# What is a VLAN?

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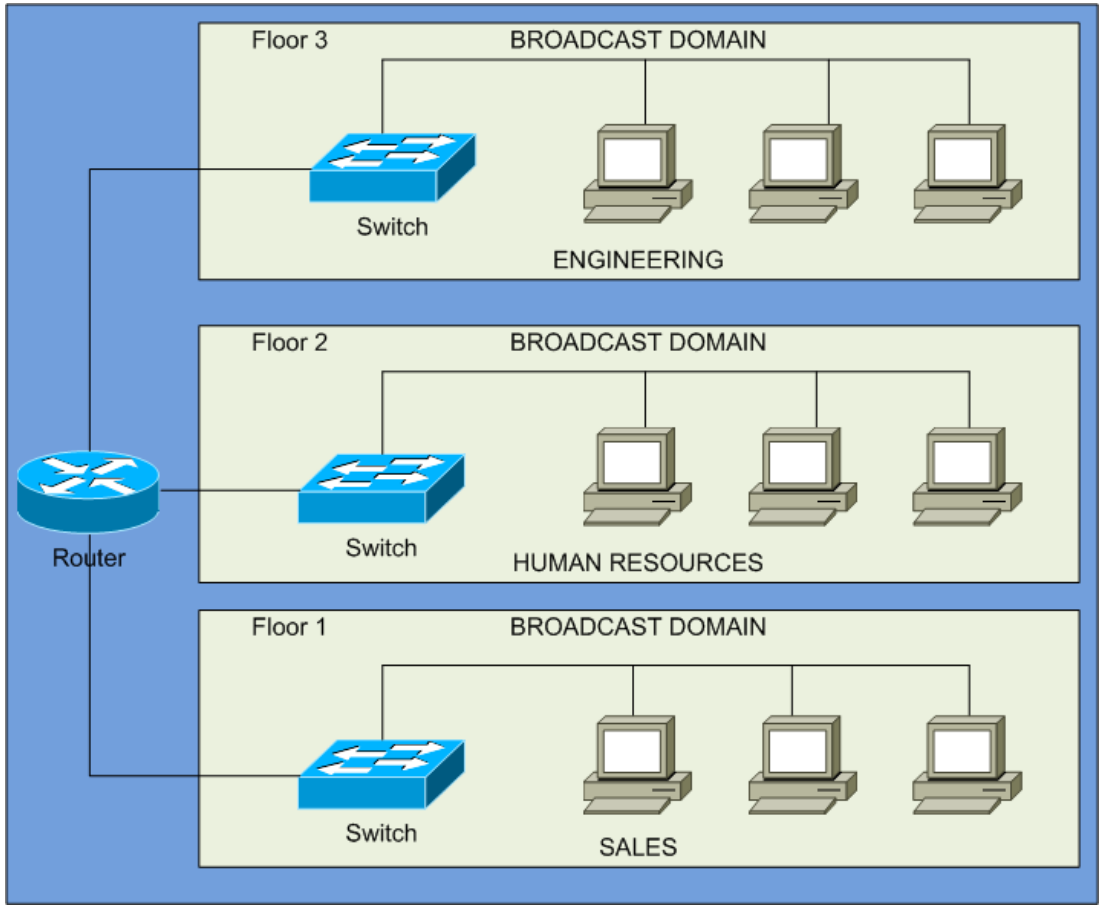
- A virtual local area network (VLAN) is a group of hosts with a common set of requirements that communicate as if they were attached to the same broadcast domain regardless of their physical location.

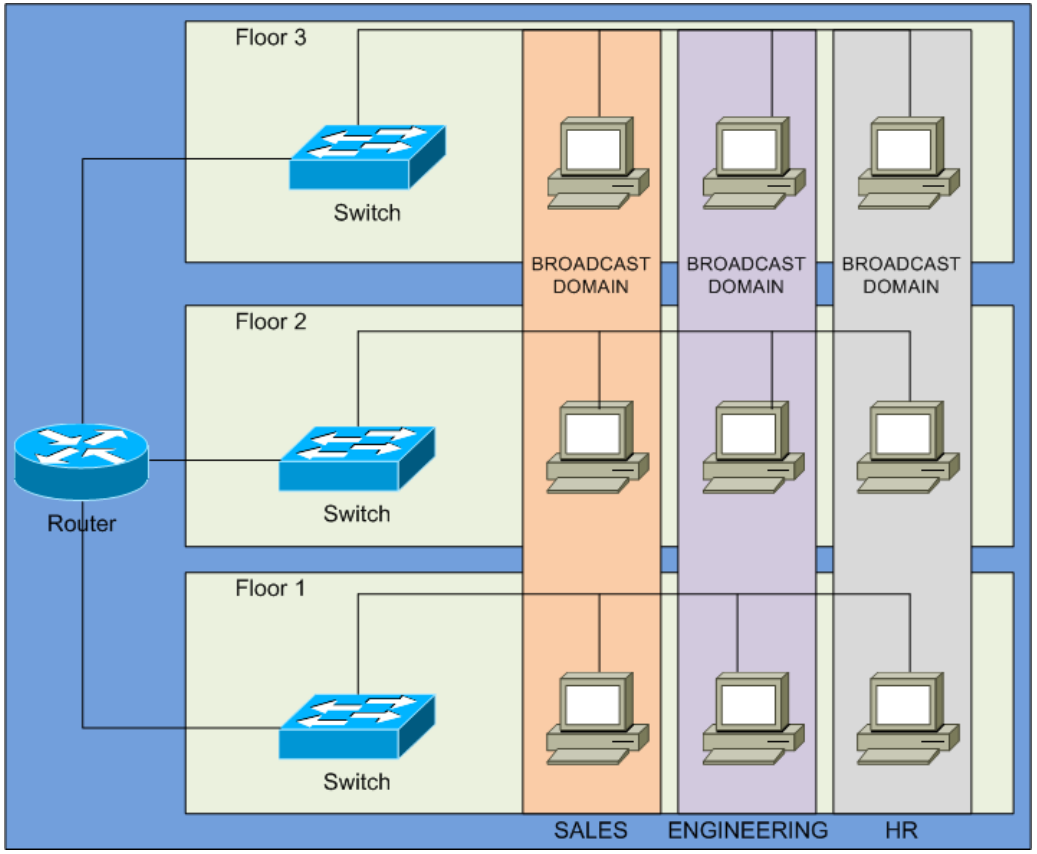
# Traditional LAN

A traditional LAN would require all users of the same requirements and same IP subnet (broadcast domain) be connected to the same equipment.



# VLAN-based LAN

- By utilizing VLANs, the same users can be spread out over various geographical locations and still remain in their same IP subnet (broadcast domain).



# How VLANs Work?

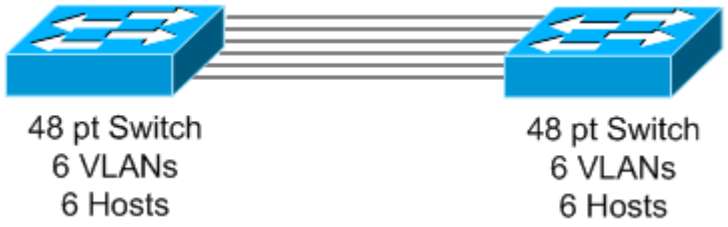
- VLANs are identified by a number
  - Valid ranges 1-4094
- On a VLAN-capable switch, you assign ports with the appropriate VLAN number
- The switch then only allows data to be sent between ports with the same VLAN

# How VLANs Work?

- Since almost every network is larger than a single switch, there needs to be a way to have traffic sent between two different switches
- One way to do it is to assign a port on each switch with a VLAN and run a cable between the switches
  - Not very feasible or cost effective

# How VLANs work?

- For example, if there were 6 hosts on each switch on 6 different vlans, you would need 6 ports on each switch to connect the switches together.  This would mean that if you had 24 different vlans you could only have 24 hosts on a 48 port switch



# How VLANs work?

- There was a standard develop to make it so that a single connection between two switches could be used to send traffic for all vlans
- 802.1q – Provides a VLAN tag in front of the Layer 2 frame

# How VLANs work?

- You enable 802.1q tagging (trunking) on the ports between the switches
- The switch receives the frame with the 802.1q header and strips it off
- It determines what VLAN and sends the data to the appropriate port

# Benefits of VLANs

# Benefits of VLANs

- Geographically separated users on the same IP subnet (broadcast domain)
- Limit the size of broadcast domains and limit broadcast activity
- Security benefits by keep hosts separated by VLAN and limiting what devices can talk to those hosts

# Benefits of VLANs

- Cost savings as you don’t need additional hardware and cabling
- Operational benefits because changing a user’s IP subnet (Broadcast Domain) is in software

# Drawbacks of VLANs

- VLANs work at Layer 2 and that layer doesn't handle redundancy in an efficient manner
- So when the network becomes mission critical, it is hard to provide fast convergence times for users when utilizing VLANs that span across multiple buildings

# Drawbacks of VLANs

- VLANs were and still are a viable method for separating users into groups
- Today, redundancy is very important so to make the network stable the following guidelines should be followed:

# Drawbacks of VLANs

- VLANs should still be used to separate and group common users
- VLANs shouldn’t span across the entire network
- They should remain in a building
- Common users in another building should be on a separate VLAN

# Difference between a VLAN and VPN?

- A VLAN helps to group workstations that are not within the same locations into the same broadcast domain and VPN is related to remote access to the network of a company.
- VLAN is a subcategory of VPN and VPN is a means of creating a secured network for safe data transmission.
- A VLAN is basically a means to logically segregate networks without physically segregating them with various switches. A VPN is used to connect two points in a secured and encrypted tunnel.
- A VPN saves the data from prying eyes while in transit and no one on the net can capture the packets and read the data. VLAN does not involve any encryption technique but it is only used to slice up your logical network into different sections for the purpose of management and security.
- VLAN is generally used when it is necessary for a person to connect with someone whom you cannot connect from outside the VLAN. It requires a special permission before access. VPN is used to communicate in a secured manner in an unsecured environment.