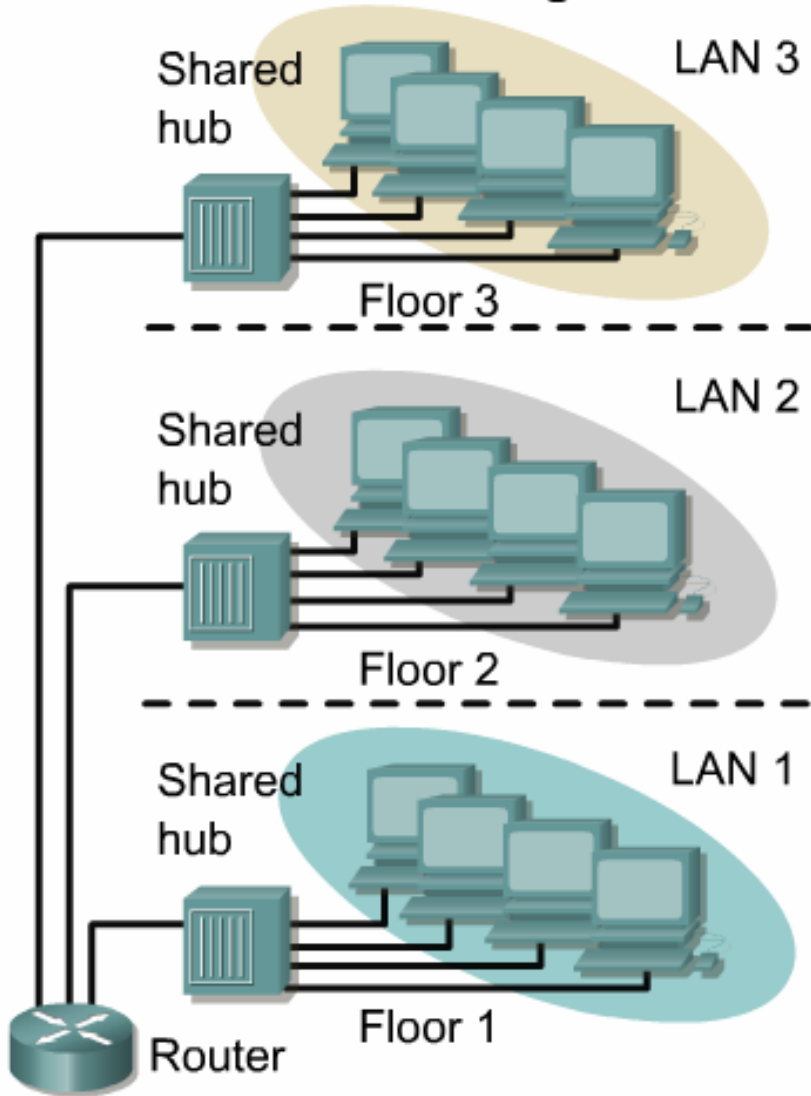
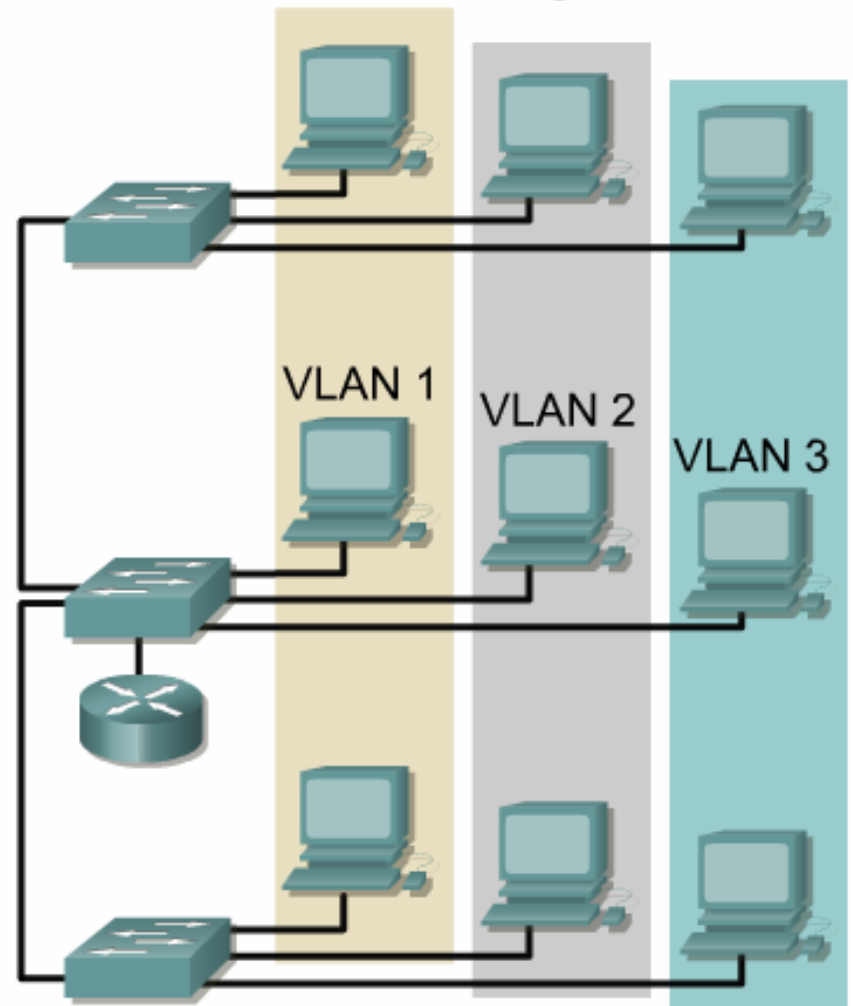
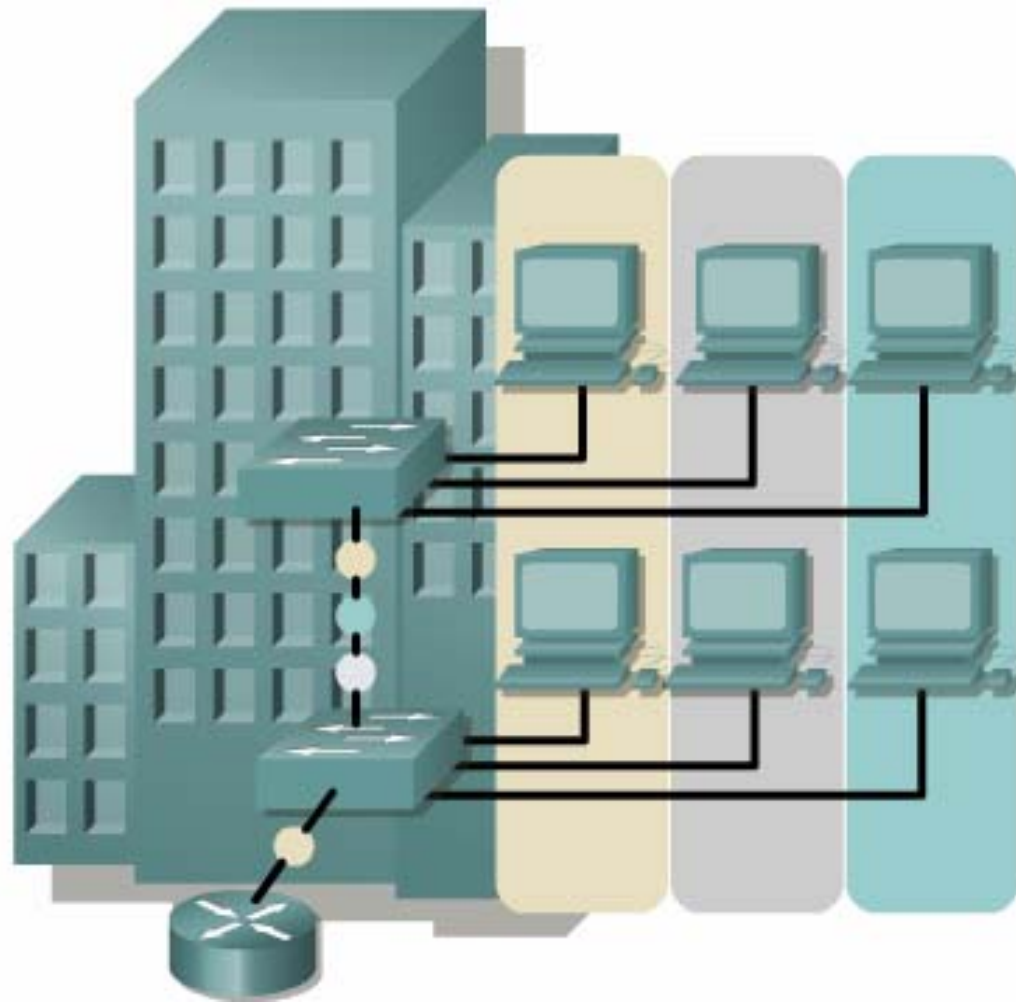


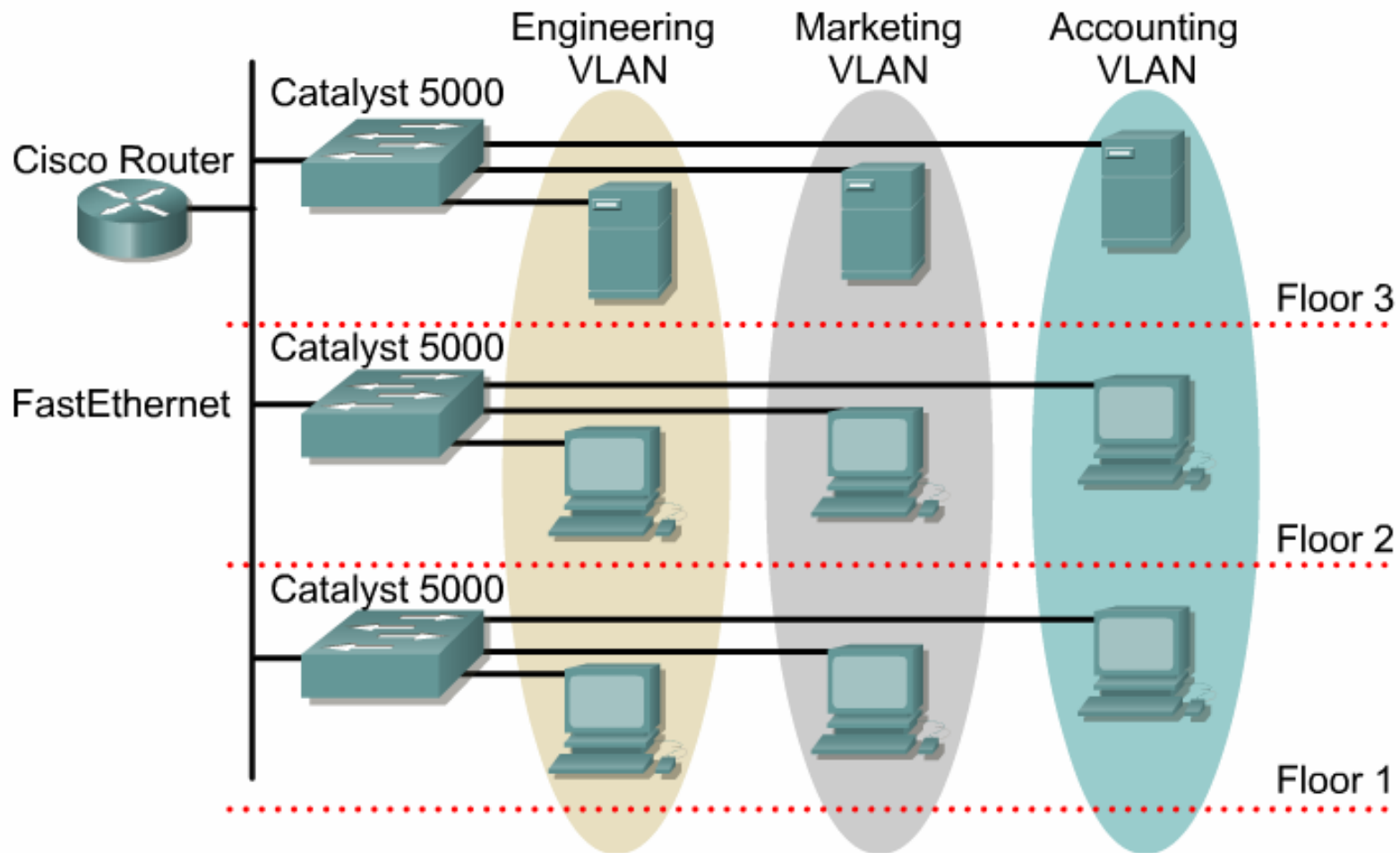
Traditional LAN Segmentation



VLAN Segmentation

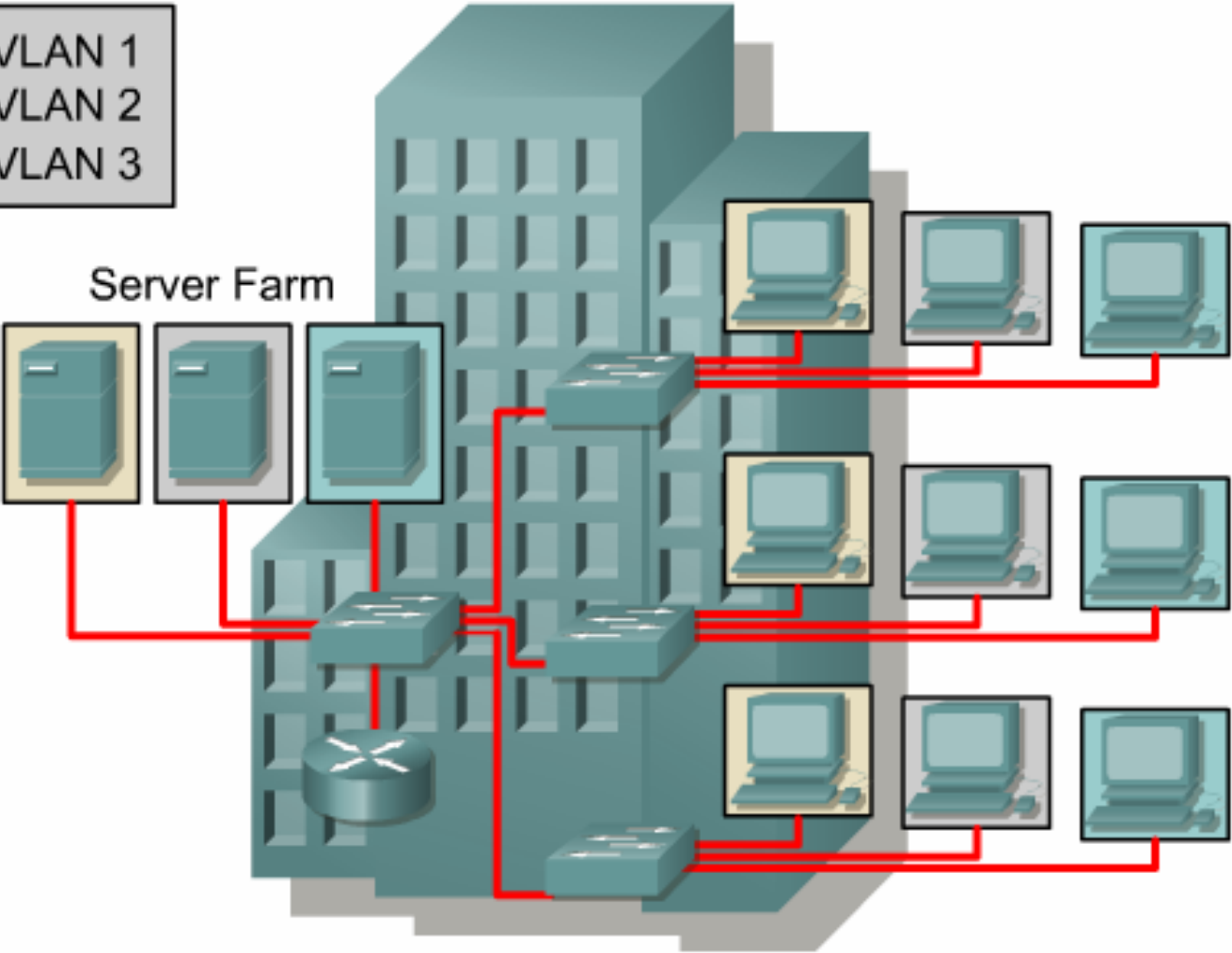


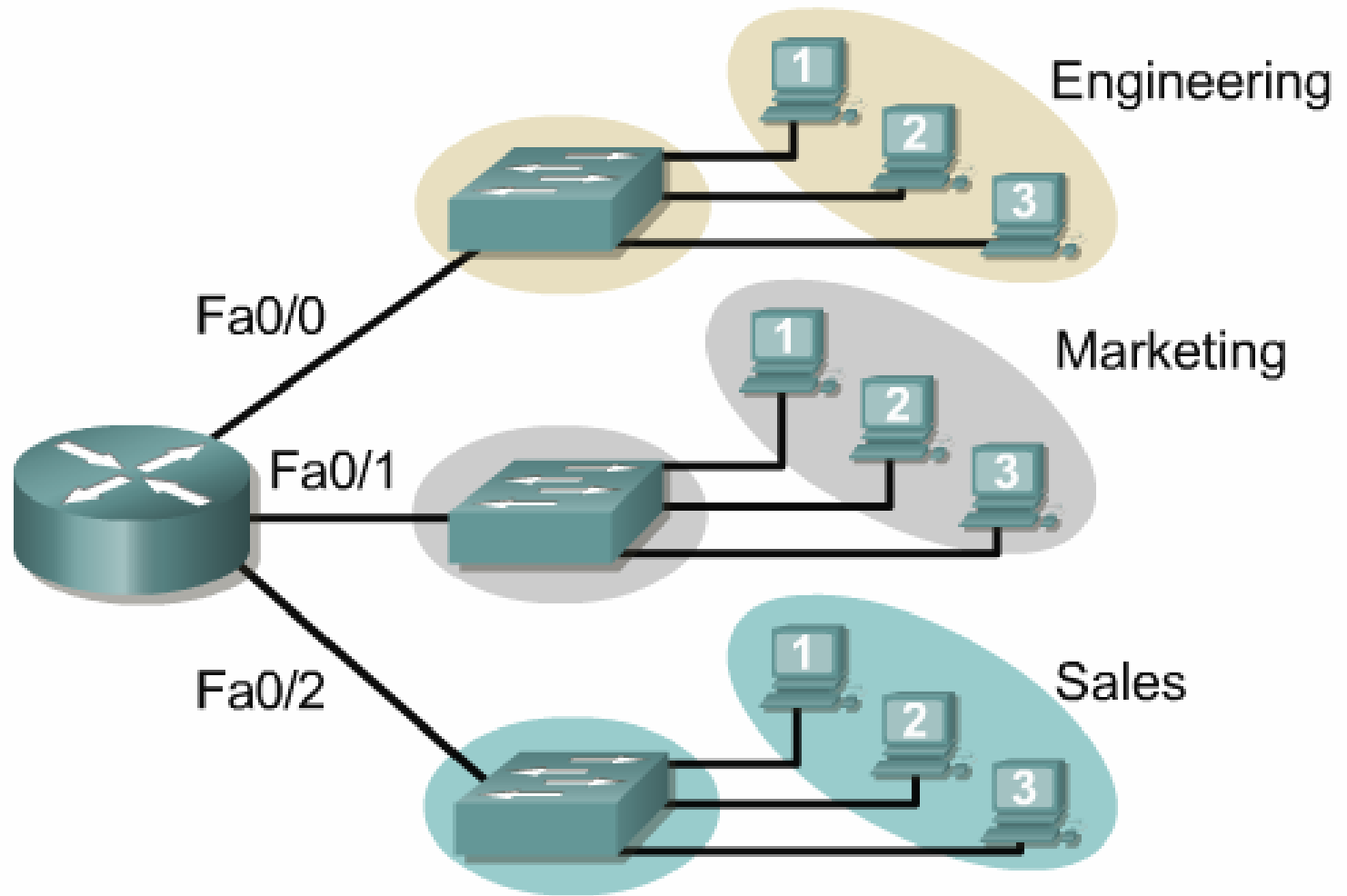


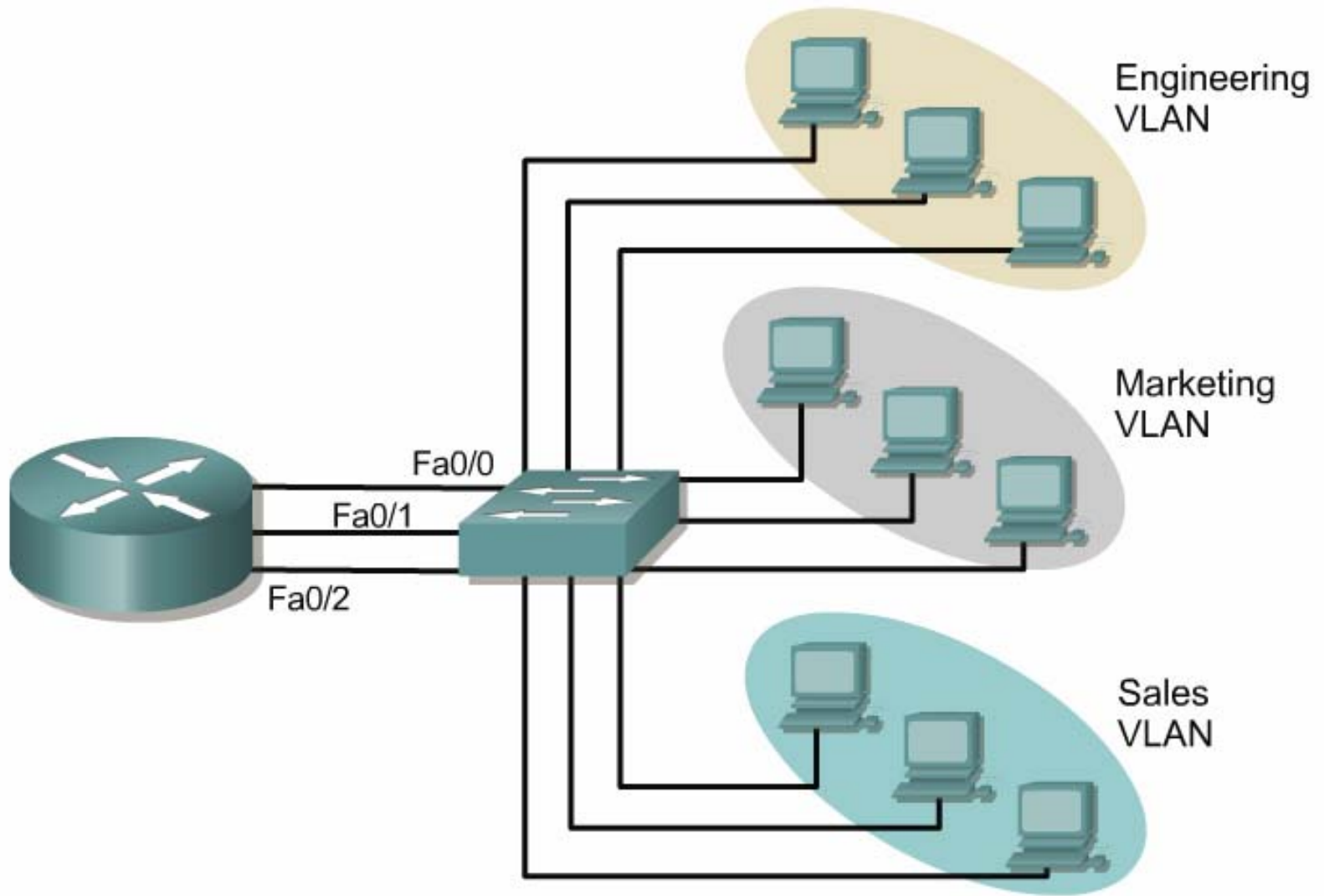


- VLAN 1
- VLAN 2
- VLAN 3

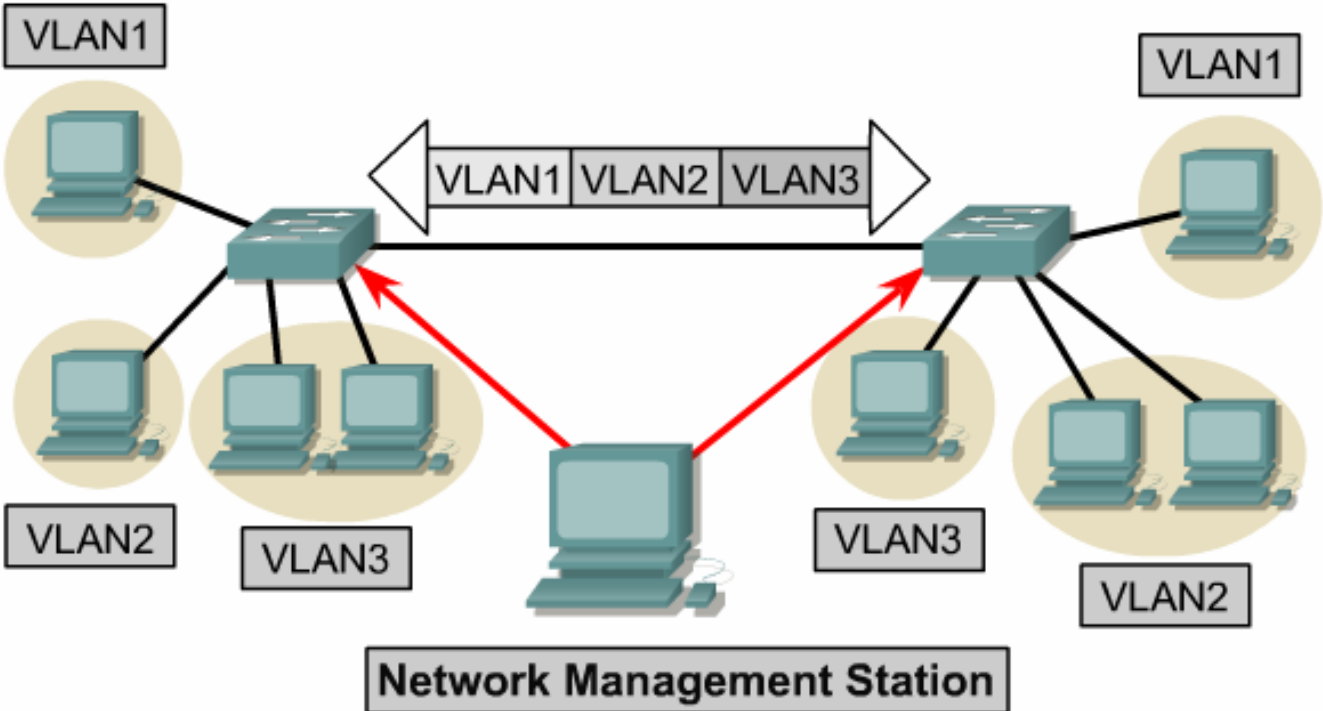
Server Farm



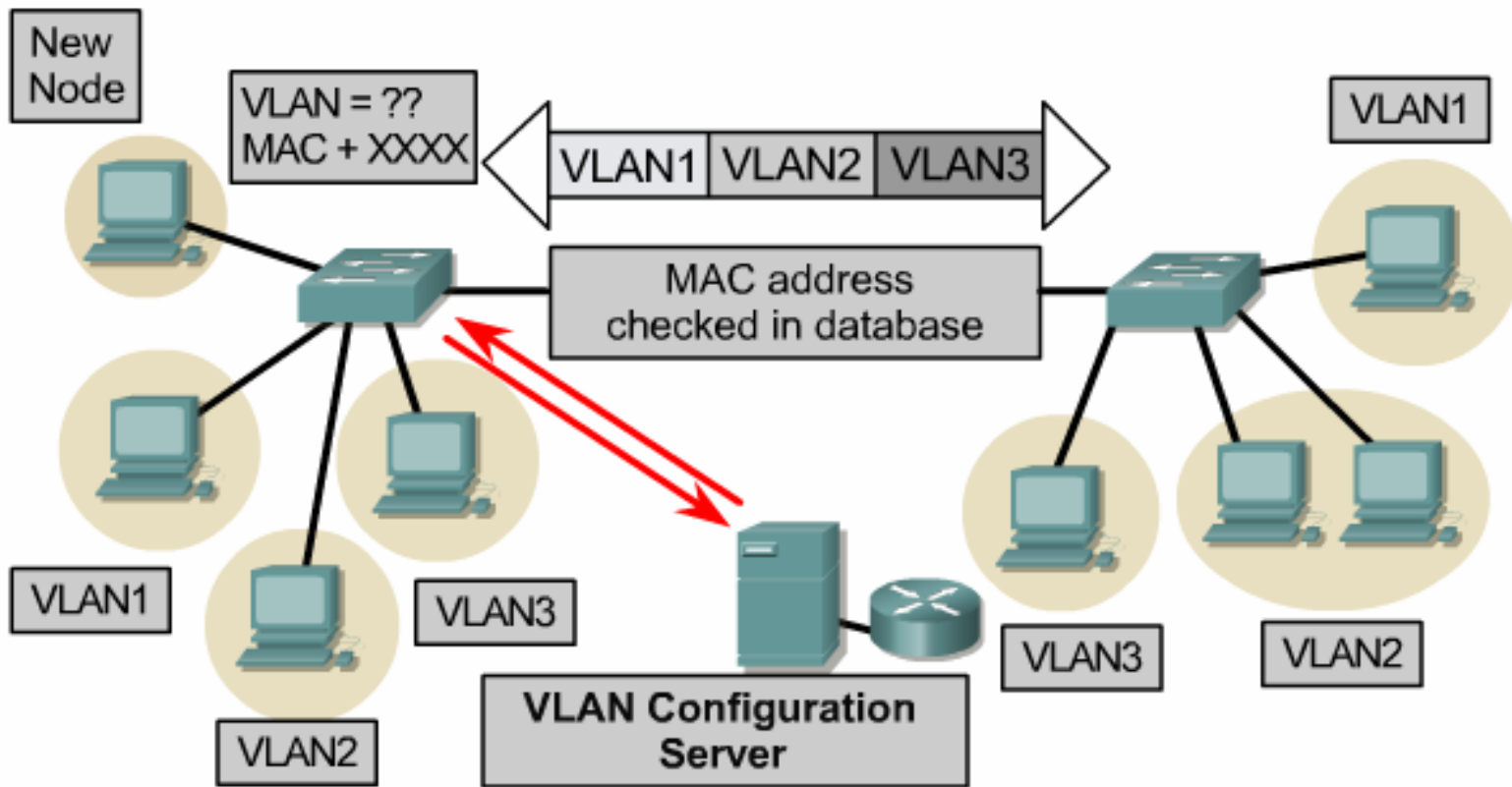


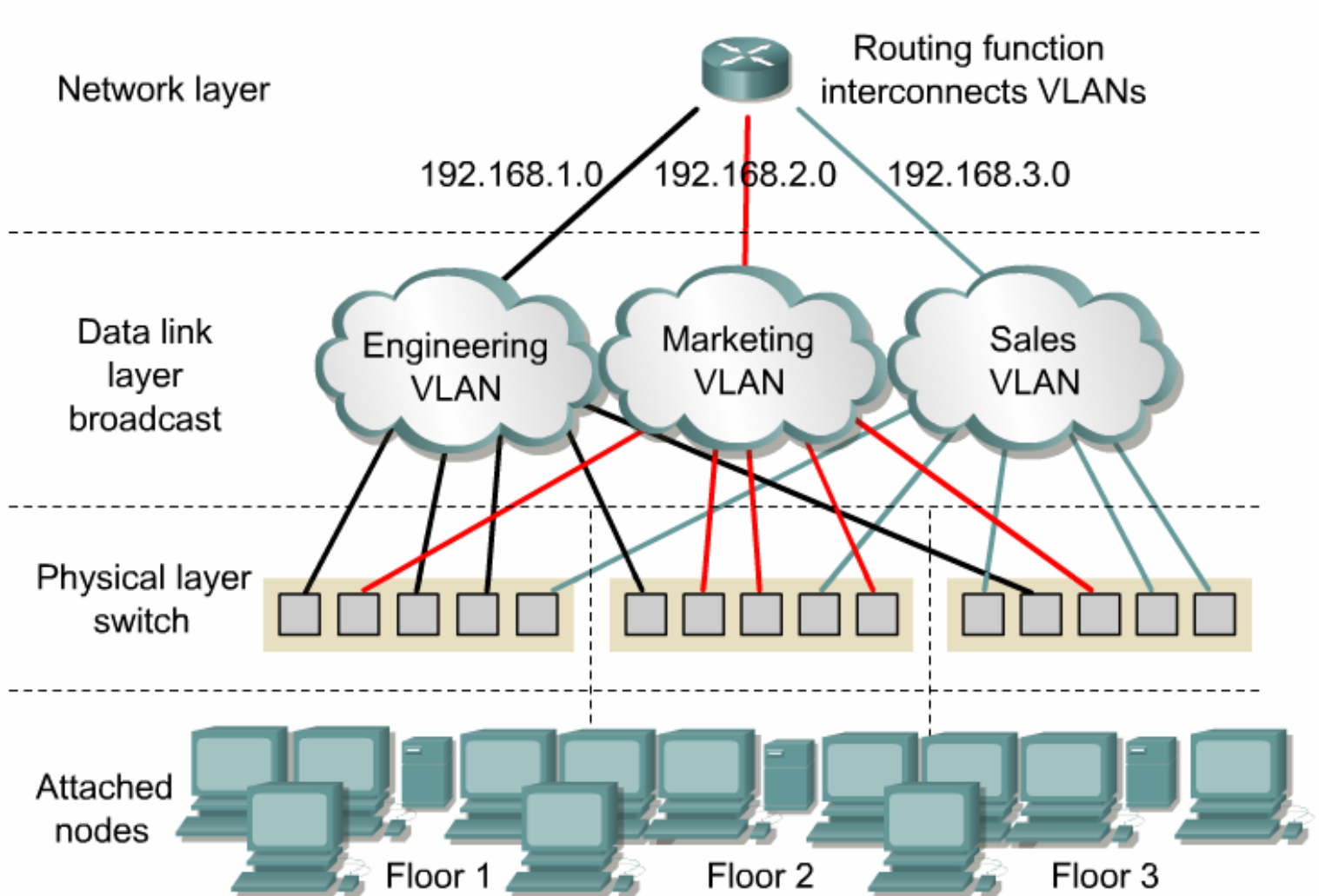


Static VLANs

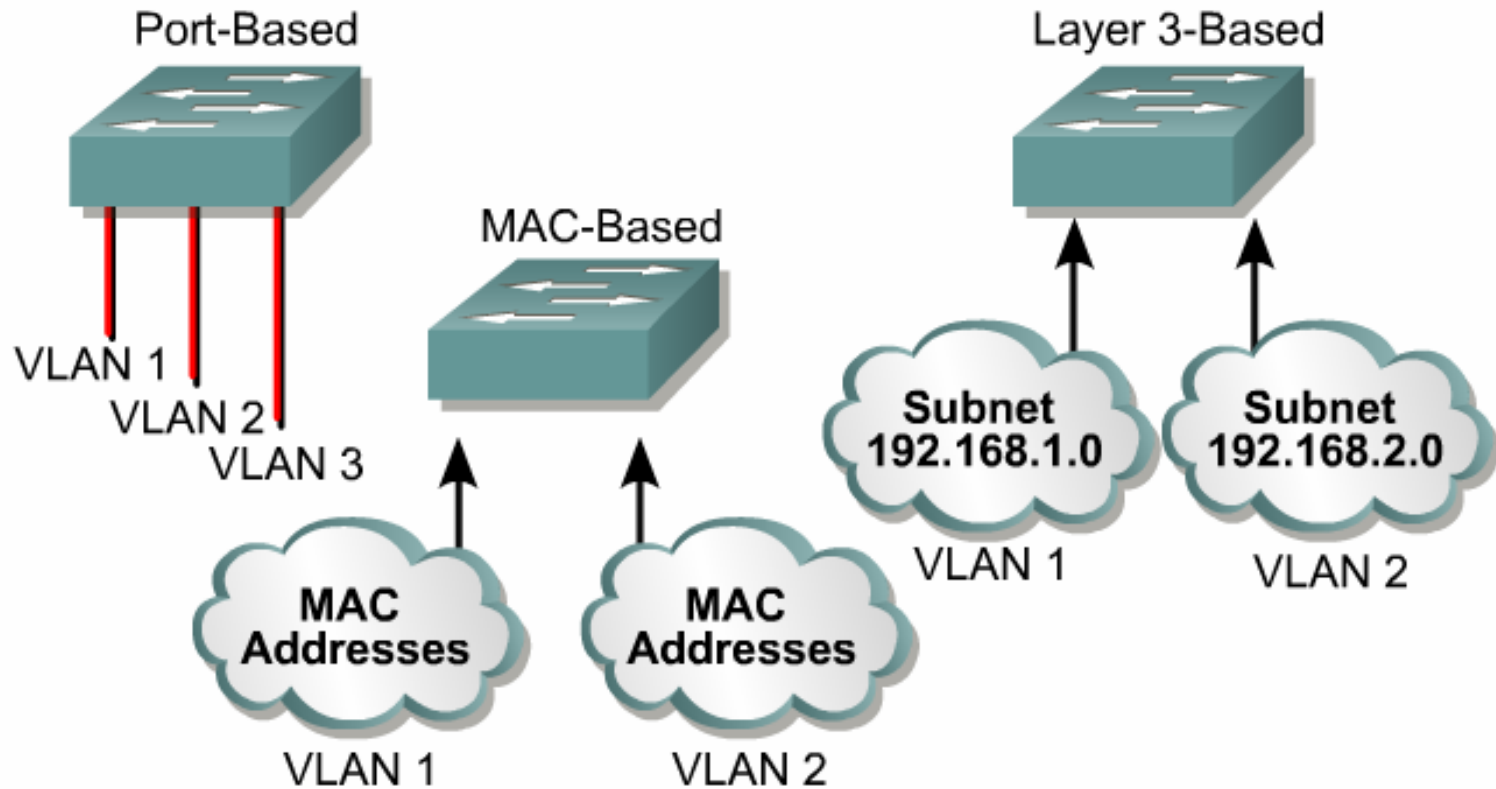


Dynamic VLANs





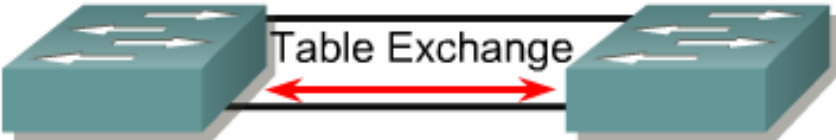
Approaches Can Vary Performance



- Port driven
- MAC address driven
- Network address driven

Requires Filtering, Impacts Performance

MAC Address Tables
VLAN 1
020701AEF1A
0A032192FA2A
026765175GA3A
VLAN 2
050503G4GF2A
040404THTB3A
070706GGGF3A



MAC Address Tables
VLAN 1
020701AEF1A
0A032192FA2A
026765175GA3A
VLAN 2
050503G4GF2A
040404THTB3A
070706GGGF3A

Table Adds
Administrative Overhead

Redundancy

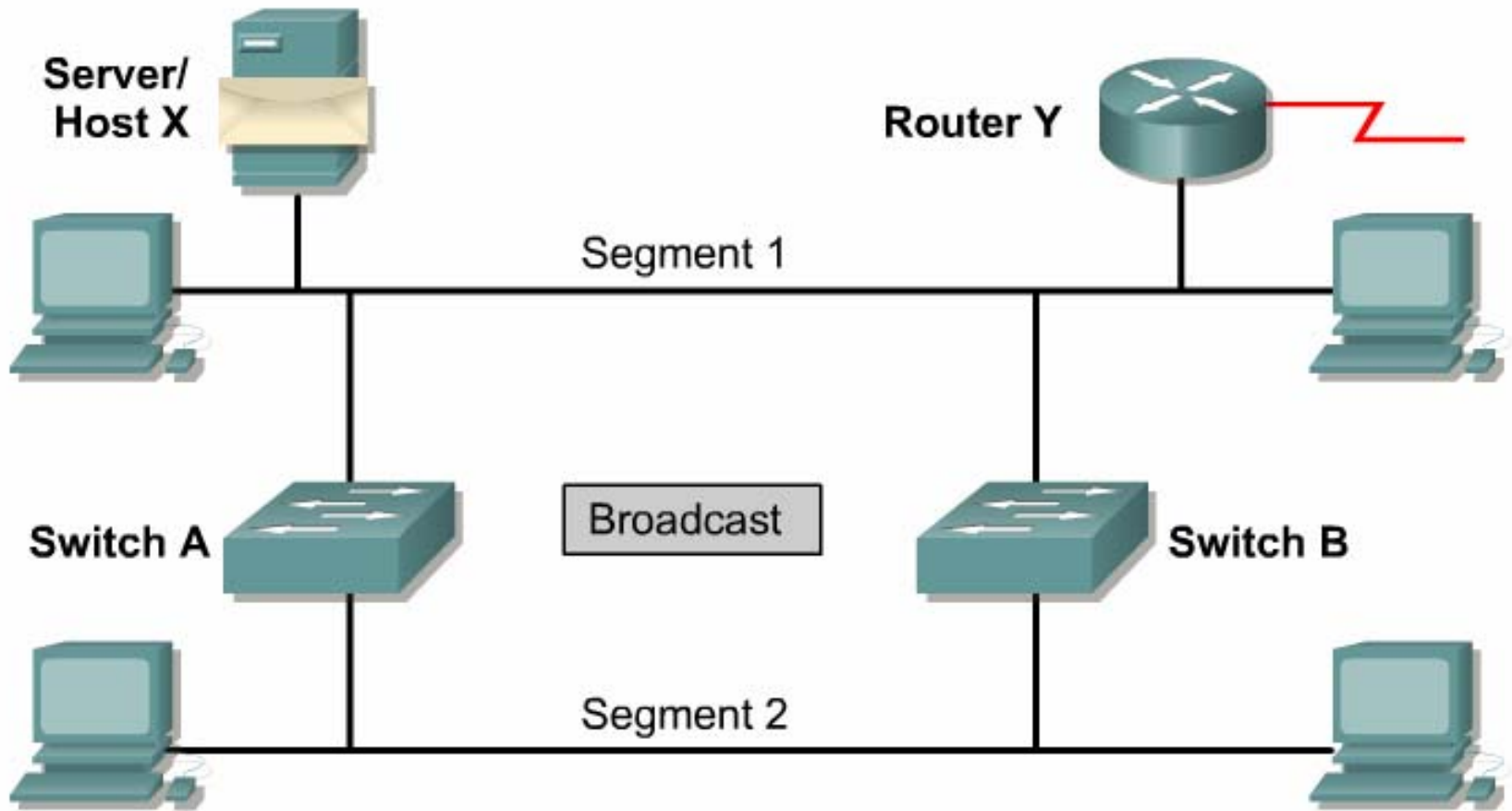


There is one car, can I drive to work?

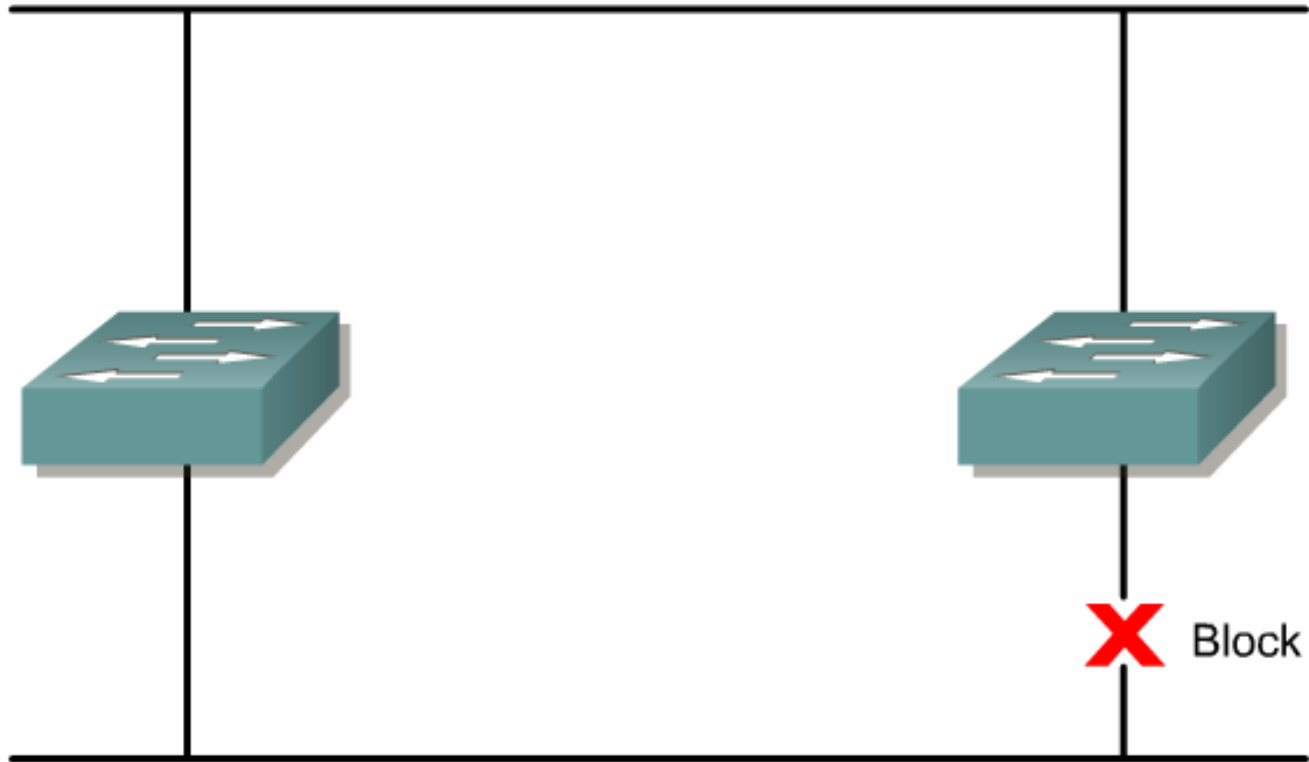


There are two cars, can I drive to work?

Broadcast Storm

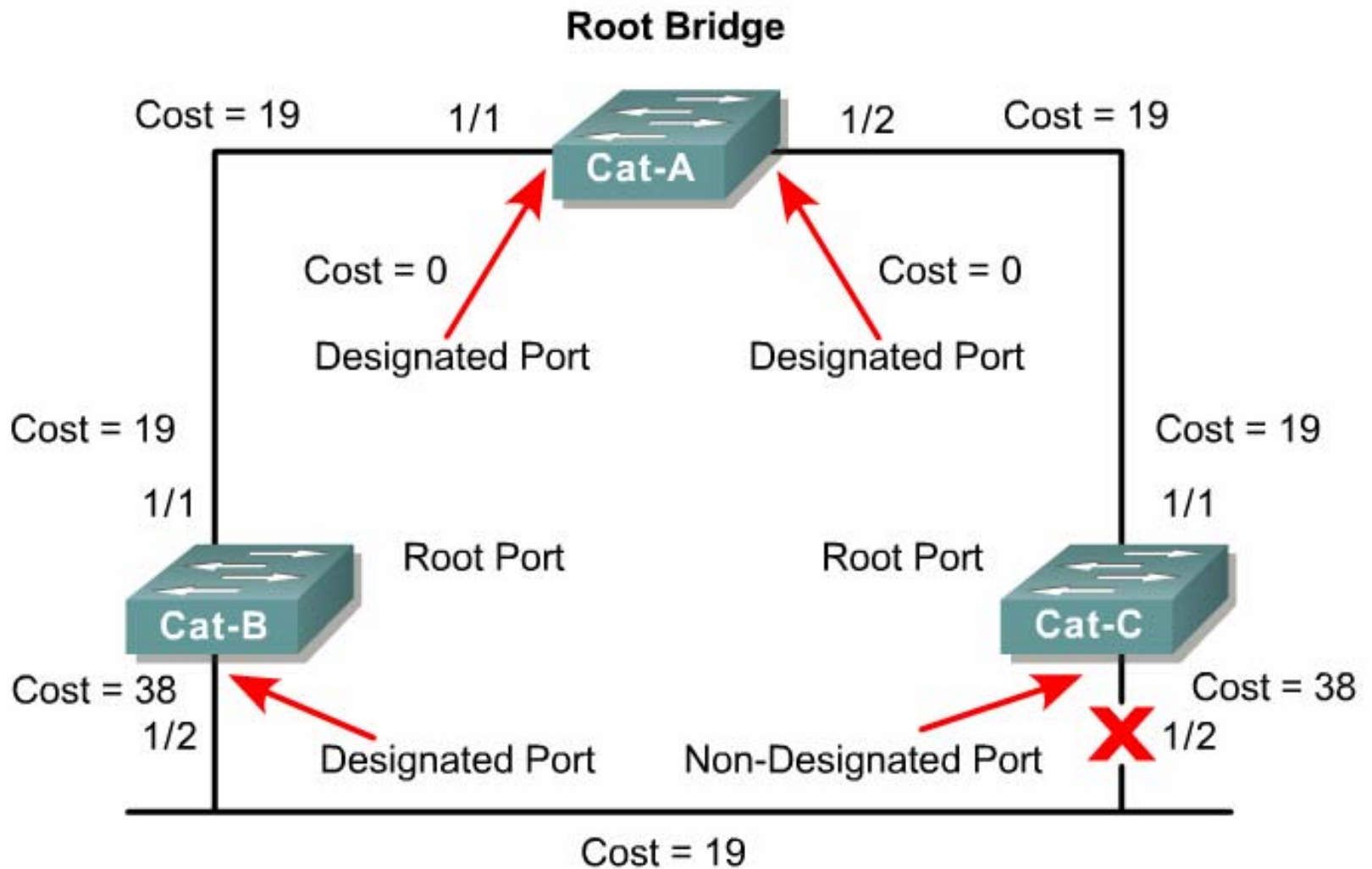


Spanning-Tree Protocol



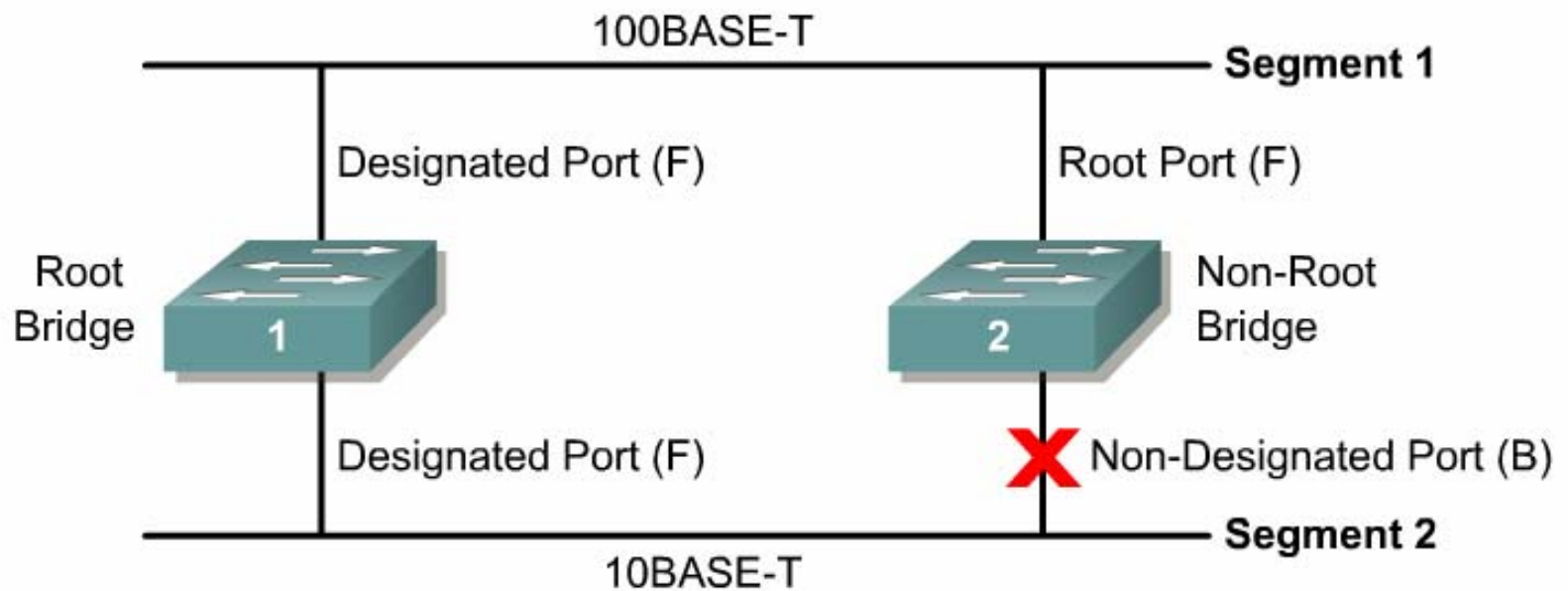
Provides a loop-free, redundant network topology by placing certain ports in the blocking state.

A Spanning-Tree

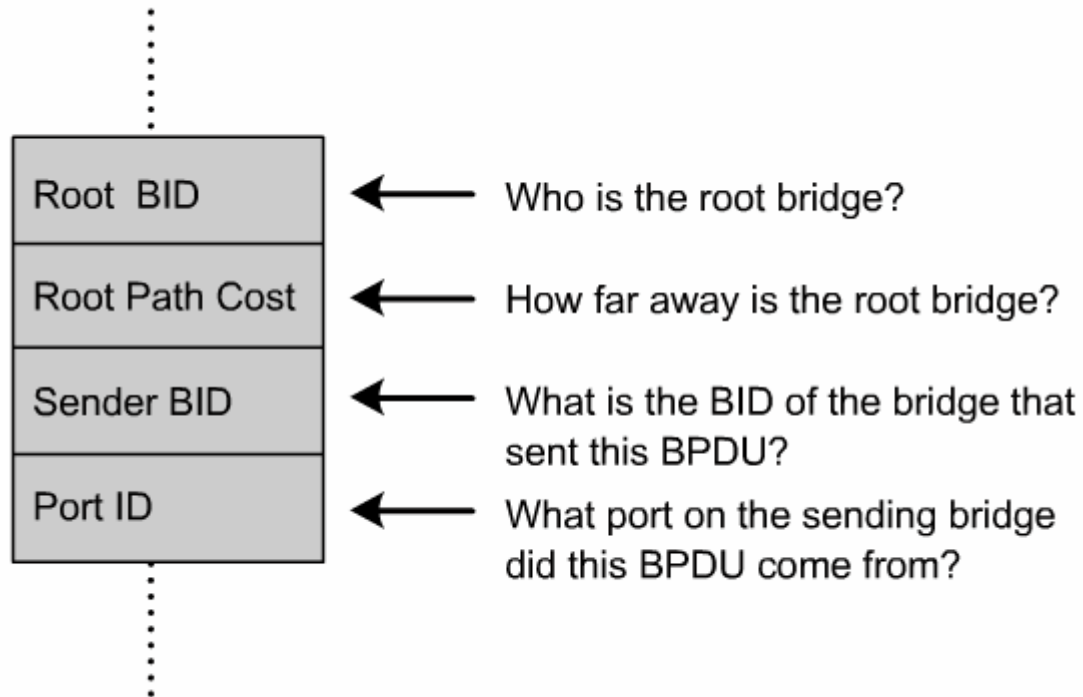


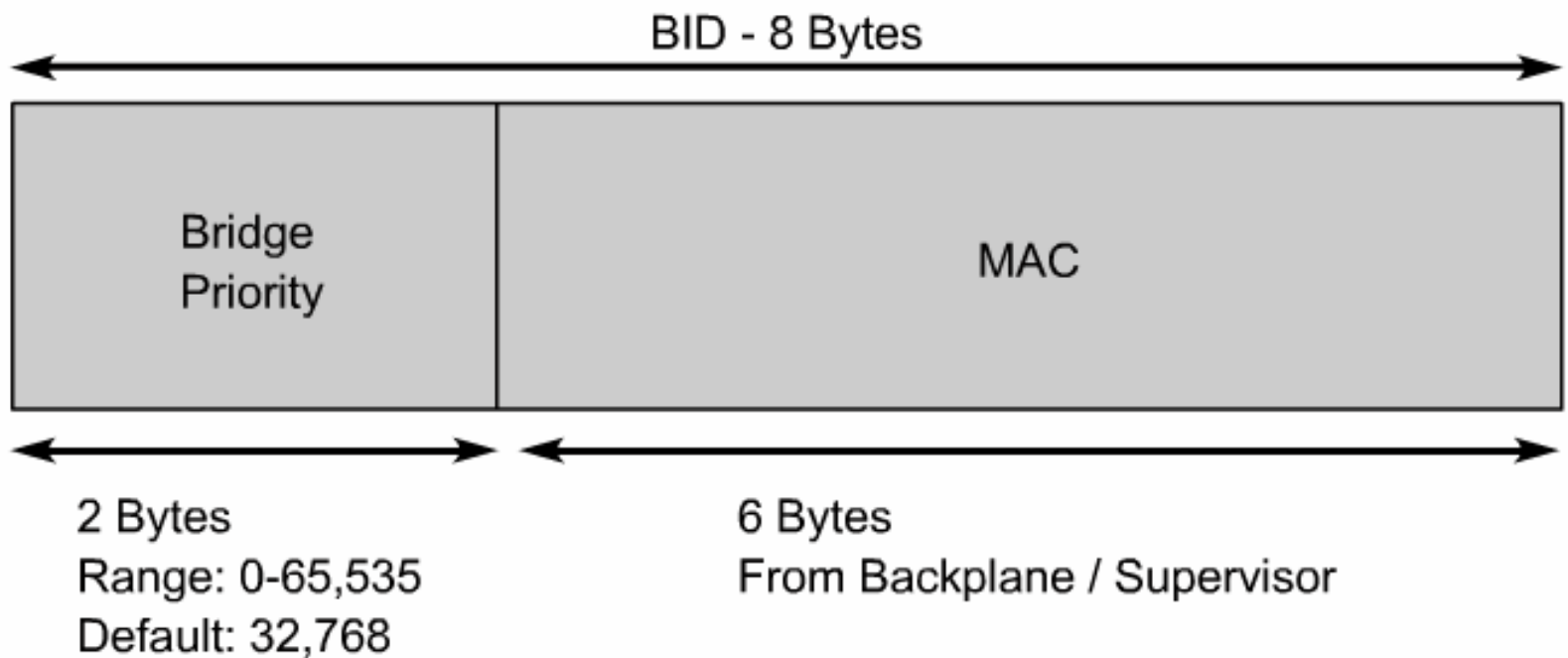
Link Speed	Cost (Revised IEEE Spec)	Cost (Previous IEEE Spec)
10 Gbps	2	1
1 Gbps	4	1
100 Mbps	19	10
10 Mbps	100	100

A Spanning-Tree

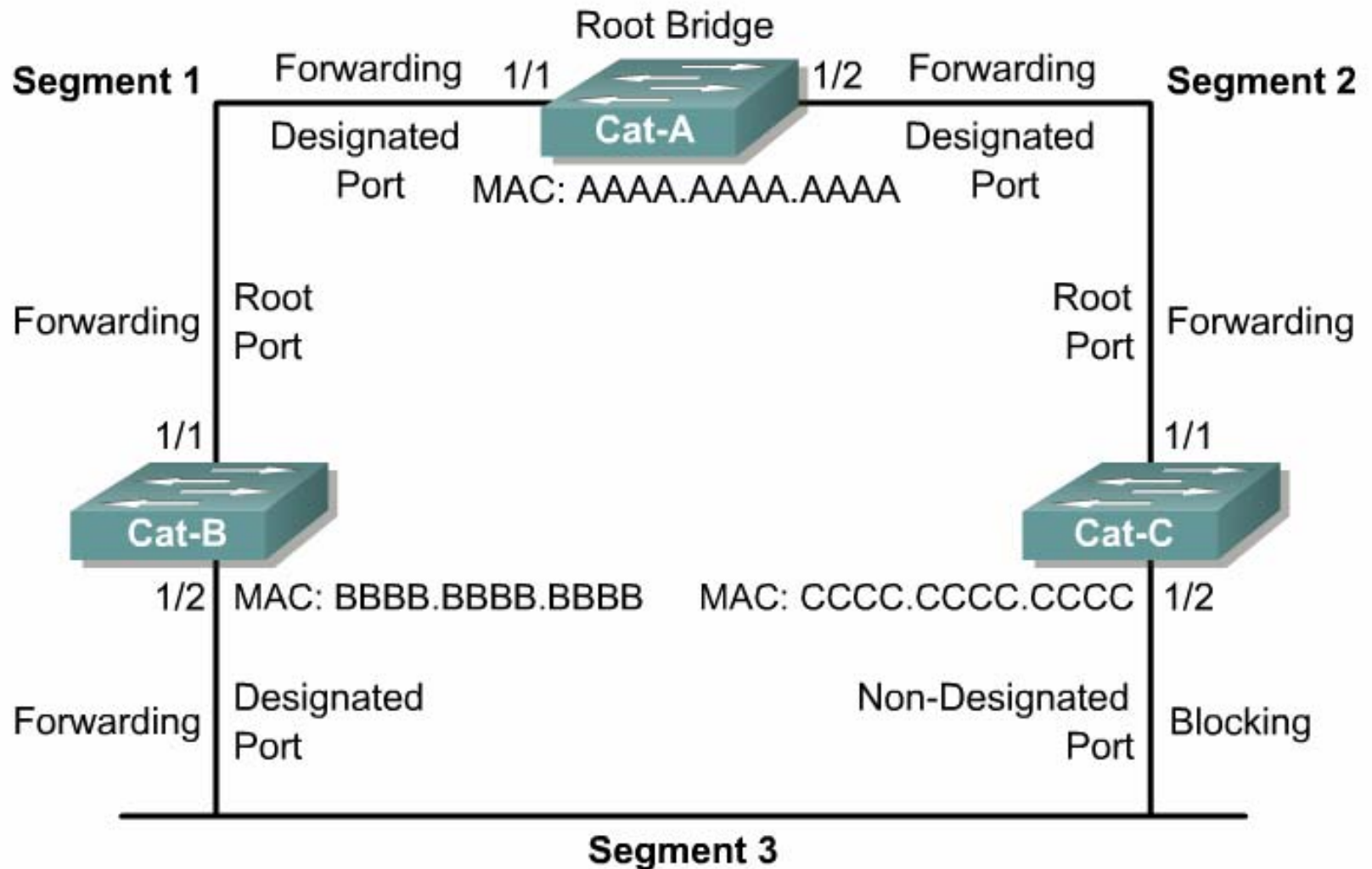


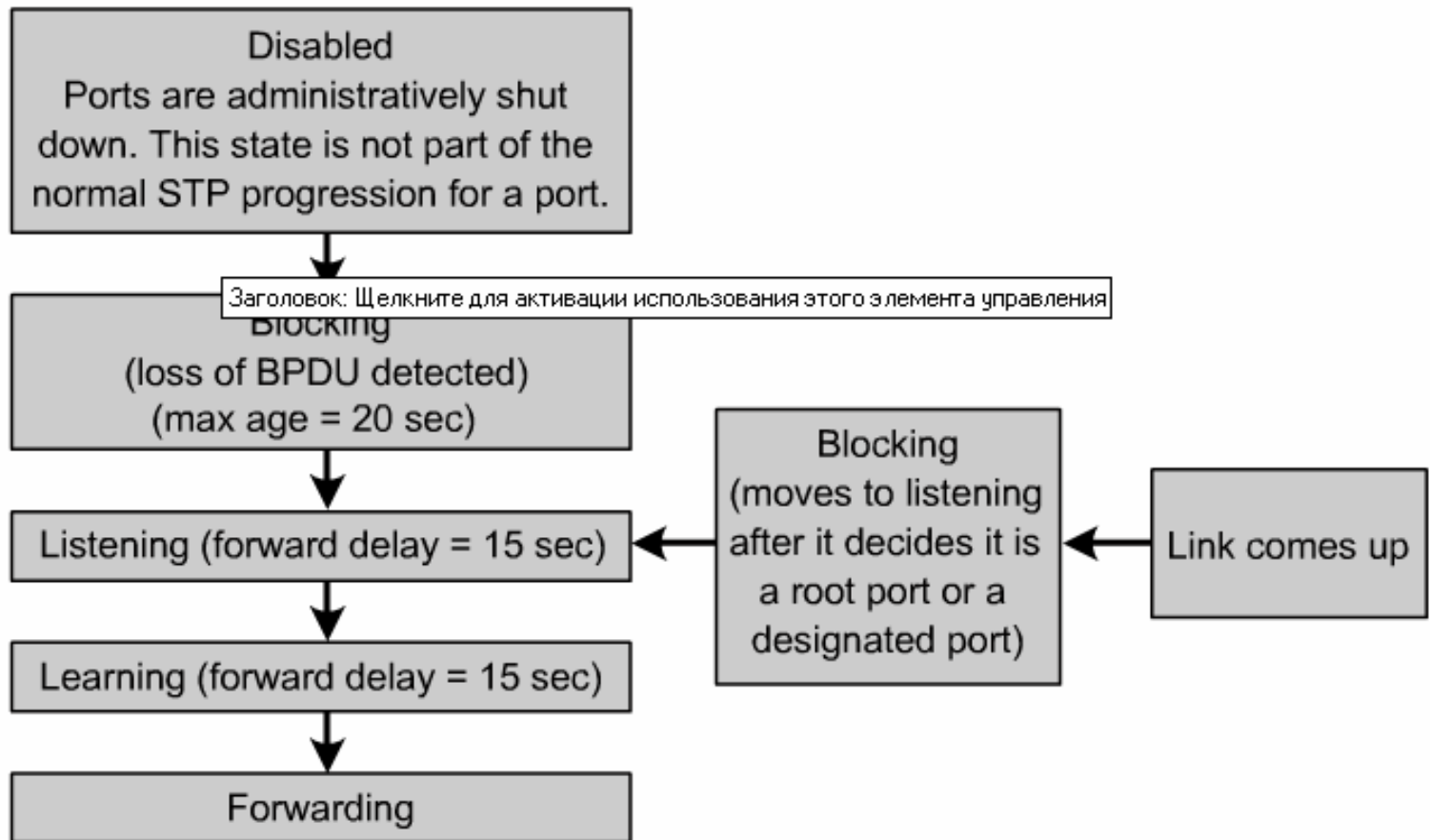
Bridge Protocol Data Unit



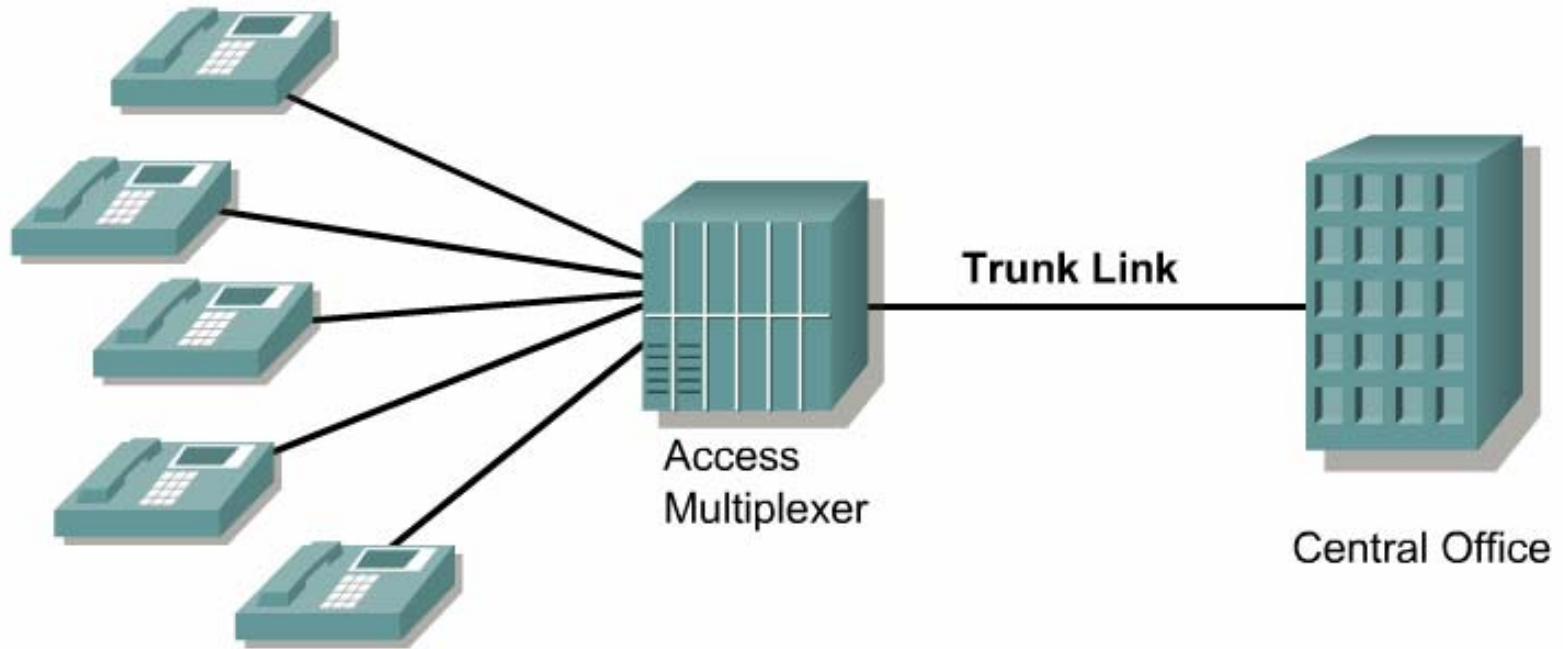


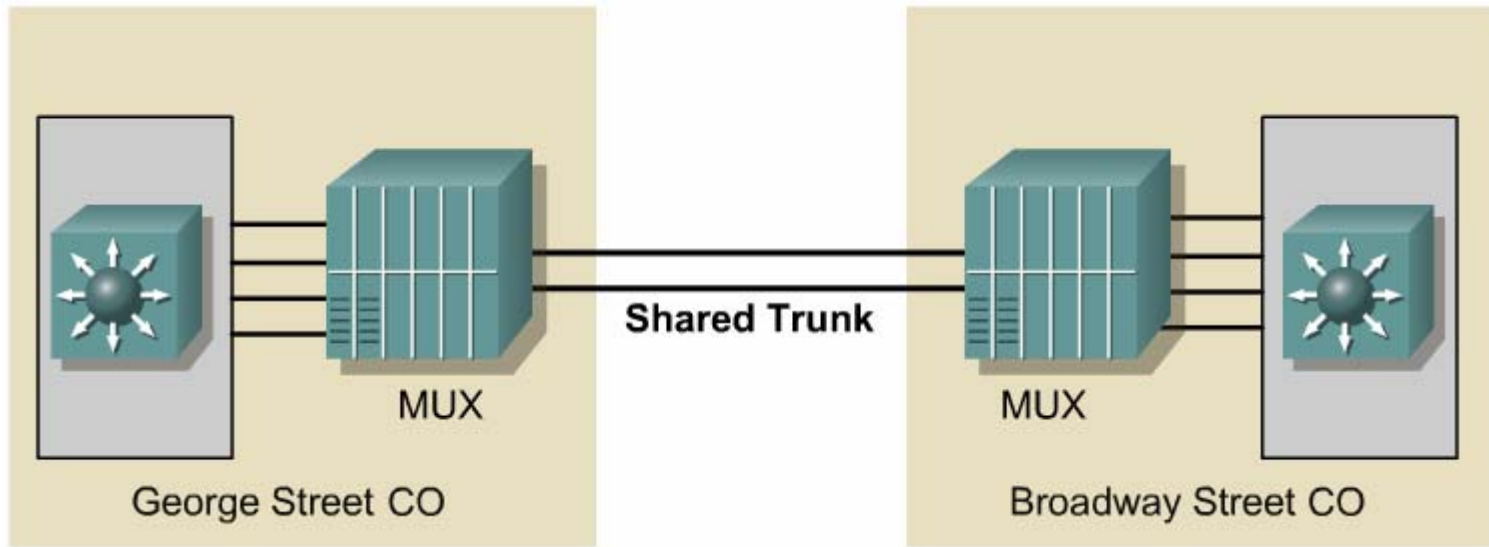
Electing the Root Bridge

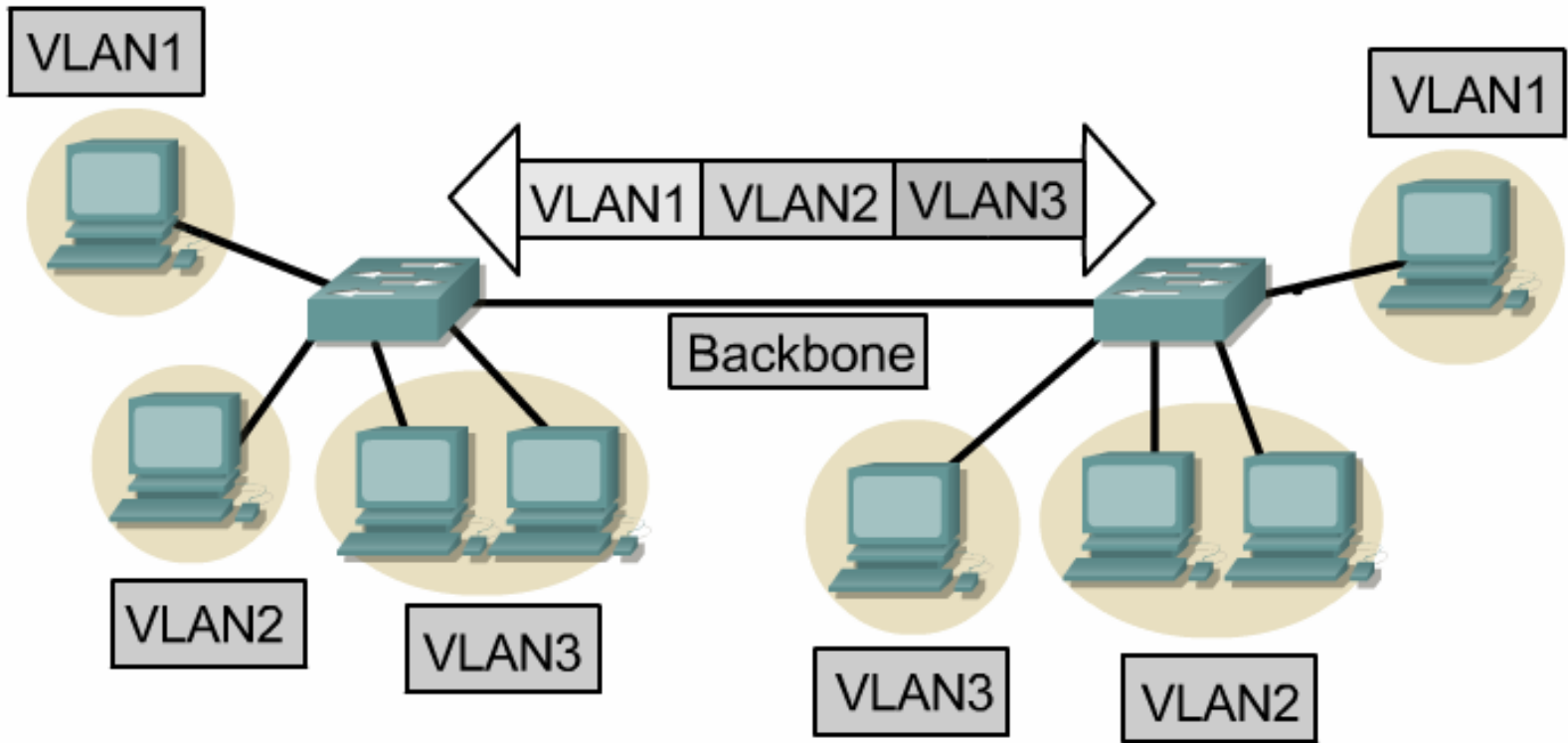


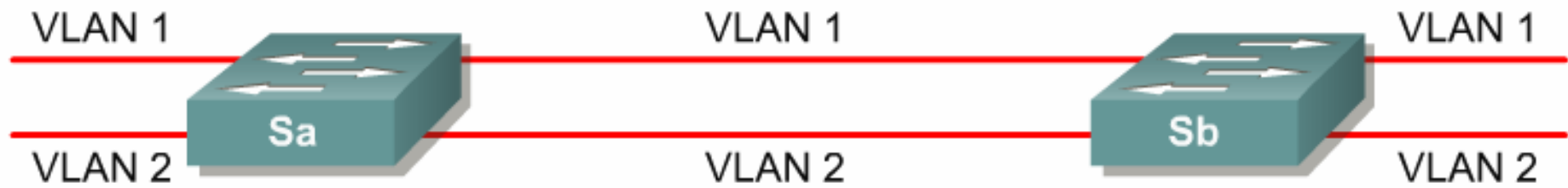


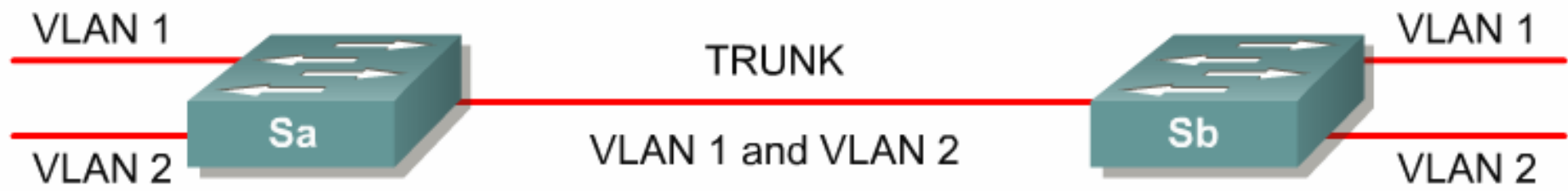
Spanning-tree transits each port through several different states.

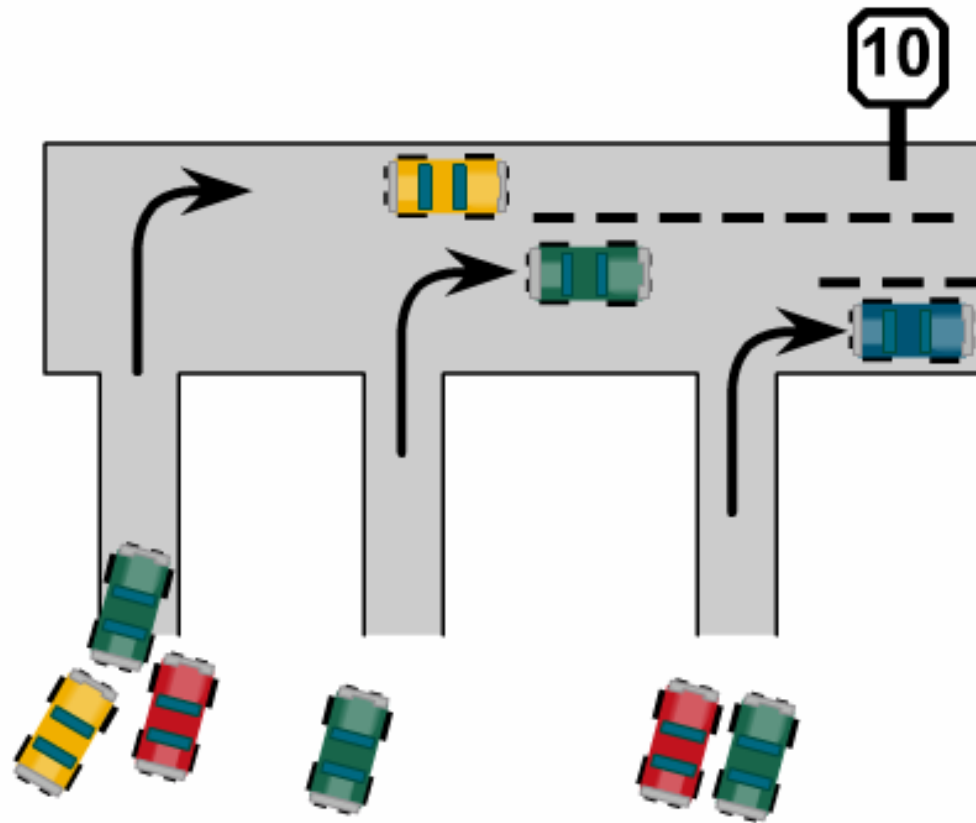


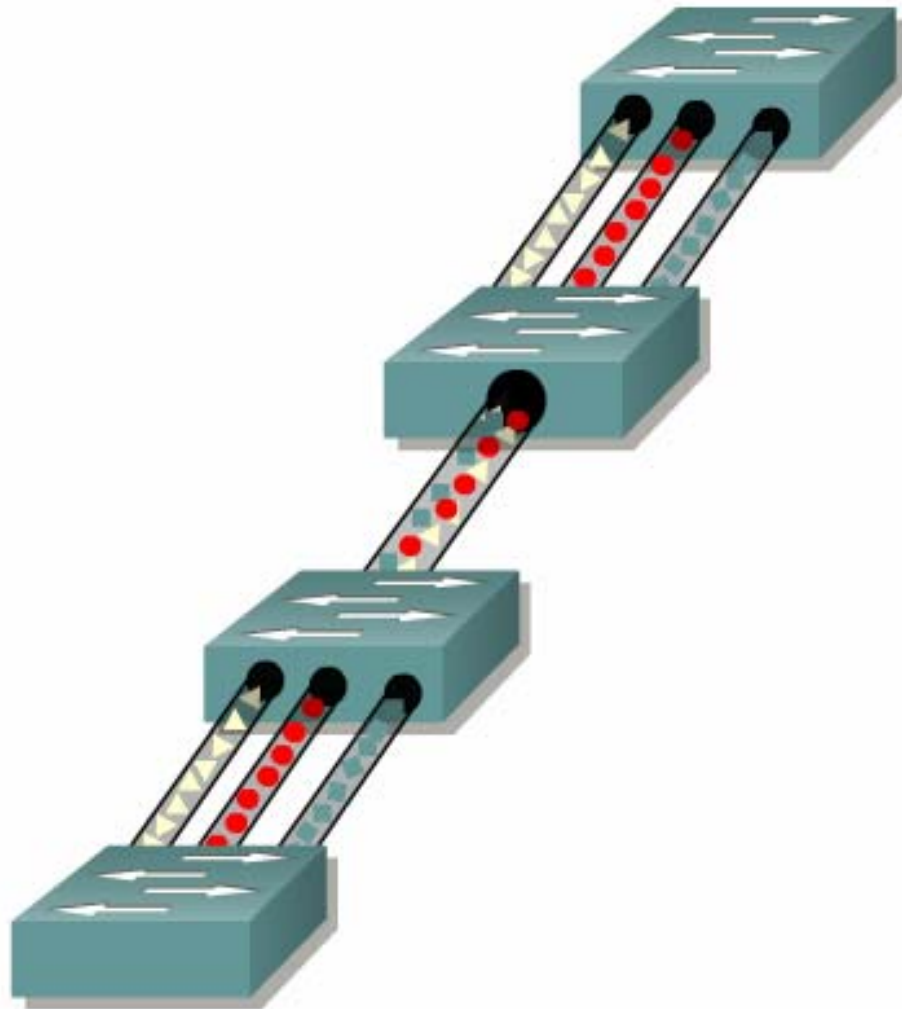












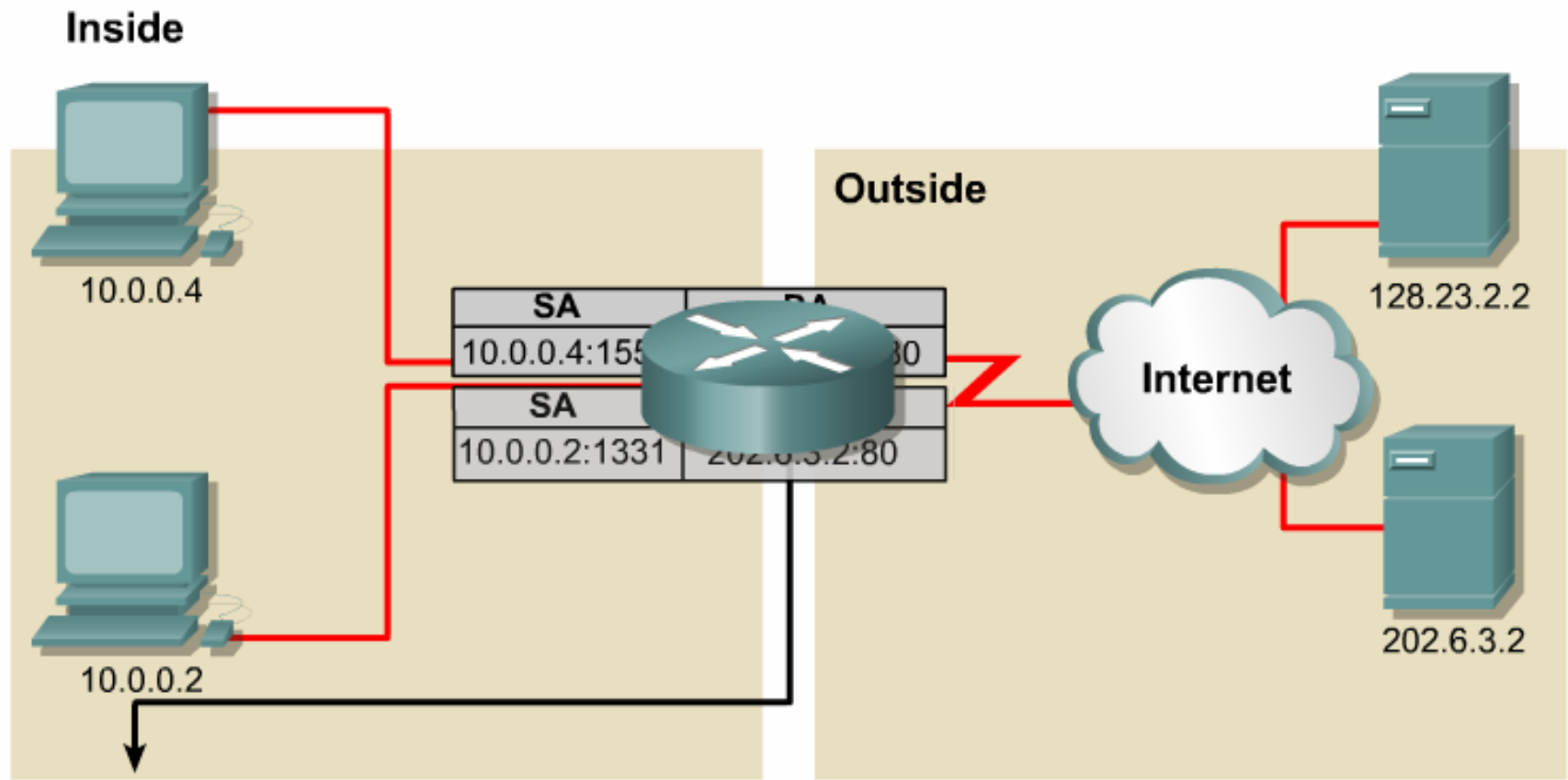
Identification Method	Encapsulation	Tagging (insertion into frame)	Media
802.1Q	No	Yes	Ethernet
ISL	Yes	No	Ethernet
802.10	No	No	FDDI
LANE	No	No	ATM

Feature	Server	Client	Transparent
Source VTP Messages	Yes	Yes	No
Listen to VTP Messages	Yes	Yes	No
Create VLANs	Yes	No	Yes*
Remember VLANs	Yes	No	Yes*

*Locally Significant only

Private IP Addresses

Class	RFC 1918 Internal Address Range	CIDR Prefix
A	10.0.0.0 - 10.255.255.255	10.0.0.0/8
B	172.16.0.0 - 172.31.255.255	172.16.0.0/12
C	192.168.0.0 - 192.168.255.255	192.168.0.0/16



NAT Table with Overload

Inside Local IP Address	Inside Global IP Address	Outside Local IP Address	Outside Global Address
10.0.0.2:1331	179.9.8.80:1331	202.6.3.2:80	202.6.3.2:80
10.0.0.4:1555	179.9.8.80:1555	128.23.2.2:80	128.23.2.2:80