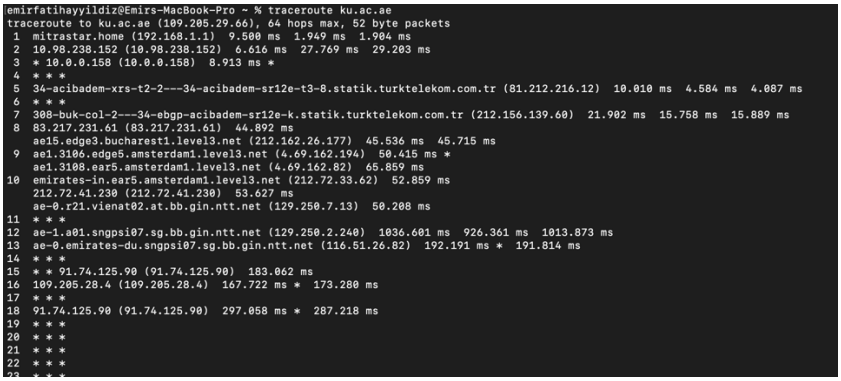
Computer Networks Project 3 Emir Fatih AYYILDIZ 71527

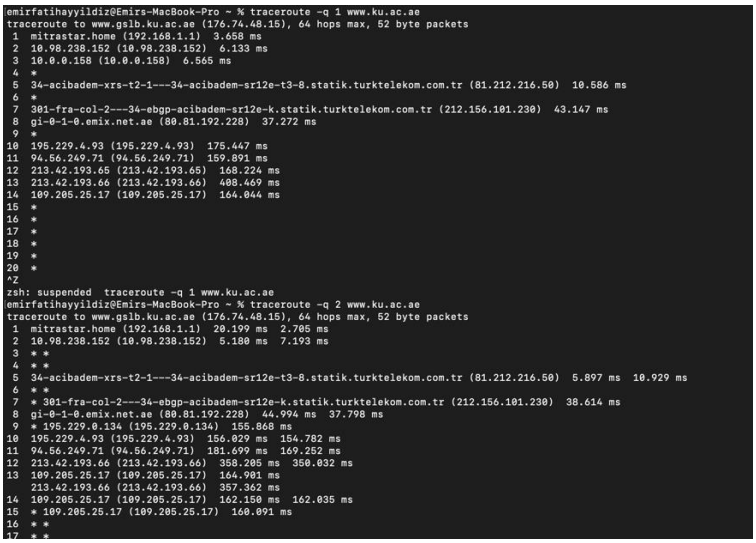
Part 1. Network Layer Analysis

Part-1.1 ICMP Analysis

1) First response from the website can be seen on line 16. Therefore 15 hops is the max ttl.



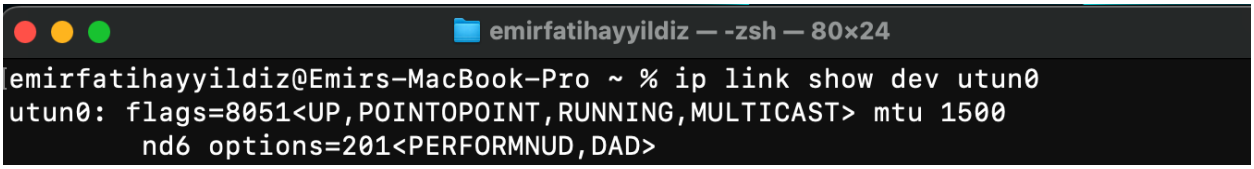
2) With command traceroute -q 2 www.ku.ac.ae, we can indicate the number of packets used. Increasing probes increases reliability, however it increases the load on destination. We can see from the first picture that on line 19, there are 3 symbols, indicating the probs. Default probe is 3.



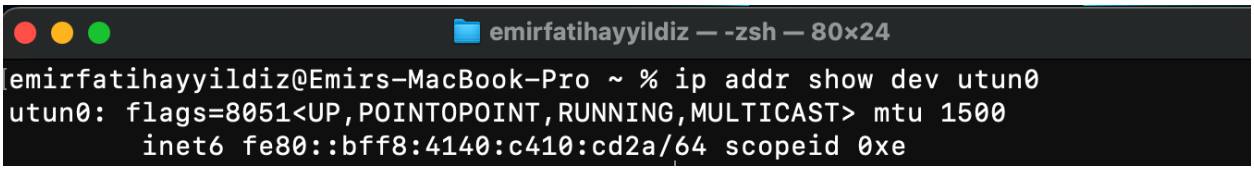
3) When a router receives packets but it doesn't pass to a specific router, the router discards the packets. This is called routing blackhole.

Part-1.2 Network Interface Analysis

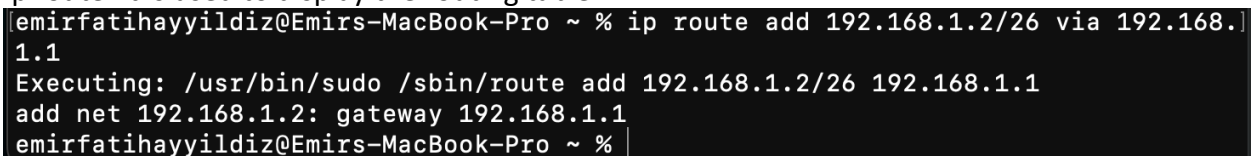
1) Ip link: it is used to display interface links of interfaces



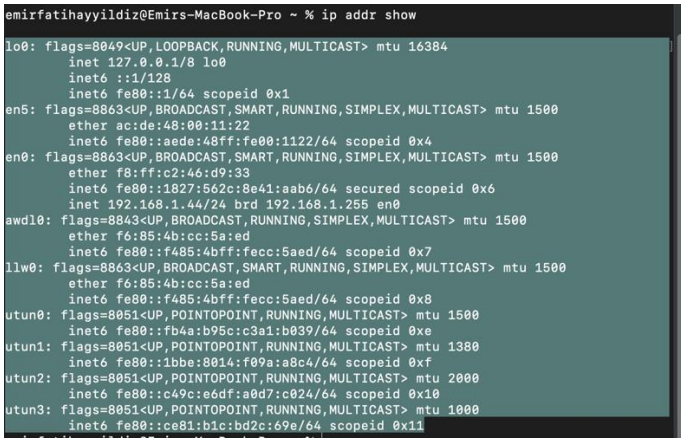
2) Ip addr: it is used to display all ip information of interfaces



3) Ip route: it is used to display the routing table



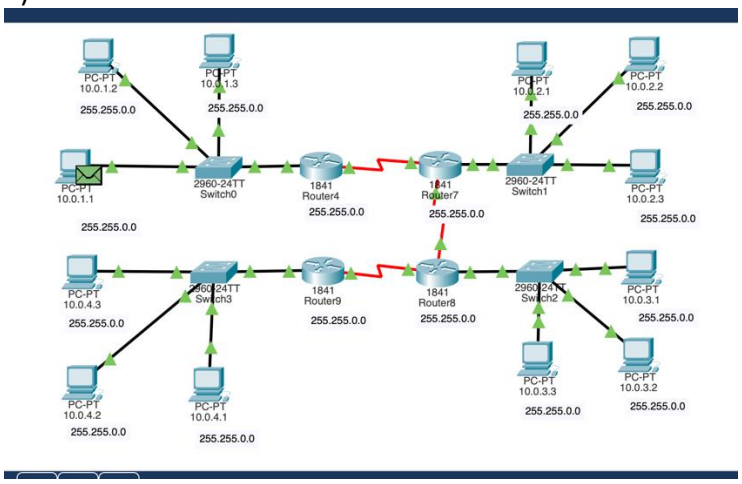
Part 2. Understanding IP and Subnetting:



1) the IP address of the network I am currently connected to is 192.168.1.44, from en0.
2) Subnet of en0 is /24, which is 255.255.255.0
3) The network address I am connected to is 192.168.1.0. I used bitmask my ip address and subnet.
4) Broadcast Address is 192.168.1.255
5) There are 256 addresses in total, 2 of these are reserved for network and broadcast addresses. So, there are room for254 devices.

Part 3. Simulations with Cisco Packet Tracer

1)



2)

Devices:

- Headquarters: 30 devices
- Branch A: 20 devices
- Branch B: 15 devices
- Branch C: 25 devices

Options for ip addresses:

- Option I: 192.168.1.0/24
- **Option II: 10.0.0.0/16**
- Option III: 172.16.0.0/20

For now, any option is enough to contain 90 devices. Subnet of option 2 has 16 bites and 16 bites for host part. When we are adding branches, bits from 16 to 24 are occupied and when we are adding hosts, last 8 bits are occupied. By using option 2, we can add many branches and many host devices for future use. Option 1 doesn't allow for new branches and option 3 has allowance for less branches than option 2.

3) there can be 256 branches from 2^8 and each branch has 256 connections from 2^8. 2 of them are reserved so there can be 256 -2 = 254 devices connected to each branch