

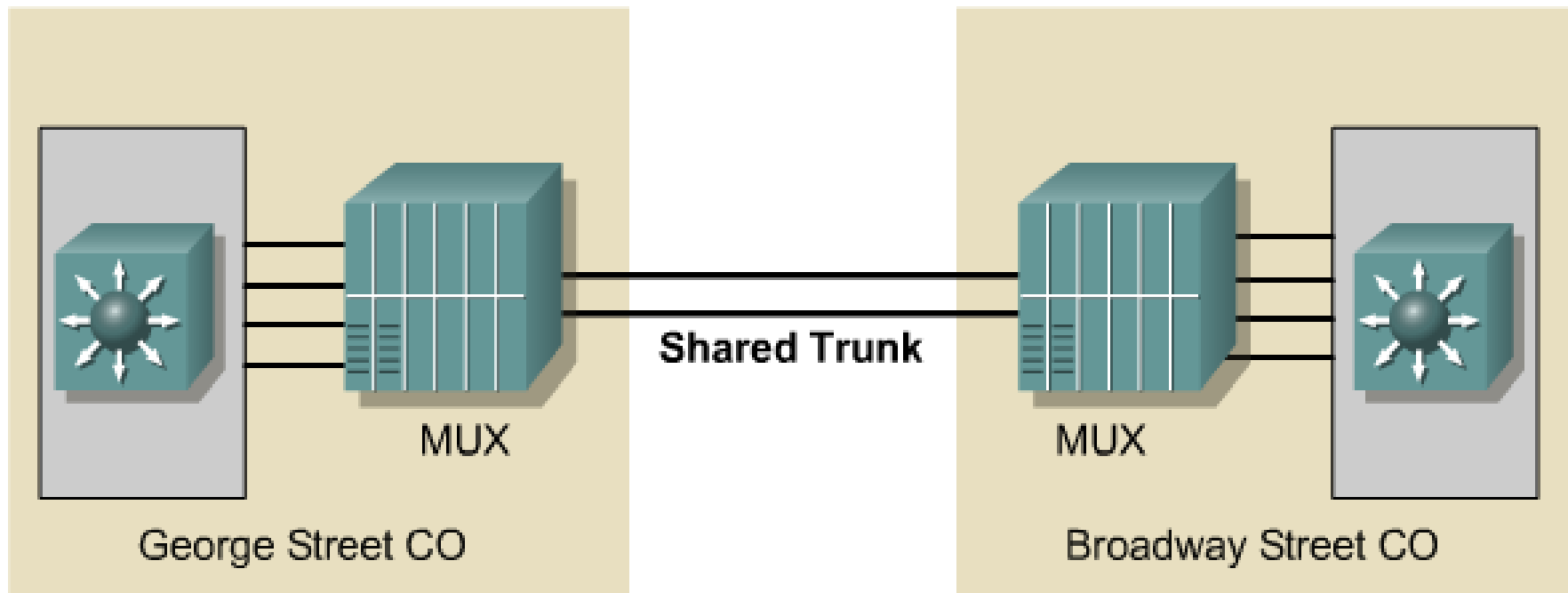
# VLAN Trunking Protocol

Slide Set 8

# Objectives

- **Trunking**
- **VTP**
- **Inter-VLAN routing**

# History of Trunking



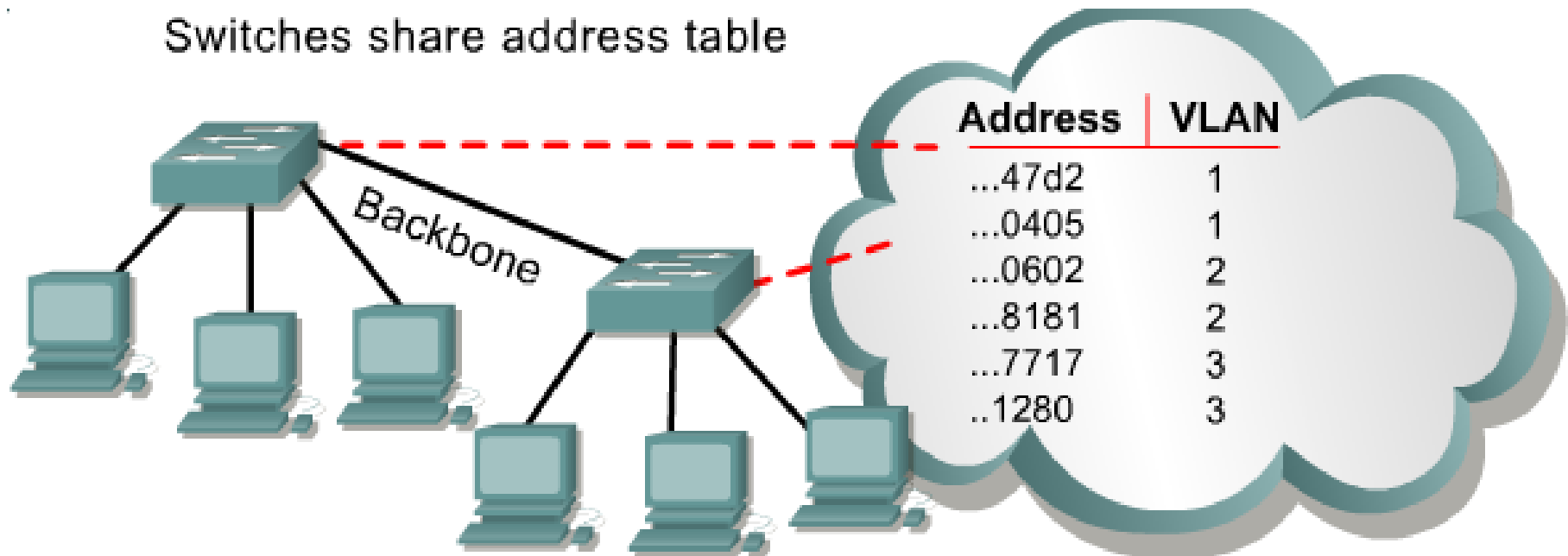
The telephone industry used multiplexers to carry multiple voice signals on a single trunk between COs.

# Trunking Concepts



# Frame Filtering

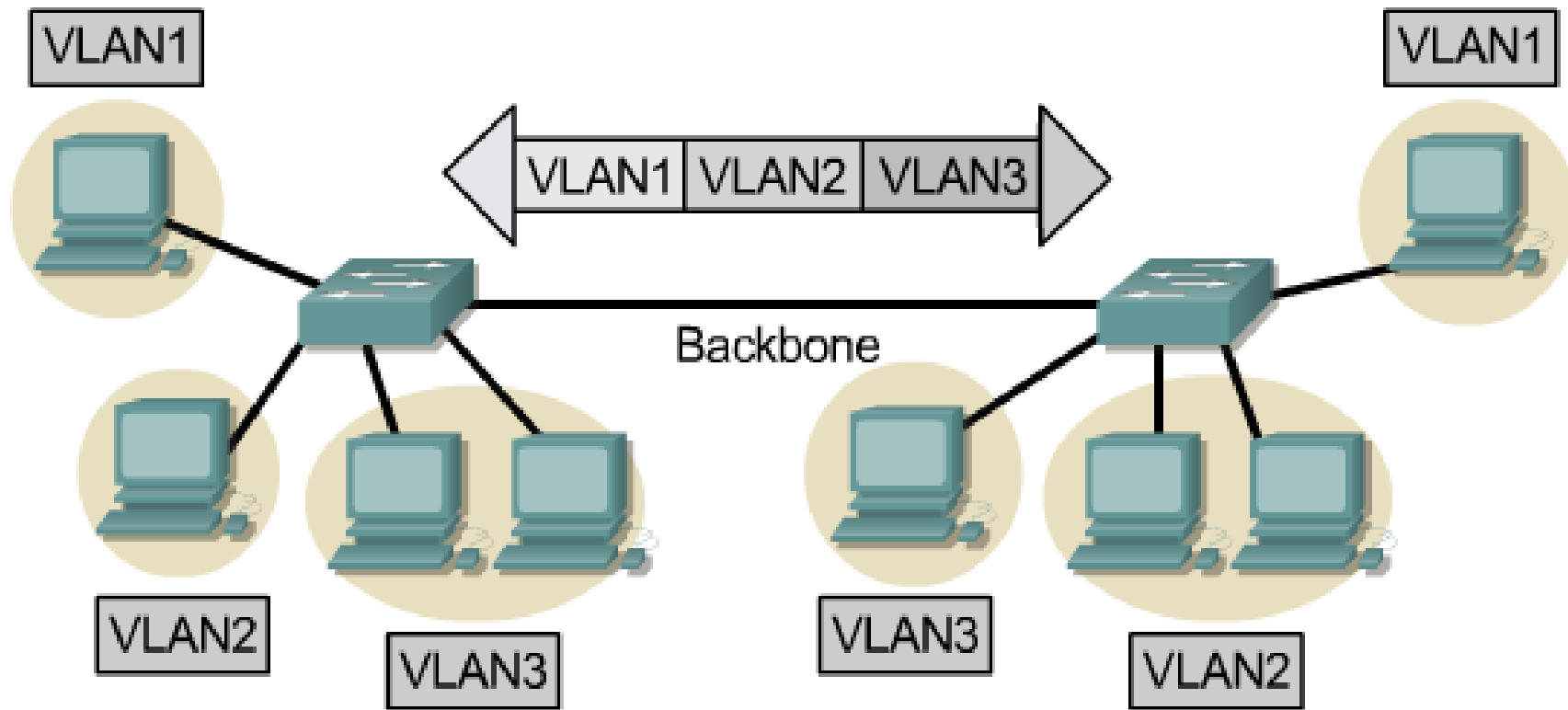
Switches share address table



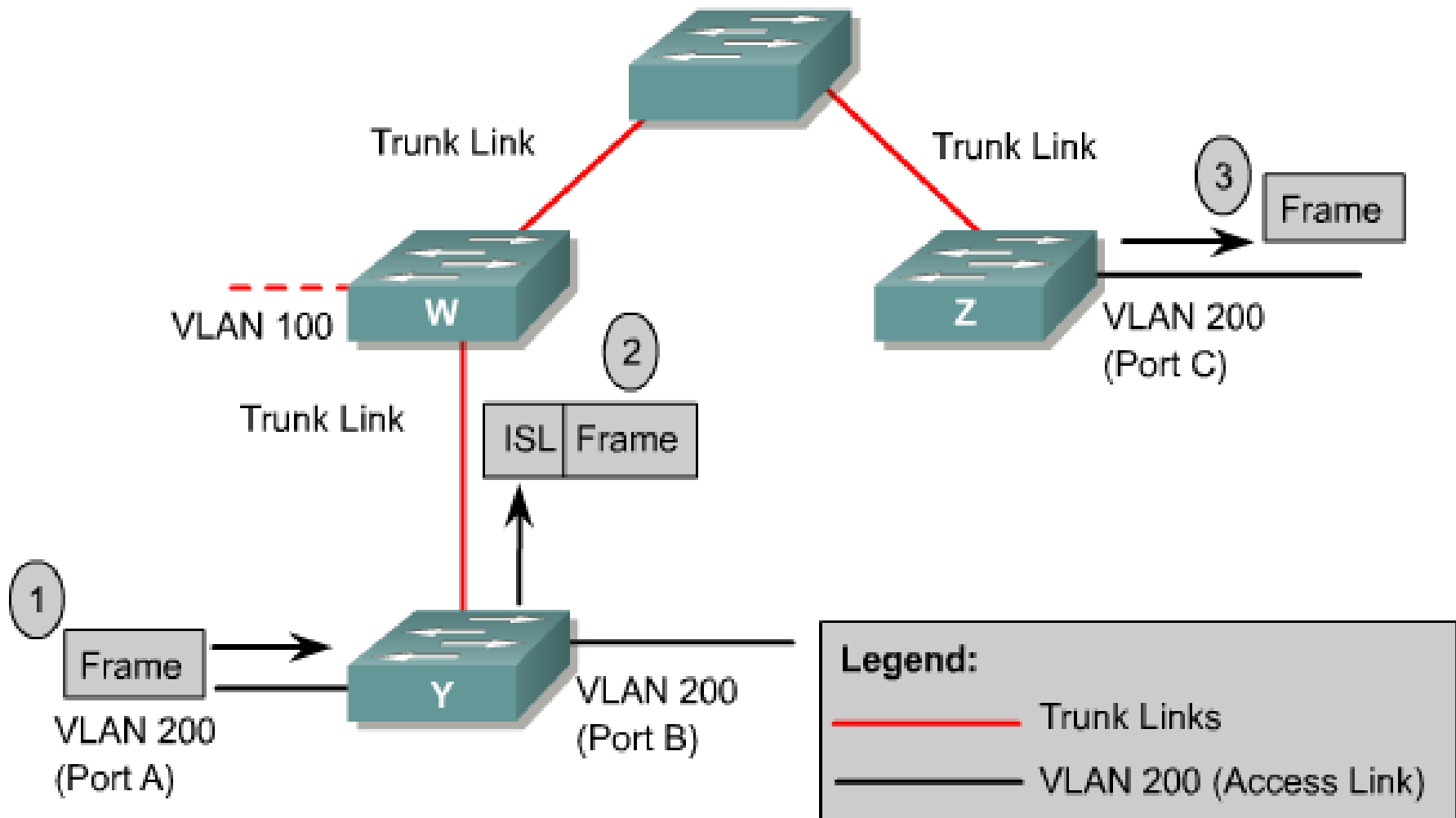
Similar to scheme used by routers

A filtering table is developed for each switch. Switches share address table information. Table entries are compared with the frames. Switch takes appropriate action

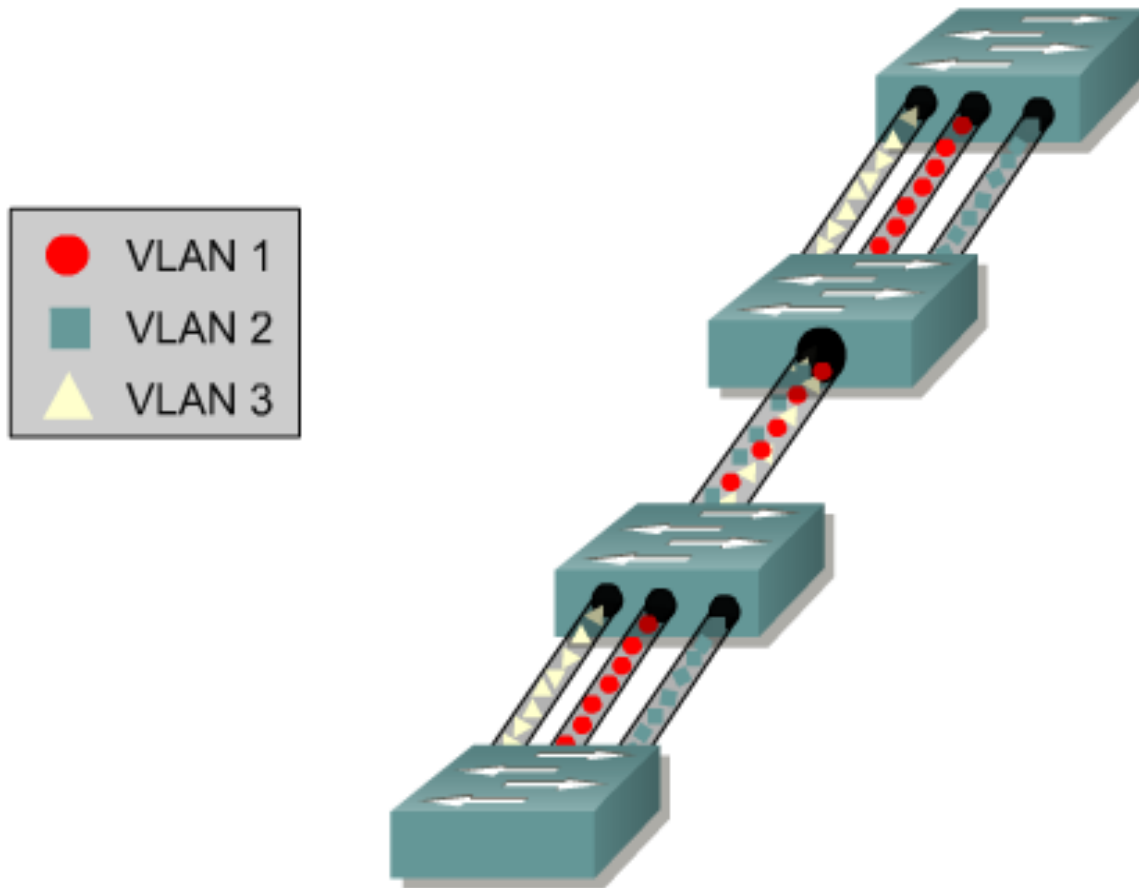
# Frame Tagging



# Inter-Switch Link Protocol



# VLANs and Trunking



Trunking provides effective communication between switches in a network.

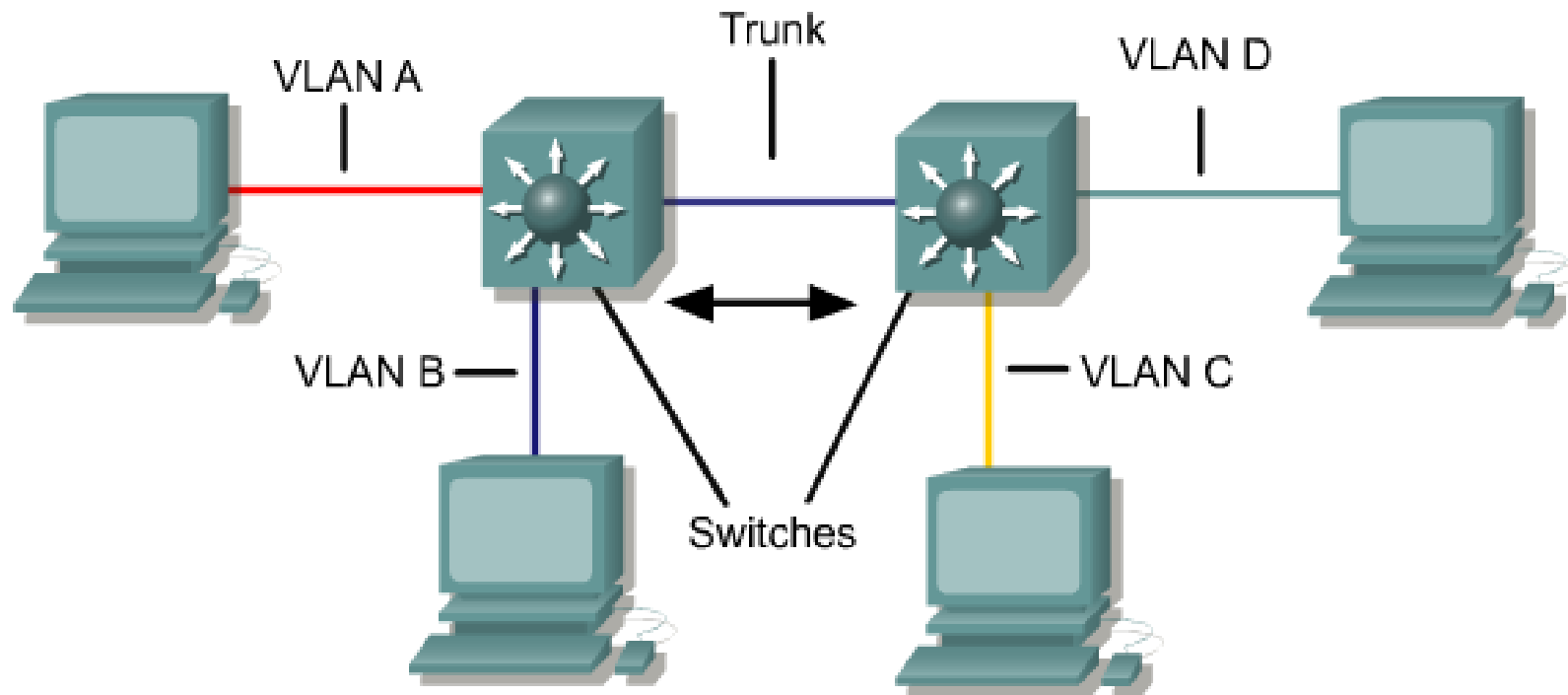
# Frame Tagging and Encapsulation Methods

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

# VTP Benefits

- VLAN configuration consistency across the network
- VLANs are trunked over mixed media. For example, an Ethernet VLAN is mapped to high-speed ATM LANE or FDDI VLAN
- Accurate tracking and monitoring of VLANs
- Dynamic reporting of added VLANs across the network
- "Plug-and-play" configuration when adding new VLANs

# VTP Concepts



**The role of VTP is to maintain VLAN configuration consistency across a common network administration domain.**

# VTP Modes

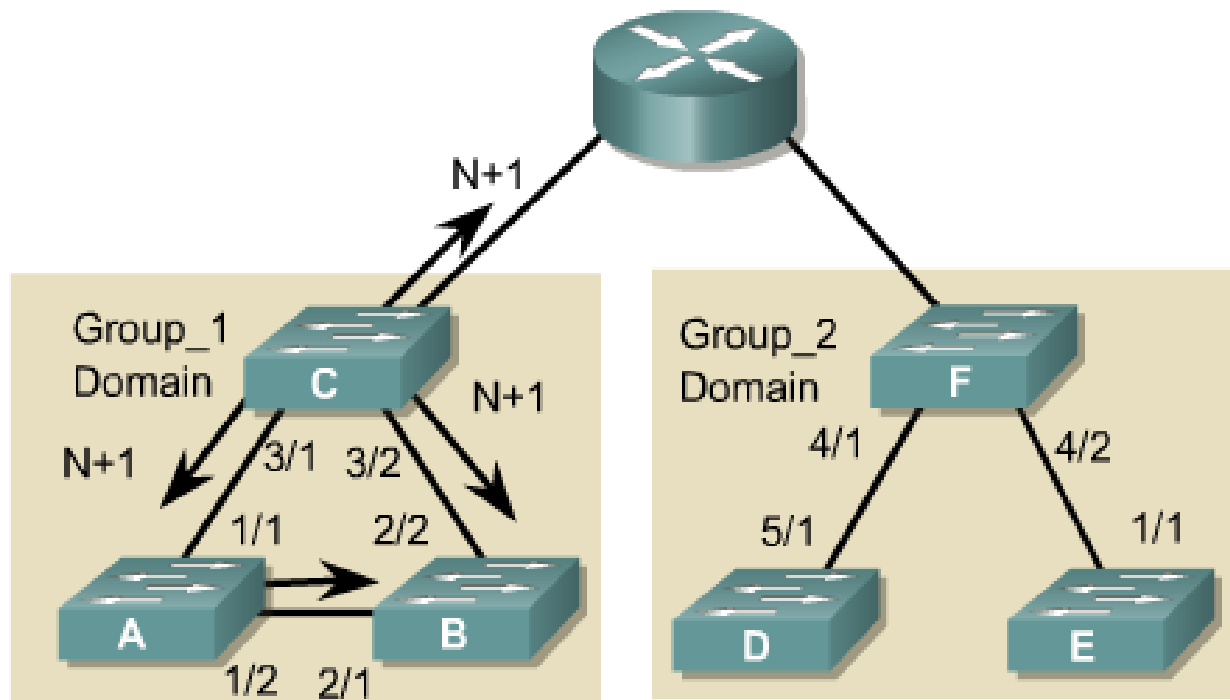
- **Server**
- **Client**
- **Transparent**

# VTP Mode Comparison

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

# VTP Operation



Group\_1 Config Rev# N+1

1	default
2	first-vtp-vlan
1002	fddi-default
1003	token-ring-default
1004	fddinet-default
1003	trnet-default

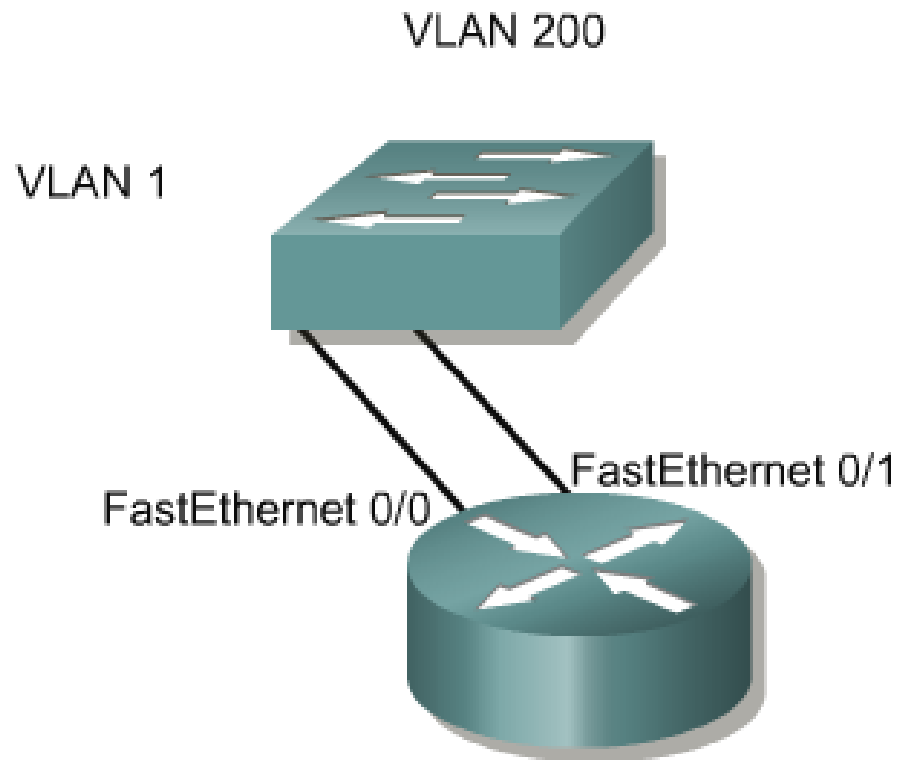
# VTP Implementation

- **There are two types of VTP advertisements:**
  - Requests from clients that want information at bootup**
  - Responses from servers**
- **There are three types of VTP messages:**
  - Advertisement requests**
  - Summary advertisements**
  - Subset advertisements**

# VTP Basic Configuration Steps

- 1. Determine the version number**
- 2. Choose the domain**
- 3. Choose the VTP mode**
- 4. Password protect the domain**

# Inter-VLAN Routing



To route traffic between VLAN 1 and VLAN 200 in a non-VLAN-trunk environment, a router must be connected to a port in VLAN1 and a port in VLAN 200.

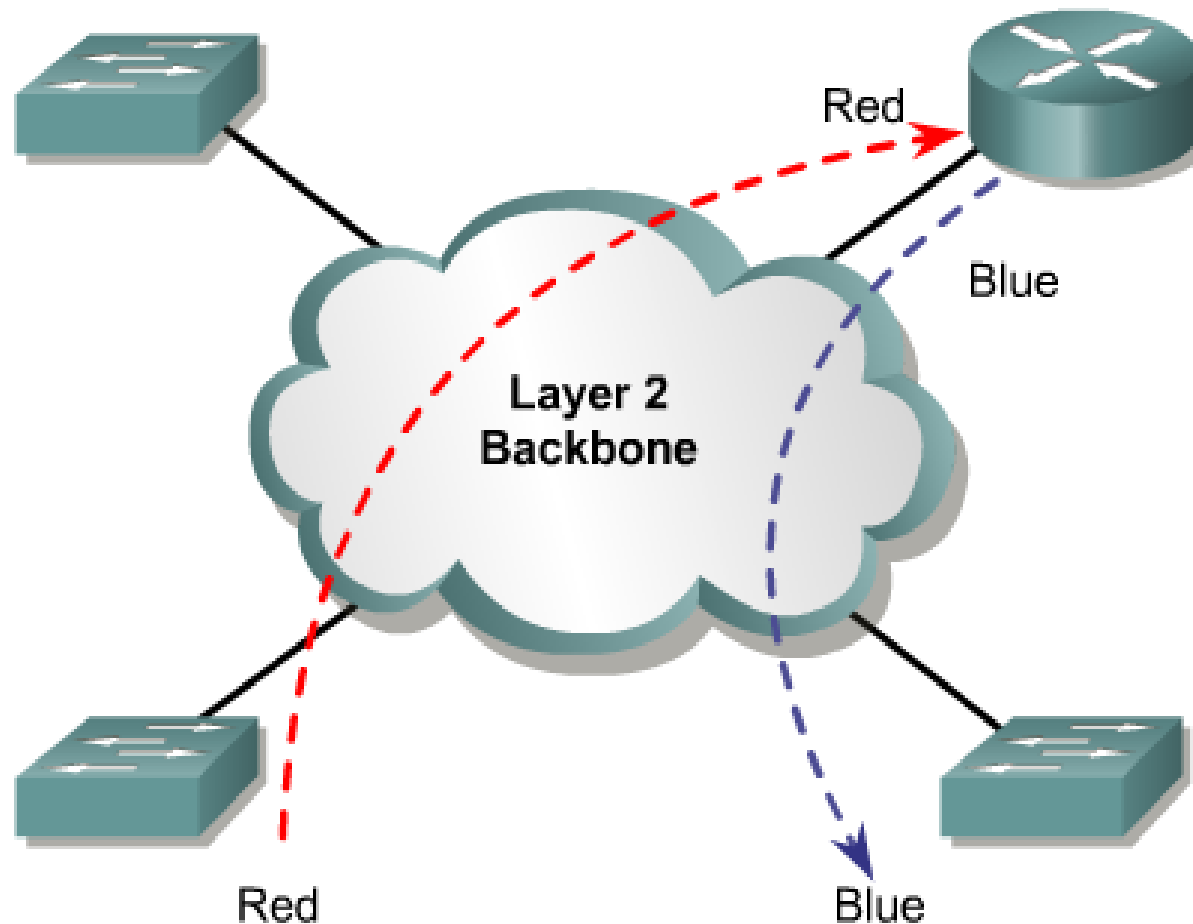
# Inter-VLAN Issues and Solutions

**Two of the most common issues that arise in a multiple-VLAN environment are as follows:**

**The need for end-user devices to reach non-local hosts**

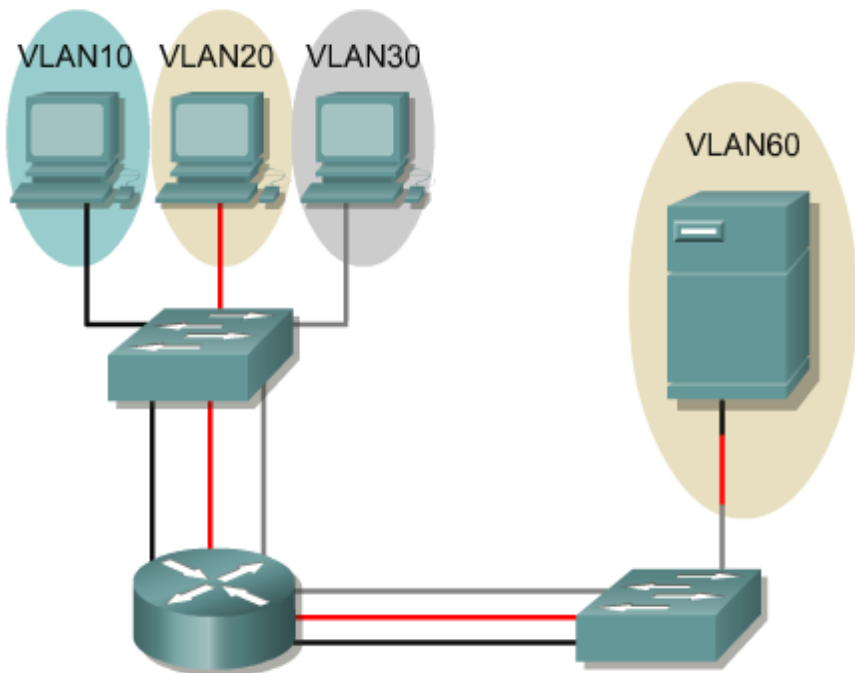
**The need for hosts on different VLANs to communicate**

# Router on a Stick

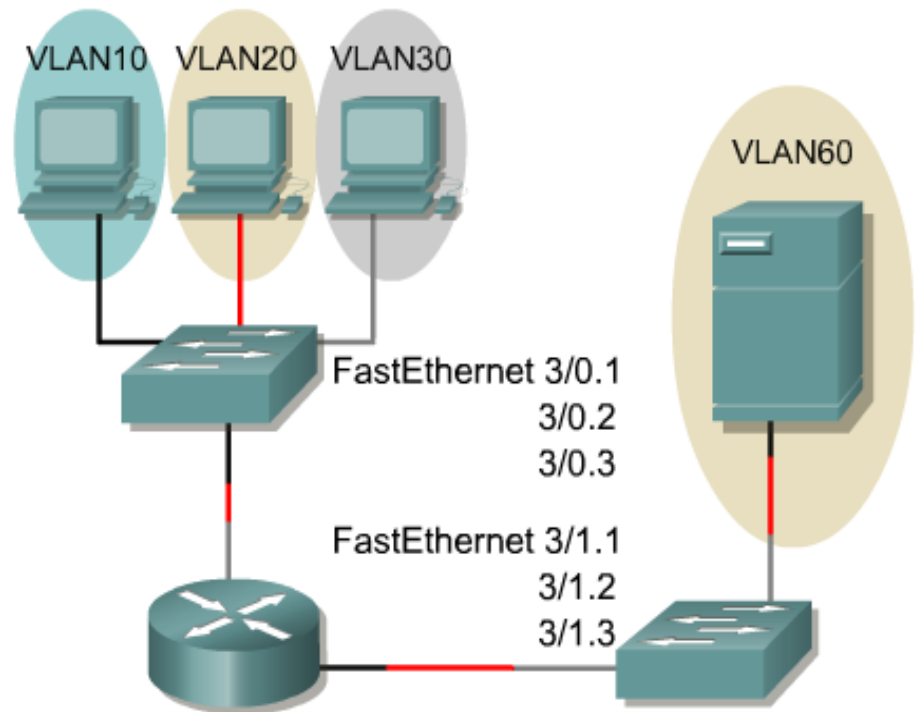


In order for traffic to move from one VLAN to another, it must go through the router.

# Physical and Logical Interfaces

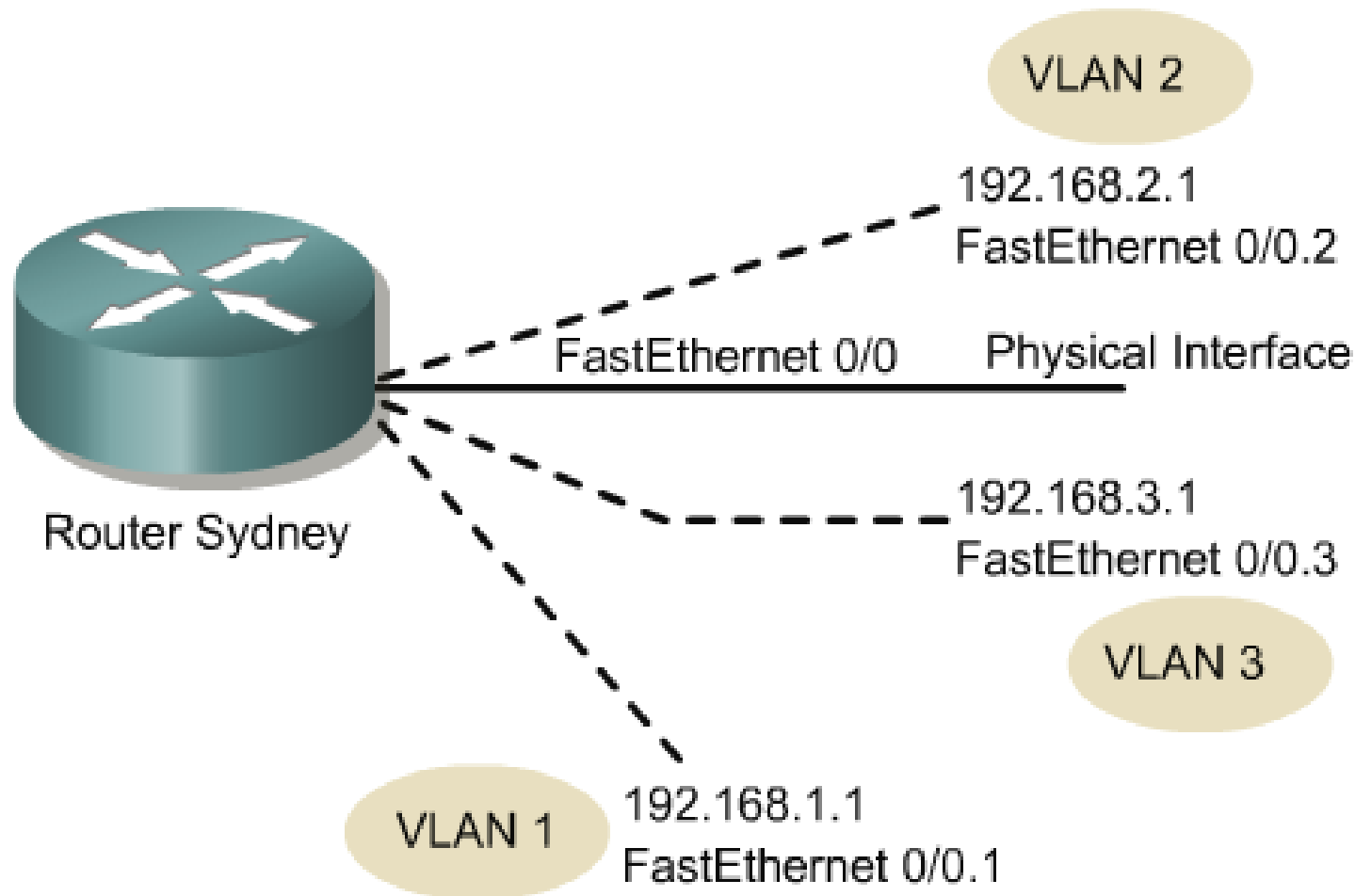


The router supports one VLAN per interface.



A single ISL link can support multiple VLANs.

# Dividing Physical Interfaces into Subinterfaces



Each VLAN is its own IP network or subnet.

# Configuring Inter-VLAN Routing

```
Sydney(config)#interface FastEthernet 0/0.1
Sydney(config-subif)#description Management VLAN1
Sydney(config-subif)#encapsulation 802.1q 1
Sydney(config-subif)#ip address 192.168.1.1
255.255.255.0
oSydney(config)#interface FastEthernet 0/0.2
Sydney(config-subif)#description Accounting VLAN 20
Sydney(config-subif)#encapsulation 802.1q 20
Sydney(config-subif)#ip address 192.168.2.1
255.255.255.0
Sydney(config)#interface FastEthernet 0/0.3
Sydney(config-subif)#description Sales VLAN 30
Sydney(config-subif)#encapsulation 802.1q 30
Sydney(config-subif)#ip address 192.168.3.1
255.255.255.0
```