Network Topology 4:

- In the Fig: 4.1 A network topology with a switch and 5 end devices are connected to it.
- And those devices are grouped or segmented with the vlan configuration
- I have created vlans vlan 100, vkan 200, and vlan 300.
- Vlan helps us to segement and isolate the networks.

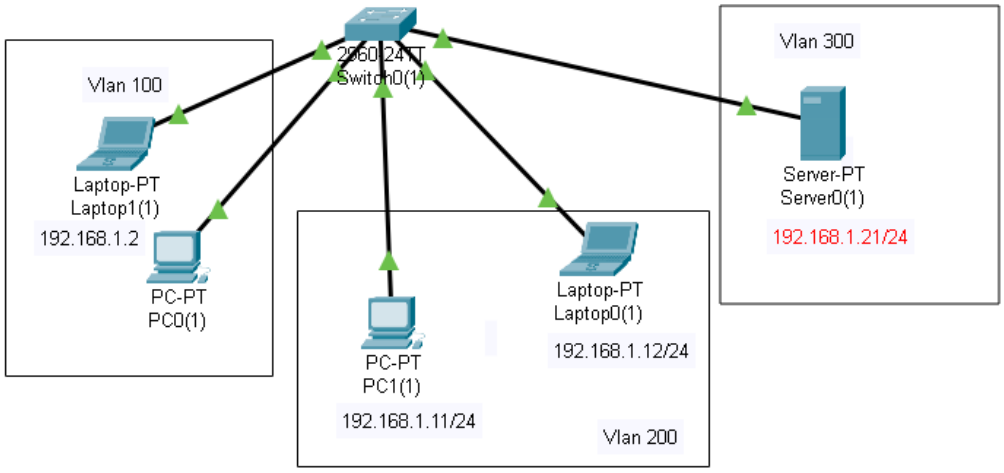

Fig: 4.1

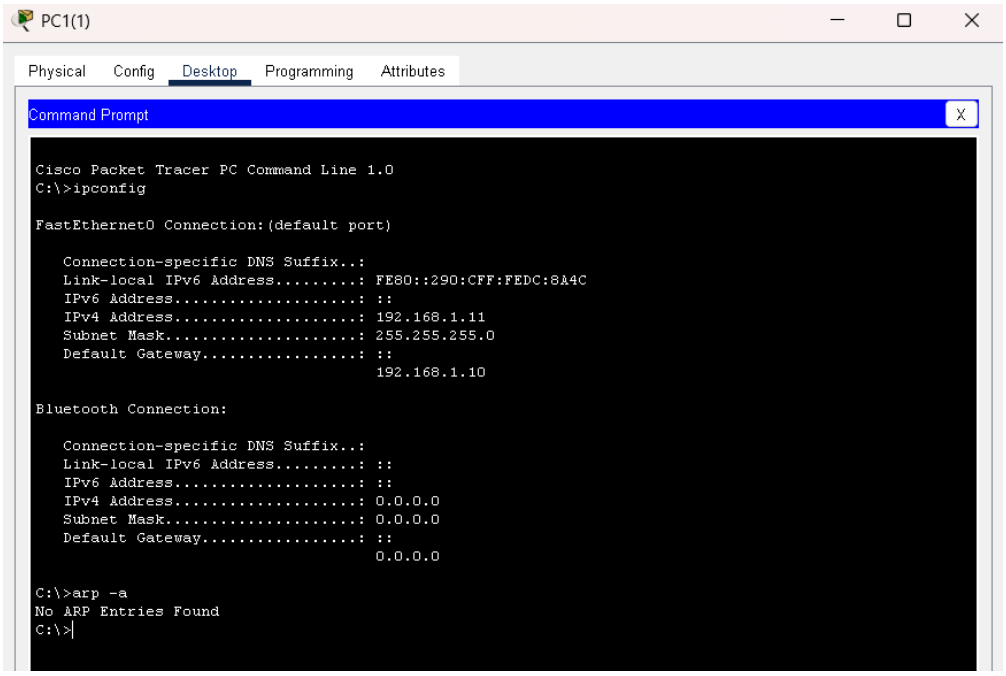

Fig:4.2

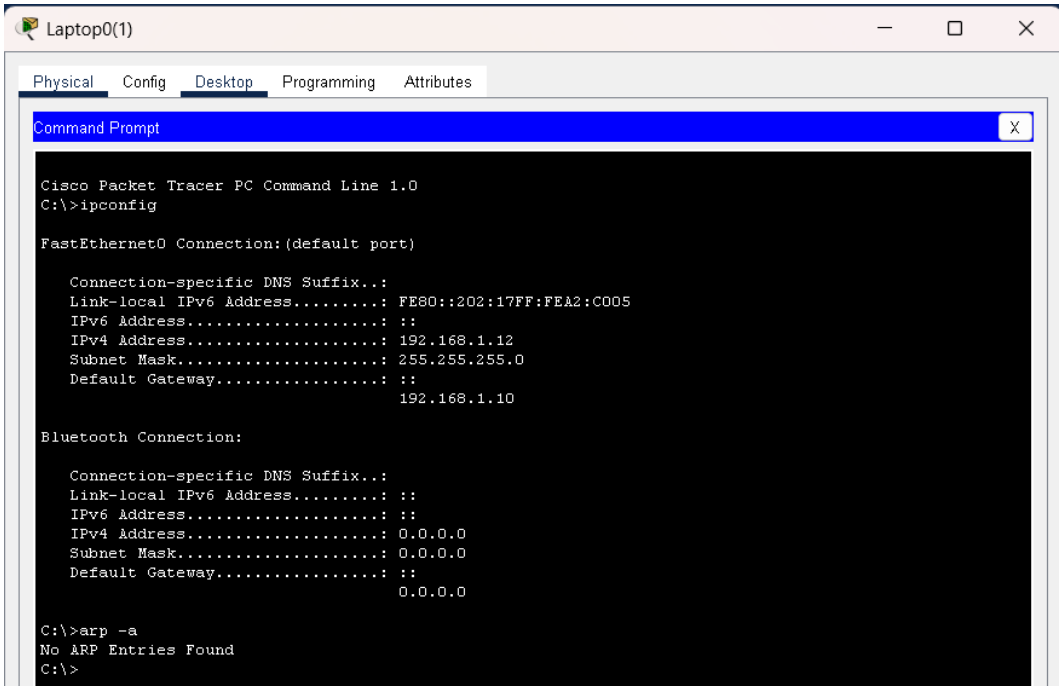

Fig:4.3

- In the Fig 4.2 and Fig:4.3 we can see the ARP cache and the ip address of both the end devices in a vlan
- We can’t communicate with other vlans untill we have a inter vlan configuration using a Multikayer switch or Router.

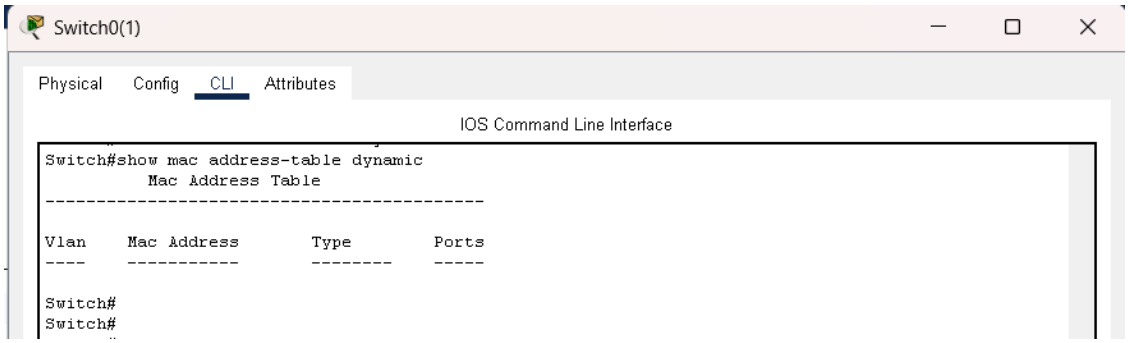

Fig:4.4

- This is the Figure of as we saw the ARP cache is empty this switch mac addres table is also empty
- And we can see this using the command “show mac address-table dynamic”

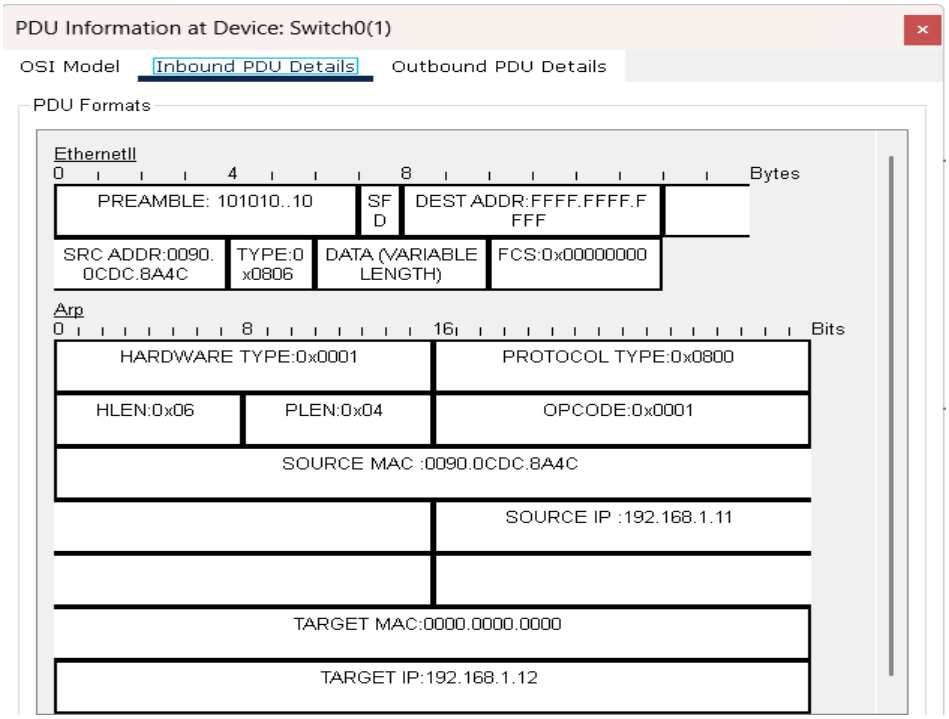

Fig:4.5

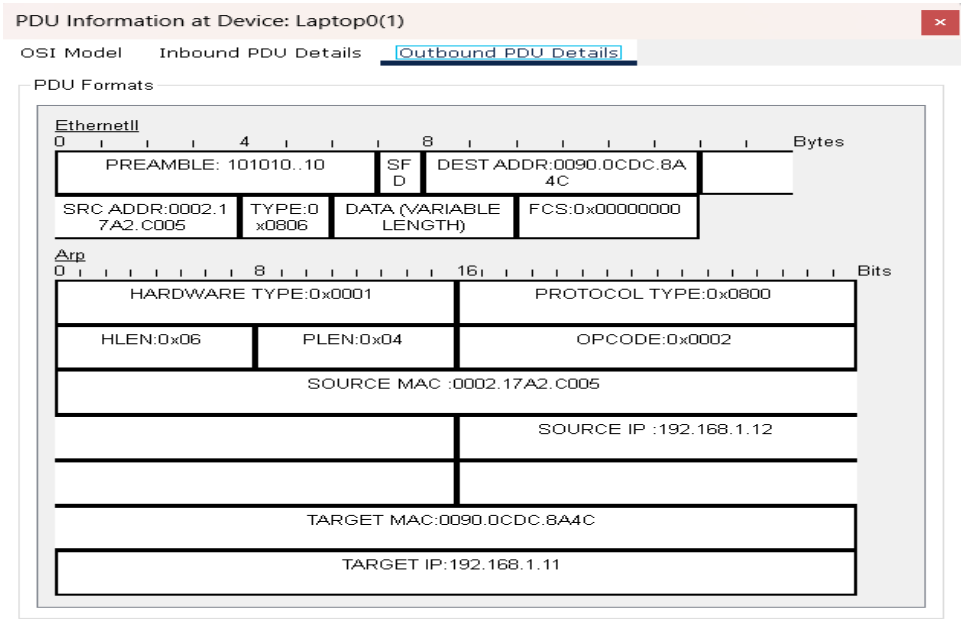

Fig:4.6

- The source device with IP 192.168.1.11 sends an ARP request to the switch. The switch broadcasts this ARP request, and the target device with IP 192.168.1.12 receives it and replies with its MAC address.
- In the ARP response, the target IP shown is 192.168.1.11 (the initiator), while the sender is 192.168.1.12.

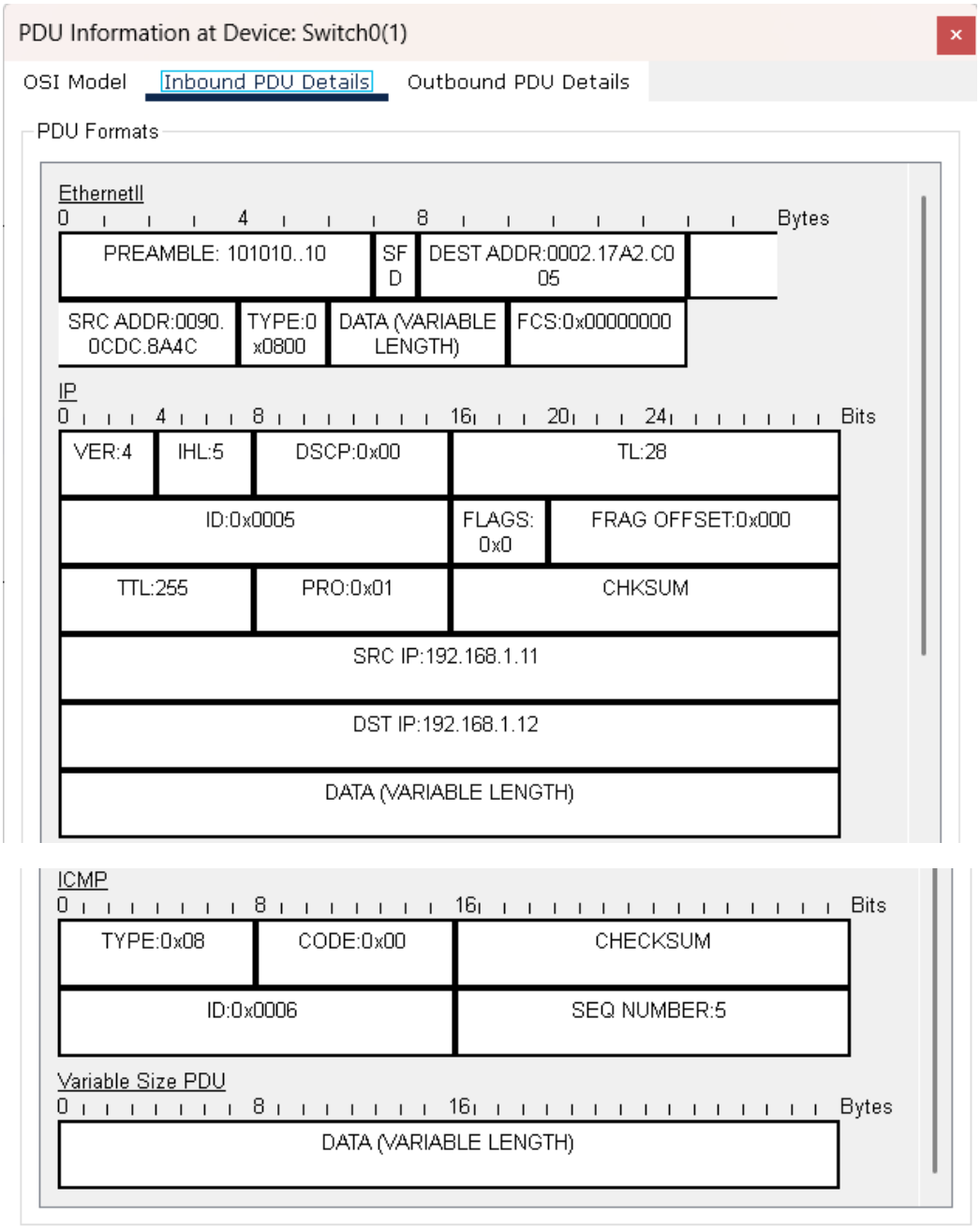

Fig:4.7

- After learning the MAC address, the source device 192.168.1.11 sends an ICMP packet (ping request) to the destination 192.168.1.12, where the ICMP type is 0x08 (Echo Request) and the code is 0x00.

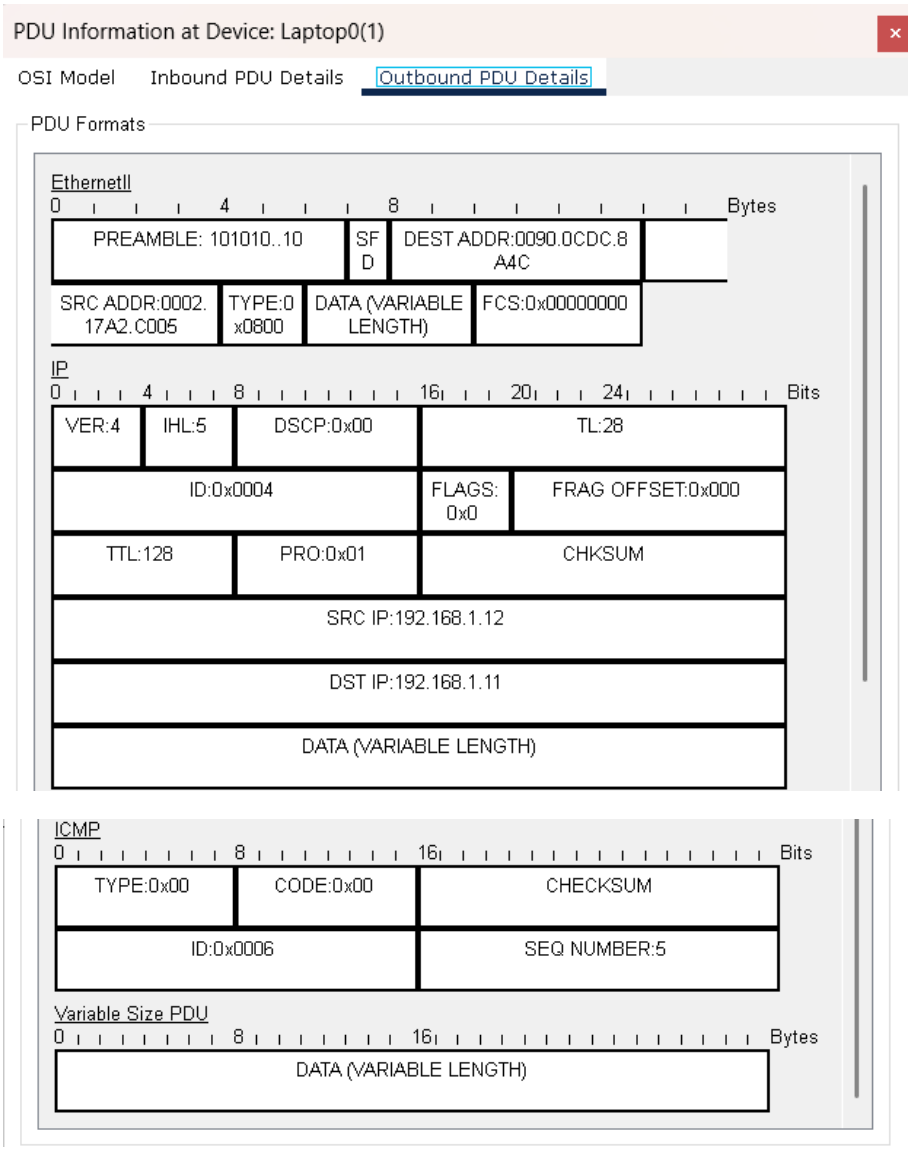

Fig:4.8

- The target device 192.168.1.12 replies with an ICMP response to 192.168.1.11. Since there are no Layer 3 devices or hops in between, the TTL remains the same, and this confirms successful communication between the two devices inside VLAN 200.
- In Fig: 4.9 we can see the packet after successful echo resoponse.

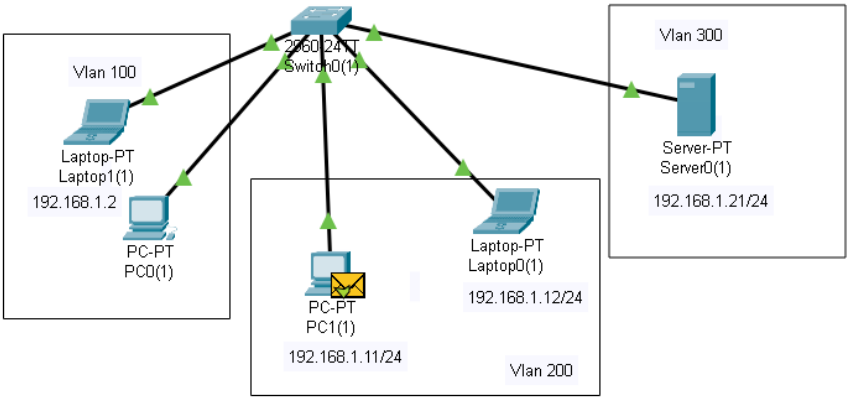

Fig:4.9

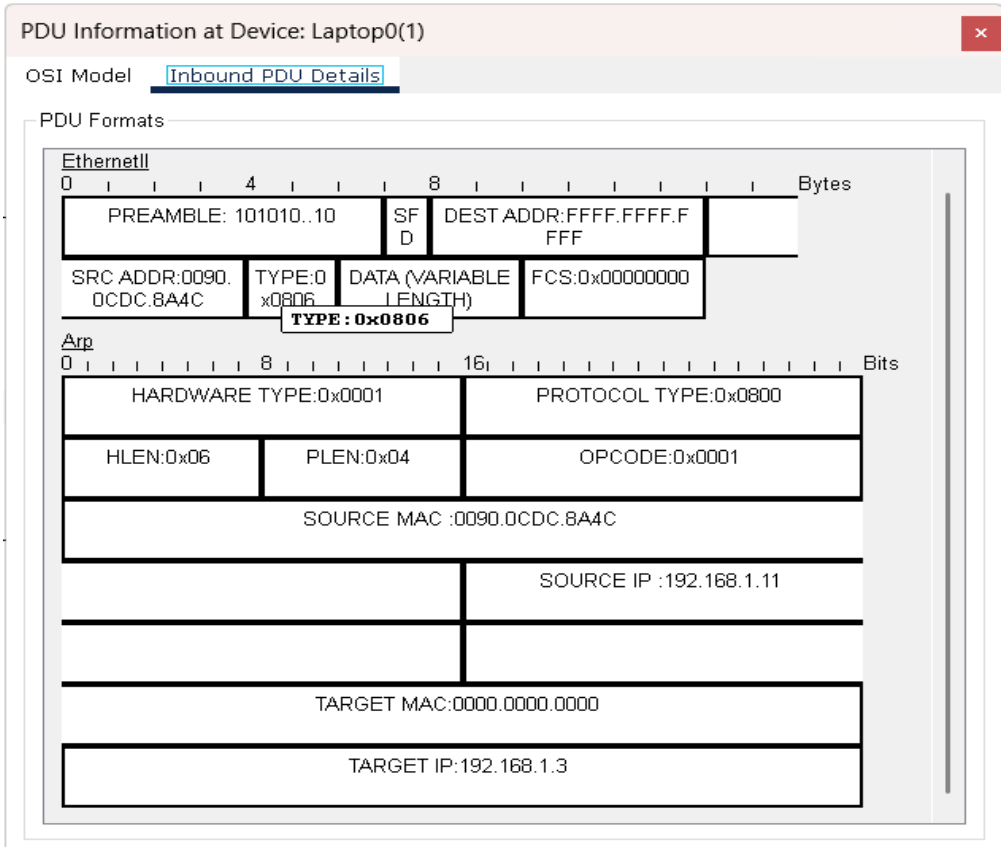

Fig:4.10

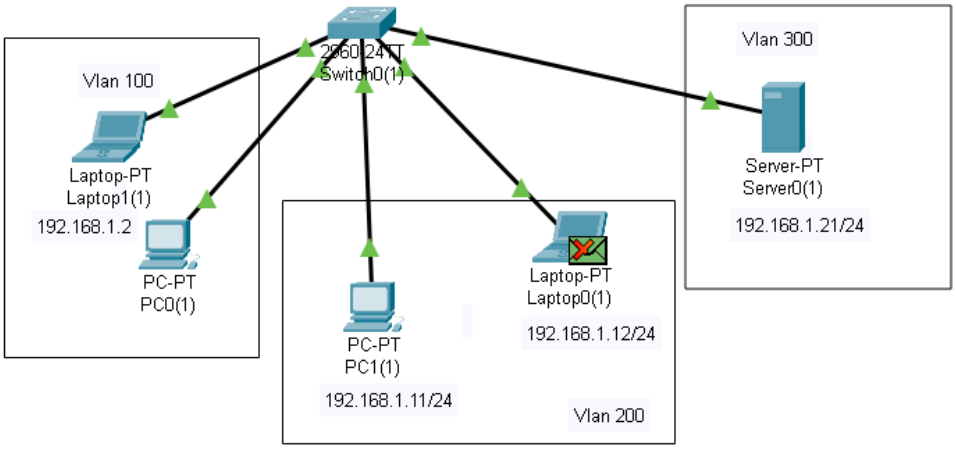

Fig:4.11

- Next, when trying to ping 192.168.1.3, which belongs to VLAN 100, the switch does not have the MAC address for this IP in its ARP cache. The switch broadcasts the ARP request only within VLAN 200 and not to other VLANs
- So the device in VLAN 100 does not receive the request. As a result, communication between these two VLANs fails. To enable successful communication between different VLANs, Inter-VLAN routing is required, which will be set up in the next topology.