**4.2.7. Packet Tracer - Configure Router-on-a-Stick Inter-VLAN Routing**

**Part 1: Add VLANs to a Switch**

***Step 1: Create VLANs on S1.***

S1>enable

S1#configure terminal

S1(config)#vlan 10

S1(config-vlan)#vlan 30

S1#show vlan brief

***Step 2: Assign VLANs to ports***

S1#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

S1(config)#interface fastEthernet 0/11

S1(config-if)#switchport mode access

S1(config-if)#switchport access vlan 10

S1(config-if)#exit

S1(config)#interface fa 0/6

S1(config-if)#switchport mode access

S1(config-if)#switchport access vlan 30

S1(config-if)#exit

S1#show vlan brief

***Step 3: Test connectivity between PC1 and PC3.***

***PC1*** ping 172.17.30.10

**Part 2: Configure Subinterfaces**

***Step 1: Configure subinterfaces on R1 using the 802.1Q encapsulation.***

R1>enable

R1#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

R1(config)#int g0/0.30

R1(config-subif)#encapsulation dot1Q 30

R1(config-subif)#ip address 172.17.30.1 255.255.255.0

R1(config-subif)#exit

R1(config)#interface g0/0.10

R1(config-subif)#encapsulation dot1Q 10

R1(config-subif)#ip address 172.17.10.1 255.255.255.0

R1(config-subif)#exit

***Step 2: Verify Configuration***

R1#show ip interface brief

R1#configure terminal

R1(config)#interface g0/0

R1(config-if)#no shutdown

**Part 3: Test Connectivity with Inter-VLAN Routing**

***Step 1: Ping between PC1 and PC3.***

ping 172.17.30.10

***Step 2: Enable trunking.***

S1>enable

S1#show vlan

S1#configure terminal

S1(config)#interface g0/1

S1(config-if)#switchport mode trunk

S1(config-if)#exit

S1(config)#exit

S1#show interface trunk

**4.3.8 Packet Tracer - Configure Layer 3 Switching and Inter-VLAN Routing**

**Part 1: Configure Layer 3 Switching**

MLS>enable

MLS#configure terminal

MLS(config)#interface g 0/2

MLS(config-if)#no switchport

MLS(config-if)#ip address 209.165.200.225 255.255.255.252

MLS(config-if)#exit

MLS(config)#exit

MLS#ping 209.165.200.225

**Part 2: Configure Inter-VLAN Routing**

***Step 1: Add VLANs.***

MLS#configure terminal

MLS(config)#vlan 10

MLS(config-vlan)#name Staff

MLS(config-vlan)#vlan 20

MLS(config-vlan)#name Student

MLS(config-vlan)#vlan 30

MLS(config-vlan)#name Faculty

***Step 2: Configure SVI on MLS.***

MLS(config)#interface vlan 10

MLS(config-if)#ex

MLS(config-if)#exit

MLS(config)#interface vlan 20

MLS(config-if)#ip address 192.168.20.254 255.255.255.0

MLS(config-if)#exit

MLS(config)#interface vlan 30

MLS(config-if)#ip address 192.168.30.254 255.255.255.0

MLS(config-if)#exit

MLS(config)#interface vlan 99

MLS(config-if)#ip address 192.168.99.254 255.255.255.0

MLS(config-if)#exit

***Step 3: Configure Trunking on MLS.***

MLS(config)#interface g0/1

MLS(config-if)#switchport mode trunk

MLS(config-if)#switchport trunk native vlan 99

MLS(config-if)#switchport trunk encapsulation dot1q

***Step 4: Configure trunking on S1.***

S1>enable

S1#configure terminal

S1(config)#interface g0/1

S1(config-if)#switchport mode trunk

S1(config-if)#switchport trunk native vlan 99

***Step 5: Enable routing.***

MLS#show ip route

MLS#configure terminal

MLS(config)#ip routing

MLS(config)#exit

MLS#show ip route

***Step 6: Verify end-to-end connectivity.***

*PC0* ping 192.168.10.2

PC1 ping 192.168.20.2

PC2 ping 192.168.30.2

S2>enable

S2#show ip interface brief

*PC0* ping 192.168.20.2

*PC0* ping 192.168.30.2

*PC0* ping 209.165.200.226

**Part 3: Configure IPv6 Inter-VLAN Routing**

***Step 1: Enable IPv6 routing***

MLS#configure terminal

MLS(config)#ipv6 unicast-routing

***Step 2: Configure SVI for IPv6 on MLS.***

MLS(config)#interface vlan 10

MLS(config-if)#ipv6 address 2001:db8:acad:10::1/64

MLS(config)#interface vlan 20

MLS(config-if)#ipv6 address 2001:db8:acad:20::1/64

MLS(config-if)#exit

MLS(config)#interface vlan 30

MLS(config-if)#ipv6 address 2001:db8:acad:30::1/64

MLS(config-if)#exit

***Step 3: Configure G0/2 with IPv6 on MLS.***

MLS#configure terminal

MLS(config)#interface G0/2

MLS(config-if)#ipv6 address 2001:db8:acad:a::1/64

**4.4.8 Packet Tracer - Troubleshoot Inter-VLAN Routing**

*PC1* \>ipconfig

S1>enable

S1#show vlan brief

R1>enable

R1#show ip interface

R1#show interface g0/1.10

R1#show interface g0/1.20

S1#show interface trunk

S1#configure terminal

S1(config)#interface g0/1

S1(config-if)#switch mode trunk

R1#configure terminal

R1(config)#interface g0/1.10

R1(config-subif)#no shutdown

R1#show ip interface brief

R1(config-subif)#encapsulation dot1q 666

R1(config-subif)#int g0/1.30

R1(config-subif)#encapsulation dot1q 30

R1(config-subif)#int g0/1.10

R1(config-subif)#encapsulation dot1q 10

R1(config-subif)#end

**4.4.9 Packet Tracer - Troubleshoot Inter-VLAN Routing – Physical Mode**

R1>enable

R1#configure terminal

R1(config)#int g0/0/1.8

R1(config-subif)#encapsulation dot1q 8 native

R1(config-subif)#exit

S1#configure terminal

S1(config)#int f0/5

S1(config-if)#no switchport access vlan 3

S1(config-if)#switchport mode trunk

S1(config-if)#switchport trunk native vlan 8

S1(config-if)#switchport trunk allowed vlan 3,4,8,13

S1(config-if)#exit

S1(config)#int f0/1

S1(config-if)#switchport trunk native vlan 8

S1(config-if)#switchport trunk allowed vlan 3,4,8,13

S1(config-if)#exit

S1#show vlan brief

S1#configure terminal

S1(config)#vlan 13

S1(config-vlan)#name Maintenance

S1(config-vlan)#exit

S2>enable

S2#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

S2(config)#int f0/1

S2(config-if)#switchport trunk allowed vlan 3,4,8,13

S2(config-if)#exit

R1#configure terminal

R1(config)#interface g0/1.10

R1(config-subif)#no encapsulation dot1q

R1(config-subif)#exit

R1(config)#interface g0/1.30

R1(config-subif)#no encapsulation dot1q

R1(config-subif)#exit

R1(config)#interface g0/1.30

R1(config-subif)#no encapsulation dot1q 30

R1(config-subif)#ip address 172.17.30.1 255.255.255.0

R1(config)#interface g0/1.10

R1(config-subif)#encapsulation dot1q 10

R1(config-subif)#ip address 172.17.10.1 255.255.255.0

R1(config-subif)#end

**4.5.1 Packet Tracer - Inter-VLAN Routing Challenge**

R1>enable

R1#show ip interface brief

R1(config)#interface g0/1.10

R1(config-subif)#encapsulation dot1q 10

R1(config-subif)#ip address 172.17.10.1 255.255.255.0

R1(config-subif)#exit

R1(config)#interface g0/1.20

R1(config-subif)#encapsulation dot1q 20

R1(config-subif)#ip address 172.17.20.1 255.255.255.0

R1(config-subif)#exit

R1(config)#interface g0/1.30

R1(config-subif)#encapsulation dot1q 30

R1(config-subif)#ip address 172.17.30.1 255.255.255.0

R1(config-subif)#interface g0/1.88

R1(config-subif)#encapsulation dot1q 88

R1(config-subif)#ip address 172.17.88.1 255.255.255.0

R1(config-subif)#interface g0/1.99

R1(config-subif)#encapsulation dot1q 99

R1(config-subif)#ip address 172.17.99.1 255.255.255.0

R1(config-subif)#exit

R1(config)#interface g0/1

R1(config-if)#no shutdown

S1>enable

S1#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

S1(config)#interface vlan 99

S1(config-if)#ip address 172.17.99.10 255.255.255.0

S1(config-if)#exit

S1(config)#ip default-gateway 172.17.99.1

S1(config)#interface vlan 99

S1(config-if)#no shutdown

S1(config)#vlan 10

S1(config-vlan)#name Faculty/Staff

S1(config-vlan)#vlan 20

S1(config-vlan)#name Students

S1(config-vlan)#vlan 30

S1(config-vlan)#name Guest(Default)

S1(config-vlan)#vlan 88

S1(config-vlan)#name Native

S1(config-vlan)#vlan 99

S1(config-vlan)#Name Management

S1(config)#interface range fa0/11-17

S1(config-if-range)#switch mode access

S1(config-if-range)#switchport mode access

S1(config-if-range)#switchport access vlan 10

S1(config-if-range)#exit

S1(config)#interface range fa0/18-24

S1(config-if-range)#switchport mode access

S1(config-if-range)#switchport access vlan 20

S1(config-if-range)#exit

S1(config)#interface range fa0/6-10

S1(config-if-range)#switchport mode access

S1(config-if-range)#switchport access vlan 30

S1(config-if-range)#exit

S1(config)#interface g0/1

S1(config-if)#switchport mode trunk

S1(config-if)#switchport trunk native vlan 88

S1(config)#interface range fa0/1-5, fa0/7-10, fa0/12-17, fa0/19-24, g0/2

S1(config-if-range)#shutdown

R1>enable

R1#configure terminal

Enter configuration commands, one per line. End with CNTL/Z.

R1(config)#interface g0/1.88

R1(config-subif)#encapsulation dot1q 88 native