

CISC 7332X T6

LAN Switching and Virtual LAN

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Terms and Devices

- Terms and devices: repeaters, hubs, bridges, switches, routers, gateways
- Devices are named according to the layer they process
- A bridge or LAN switch operates in the Link layer

Application layer	Application gateway
Transport layer	Transport gateway
Network layer	Router
Data link layer	Bridge, switch
Physical layer	Repeater, hub

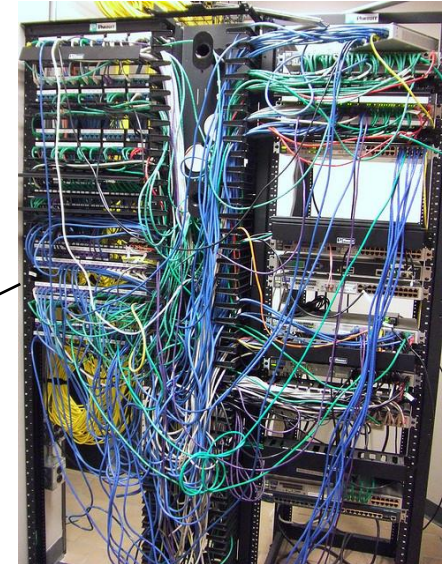
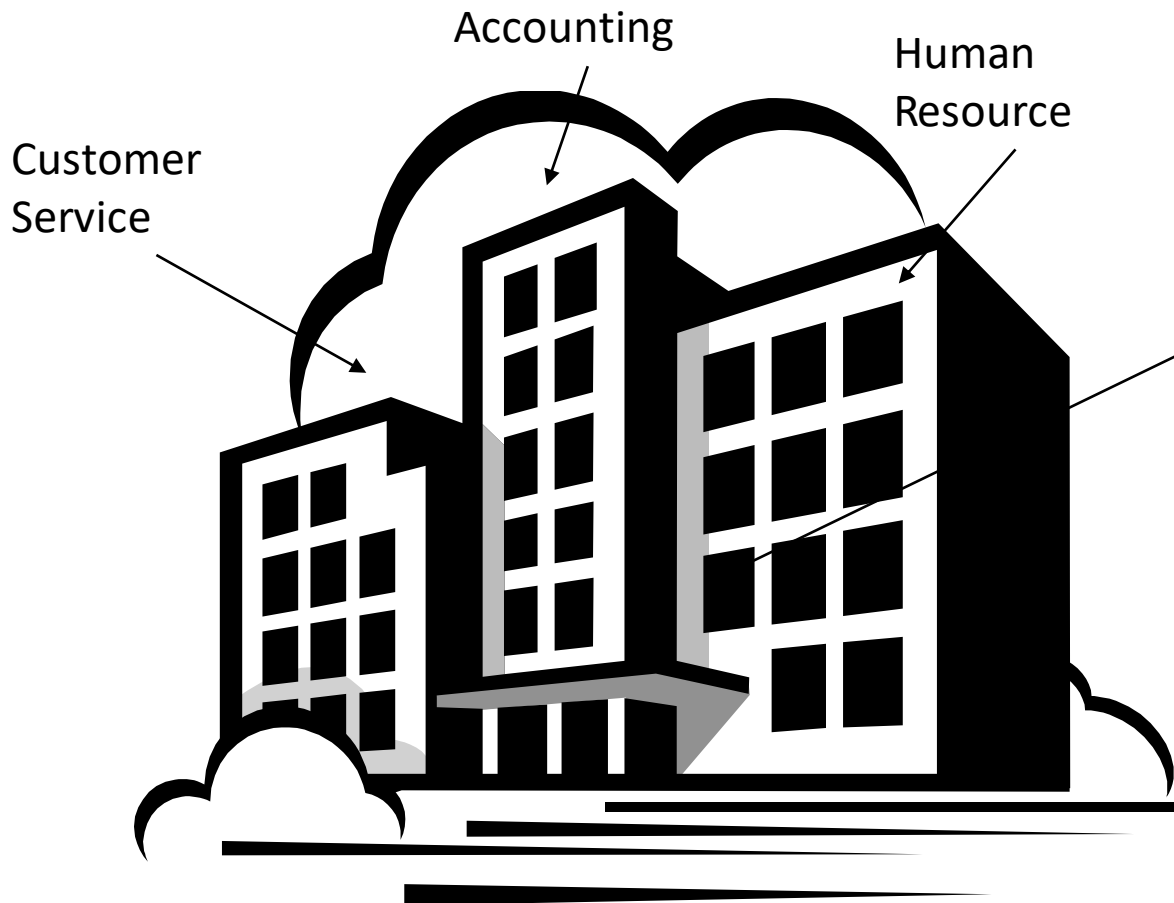
Virtual LAN

- VLANs (Virtual LANs) splits one physical LAN into multiple logical LANs to ease management tasks

Logical Separation



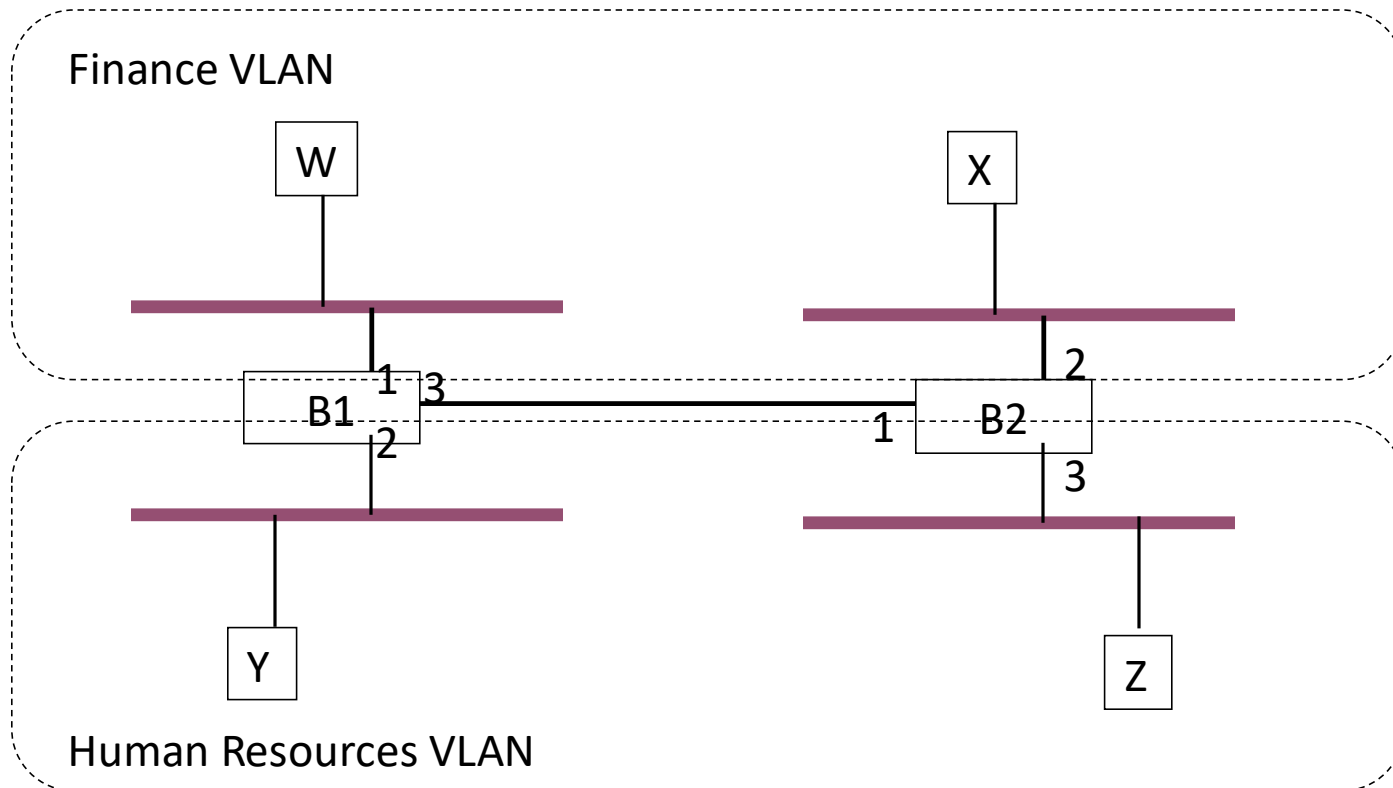
Logical Separation



Change logical topology without moving any wires or change addresses

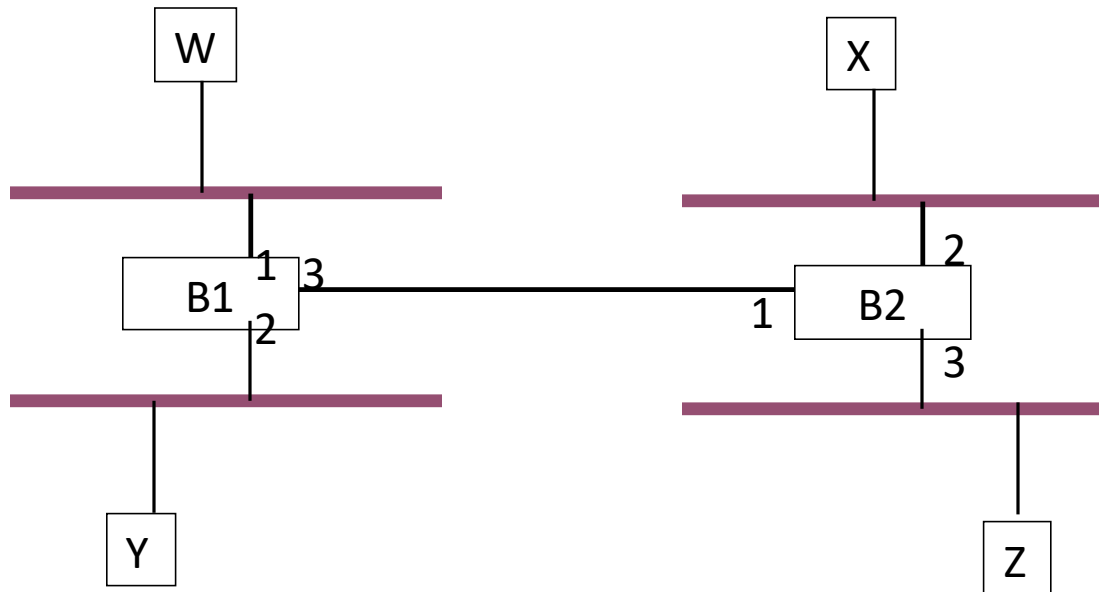
Logical Separation

A frame can travel only within a segment (VLAN)



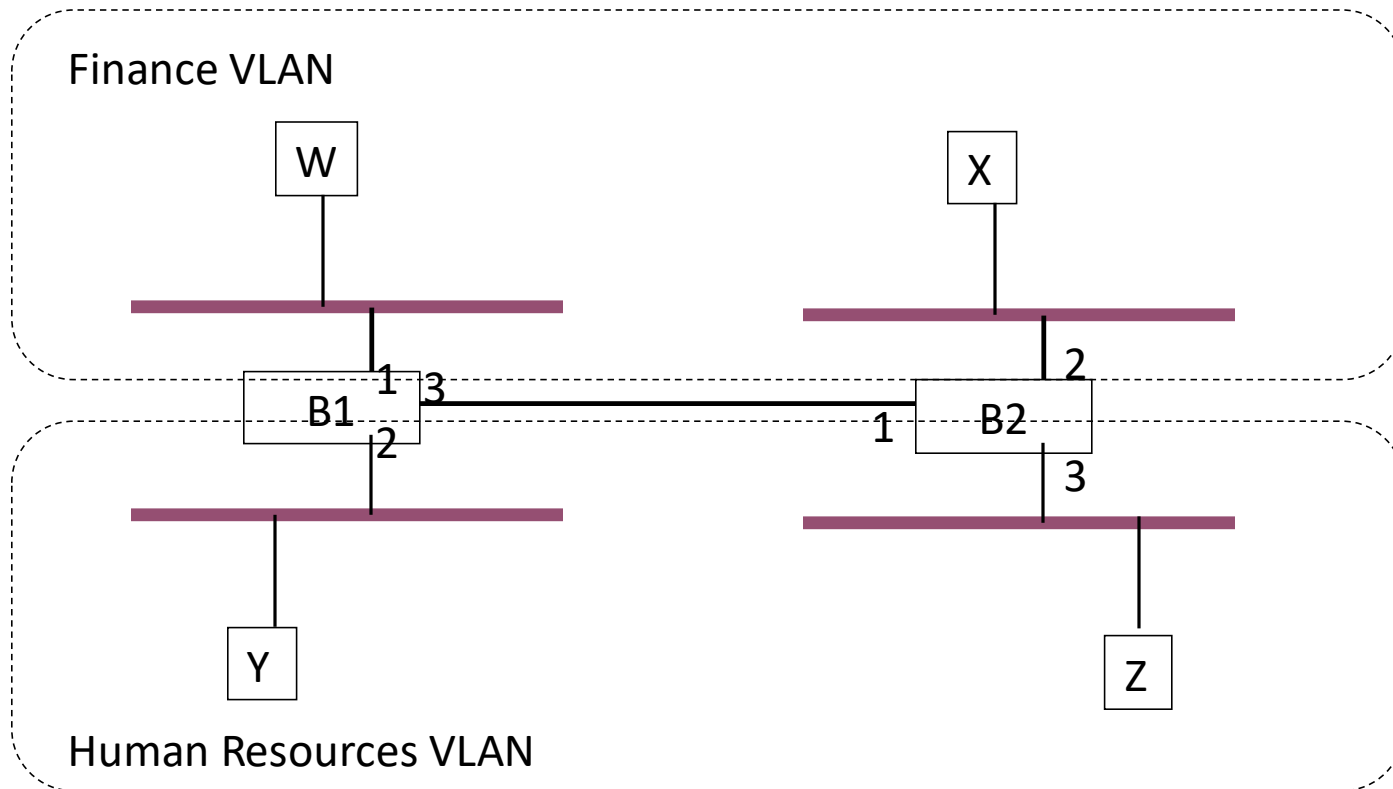
Without VLAN

A frame can travel anywhere within the extended LAN



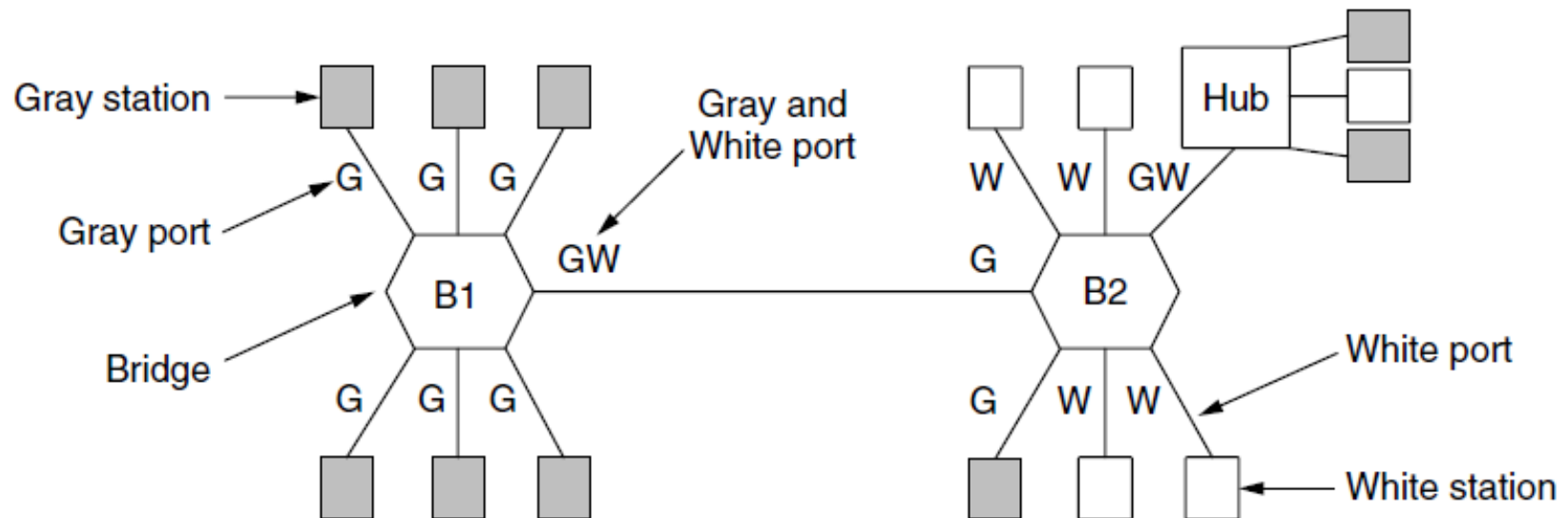
Logical Separation with VLAN

A frame can travel only within a segment (VLAN)



Virtual LAN: Example with Color/ID

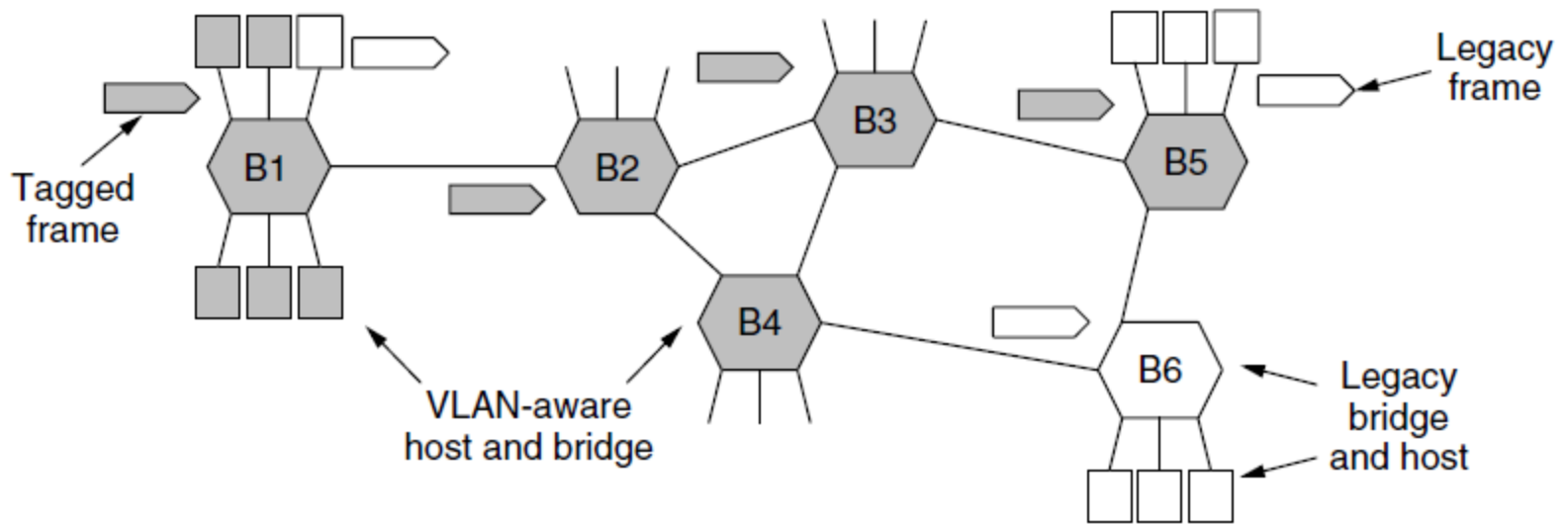
- Ports are “colored” according to their VLAN



Virtual LAN: IEEE 802.1Q

- Bridges need to be aware of VLANs to support them
- In 802.1Q, frames are tagged with their “color”
- Legacy switches with no tags are supported

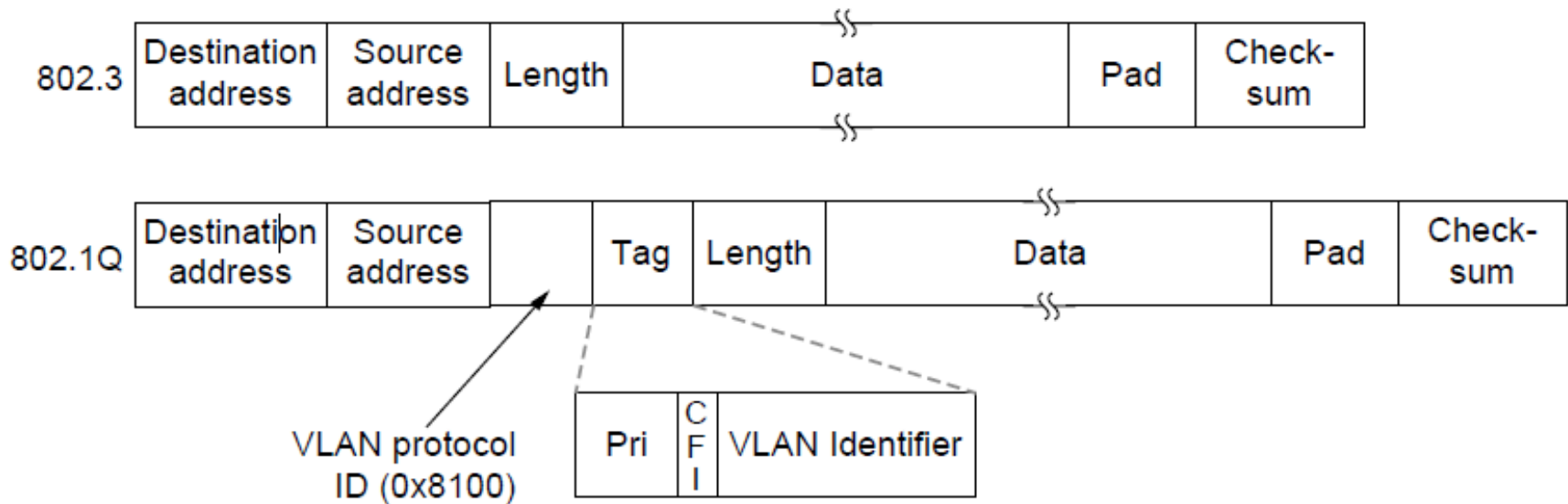
IEEE 802.1Q: Example



IEEE 802.1Q: Frame Format

- 802.1Q frames carry a color tag (VLAN identifier)
- Length/Type value is 0x8100 for VLAN protocol

IEEE 802.1Q: Frame Format



Questions?

- Terms and devices
- Concepts of VLAN and IEEE 802.1Q