed state to down
VLINE-4-CHANGED: Interface FastEthernet0/6, changed state to up
VLINEPROTO-4-UPDOWN: Line protocol on Interface FastEthernet0/6, changed state to up

Switch con0 is now available.

Press RETURN to get started.

Switch>enable
Switch#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 10
Switch(config-vlan)#name h1YAA
Switch(config-vlan)#exit
Switch(config)#vlan 20
Switch(config-vlan)#name h1YAA2
Switch(config-vlan)#exit
Switch(config)#interface FastEthernet0/1
% Invalid input detected at '^' marker.
Switch(config)#interface FastEthernet0/1
Switch(config-if)#interface range fa0/1-10
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 10
Switch(config-if-range)#exit
Switch(config)#interface range fa0/11-20
Switch(config-if-range)#switchport mode access
Switch(config-if-range)#switchport access vlan 20
Switch(config-if-range)#exit
Switch(config)#
```



Result: Successfully implemented the inter VLAN Routing using Cisco Packet Tracer