VLAN

VIRTUAL LOCAL AREA NETWORK

NETWORK SWITCH (1/2)

- A high speed device
- Connect multiple devices (computers, printers, etc.)
- Layer-2 device (data-link layer)
- Similar to hub (only smarter, collision free)
- Creates an electronic tunnel

NETWORK SWITCH (2/2)

- Like Routers as well
- But limited to node-node communication on same network
- MAC Bridge
- Uses MAC address for data transfer
- Decides which computer is the messages intended

BASIC SWITCH CONFIGURATIONS (PACKET TRACER)

- Assign name
- Password setup
- Banner MOTD
- NVRAM

PACKET TRACER COMMANDS (1/3)

- Show MAC address table

- S1#**show mac-address-table ?**
- S1#**show mac-address-table address dynamic**
- S1#**clear mac-address-table dynamic**

PACKET TRACER COMMANDS (2/3)

- **Setup Static MAC address**

❑S1(config)#mac-address-table static 00e0.2917.1884 vlan 99 interface fastethernet interface number (fa0/1)

- **Remove MAC address entry**

❑S1(config)#**no mac-address-table static 00e0.2917.1884 vlan 99 interface fastethernet 0/1**

PACKET TRACER COMMANDS (3/3)

- Port Security

- ❑ S1# **configure terminal**
- ❑ S1(config)#**interface fastethernet 0/18**
- ❑ S1(config-if)#**switchport port-security**
- ❑ S1(config-if)#**switchport mode access**
- ❑ S1(config-if)#**switchport port-securityS1(config-if)#switchport port-security maximum 2**
- ❑ S1(config-if)#**switchport port-security mac-address sticky**
- ❑ **S1(config-if)#switchport port-security violation protect/shutdown**
- ❑ **S1(config-if)#end**

VLAN INTRODUCTION

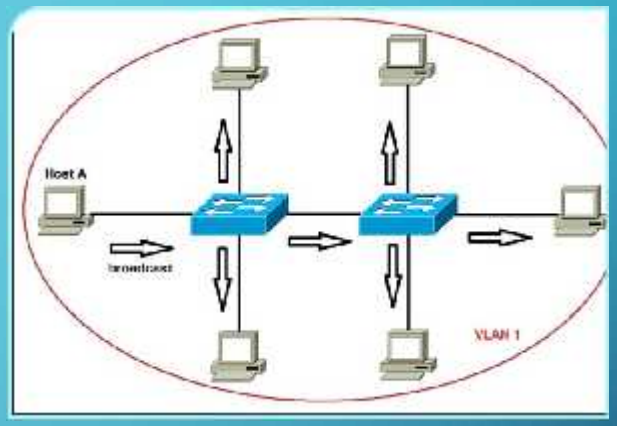
- Logical grouping of devices in same domain
- Each VLAN acts as a subgroup of switchports
- VLAN's can spread across multiple switches
- Act like a physical LAN

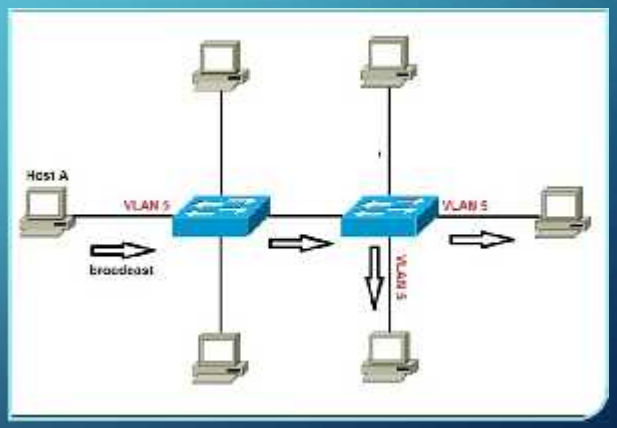
ADVANTAGES

- Increase number of broadcast domains
- Reduce security risks
- Network changes are achieved with ease
- Hosts with sensitive data on separate VLAN to improve security

VISUALISATION

- Without VLANs, a broadcast sent from host A would reach all devices on the network
- By placing interfaces on both switches into a separate VLAN, a broadcast from host A would reach only devices inside the same VLAN, since each VLAN is a separate broadcast domain





TRUNKING

- Trunks are connections between the switches that allow the switches to exchange information for all VLANS
- By-default trunk ports belong to all VLANS
- Opposed to an access port, which can only belong to a single VLAN
- IEEE 802.1Q

VLAN TYPES (1/3)

- Default VLAN

❑ All switch ports are default member

❑Default VLAN for CISCO switches is VLAN1

❑Cannot be renamed or deleted

VLAN TYPES (2/3)

- Management VLAN

❑ Remotely access and manage the switch

❑ Assigned an IP address and subnet mask

❑ By-default is VLAN1

❑ Best practice is to create a separate management VLAN

VLAN TYPES (3/3)

- Native VLAN

❑ Assigned to an 802.1Q trunk ports

❑802.1Q port placed untagged traffic

❑ Untagged traffic is generated by a computer attached to a switch port that is configured with the native VLAN