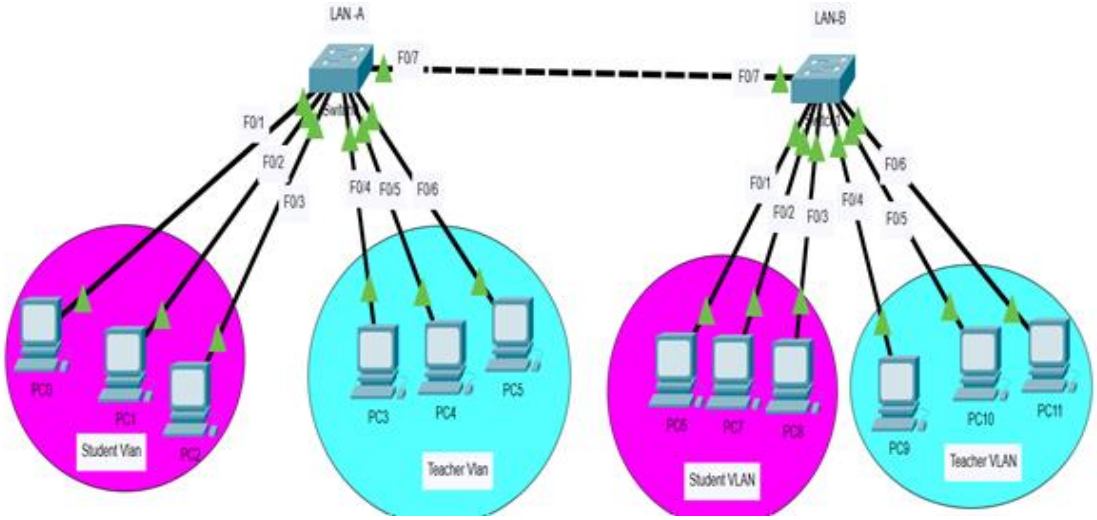
***VLAN Configuration*:**



Topology:

Add **12 PCs** and **2 Switches (2960**) to the workplace.

Cabling:

Select **copper straight through** to connect **PC** s to the **Switches**
Select **cross-over** to connect **Switch 0** to **Switch 1.** Select **Fast Ethernet 0/7** at **Switch 0** and **Fast Ethernet 0/7** at **Switch 1**

PCs Interfaces	Switch0 Interfaces
PC0 (FastEthernet0)	Fast Ethernet 0/1
PC1 (FastEthernet0)	Fast Ethernet 0/2
PC2 (FastEthernet0)	Fast Ethernet 0/3
PC3(FastEthernet0)	Fast Ethernet 0/4
PC4 (FastEthernet0)	Fast Ethernet 0/5
PC5 (FastEthernet0)	Fast Ethernet 0/6

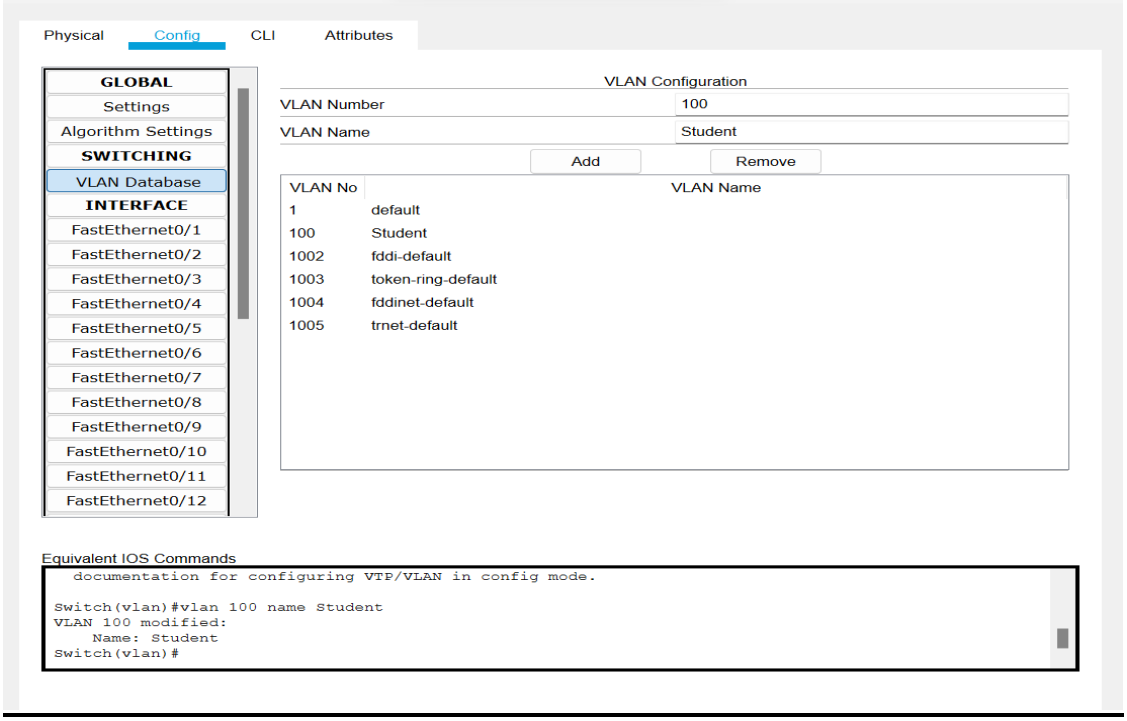
PCs Interfaces	Switch1 Interfaces
PC6 (FastEthernet0)	Fast Ethernet 0/1
PC7 (FastEthernet0)	Fast Ethernet 0/2
PC8 (FastEthernet0)	Fast Ethernet 0/3
PC9 (FastEthernet0)	Fast Ethernet 0/4
PC10 (FastEthernet0)	Fast Ethernet 0/5
PC11 (FastEthernet0)	Fast Ethernet 0/6

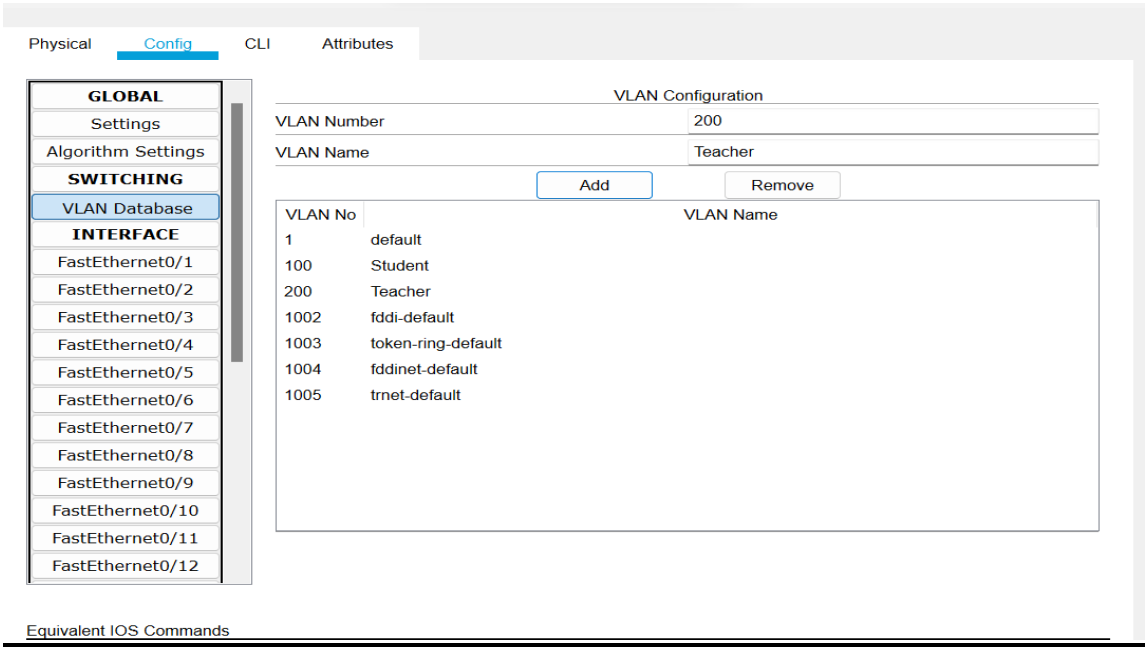
PC0: **IP Address:192.168.1.1** **Subnet mask:255.255.255.0** **Default Gateway:0.0.0.0**	**PC3:** **IP Address:192.168.1.4** **Subnet mask:255.255.255.0** **Default Gateway:0.0.0.0**
PC1: **IP Address:192.168.1.2** **Subnet mask:255.255.255.0** **Default Gateway:0.0.0.0**	**PC4:** **IP Address:192.168.1.5** **Subnet mask:255.255.255.0** **Default Gateway:0.0.0.0**
PC2: **IP Address:192.168.1.3** **Subnet mask:255.255.255.0** **Default Gateway:0.0.0.0**	**PC5:** **IP Address:192.168.1.6** **Subnet mask:255.255.255.0** **Default Gateway:0.0.0.0**

Switch 0 Configuration:

Step 1: At first, we create a LAN, LAN-A with 6 hosts. To create a LAN, we need one Layer 2 switch **Switch0(2960)** and **6 end devices(PC)**. Now we provide IP addresses to the hosts starting from 192.168.1.1 (you can provide any valid IP addresses). To provide an IP address to a host just select that **host → Desktop → IP Configuration → IPv4 Addresses** and provide an IP address and then **ENTER,** the Subnet Mask will be provided by default.

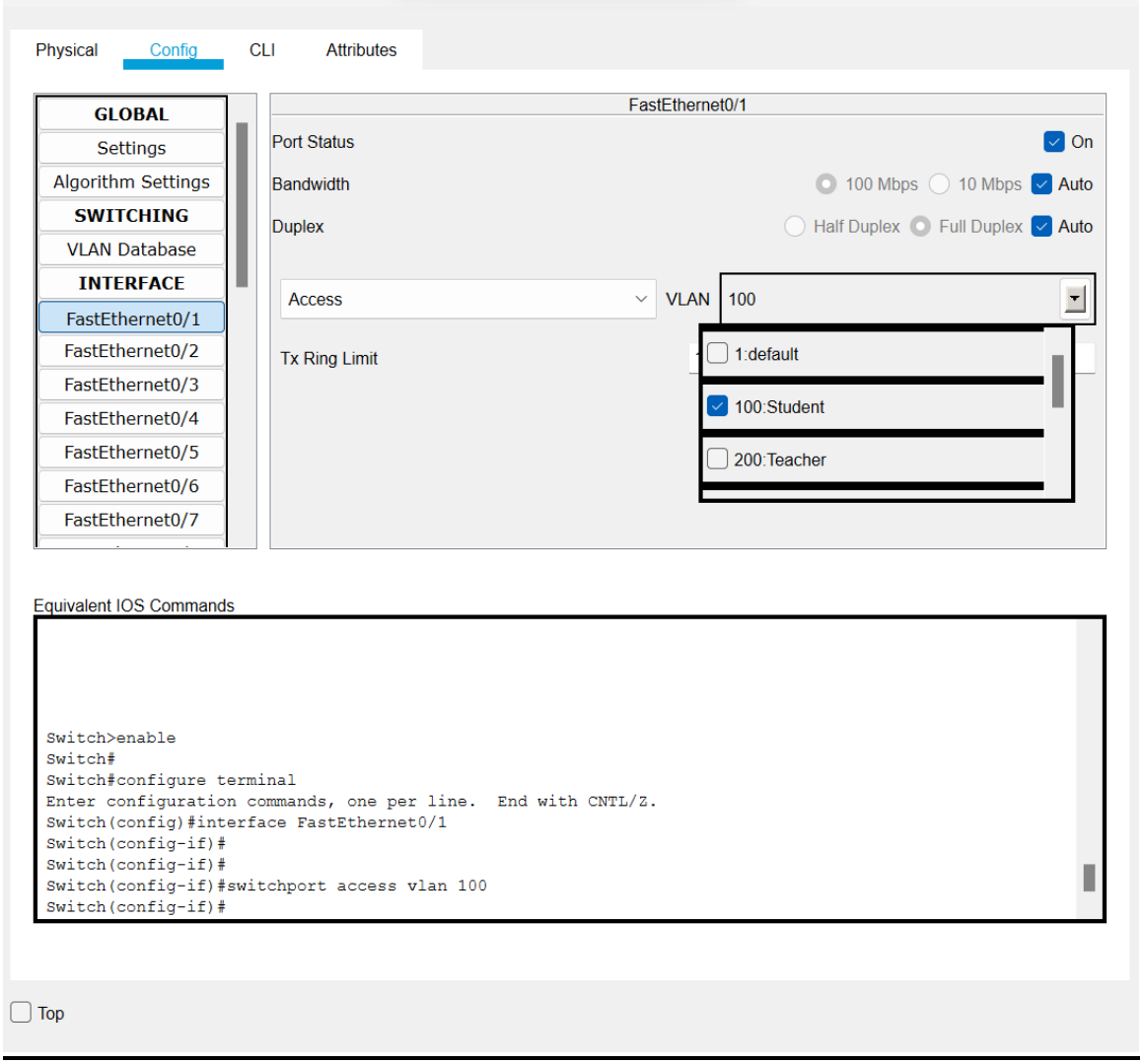
Step 2: Let us create 2 VLANs where the name of the first VLAN is **VLAN-STUDENT** and the second VLAN is VLAN-FACULTY. To configure VLANs we have to go to the switch **Switch0(2960)** and move to **Config → SWITCHING → VLAN Database**. Now let us take the **VLAN Number** for **STUDENT is 100** and for **Teacher is 200** and **add** these numbers **to VLAN Database.**



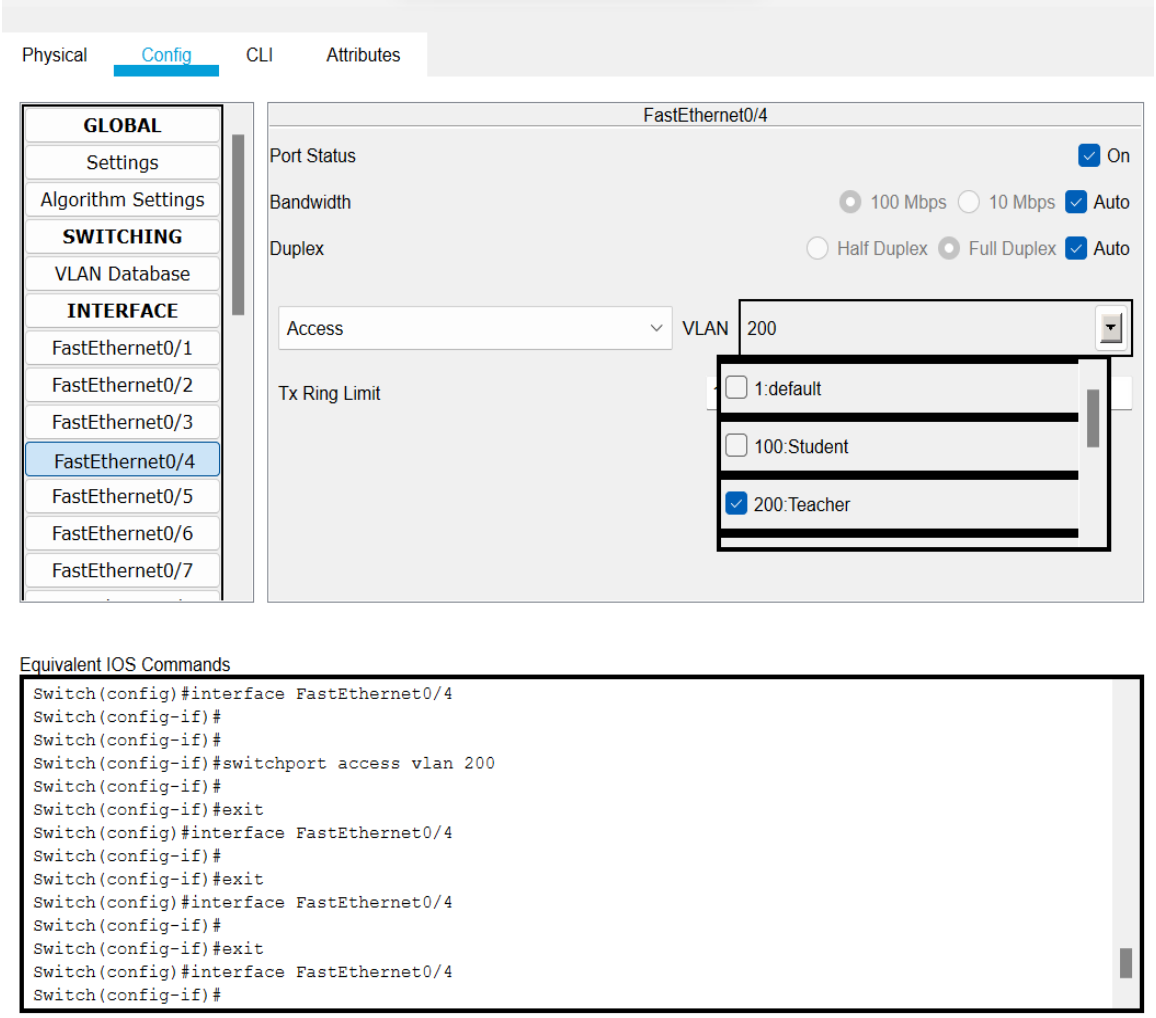


Step 3: Next we have to select the hosts under **VLAN-STUDENT**. Here I have put hosts with IP addresses from **192.168.1.1 to 192.168.1.3** under **VLAN-STUDENT**. To do so we have to select the switch **Switch0 → Config → INTERFACE,** here we choose **FastEthernet0/1** corresponding to the host 192.168.1.1 which we consider to be in **VLAN-STUDENT**. Now we select the down arrow beside VLAN and select **100: STUDENT**, which is for **student VLAN**.

Similarly, we do this same process for **FastEthernet0/2 and FastEthernet0/3**



Step 4: Now we have to configure the hosts under **VLAN-Teacher**. Here I have put hosts with IP addresses **192.168.1.4** to **192.168.1.6** under **VLAN-Teacher.** To do so, just follow the process mentioned in Step 3, but instead of selecting the VLAN Number **100:STUDENT**, select **200:Teacher** for **FastEthernet0/4, FastEthernet0/5, and FastEthernet0/6**.



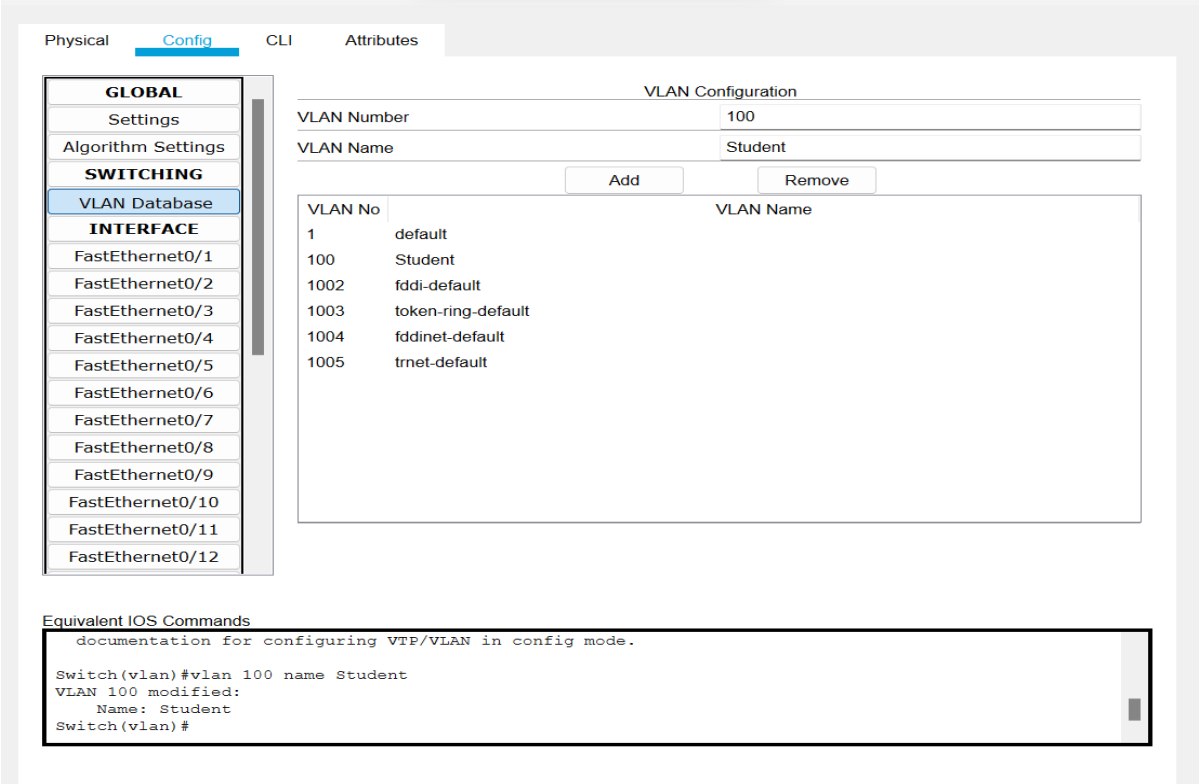
Step 5: Lastly, just change the switch port mode from **Access to Trunk** for **FastEthernet0/7.**

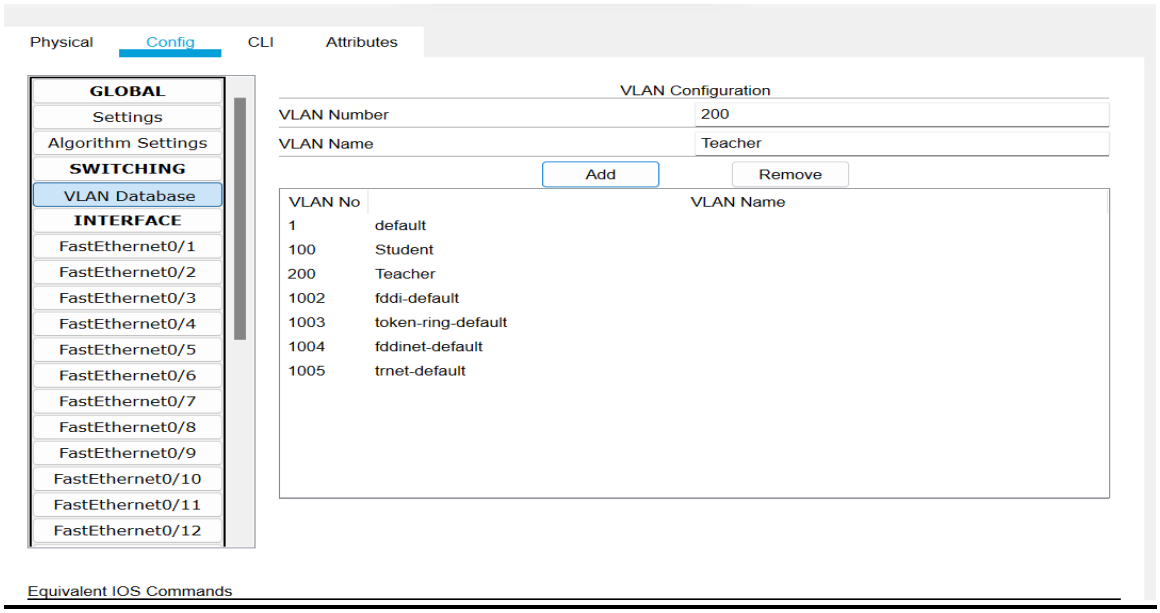
Switch 1 Configuration:

Step 6: At first, we create a LAN, LAN-B with 6 hosts. To create a LAN, we need one Layer 2 switch **Switch0(2960)** and **6 end devices(PC)**. Now we provide IP addresses to the hosts starting from **192.168.1.7** (you can provide any valid IP addresses). To provide an IP address to a host just select that **host → Desktop → IP Configuration → IPv4 Addresses** and provide an IP address and then **ENTER,** the Subnet Mask will be provided by default.

PC6: **IP Address:192.168.1.7** **Subnet mask:255.255.255.0** **Default Gateway:0.0.0.0**	**PC9:** **IP Address:192.168.1.10** **Subnet mask:255.255.255.0** **Default Gateway:0.0.0.0**
PC7: **IP Address:192.168.1.8** **Subnet mask:255.255.255.0** **Default Gateway:0.0.0.0**	**PC10:** **IP Address:192.168.1.11** **Subnet mask:255.255.255.0** **Default Gateway:0.0.0.0**
PC8: **IP Address:192.168.1.9** **Subnet mask:255.255.255.0** **Default Gateway:0.0.0.0**	**PC11:** **IP Address:192.168.1.12** **Subnet mask:255.255.255.0** **Default Gateway:0.0.0.0**

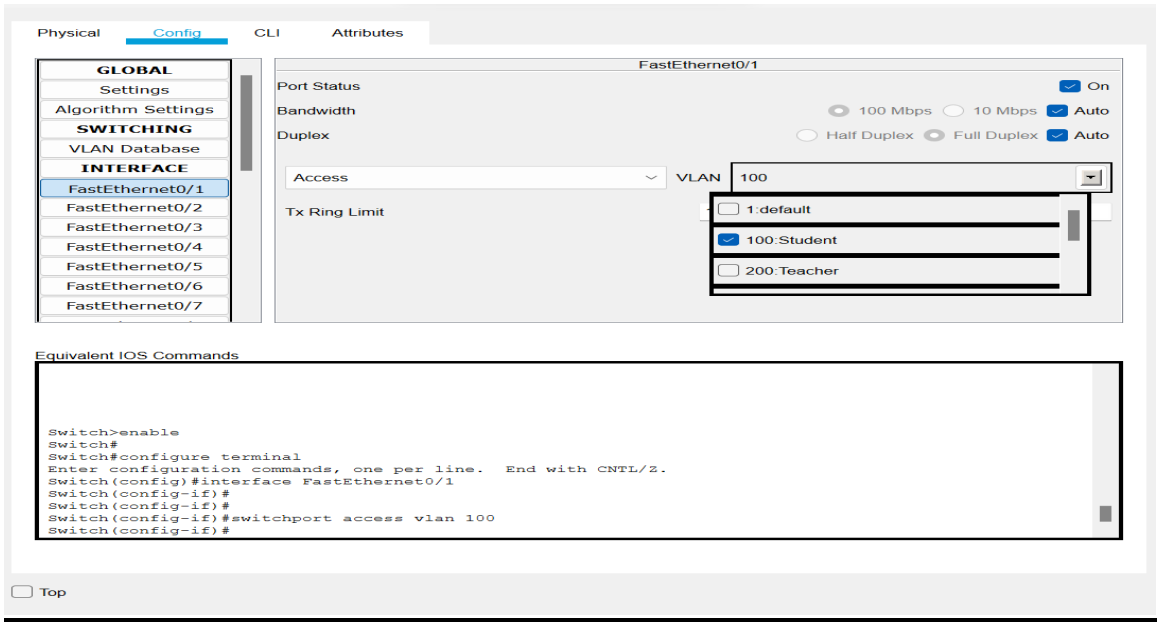
Step7: Let us create 2 VLANs where the name of the first VLAN is **VLAN-STUDENT** and the second VLAN is VLAN-FACULTY. To configure VLANs we have to go to the switch **Switch1 (2960)** and move to **Config → SWITCHING → VLAN Database**. Now let us take the **VLAN Number** for **STUDENT is 100** and for **Teacher is 200** and **add** these numbers **to VLAN Database.**



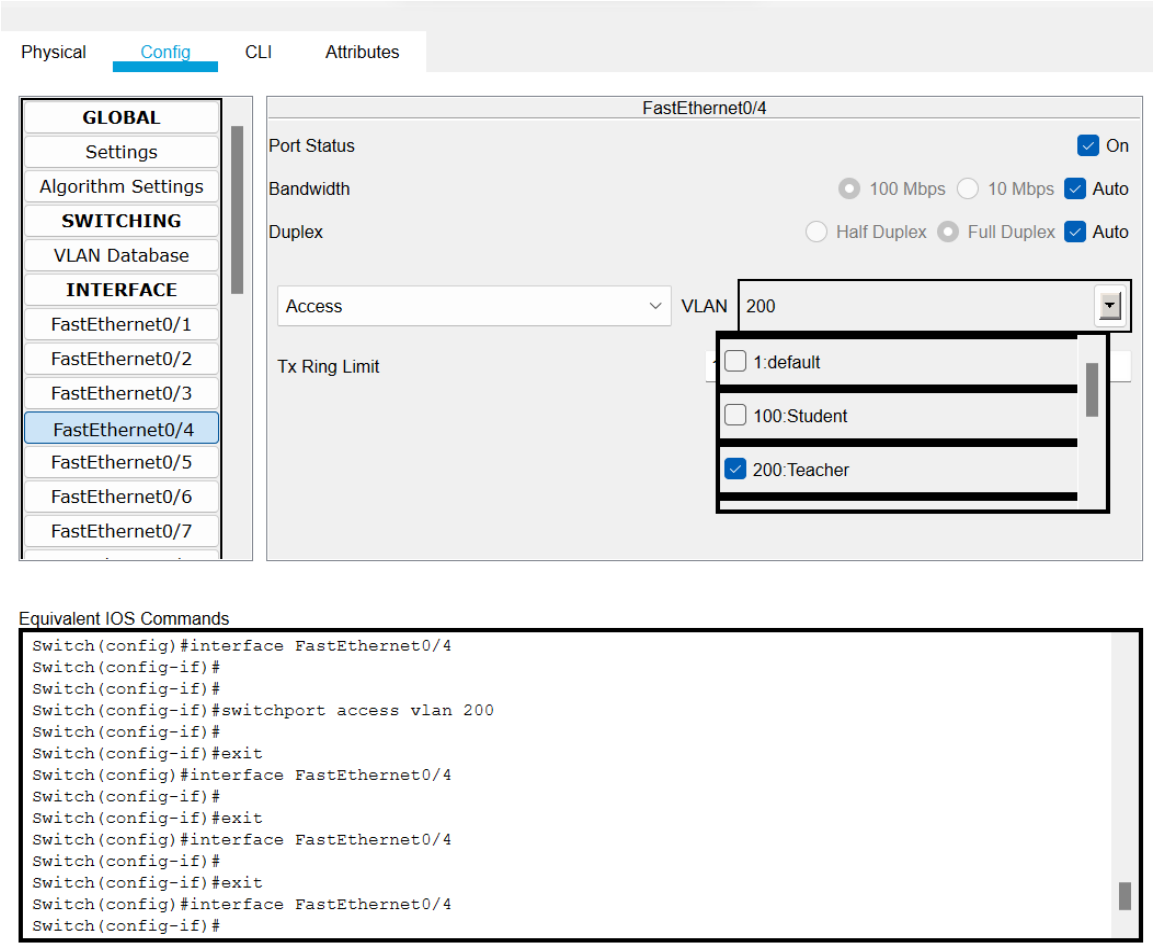


Step8: Next we have to select the hosts under **VLAN-STUDENT**. Here I have put hosts with IP addresses from **192.168.1.7 to 192.168.1.9** under **VLAN-STUDENT**. To do so we have to select the switch **Switch1 → Config → INTERFACE,** here we choose **FastEthernet0/1** corresponding to the host 192.168.1.1 which we consider to be in **VLAN-STUDENT**. Now we select the down arrow beside VLAN and select **100:STUDENT**, which is for **student VLAN**.

Similarly, we do this same process for **FastEthernet0/2 and FastEthernet0/3**



Step9: Now we have to configure the hosts under **VLAN-Teacher**. Here I have put hosts with IP addresses **192.168.1.10** to **192.168.1.12** under **VLAN-Teacher.** To do so, just follow the process mentioned in Step 3, but instead of selecting the VLAN Number **100: STUDENT**, select **200: Teacher** for **FastEthernet0/4, FastEthernet0/5, and FastEthernet0/6**.



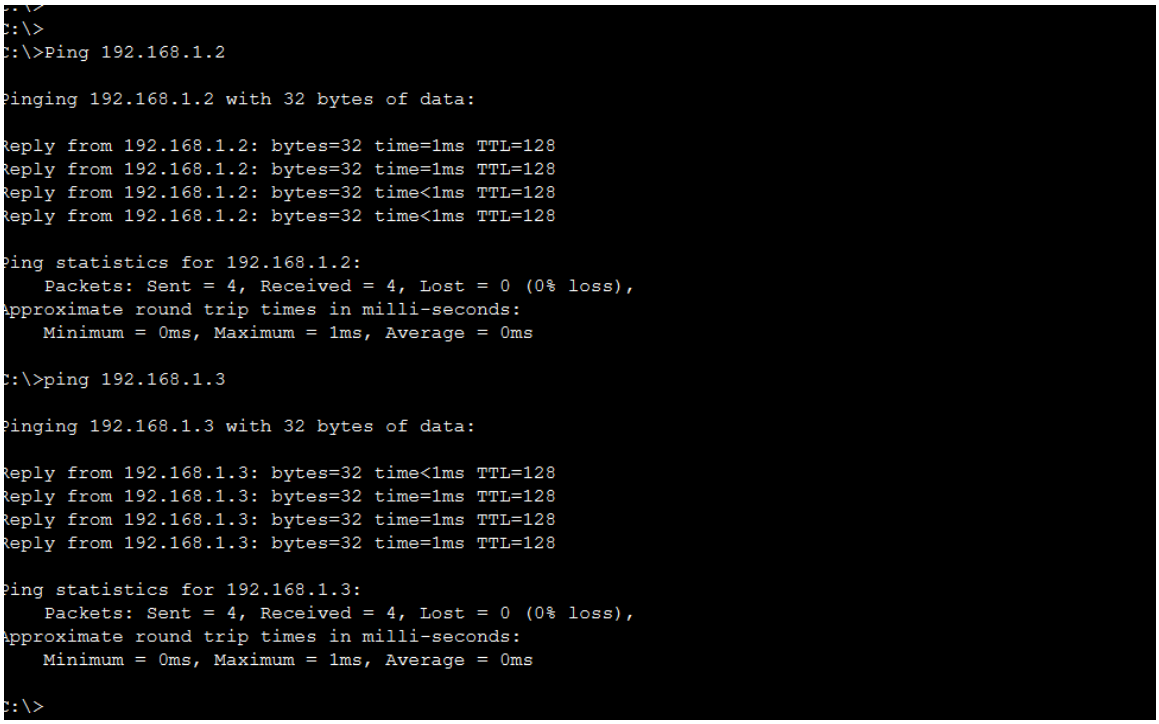
Step10: Lastly, just change the switch port mode from **Access to Trunk** for **FastEthernet0/7.**

Checking Connectivity:

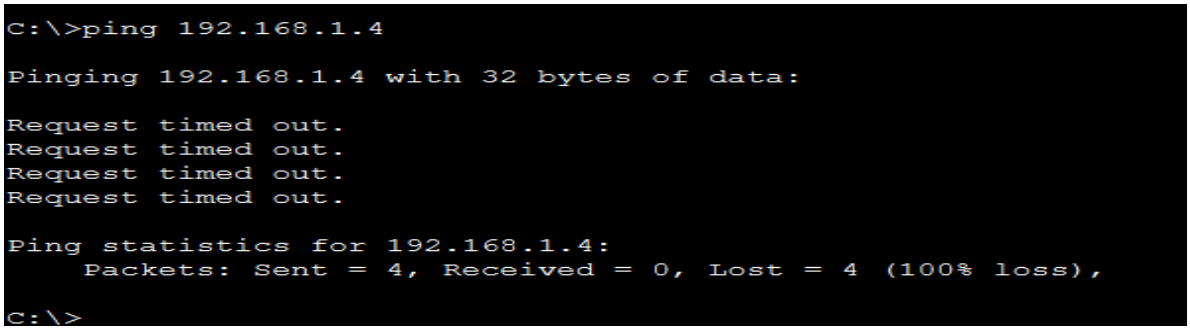
Now our VLAN configuration is ready, and we can check this by sending data packets from one host to another under LAN-A. Let us ping from **192.168.1.1** to **192.168.1.3.** To do so, we have to select the host with IP **192.168.1.1** and then select **Desktop → Command Prompt.** Now run the following command to ping **192.168.1.3**.

ping 192.168.1.3

Note: The Connectivity is Successful. Because PC0(192.168.1.1) PC1(192.168.1.2) and PC2(192.168.1.3) belong to the same VLAN (VLAN -Student) so devices that are in same VLAN can communicate and sending data without time out



Now its time to check connectivity between PCs that are belong to the different VLANs for example **PC 0 (192.168.1.1)** belongs to the **Student VLAN** but **PC 3(192.168.1.4)** belongs to the **Teacher VLAN** so they can not connect to each other the connectivity request **was timed out**



Now it's time to check connectivity between PCs that are belong to the same VLANs but at the different switches for example **PC 0 (192.168.1.1)** belongs to the **Student VLAN** and **PC 6(192.168.17)** belongs to the **Student VLAN** same VLANs but at different switches can communicate with each other even they belong to the different switches.

```
C:\>ping 192.168.1.7

Pinging 192.168.1.7 with 32 bytes of data:

Reply from 192.168.1.7: bytes=32 time<1ms TTL=128
Reply from 192.168.1.7: bytes=32 time=1ms TTL=128
Reply from 192.168.1.7: bytes=32 time<1ms TTL=128
Reply from 192.168.1.7: bytes=32 time=9ms TTL=128

Ping statistics for 192.168.1.7:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 9ms, Average = 2ms

C:\>
```