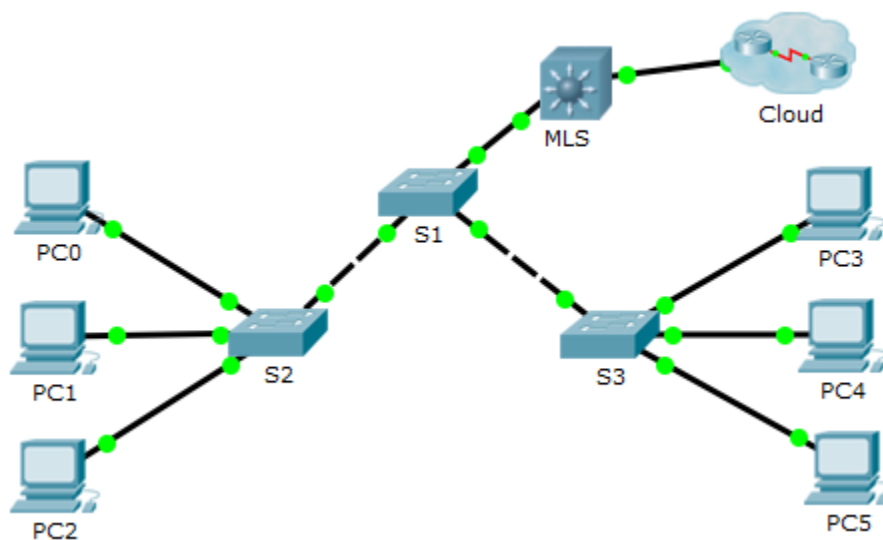# Packet Tracer – Configure Layer 3 Switching and Inter-VLAN Routing

Topology

Addressing Table

Device	Interface	IP Address	Subnet Mask
MLS	VLAN 10	192.168.10.254	255.255.255.0
	VLAN 20	192.168.20.254	255.255.255.0
	VLAN 30	192.168.30.254	255.255.255.0
	VLAN 99	192.168.99.254	255.255.255.0
	G0/2	209.165.200.225	255.255.255.252
PC0	NIC	192.168.10.1	255.255.255.0
PC1	NIC	192.168.20.1	255.255.255.0
PC2	NIC	192.168.30.1	255.255.255.0
PC3	NIC	192.168.30.2	255.255.255.0
PC4	NIC	192.168.20.2	255.255.255.0
PC5	NIC	192.168.10.2	255.255.255.0
S1	VLAN 99	192.168.99.1	255.255.255.0
S2	VLAN 99	192.168.99.2	255.255.255.0
S3	VLAN 99	192.168.99.3	255.255.255.0

Objectives

Part 1: Configure Layer 3 Switching

Part 2: Configure Inter-VLAN Routing

Background / Scenario

A multilayer switch like the Cisco Catalyst 3560 is capable of both Layer 2 switching and Layer 3 routing. One of the advantages of using a multilayer switch is this dual functionality. A benefit for a small- to medium-sized company would be the ability to purchase a single multilayer switch instead of separate switching and routing network devices. Capabilities of a multilayer switch include the ability to route from one VLAN to another using multiple switched virtual interfaces (SVIs), as well as the ability to convert a Layer 2 switchport to a Layer 3 interface.

Note: The switches used in this lab are a Cisco Catalyst 3560 with Cisco IOS Release 12.2(37) (advipservicesk9) and Cisco Catalyst 2960s with Cisco IOS Release 15.0(2) (lanbasek9 image). Other switches and Cisco IOS versions can be used. Depending on the model and Cisco IOS version, the commands available and output produced might vary from what is shown in the labs.

Note: Make sure that the switches have been erased and have no startup configurations. If you are unsure, contact your instructor.

Part 1: Configure Layer 3 Switching

In Part 1, you will configure the GigabitEthernet 0/2 port on switch MLS as a routed port and verify that you can ping another Layer 3 address.

a.   On MLS, configure G0/2 as a routed port and assign an IP address according to the Addressing Table.

```
MLS(config)# interface g0/2
MLS(config-if)# no switchport
MLS(config-if)# ip address 209.165.200.225 255.255.255.252
```

b. Verify connectivity to **Cloud** by pinging 209.165.200.226.

```
MLS# ping 209.165.200.226

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 209.165.200.226, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 0/0/0 ms
```

Part 2: Configure Inter-VLAN Routing

Step 1: Add VLANs.

Add VLANs to MLS according to the table below.

VLAN Number	VLAN Name
10	Staff
20	Student
30	Faculty

Step 2: Configure SVI on MLS.

Configure and activate the SVI interface for VLANs 10, 20, 30, and 99 according to the Addressing Table. The configuration for VLAN 10 is shown below.

```
MLS(config)# interface vlan 10
MLS(config-if)# ip address 192.168.10.254 255.255.255.0
```

Step 3: Enable routing.

a. Use the **show ip route** command. Are there any active routes?

b. Enter the **ip routing** command to enable routing in global configuration mode.

```
MLS(config)# ip routing
```

c. Use the **show ip route** command to verify routing is enabled.

```
MLS# show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set
```

```
C    192.168.10.0/24 is directly connected, Vlan10
C    192.168.20.0/24 is directly connected, Vlan20
C    192.168.30.0/24 is directly connected, Vlan30
C    192.168.99.0/24 is directly connected, Vlan99
     209.165.200.0/30 is subnetted, 1 subnets
C       209.165.200.224 is directly connected, GigabitEthernet0/2
```

Step 4: Verify end-to-end connectivity.

a. From PC0, ping PC3 or MLS to verify connectivity within VLAN 10.

b. From PC1, ping PC4 or MLS to verify connectivity within VLAN 20.

c. From PC2, ping PC5 or MLS to verify connectivity within VLAN 30.

d. From S1, ping S2, S3, or MLS to verify connectivity with VLAN 99.

e. To verify inter-VLAN routing, ping devices outside the sender's VLAN.

f. From any device, ping this address inside **Cloud**, 209.165.200.226