

Experiment #	<TO BE FILLED BY STUDENT>	Student ID	<TO BE FILLED BY STUDENT>
Date	<TO BE FILLED BY STUDENT>	Student Name	[@KLWKS_BOT] THANOS

Lab 4: Construction of different VLANS and TRUNKING using cisco packet tracer

Date of the Session: ____ / ____ / ____

Session Time: ____ to ____

Learning Outcome:

- Students should be able to explain what VLANs are and understand their purpose in network segmentation
- Understand how VLANs can improve network performance, security, and management.
- Configure VLANs on network switches, including creating, modifying, and deleting VLANs.
- Understand the concept of VLANs (Virtual Local Area Networks) and their significance in network segmentation and management.
- Understand and configure trunk ports on switches to allow the passage of VLAN traffic between switches.

Pre-Lab Task:

1. Identify the number of VLANs you need, their purpose, and the devices that will be part of each VLAN?

- **VLAN 10 (Sales):** PCs, printers, phones.
- **VLAN 20 (HR):** HR workstations, printers.
- **VLAN 30 (IT/Admin):** Servers, admin PCs.

Course Title	NETWORK PROTOCOLS & SECURITY	ACADEMIC YEAR: 2024-25
Course Code(s)	23EC2210R	1 Page

Experiment #	<TO BE FILLED BY STUDENT>	Student ID	<TO BE FILLED BY STUDENT>
Date	<TO BE FILLED BY STUDENT>	Student Name	[@KLWKS_BOT] THANOS

2. Ensure you have access to the necessary equipment, including the network switch that supports VLANs and trunking.

- Ensure the switch supports VLANs & trunking.
- Verify availability of routers, PCs, and cables.

3. Plan the IP addressing scheme for your network, including IP subnets and subnet masks and Allocate IP addresses for your devices within each VLAN.

- VLAN 10: 192.168.10.0/24
- VLAN 20: 192.168.20.0/24
- VLAN 30: 192.168.30.0/24
- Assign static/DHCP IPs based on device roles.

Course Title	NETWORK PROTOCOLS & SECURITY	ACADEMIC YEAR: 2024-25
Course Code(s)	23EC2210R	2 Page

Experiment #	<TO BE FILLED BY STUDENT>	Student ID	<TO BE FILLED BY STUDENT>
Date	<TO BE FILLED BY STUDENT>	Student Name	[@KLWKS_BOT] THANOS

In Lab Task: Construction of different VLANS and TRUNKING using cisco packet tracer Creating different VLANs (Virtual LANs) and configuring trunking between switches are common tasks in networking, and they can be effectively simulated using Cisco Packet Tracer. Here are the steps involved in constructing different VLANs and trunking using Cisco Packet Tracer:

Construction of Different VLANs:

1. Open Cisco Packet Tracer:

- Launch the Cisco Packet Tracer application on your computer.

2. Create the Network Topology:

- Add the required network devices to the workspace. For VLANs, you'll need multiple switches. Connect them using appropriate cables.

3. Access Switches:

- Double-click on each switch to access the device configuration.

4. Enter Global Configuration Mode:

- Enter global configuration mode using the following command:

Switch> enable Switch# configure terminal

5. Create VLANs:

- Use the following command to create VLANs. Replace <vlan_id> with the desired VLAN ID.

Switch(config)# vlan <vlan_id>

6. Assign VLAN Names:

- Optionally, assign names to the VLANs for better identification:

Switch(config-vlan)# name <vlan_name>

7. Assign VLANs to Switch Ports:

- Navigate to individual switch interfaces and assign them to specific VLANs:

Switch(config)# interface <interface_type> <interface_number>

Switch(config-if)# switchport mode access

Switch(config-if)# switchport access vlan <vlan_id>

- Repeat this process for each switch interface and VLAN.

8. Verify VLAN Configuration:

- Use the following commands to verify your VLAN configuration:

Course Title	NETWORK PROTOCOLS & SECURITY	ACADEMIC YEAR: 2024-25
Course Code(s)	23EC2210R	3 Page

Experiment #	<TO BE FILLED BY STUDENT>	Student ID	<TO BE FILLED BY STUDENT>
Date	<TO BE FILLED BY STUDENT>	Student Name	[@KLWKS_BOT] THANOS

Switch# show vlan **Switch# show interfaces switchport**

Configuration of Trunking:

1. Connect Two Switches:

- Ensure that two switches are connected. Use a straight-through cable between their trunking interfaces.

2. Configure Trunking on the Interface:

- Access the configuration mode of the interface connected to the other switch and configure it as a trunk port:

Switch(config)# interface <interface_type> <interface_number>

Switch(config-if)# switchport mode trunk

3. Set Allowed VLANs:

- Optionally, restrict the allowed VLANs on the trunk to improve security:

Switch(config-if)# switchport trunk allowed vlan <vlan_list>

- Replace <vlan_list> with a comma-separated list of VLAN IDs.

4. Verify Trunk Configuration:

- Use the following command to verify the trunk configuration:

Switch# show interfaces trunk

5. Repeat for Additional Switches:

- If you have more switches, repeat the trunking configuration between them, connecting the trunking interfaces.

6. Test Connectivity:

- Connect devices to the VLANs on different switches and verify that they can communicate across the network.

By following these steps, you can construct different VLANs and configure trunking between switches using Cisco Packet Tracer.

Course Title	NETWORK PROTOCOLS & SECURITY	ACADEMIC YEAR: 2024-25
Course Code(s)	23EC2210R	4 Page

Experiment #	<TO BE FILLED BY STUDENT>	Student ID	<TO BE FILLED BY STUDENT>
Date	<TO BE FILLED BY STUDENT>	Student Name	[@KLWKS_BOT] THANOS

Writing space for the Problem: (For Student's use only)

Device Configuration details

Device Name(Label)	Interface	IP Address	Subnet Mask	Default Gateway address
PC-1	Ethernet	192.168.1.1	255.255.255.0	0.0.0.0
PC-2	Ethernet	192.168.1.2	255.255.255.0	0.0.0.0
PC-3	Ethernet	192.168.1.3	255.255.255.0	0.0.0.0
PC-4	Ethernet	192.168.1.4	255.255.255.0	0.0.0.0
PC-5	Ethernet	192.168.1.5	255.255.255.0	0.0.0.0

Course Title	NETWORK PROTOCOLS & SECURITY	ACADEMIC YEAR: 2024-25
Course Code(s)	23EC2210R	5 Page

Experiment #	<TO BE FILLED BY STUDENT>	Student ID	<TO BE FILLED BY STUDENT>
Date	<TO BE FILLED BY STUDENT>	Student Name	[@KLWKS_BOT] THANOS

VLAN configuration in Switches
Switch-A
<pre> Switch>en Switch#config t Switch(config)#vlan 10 Switch(config-vlan)#name green Switch(config-vlan)#exit Switch(config)#vlan 20 Switch(config-vlan)#name yellow Switch(config-vlan)#exit Switch(config)#exit Switch#show vlan brief Switch#config t Switch(config)#int fa0/1 Switch(config-if)#switchport mode access Switch(config-if)#switchport access vlan 10 Switch(config-if)#exit Switch(config)#int fa0/2 Switch(config-if)#switchport mode access Switch(config-if)#switchport access vlan 20 Switch(config-if)#exit Switch(config)#exit Switch#show vlan brief Switch#config t Switch(config)#int fa0/3 Switch(config-if)#switchport mode trunk Switch(config)#int fa0/1 Switch(config-if)#switchport mode trunk </pre>

Course Title	NETWORK PROTOCOLS & SECURITY	ACADEMIC YEAR: 2024-25
Course Code(s)	23EC2210R	6 Page

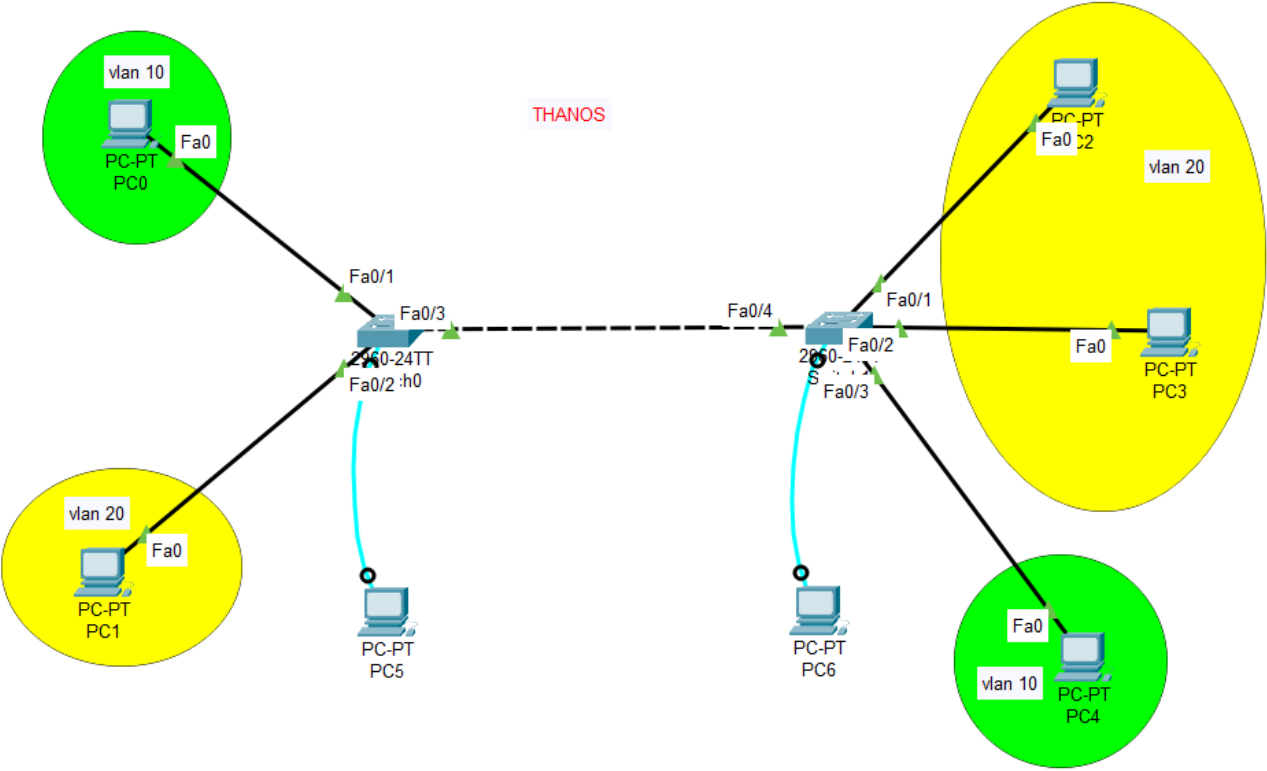
Experiment #	<TO BE FILLED BY STUDENT>	Student ID	<TO BE FILLED BY STUDENT>
Date	<TO BE FILLED BY STUDENT>	Student Name	[@KLWKS_BOT] THANOS

VLAN configuration in Switches
Switch-B
Switch>en Switch#config t Switch(config)#vlan 20 Switch(config-vlan)#name yellow Switch(config-vlan)#exit Switch(config-vlan)#vlan 10 Switch(config-vlan)#name green Switch(config-vlan)#exit Switch(config)#exit Switch#show vlan brief Switch#config t Switch(config)#int range fa0/2-3 Switch(config-if-range)#switchport mode access Switch(config-if-range)#switchport access vlan 20 Switch(config-if-range)#exit Switch(config)#int fa0/4 Switch(config-if)#switchport mode access Switch(config-if)#switchport access vlan 10 Switch(config-if)#exit Switch(config)#exit Switch#show vlan brief Switch#config t Switch(config)#int fa0/1 Switch(config-if)#switchport mode trunk Switch(config)#int fa0/3 Switch(config-if)#switchport mode trunk

Course Title	NETWORK PROTOCOLS & SECURITY	ACADEMIC YEAR: 2024-25
Course Code(s)	23EC2210R	7 Page

Experiment #	<TO BE FILLED BY STUDENT>	Student ID	<TO BE FILLED BY STUDENT>
Date	<TO BE FILLED BY STUDENT>	Student Name	[@KLWKS_BOT] THANOS

DIAGRAM



Course Title	NETWORK PROTOCOLS & SECURITY	ACADEMIC YEAR: 2024-25
Course Code(s)	23EC2210R	8 Page

Experiment #	<TO BE FILLED BY STUDENT>	Student ID	<TO BE FILLED BY STUDENT>
Date	<TO BE FILLED BY STUDENT>	Student Name	[@KLWKS_BOT] THANOS

VIVA-VOCE Questions (In-Lab):

1. Explain the concept of trunking. How does it differ from access ports on a network switch?

- Trunking carries multiple VLANs over a single link using 802.1Q tagging.
- Access ports connect end devices and belong to a single VLAN (no tagging).

2. What are the advantages and disadvantages of using VLANs in a network design?

- ✓ **Advantages:** Security, reduced broadcast traffic, better management, improved performance.
- ✗ **Disadvantages:** Complex setup, requires Layer 3 device for inter-VLAN, misconfigurations can cause issues.

3. Can you describe the process of creating a new VLAN on a network switch?

```
bash
enable
configure terminal
vlan 10
name Sales
exit
write memory
```

Course Title	NETWORK PROTOCOLS & SECURITY	ACADEMIC YEAR: 2024-25
Course Code(s)	23EC2210R	9 Page

Experiment #	<TO BE FILLED BY STUDENT>	Student ID	<TO BE FILLED BY STUDENT>
Date	<TO BE FILLED BY STUDENT>	Student Name	[@KLWKS_BOT] THANOS

4. How do you assign ports to a specific VLAN on a network switch?

```

bash
enable
configure terminal
interface FastEthernet 0/1
switchport mode access
switchport access vlan 10
exit
write memory

```

5. How can you verify that your VLAN and trunking configurations are working correctly??

- `show vlan brief` → Check VLANs
- `show interfaces trunk` → Verify trunk ports
- `show interfaces FastEthernet 0/1 switchport` → Check VLAN assignment
- Ping test for connectivity

Course Title	NETWORK PROTOCOLS & SECURITY	ACADEMIC YEAR: 2024-25
Course Code(s)	23EC2210R	10 Page

Experiment #	<TO BE FILLED BY STUDENT>	Student ID	<TO BE FILLED BY STUDENT>
Date	<TO BE FILLED BY STUDENT>	Student Name	[@KLWKS_BOT] THANOS

Post Lab Task:

1. Were the VLAN configurations on the network switch error-free, and did they match your pre-lab plan?

- Verified using `show vlan brief` and `show interfaces trunk`.
- Fixed any mismatches with the pre-lab plan.

2. How does this lab experiment align with real-world scenarios or challenges related to network design and VLAN configuration?

- VLANs improve security, traffic management, and scalability.
- Prevents broadcast issues and supports multi-switch networks.

Course Title	NETWORK PROTOCOLS & SECURITY	ACADEMIC YEAR: 2024-25
Course Code(s)	23EC2210R	11 Page

Experiment #	<TO BE FILLED BY STUDENT>	Student ID	<TO BE FILLED BY STUDENT>
Date	<TO BE FILLED BY STUDENT>	Student Name	[@KLWKS_BOT] THANOS

3. How did you configure trunk ports to carry traffic for multiple VLANs?

```

bash
enable
configure terminal
interface FastEthernet 0/24
switchport mode trunk
switchport trunk allowed vlan 10,20,30
exit
write memory

```

- Uses 802.1Q tagging to carry multiple VLANs.

Evaluator Remark (if Any):	Marks Secured _____ out of 50
	Signature of the Evaluator with Date

Course Title	NETWORK PROTOCOLS & SECURITY	ACADEMIC YEAR: 2024-25
Course Code(s)	23EC2210R	12 Page