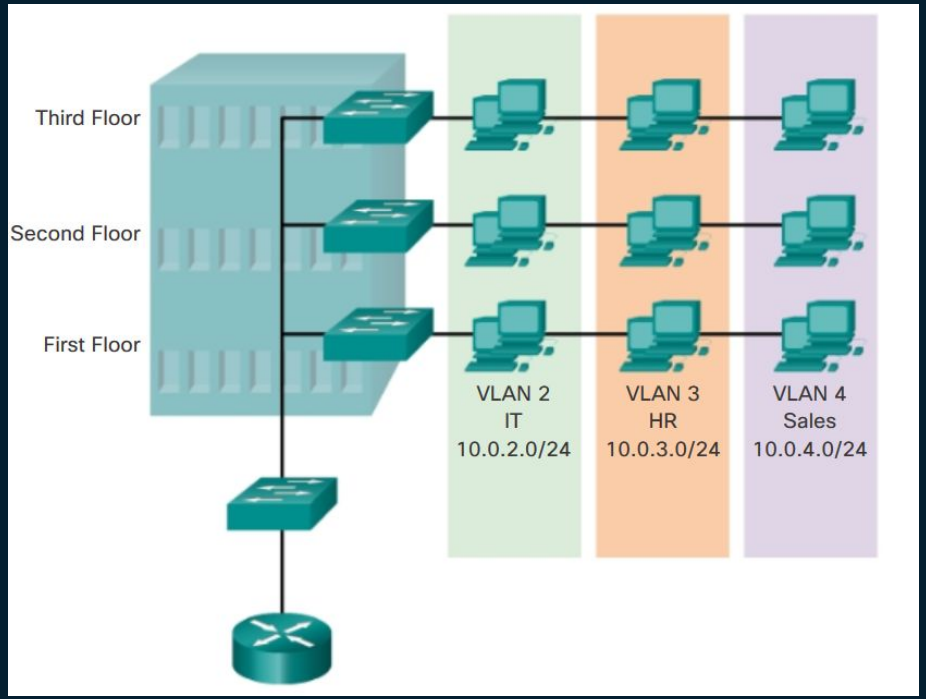
VLANs and TRUNKING

What are VLANS?

- VLANs are a way to simulate separate LANs while still using the same hardware
- They improve security by separating different networks without increasing costs

VLANs vs. LANs



Benefits of VLANs

- Increased Security
- Lower costs
- Smaller broadcast domains
- Easier management

Types of VLANs

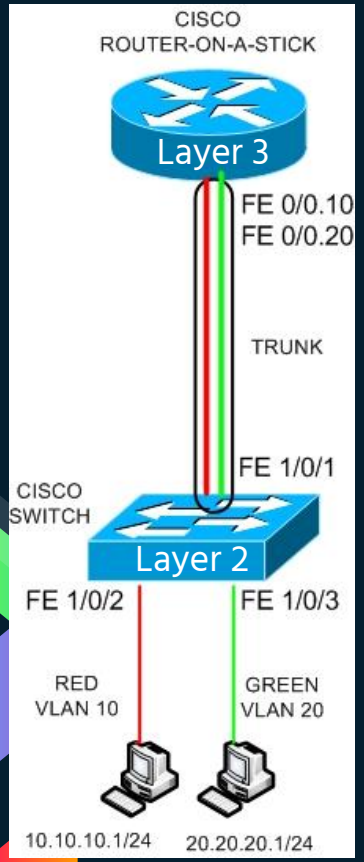
- Data VLAN
  - AKA user VLAN
  - Used to carry non-management traffic
- Default VLAN
  - VLAN 1 on all switches
  - Cannot be renamed or deleted
  - All ports assigned here initially
- Native VLAN
  - Used for trunk ports
  - Maintains legacy compatibility
  - Default is VLAN 1
- Management VLAN
  - Default is VLAN 1, but should be changed for security purposes
  - Assigned an IP for remote access
  - Each switch should only have one

What is trunking?

- Way to send frames from one VLAN to another
- Uses Dot1Q (aka IEEE 802.1Q) encapsulation to tag each frame with the originating VLAN number
- Can be done via multilayer switch
- View Kyra's Checklist for how it is implemented

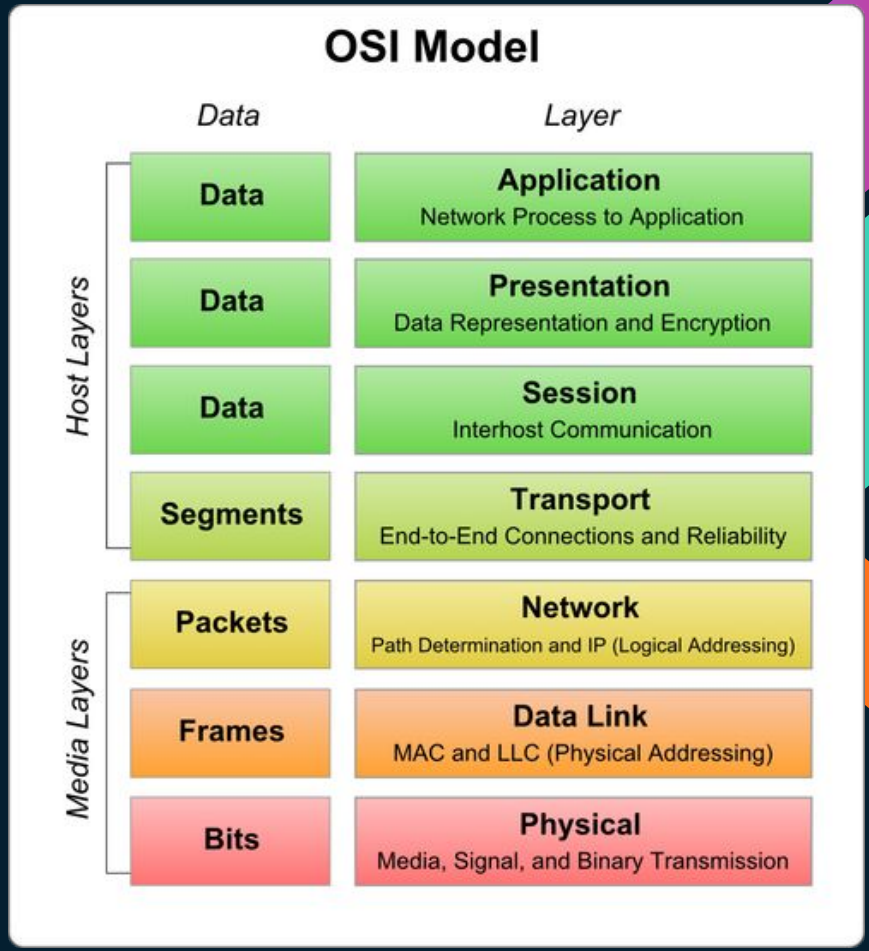
Switch Port Modes

- Access
  - The port is in one VLAN
- Trunk
  - The connection can carry traffic in any VLAN
  - The port connects to a network device
- Dynamic Auto
  - Will default to which one the other host uses
  - If both dynamic auto, defaults to access
- Dynamic Desirable
  - Will default to which one the other host uses
  - If both are dynamic, defaults to trunk
  - Overrides dynamic auto



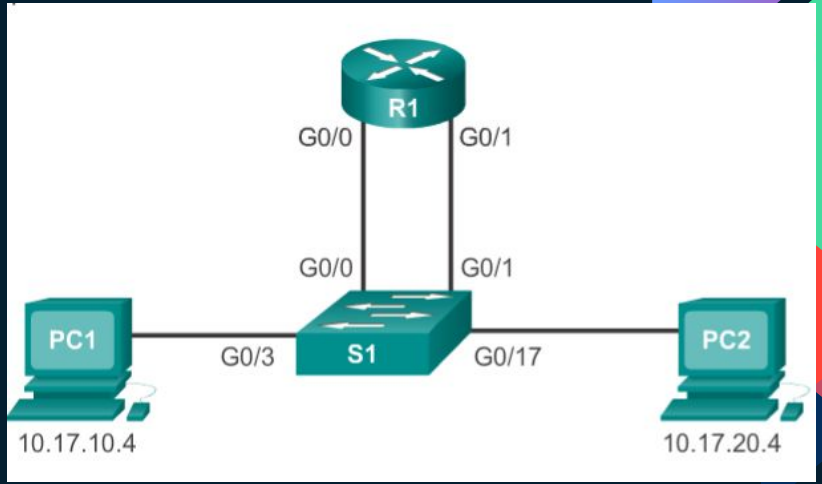
How it relates to the OSI model:

LANs are layer 2 objects. To send data between LANs, routing (layer 3) must be used.



Legacy Trunking

- Uses two cables between the router and the switch
- Less efficient use of materials



Switch Configuration

- Create individual VLANs vlan [#]
- Set the interface leading to the router as a trunk switchport mode trunk
- Set the interface(s) leading to the VLANs as access ports (sometimes preconfigured) switchport mode access
- Add ports to the corresponding VLANs switchport access vlan [#]
- View VLAN configs do show vlan
- Optional: set a native VLAN switchport trunk native vlan [vlan #]

Router Configuration

- Enable the interface leading to the switch (note: it should not be assigned an IP address) no shut
- Create subinterfaces on the interface int [int type][int].[#]
- Assign subinterfaces to their corresponding VLANs encapsulation dot1q [vlan #]
- Assign an IP address to each subinterface ip address [ip address] [subnet mask]

“int vlan” vs “vlan” commands

- interface vlan [#]
  - Available on routers and switches
  - Can be used to set an IP address
  - Can enable a VLAN
- vlan [#]
  - Only available on switches
  - Can be used to name a VLAN
  - Can create multiple VLANs at once
- Both refer to the same VLAN

Credits

Special thanks to all the people who made and released these awesome resources for free:

- Presentation template by SlidesCarnival
- Photographs by Startupstockphotos