Task-8

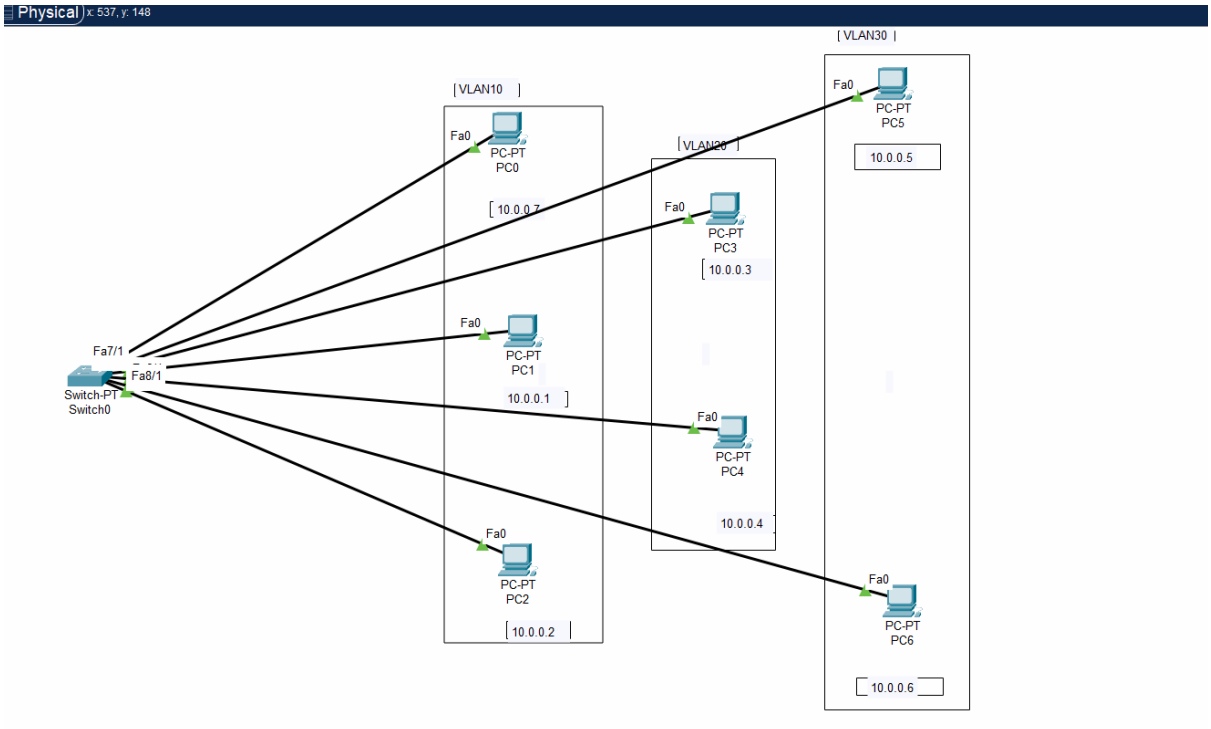
8a. Configure network topology to implement VLANs with using Packet Tracer software.

INTRA VLAN

- **Intra-VLAN** communication happens *within* the same VLAN, allowing devices assigned to that VLAN to communicate freely with each other.
- Devices in one VLAN cannot communicate with devices in another VLAN without additional configurations, such as **inter-VLAN routing**.

For example, in a network with VLAN 10 and VLAN 20:

- Devices in VLAN 10 can only communicate with other devices in VLAN 10.
- Devices in VLAN 20 can only communicate with other devices in VLAN 20.
- No communication happens between VLAN 10 and VLAN 20 without inter-VLAN routing.



1. Set Up the Devices

- **Drag and Drop Devices**: Use at least one switch and multiple PCs (or other end devices).
- **Topology**: Connect the PCs to the switch using Ethernet cables.

2. Access the Switch CLI

- **Open CLI on Switch**: Click on the switch, go to the CLI tab to configure VLANs.

3. Create VLANs

- Enter global configuration mode on the switch by typing:

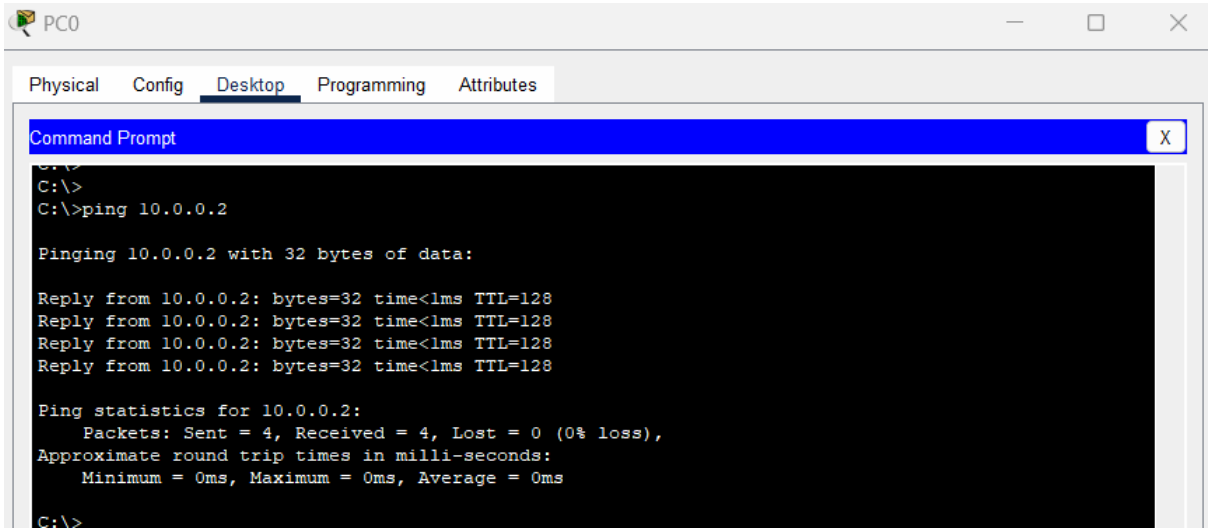
  `switchport mode access`: Configures the port as an access port.
  `switchport access vlan 10`: Assigns the port to VLAN 10. Only traffic for VLAN 10 will be allowed on this port.

```
Switch>en
Switch#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Switch(config)#vlan 10
Switch(config-vlan)#name project1
Switch(config-vlan)#int f0/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#int f2/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10
Switch(config-if)#int f1/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 10


Switch(config-if)#vlan 20
Switch(config-vlan)#int f3/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 20
Switch(config-if)#int f6/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 20


Switch(config-if)#vlan 30
Switch(config-vlan)#name project3
Switch(config-vlan)#int f7/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 30
Switch(config-if)#int f8/1
Switch(config-if)#switchport mode access
Switch(config-if)#switchport access vlan 30
Switch(config-if)#end
Switch#
```

4. Testing Intra-VLAN Communication

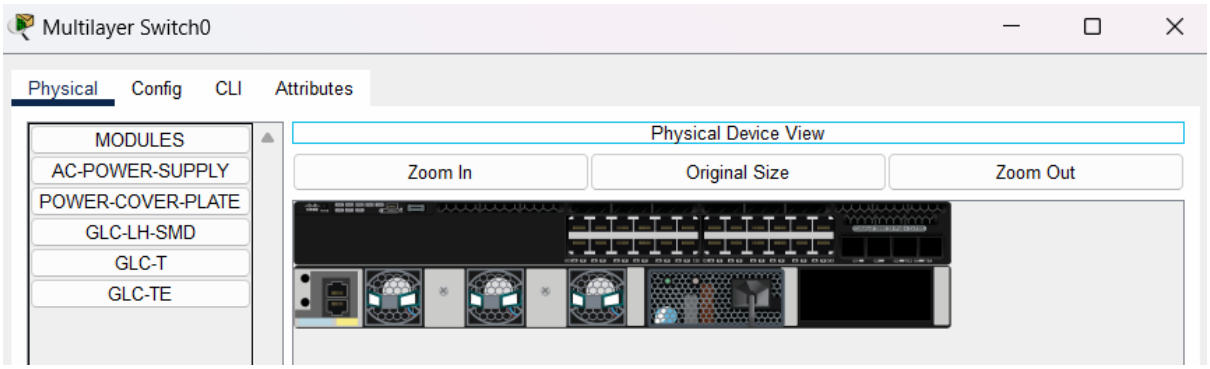
PCs within the same VLAN should be able to communicate with each other but **not with devices in other VLANs** .

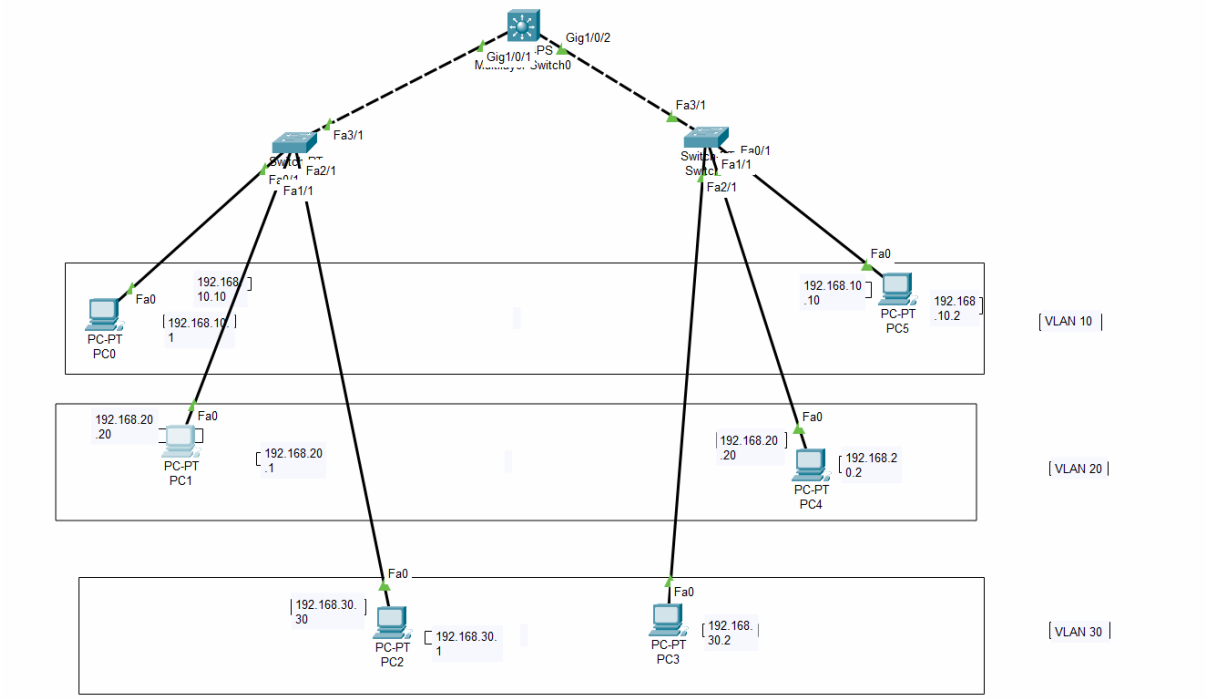
This verifies that VLANs are segmented and that only intra-VLAN communication is allowed.



INTER VLAN and Multilayer Switch Configuration.

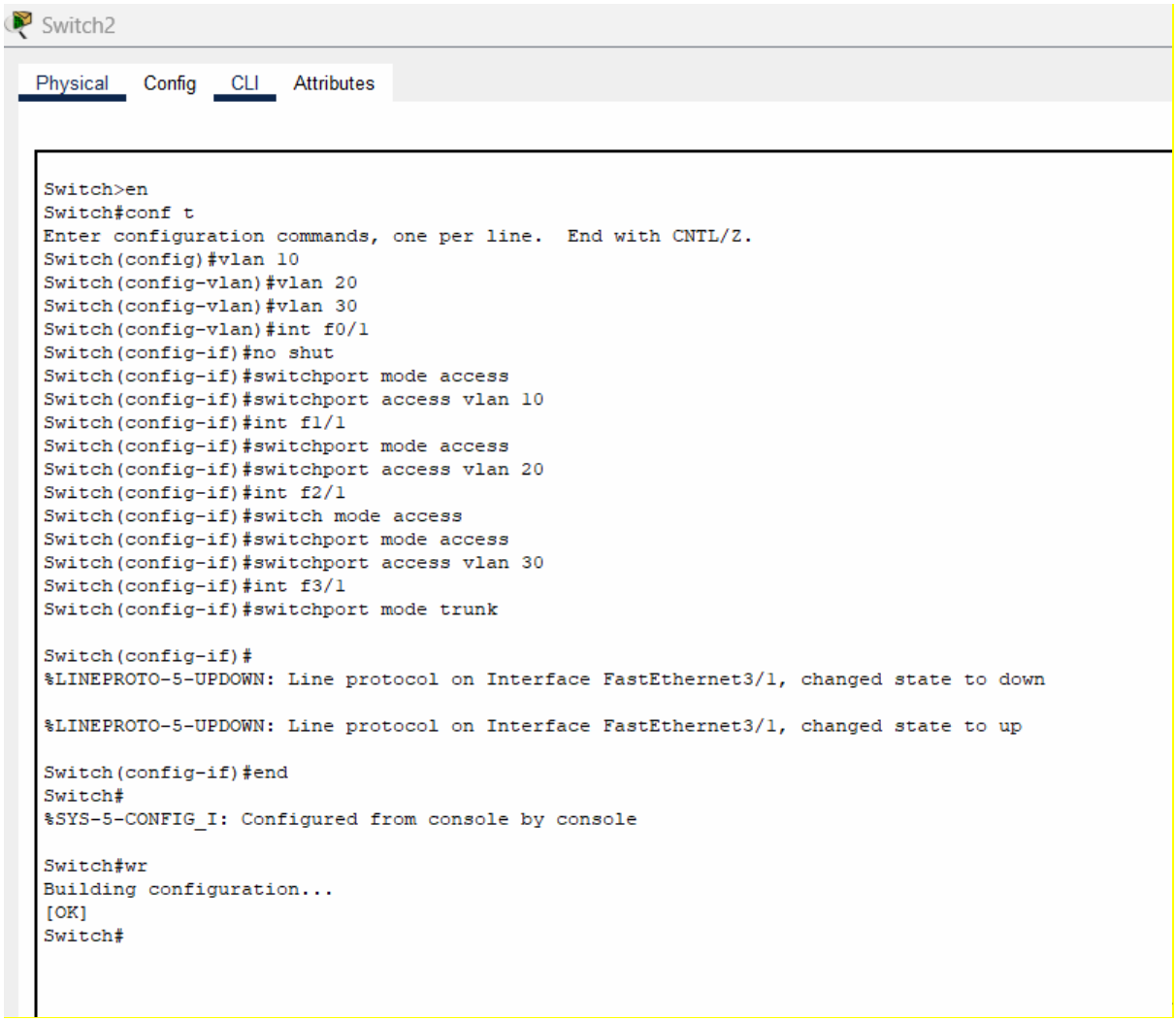
- Inter-VLAN routing on a multilayer switch enables communication between different VLANs (Virtual Local Area Networks) within the same switch, bypassing the need for an external router. A multilayer switch combines the functions of a Layer 2 switch (which operates on MAC addresses) and a Layer 3 router (which uses IP addresses), allowing it to perform routing functions for VLANs internally.
- To configure **Inter-VLAN Routing** using a **multilayer switch**, we'll enable routing between VLANs on the switch itself.
- "Turn On" Multilayer Switch:
  Drag and drop the multilayer switch (like the Cisco 3650-24PS) from the **Network Devices** > **Switches** section in Packet Tracer onto the workspace.
- Note: need to give power supply from physical(drag and drop **AC-POWER-SUPPLY** from physical to physical device view.



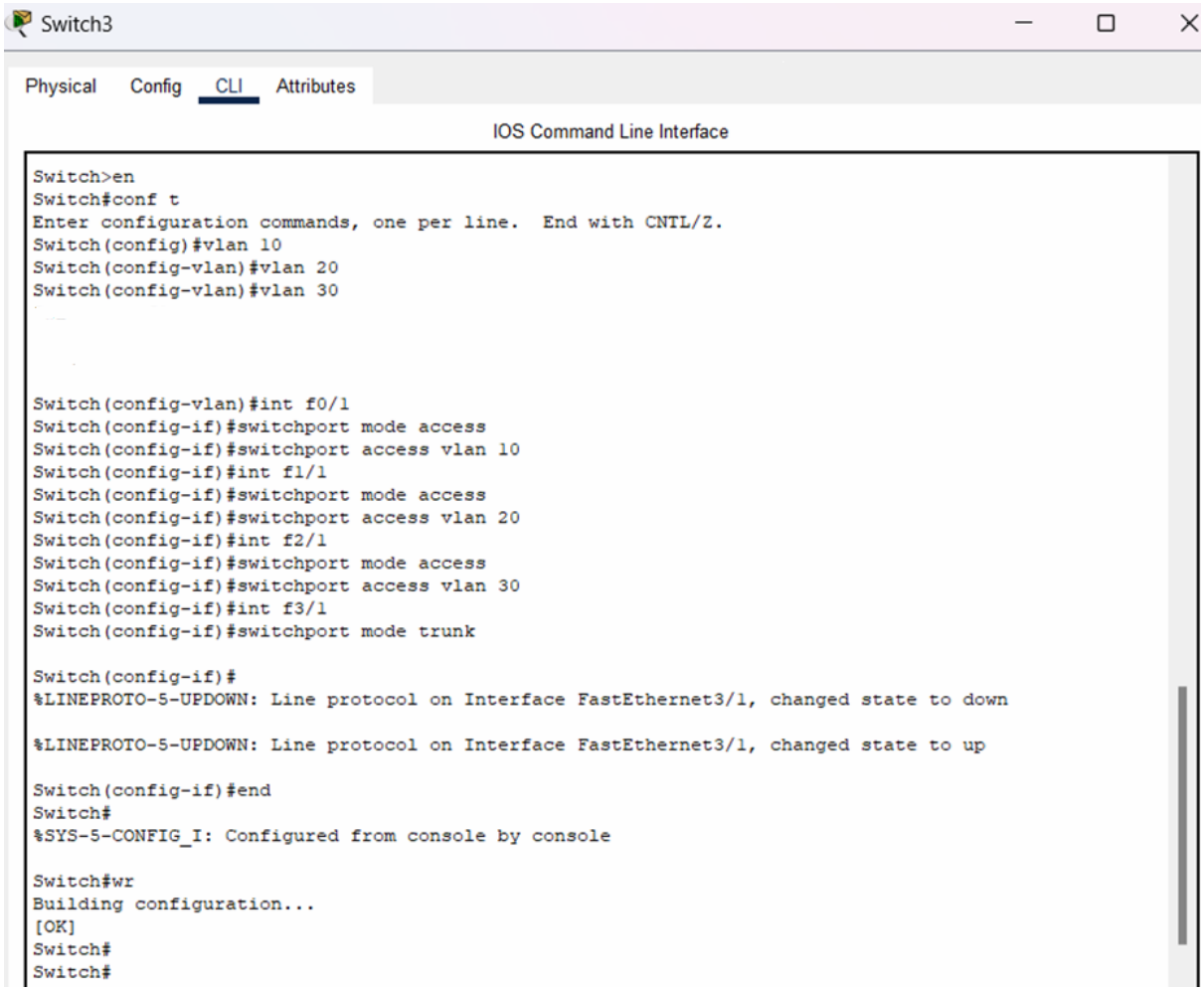


1. Configure VLANs
2. Assign Switch Ports to VLANs
3. Enable IP Routing on the Switch
5. Configure Trunk Ports

Switch2 configuration:



Switch3 configuration:

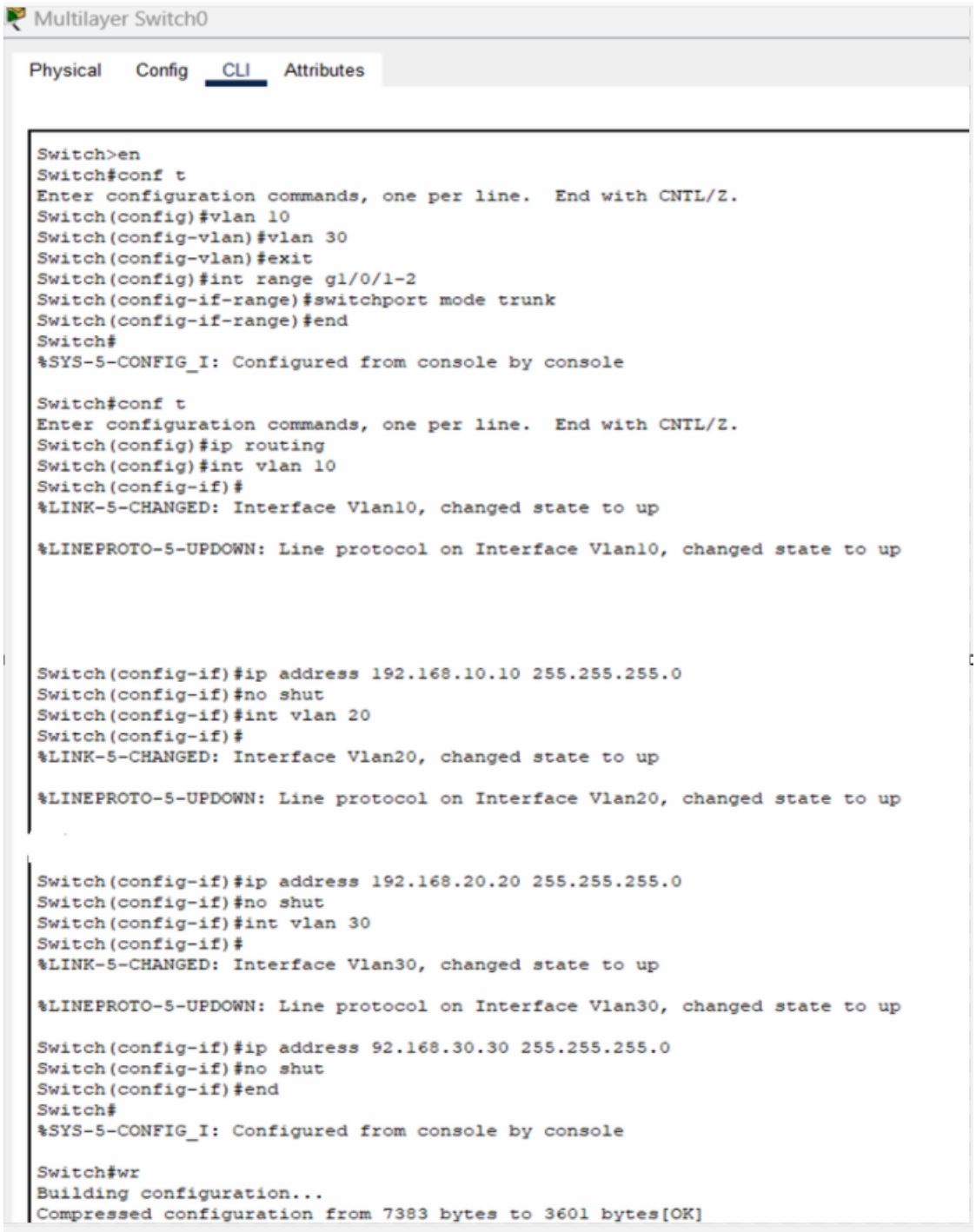


Switch> Switch>EN Switch# Switch#conf t Switch(config)# Switch(config)#vlan 10 Switch(config-vlan)#vlan 20 Switch(config-vlan)#vlan 30 Switch(config-vlan)#int f0/1 Switch(config-if)#no shut Switch(config-if)#switchport mode access Switch(config-if)#switchport access vlan 10 Switch(config-if)#int f0/2 Switch(config-if)#switchport mode access Switch(config-if)#switchport access vlan 20 Switch(config-if)#int f0/3	Switch> Switch>en Switch#conf t Switch(config)#hostname SW2 SW2(config)# SW2(config)#vlan 10 SW2(config-vlan)#vlan 20 SW2(config-vlan)#vlan 30 SW2(config-vlan)#int f0/4 SW2(config-if)#switchport mode access SW2(config-if)#switchport access vlan 30 SW2(config-if)#int f0/5 SW2(config-if)#switchport mode access SW2(config-if)#switchport access vlan 20 SW2(config-if)#int f0/6 SW2(config-if)#switchport mode access

Switch(config-if)#switchport mode access Switch(config-if)#switchport access vlan 30 Switch(config-if)#int g0/1 Switch(config-if)#switchport mode trunk Switch(config-if)#end Switch#wr Building configuration... [OK] **Switch#**	SW2(config-if)#switchport access vlan 10 SW2(config-if)#int g0/2 SW2(config-if)#sw SW2(config-if)#switchport mode trunk SW2(config-if)#end SW2#wr Building configuration... [OK] **SW2#**

Multilayer Switch0 configuration:

switchport mode trunk: Configures the port as a trunk, allowing it to carry multiple VLANs with 802.1Q tagging.

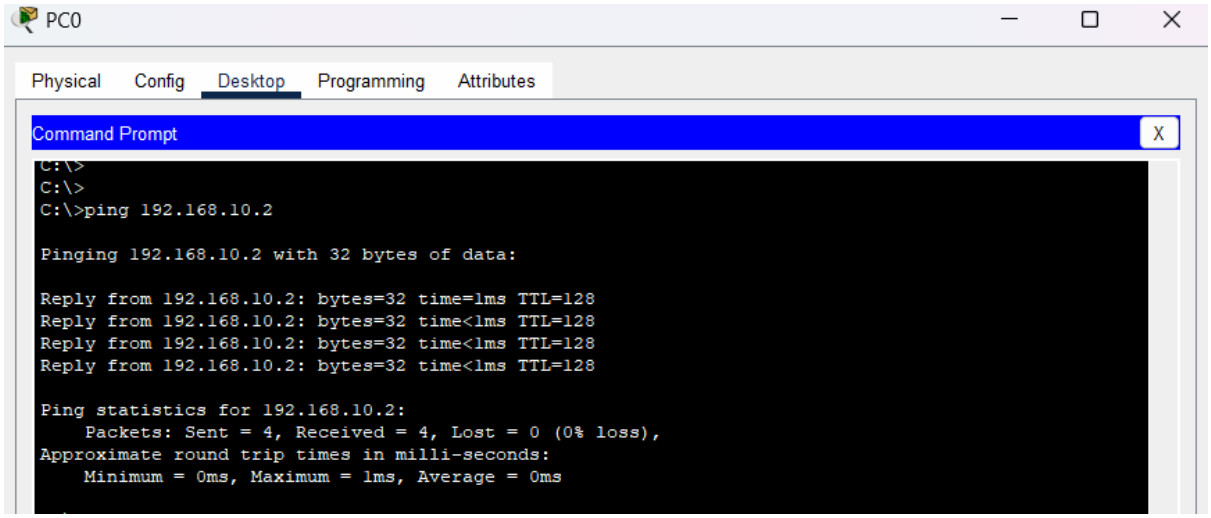


Switch> Switch>en Switch# Switch#conf t Switch(config)#hostname MLSW MLSW(config)#vlan 10 MLSW(config-vlan)#vlan 20 MLSW(config-vlan)#vlan 30 MLSW(config-vlan)#exit MLSW(config)# MLSW(config)#int range g1/0/1-2	**Below conf. is to access from one pc to all PCs.** MLSW#conf t Enter configuration commands, one per line. End with CNTL/Z. MLSW(config)# MLSW(config)#ip routing MLSW(config)#int vlan 10 MLSW(config-if)# MLSW(config-if)#ip add 192.168.10.10 255.255.255.0

MLSW(config-if-range)#switchport mode trunk MLSW(config-if-range)#end **After this you will be able to ping in between the same VLANs. But not other vlans.** Ex: 192.168.10.1 to 10.2 But you cannot access 192.168.10.1 to 20.1	MLSW(config-if)#no shut MLSW(config-if)#int vlan 20 MLSW(config-if)# MLSW(config-if)#ip add 192.168.20.20 255.255.255.0 MLSW(config-if)#no shut MLSW(config-if)# MLSW(config-if)#int vlan 30 MLSW(config-if)# MLSW(config-if)#ip add 192.168.30.30 255.255.255.0 MLSW(config-if)#no shut MLSW(config-if)# MLSW(config-if)#end MLSW# MLSW#wr Building configuration... [OK] **MLSW#**

Test Configurations

- **able to ping in between the same VLANs**



- **able to ping from one PC to all other PCs VLANs**