VLAN

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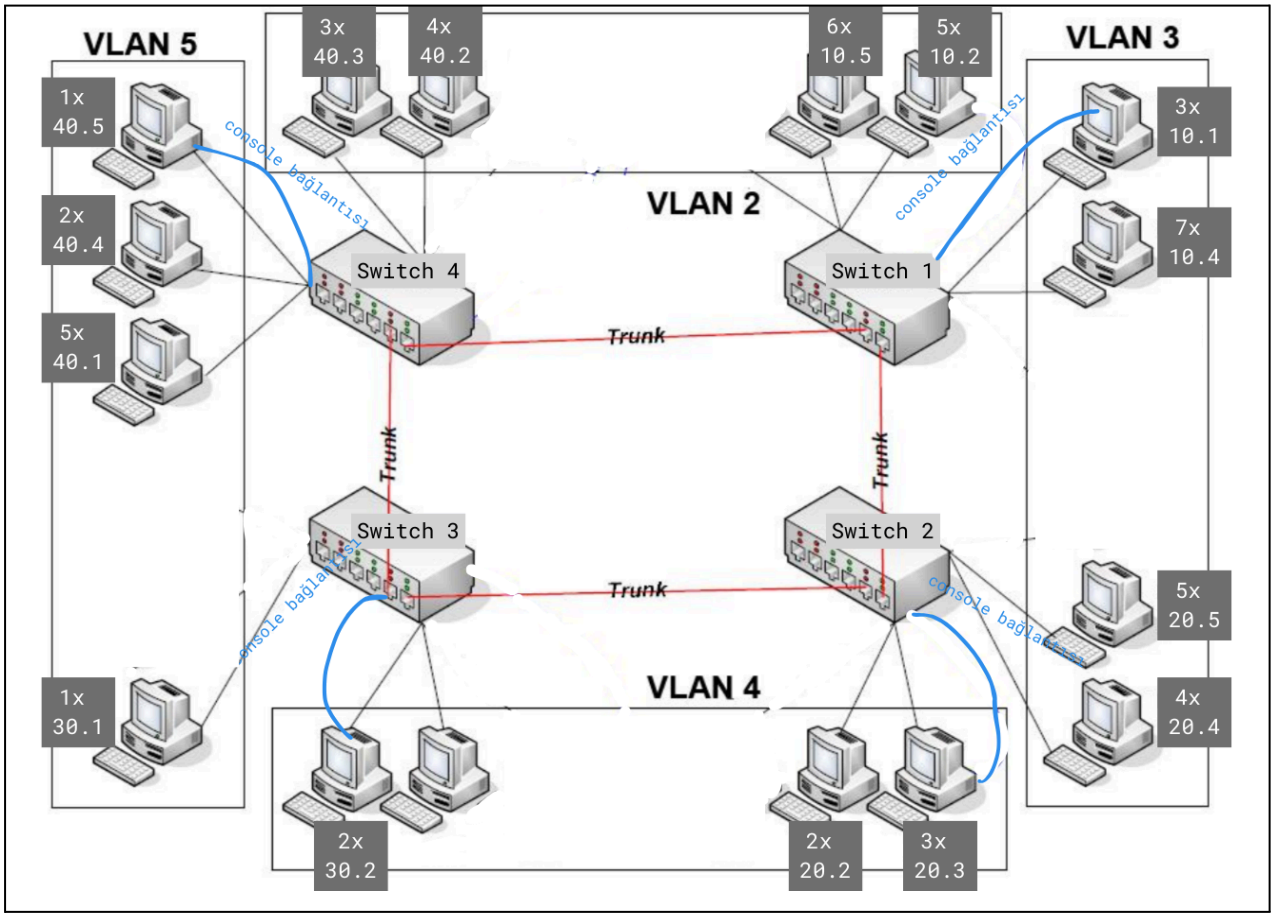
***Note: We couldn't match with our original groups because there was confusion in the lab but we worked on the same switch so our results match.

VLAN Configuration

As you can see from the topology, we have created a network that consists of 4 virtual LANs with 4 switches. In each VLAN, one computer is chosen as a console and all operations related to VLANs are done by this computer.

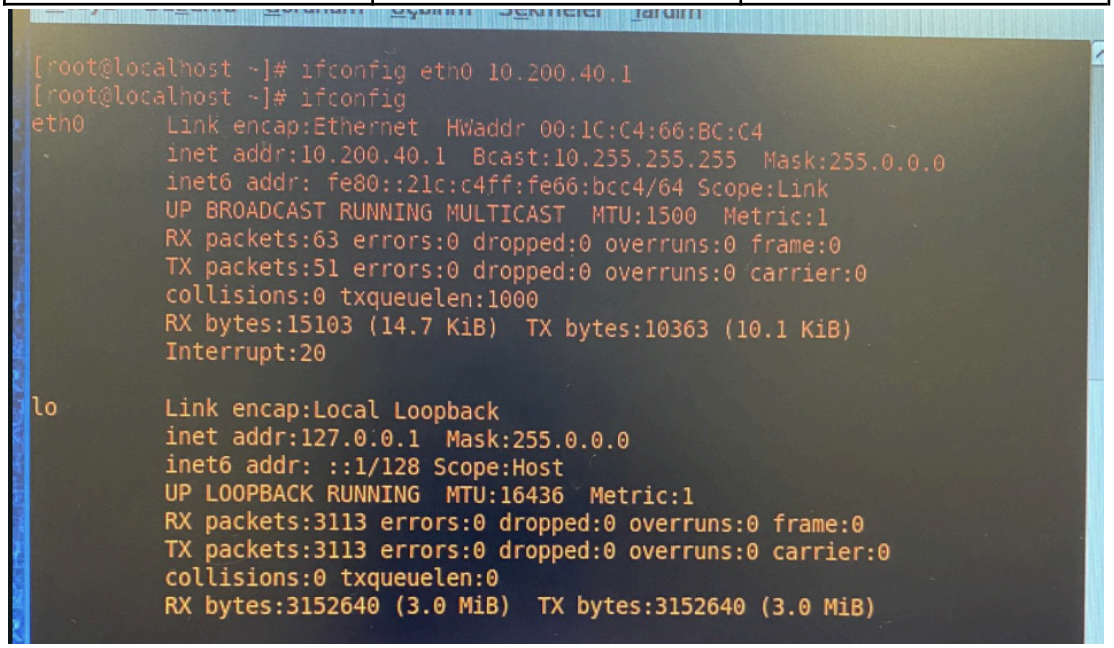


The topology image

IP Adress Assignment

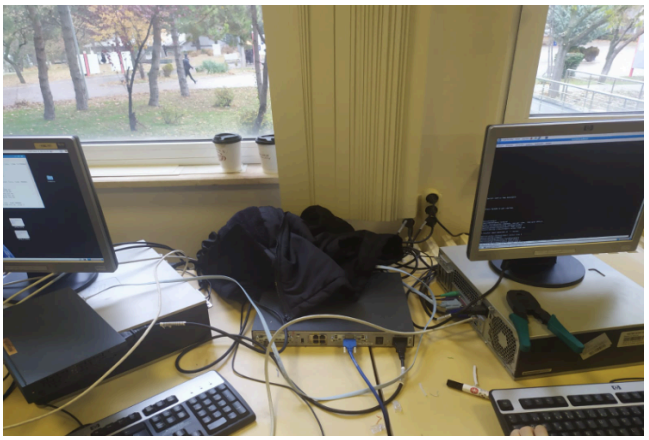
We worked on Group 4 with computers 10.200.40.1 and 10.200.40.4

Group Name	IP Address	Subnet mask
Group1	10.200.10.1 - 10.200.10.5	255.255.0.0
Group2	10.200.20.1 - 10.200.20.5	255.255.0.0
Group3	10.200.30.1 - 10.200.30.2	255.255.0.0
Group4	10.200.40.1 - 10.200.40.5	255.255.0.0



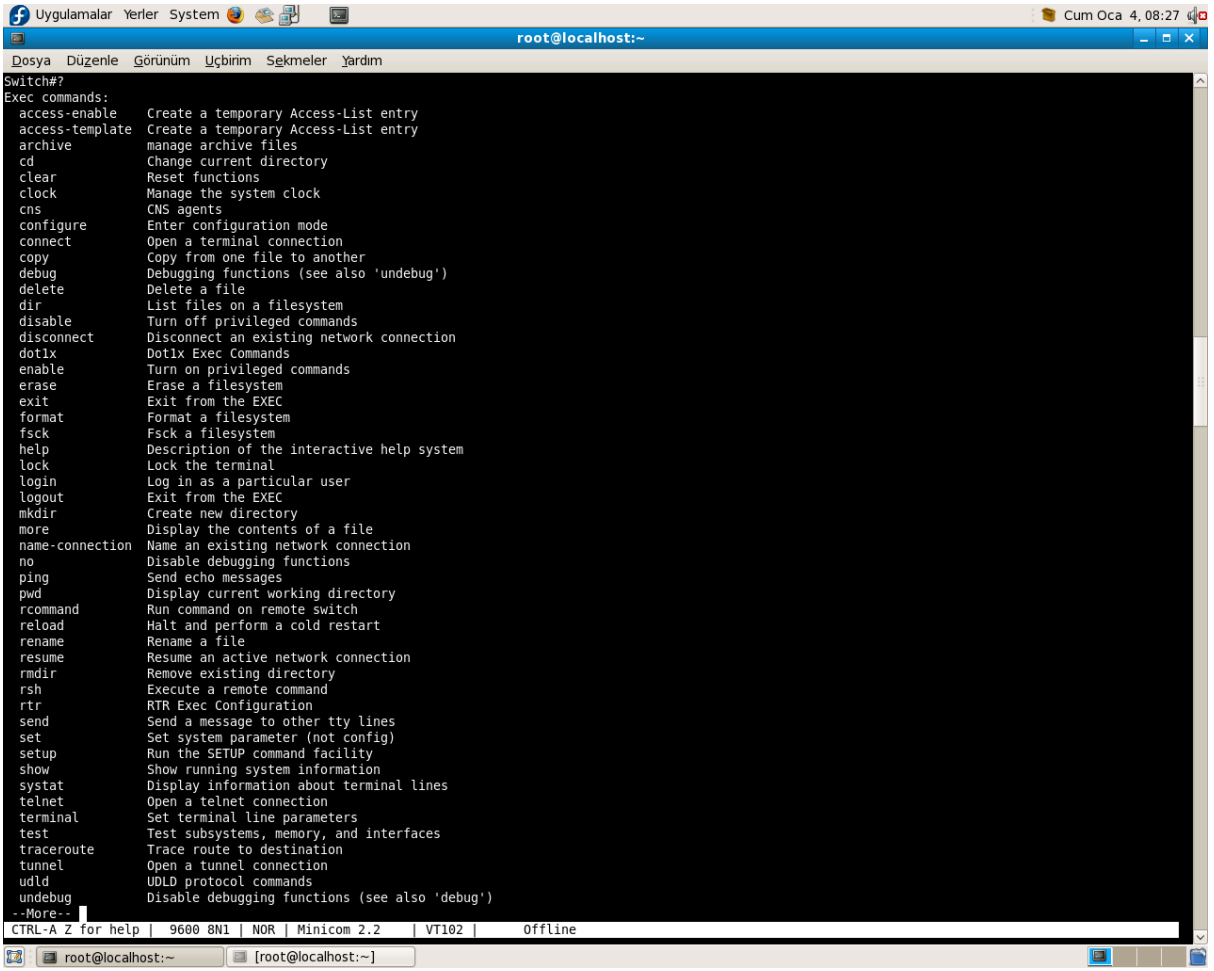
Switch Configuration

In our group computer with IP address 10.200.40.4. We connected our computer with a blue cable to the console input port as you can see from the image.



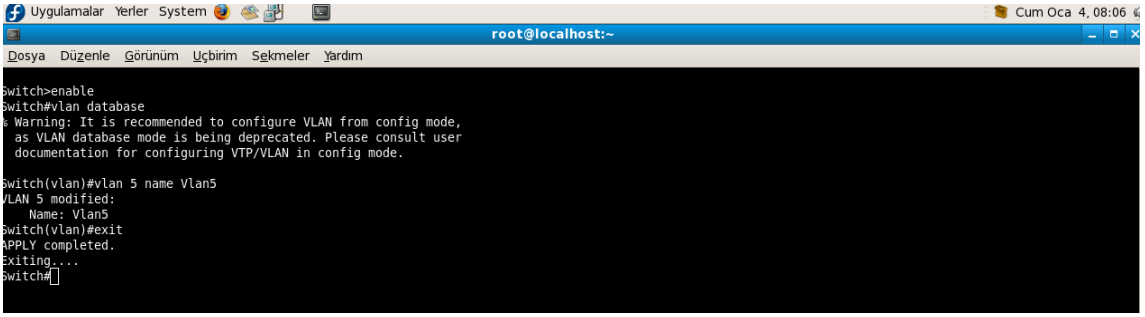
Minicom Use

We have configured the Cisco switch with the **minicom** command. After entering the Cisco operating system, we can see what kind of commands we can use by **?** command.



VLAN Configuration Commands

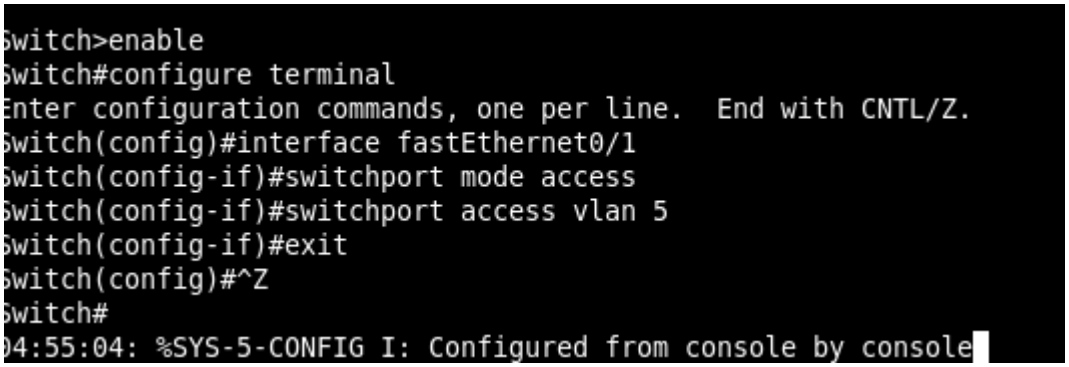
And now we will configure our VLAN settings. First of all, we will create a new VLAN. To do this, we enter the VLAN database and create a new one with the ID we want.

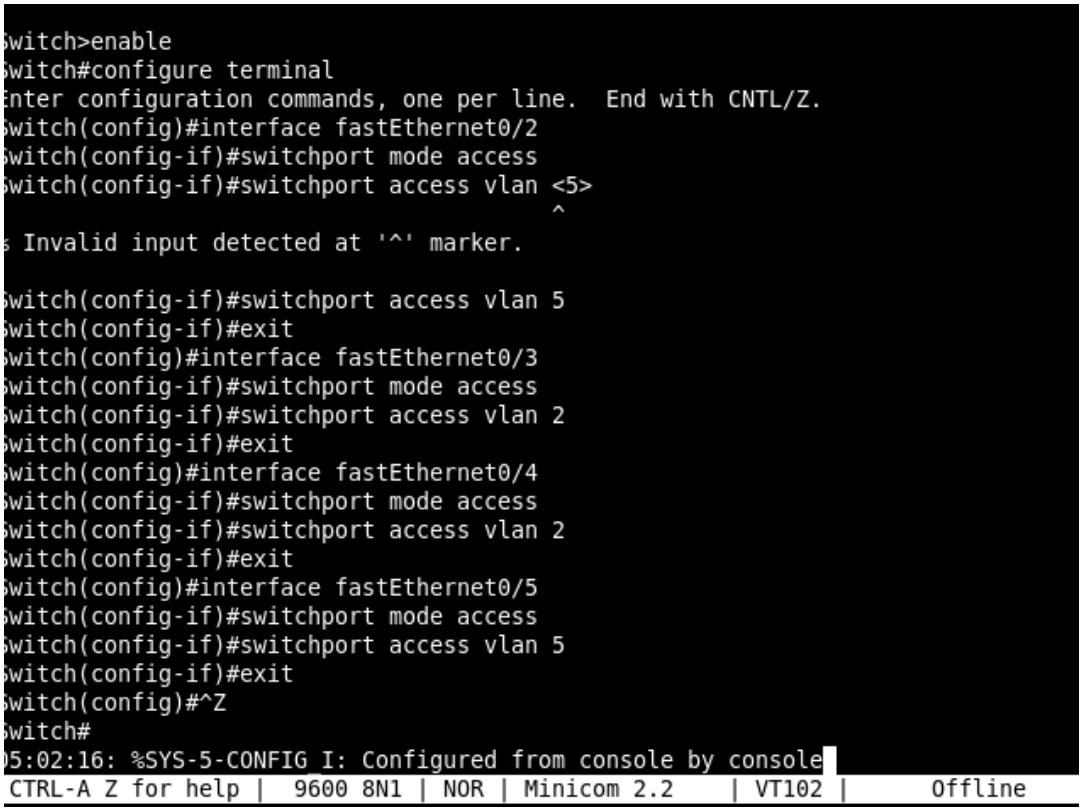


After this, we assign different computers to our VLAN. For this experiment, our group consisted of 5 computers. Respectively, their IP addresses and switch ports were assigned as this:

10.200.40.1 → 5x
10.200.40.2 → 4x
10.200.40.3 → 3x
10.200.40.4 → 2x
10.200.40.5 → 1x

And we did this assignment on minicom with these commands you can see in the screenshots:





After this, we assigned switch ports to trunk mode. It can be done using these commands:

```
Switch>
Switch>enable
Switch#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Switch(config)#interface fastEthernet0/7
Switch(config-if)#switchport mode trunk
Switch(config-if)#exit
Switch(config)#interface fastEthernet0/8
Switch(config-if)#switchport mode trunk
Switch(config-if)#exit
Switch(config)#
CTRL-A Z for help |  9600 8N1 | NOR | Minicom 2.2     | VT102 |
```

And finally, we can see the network just like in the topology:

```
Switch>
Switch>enable
Switch#show vlan

VLAN Name                              Status    Ports
---- --------------------------------- --------- -------------------------------
1    default                           active    Fa0/6, Gi0/1
2    VLAN2                             active    Fa0/3, Fa0/4
3    VLAN3                             active
5    Vlan5                             active    Fa0/1, Fa0/2, Fa0/5
20   VLAN0020                          active
50   VLAN0050                          active
1002 fddi-default                      act/unsup
1003 token-ring-default                act/unsup
1004 fddinet-default                   act/unsup
1005 trnet-default                     act/unsup
```

From the screenshot, you can see that Vlan5 has 3 different ports 1 and Vlan2 has 2 different ports. As you saw from the topology, all these ports are on Switch 4 but ports 1, 2 and 5 are in VLAN 5 and ports 3 and 4 are connected to VLAN 2.

Testing

After all these configurations when we tested we can ping:

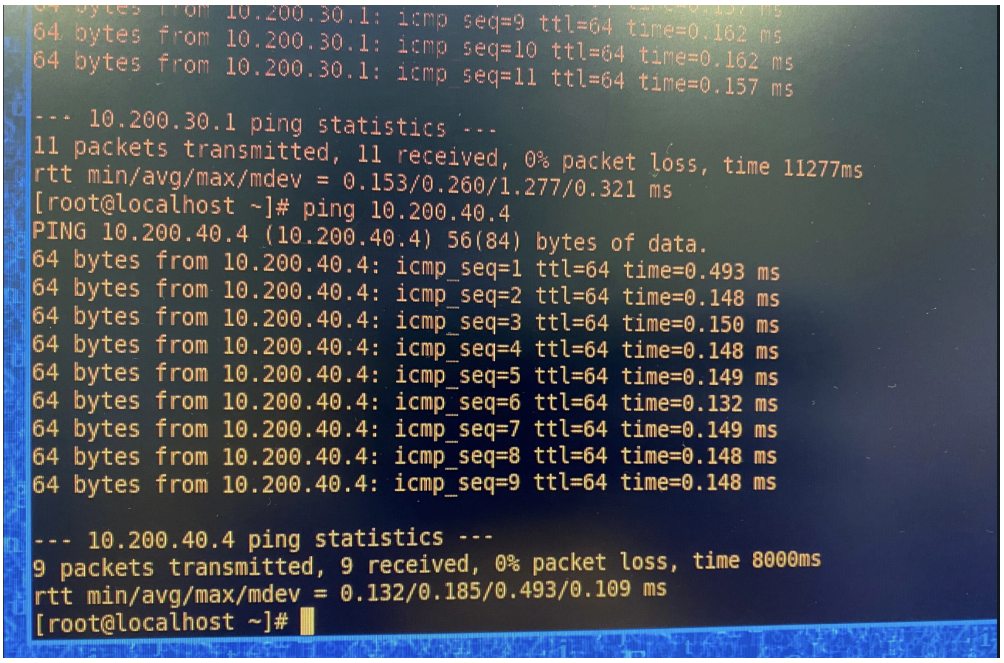
1. A computer which is in another VLAN and connected to the same switch

```
[root@localhost ~]# ping 10.200.40.2
PING 10.200.40.2 (10.200.40.2) 56(84) bytes of data.
From 10.200.40.4 icmp_seq=2 Destination Host Unreachable
From 10.200.40.4 icmp_seq=3 Destination Host Unreachable
From 10.200.40.4 icmp_seq=4 Destination Host Unreachable

--- 10.200.40.2 ping statistics ---
4 packets transmitted, 0 received, +3 errors, 100% packet loss, time 2999ms
, pipe 3
```

2. A computer that is in the same VLAN but connected to another switch

```
[root@localhost ~]# ping 10.200.30.1
PING 10.200.30.1 (10.200.30.1) 56(84) bytes of data.
64 bytes from 10.200.30.1: icmp_seq=1 ttl=64 time=0.178 ms
64 bytes from 10.200.30.1: icmp_seq=2 ttl=64 time=0.171 ms
64 bytes from 10.200.30.1: icmp_seq=3 ttl=64 time=0.174 ms

--- 10.200.30.1 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 1999ms
rtt min/avg/max/mdev = 0.171/0.174/0.178/0.011 ms
```

3. A computer that has the same VLAN and the same switch



Conclusion

In this experiment, we created a VLAN configuration for creating a segmented and organized network environment. We followed each step one by one. Lastly decided to test it with two different scenarios.

1- A computer that is in another VLAN and connected to the same switch

When we tried to ping that computer the host was unreachable. This was caused because, between these two computers, there was not a successful inter-VLAN communication capability. We can see that if we want to segment and organize our network environment VLAN can be used. In this way, we can limit the scope of broadcast domains and facilitate more efficient network management. This result is proof that a switch that supports VLANs allows multiple virtual local area networks to be defined over a single physical local area network infrastructure.

2- A computer that is in the same VLAN but connected to another switch

When we tried to ping that computer the process was successful. This was successful because ports within the same VLAN communicate directly with each other, regardless of the physical switch to which they are connected. That shows us the scalability and organizational capabilities of modern network architectures.

3- A computer that is in the same VLAN and connected to the same switch

The successful ping between two computers in the same VLAN and connected to the same switch emphasizes the efficiency and simplicity of VLANs in local communication.