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Lab Report - 06

Course Title : Computer Networks Lab
Course Code : CSE 320
Report Name :

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1. Objectives

- To understand and apply basic VLAN configuration on a network switch.
- To create VLANs and assign them to specific ports on the switch.
- To enable between switches for VLAN communication across devices.
- To troubleshoot common configuration issues in VLAN setup.

2. Necessary Tools

2.1 Software:

Cisco Packet Tracer: A network simulation tool used to design and simulate networking environments, specifically VLANs in this lab.

2.2 Hardware:

- **Two Switch**: A central network device that connects multiple devices on the network and facilitates data transmission. In this lab, a 2960-24TT switch is used to connect all PCs.
- **Client Devices**: PCs (Personal Computers) that serve as nodes in each VLAN. Each PC in this simulation is used to demonstrate connectivity and isolation within the network.
- **Cables**: Straight-through cables are used to connect PCs to the switch.

3. Theory/Background

VLANs allow network administrators to logically segment a network into different broadcast domains. Devices within the same VLAN can communicate directly, but devices on separate VLANs require a Layer 3 device, like a router, to communicate with each other. VLANs enhance network security and efficiency by isolating traffic and reducing broadcast domains.

4. Figures

The network topology shows three distinct VLANs:

- **Default VLAN** (Cyan color): Contains PCs from both the left and right sides of the switch setup.
- **CSE VLAN** (Pink color): Contains selected PCs on both sides.
- **EEE VLAN** (Green color): Contains selected PCs mainly in the middle section of the topology.

5.5: Assign the switch ports to respective VLANs:

For Switch 01

```
Switch#config t
Switch(config)#int fa 0/4
Switch(config-if)#sw mo access
Switch(config-if)#sw access vlan 2
Switch(config-if)#int fa 0/5
Switch(config-if)#sw mo access
Switch(config-if)#sw access vlan 2
Switch(config-if)#int fa 0/6
Switch(config-if)#sw mo access
Switch(config-if)#sw access vlan 2
Switch(config-if)#
Switch(config-if)#int fa 0/7
Switch(config-if)#sw mo access
Switch(config-if)#sw access vlan 3
Switch(config-if)#int fa 0/8
Switch(config-if)#sw mo access
Switch(config-if)#sw access vlan 3
Switch(config-if)#int fa 0/9
Switch(config-if)#sw mo access
Switch(config-if)#sw access vlan 3
Switch(config-if)#exit
Switch(config)#exit
Switch#
```

For Switch 02

```
Switch#config t
Switch(config)#int fa 0/4
Switch(config-if)#sw mo access
Switch(config-if)#sw access vlan 2
Switch(config-if)#int fa 0/5
Switch(config-if)#sw mo access
Switch(config-if)#sw access vlan 2
Switch(config-if)#int fa 0/6
Switch(config-if)#sw mo access
Switch(config-if)#sw access vlan 2
Switch(config-if)#int fa 0/1
Switch(config-if)#sw mo access
Switch(config-if)#sw access vlan 3
Switch(config-if)#int fa 0/2
Switch(config-if)#sw mo access
Switch(config-if)#sw access vlan 3
```

```
Switch(config-if)#int fa 0/3
Switch(config-if)#sw mo access
Switch(config-if)#sw access vlan 3
Switch(config-if)#exit
Switch(config)#exit
Switch#
```

5.6: Set Up a Trunk Port

If you are connecting this switch to another switch and need to allow VLAN traffic between them, set up a trunk port on both switches. A trunk port allows traffic from multiple VLANs to pass between switches.

To set fa0/10 as a trunk port in Switch 01, use:

```
Switch(config)#int fa 0/10
Switch(config-if)#sw mo trunk
Switch(config-if)#sw trunk allowed vlan 1-5
Switch(config-if)#
```

6. Inputs and Outputs

Inputs:

- **Commands**: Commands for creating VLANs, assigning ports, and setting trunk modes (as shown in Step 5).
- **Switch Ports**: Physical ports assigned to specific VLANs based on lab requirements.

Outputs:

- **Show vlan brief**: Displays the current VLAN configuration, showing which ports are assigned to each VLAN.
- **Error Messages**: Inconsistency errors if trunk and access configurations conflict, which can be observed in the console output.

7. Remarks/Comments

- **Successful VLAN Configuration**: VLANs 2 and 3 were successfully created and named. Ports were assigned without issue.
- **Trunk Port Configuration**: Configuring fa0/10 as a trunk was successful, but the switch displayed warnings about BPDU received on non-trunk ports. Ensuring both ends of the trunk connection are configured identically resolved this.
- **Lesson Learned**: Proper VLAN configuration improves network segmentation and security. Consistent trunk configuration is crucial to avoid Spanning Tree Protocol issues.
- **Future Improvements**: Using management VLANs or assigning IP addresses to VLANs could enhance remote access and monitoring.