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# CSP450: PROJECT 1

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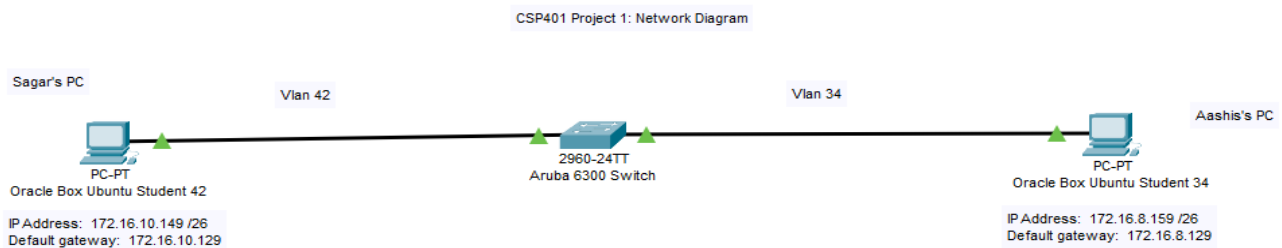
By Sagar Sharma and Aashis Panthi



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# Network Diagram:



Aruba 6300 Switch is at the center.  
Sagar's PC is in VLAN 42 with IP 172.16.10.149/26.  
Aashis's PC is in VLAN 34 with IP 172.16.10.159/26.

## Features and Services:

- Both PCs are getting IP address from two different DHCP pools.

1. pool ssharma533  
Sagar's PC is receiving IP address via this pool.  
Range: 172.16.10.130 - 172.16.10.191
2. pool apanthi  
Aashis's PC is receiving IP address via this pool.  
Range: 172.16.8.130 - 172.16.8.191

- Installed openssh-server on both PCs to allow SSH connection in between them and with the Switch, as well.  
- Internet connection is available in both of the PCs.  
- Static routes have been added from both of the PCs to route traffic via their default gateway.  
- SSH connection to the root account have been disabled on both of the PCs, by editing sshd\_config file.

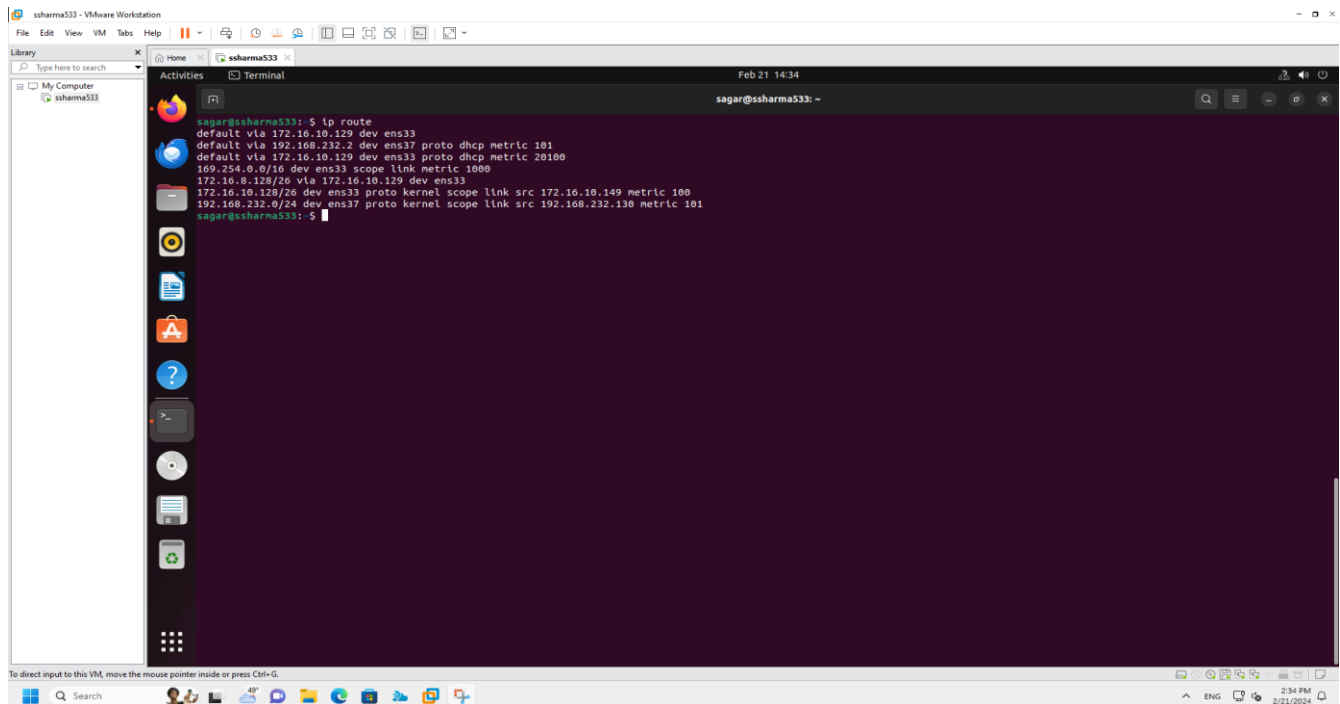
# Screenshots:

## 1. Using command *ip address*

Sagar's PC IP address: 172.16.10.149/26

```
sagar@ssharna533:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: ens33: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 00:0c:29:4d:72:99 brd ff:ff:ff:ff:ff:ff
    altname enp2s1
    inet 172.16.10.149/26 brd 172.16.10.191 scope global dynamic noprefixroute ens33
        valid_lft 3345sec preferred_lft 3345sec
    inet6 fe80:a80a:3125:1f22:f41c:64 scope link noprefixroute
        valid_lft forever preferred_lft forever
3: ens37: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 00:0c:29:4d:72:a3 brd ff:ff:ff:ff:ff:ff
    altname enp2s5
    inet 192.168.232.130/24 brd 192.168.232.255 scope global dynamic noprefixroute ens37
        valid_lft 1553sec preferred_lft 1553sec
    inet 192.168.232.131/24 brd 192.168.232.255 scope global secondary dynamic ens37
        valid_lft 1628sec preferred_lft 1628sec
    inet6 fe80:f52a:6d79:529b:d67d:64 scope link noprefixroute
        valid_lft forever preferred_lft forever
sagar@ssharna533:~$
```

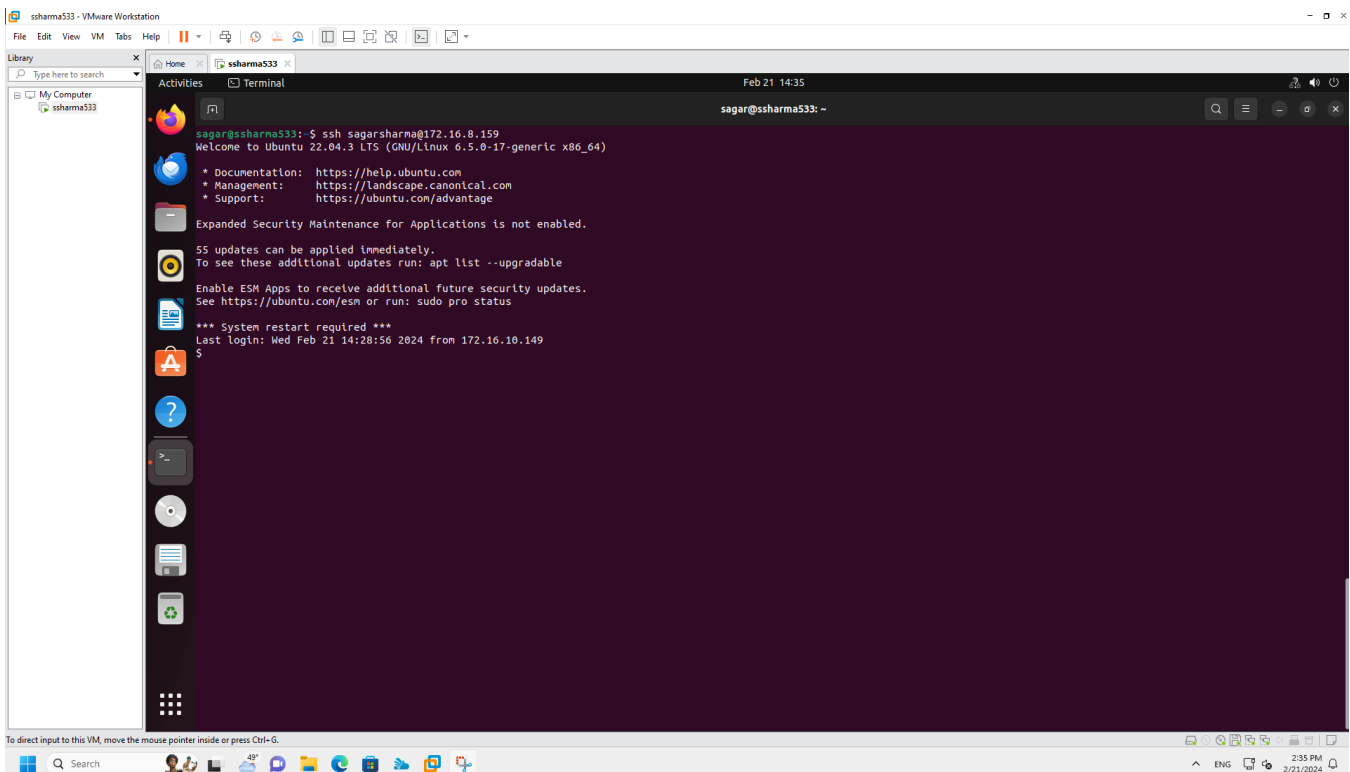
## 2. Command `ip route` 172.16.8.128/26 via 172.16.10.129



The screenshot shows a terminal window titled 'sshama533' within a VMware Workstation environment. The user 'sagar' is logged in. The command 'ip route' has been executed, displaying the following output:

```
sagar@sshama533:~$ ip route
default via 172.16.10.129 dev ens33
default via 192.168.232.2 dev ens37 proto dhcp metric 101
default via 172.16.10.129 dev ens33 proto dhcp metric 20100
169.254.0.0/16 dev ens33 scope link metric 1000
172.16.8.128/26 via 172.16.10.129 dev ens33
172.16.10.128/26 dev ens33 proto kernel scope link src 172.16.10.149 metric 100
192.168.232.0/24 dev ens37 proto kernel scope link src 192.168.232.130 metric 101
sagar@sshama533:~$
```

## 3. SSH result from my Ubuntu VM to partner's VM:



The screenshot shows a terminal window titled 'sshama533' within a VMware Workstation environment. The user 'sagar' is logged in. The command 'ssh sagarsharma@172.16.8.159' has been executed, resulting in a successful SSH connection to another Ubuntu VM. The output shows the SSH banner and system messages:

```
sagar@sshama533:~$ ssh sagarsharma@172.16.8.159
Welcome to Ubuntu 22.04.3 LTS (GNU/Linux 6.5.0-17-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

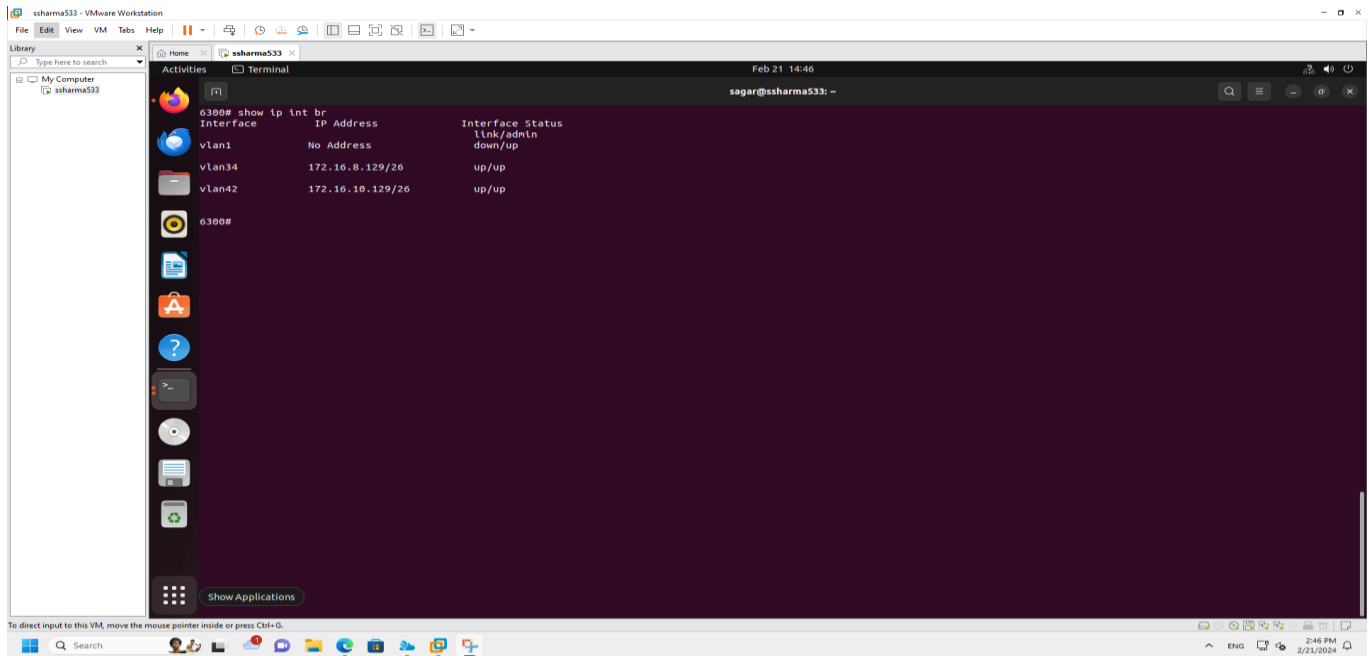
Expanded Security Maintenance for Applications is not enabled.

SS updates can be applied immediately.
To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.
See https://ubuntu.com/esm or run: sudo pro status

*** System restart required ***
Last login: Wed Feb 21 14:28:56 2024 from 172.16.10.149
sagar@sshama533:~$
```

#### 4. Command *show ip interface brief*

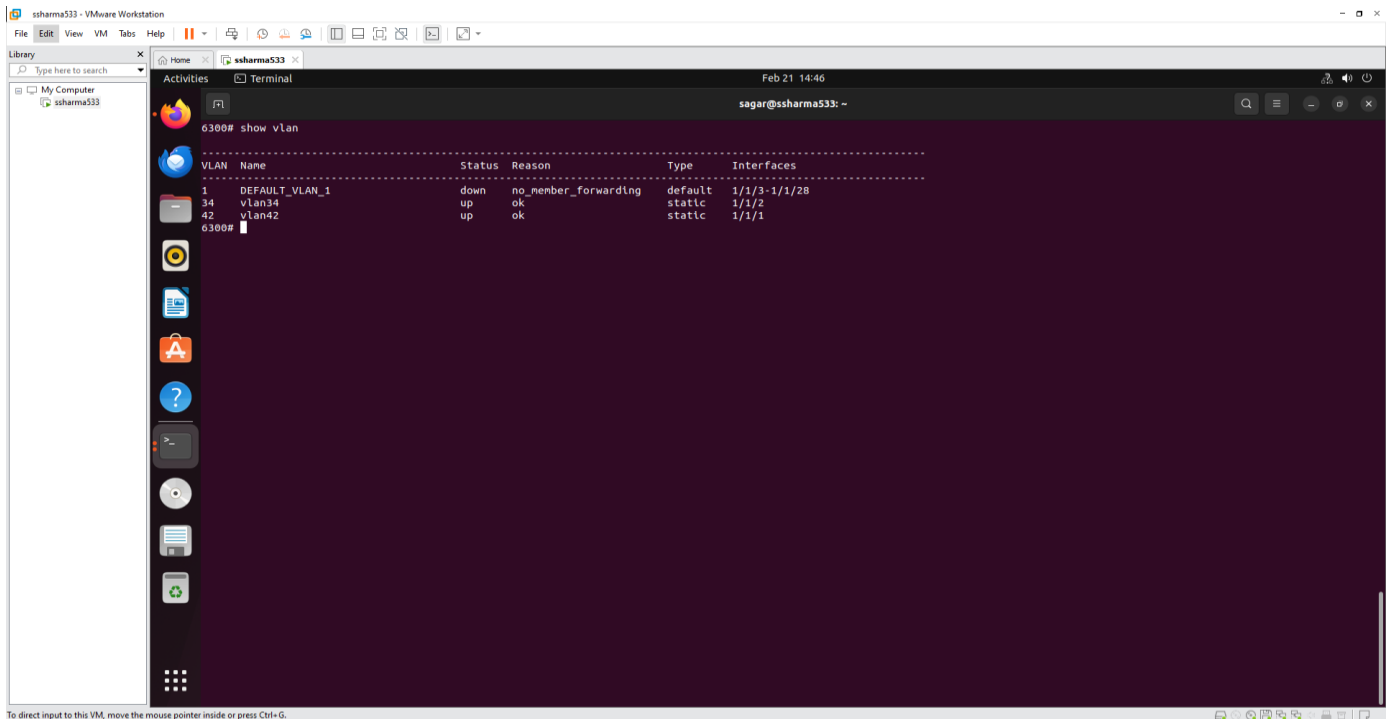


The screenshot shows a VMware Workstation window titled 'sshama533 - VMware Workstation'. Inside, a terminal window is open with the prompt 'sagar@sshama533: ~'. The user has entered the command '6300# show ip int br'. The output is as follows:

Interface	IP Address	Interface Status
vlan1	No Address	link/admin down/up
vlan34	172.16.8.129/26	up/up
vlan42	172.16.10.129/26	up/up

The terminal prompt is now '6300#'. The VMware interface includes a 'Library' pane on the left and a taskbar at the bottom with various application icons.

#### 5. Command *show vlan*

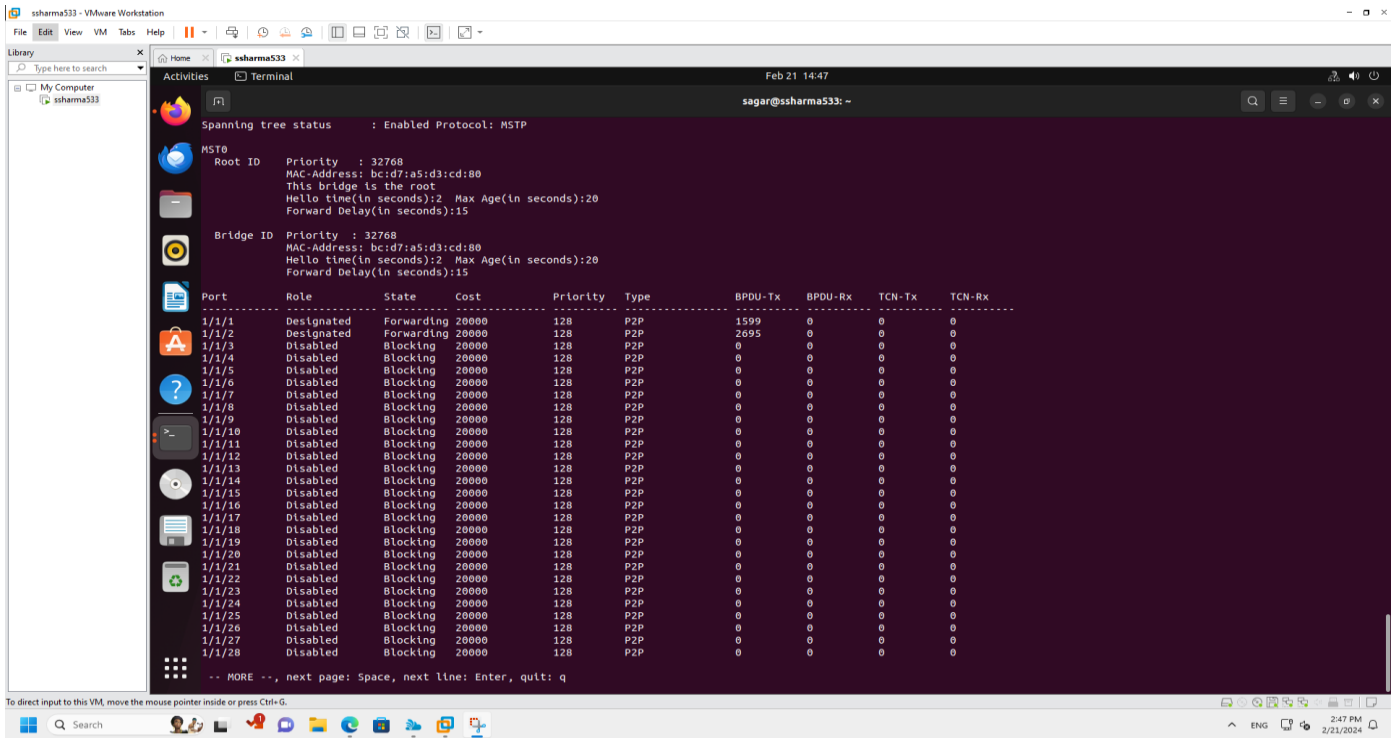


The screenshot shows the same VMware Workstation environment. The terminal window now displays the output of the command '6300# show vlan'. The output is a table with the following data:

VLAN	Name	Status	Reason	Type	Interfaces
1	DEFAULT_VLAN_1	down	no_member_forwarding	default	1/1/3-1/1/28
34	vlan34	up	ok	static	1/1/2
42	vlan42	up	ok	static	1/1/1

The terminal prompt is now '6300#'. The interface remains the same as in the previous screenshot.

## 6. Command *show spanning tree*



```
sagar@ssharmas533:~$ show spanning tree
Spanning tree status      : Enabled Protocol: MSTP

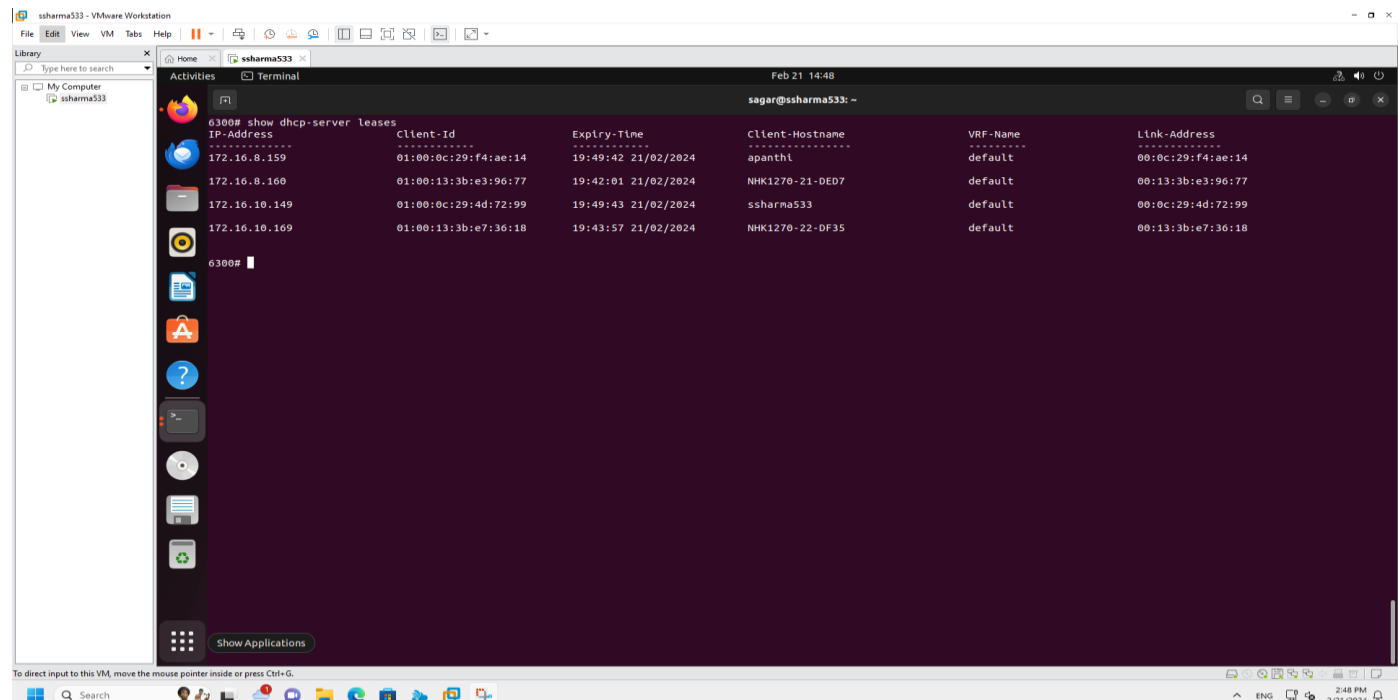
MST0
  Root ID    Priority : 32768
             MAC-Address: bc:d7:a5:d3:cd:80
             This bridge is the root
             Hello time(in seconds):2  Max Age(in seconds):20
             Forward Delay(in seconds):15

  Bridge ID   Priority : 32768
             MAC-Address: bc:d7:a5:d3:cd:80
             Hello time(in seconds):2  Max Age(in seconds):20
             Forward Delay(in seconds):15

  Port      Role      State      Cost      Priority  Type      BPDU-Tx  BPDU-Rx  TCN-Tx  TCN-Rx
  ---
  1/1/1     Designated Forwarding 20000     128       P2P      1599     2695     0        0
  1/1/2     Designated Forwarding 20000     128       P2P      0         0        0        0
  1/1/3     Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/4     Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/5     Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/6     Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/7     Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/8     Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/9     Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/10    Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/11    Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/12    Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/13    Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/14    Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/15    Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/16    Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/17    Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/18    Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/19    Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/20    Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/21    Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/22    Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/23    Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/24    Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/25    Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/26    Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/27    Disabled  Blocking 20000     128       P2P      0         0        0        0
  1/1/28    Disabled  Blocking 20000     128       P2P      0         0        0        0

-- MORE --, next page: Space, next line: Enter, quit: q
```

## 7. Command *show dhcp-server leases*

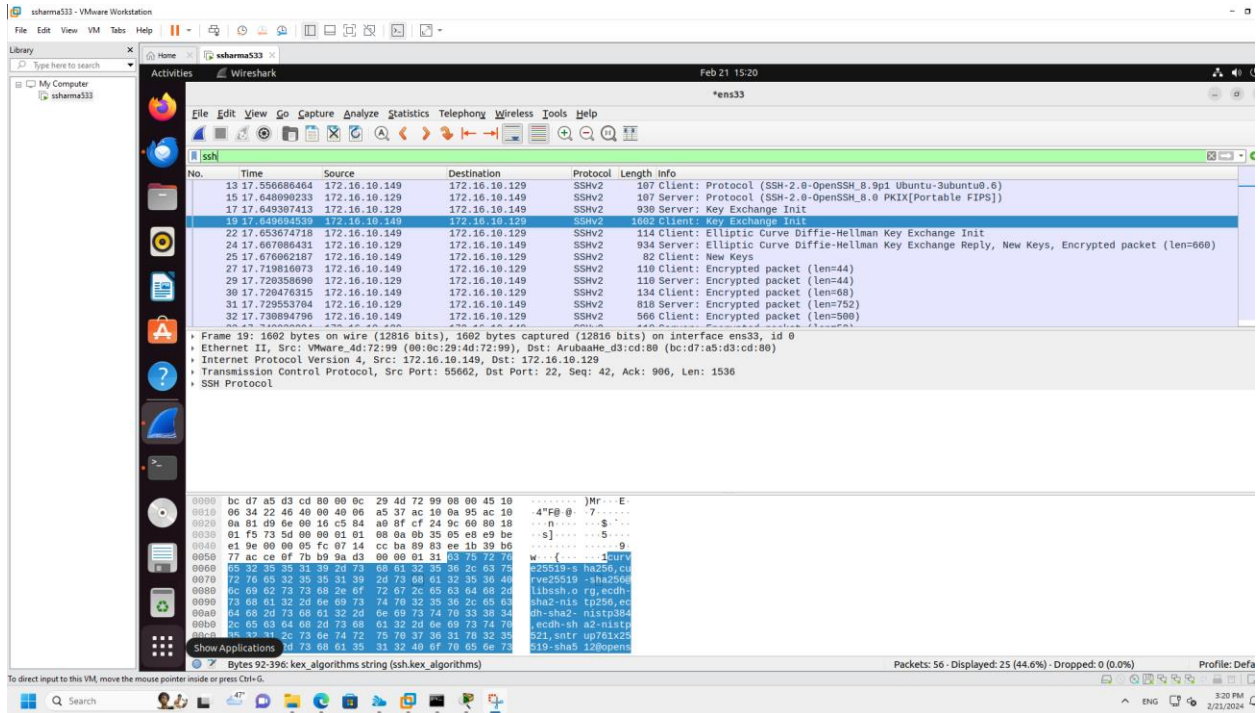


```
6300# show dhcp-server leases
IP-Address      Client-Id      Expiry-Time    Client-Hostname VRF-Name      Link-Address
-----
172.16.8.159    01:00:0c:29:f4:ae:14  19:49:42 21/02/2024  apanthi      default       00:0c:29:f4:ae:14
172.16.8.160    01:00:13:3b:e3:96:77  19:42:01 21/02/2024  NHK1270-21-DED7 default       00:13:3b:e3:96:77
172.16.10.149   01:00:0c:29:4d:72:99  19:49:43 21/02/2024  ssharmas533  default       00:0c:29:4d:72:99
172.16.10.169   01:00:13:3b:e7:36:18  19:43:57 21/02/2024  NHK1270-22-DF35 default       00:13:3b:e7:36:18

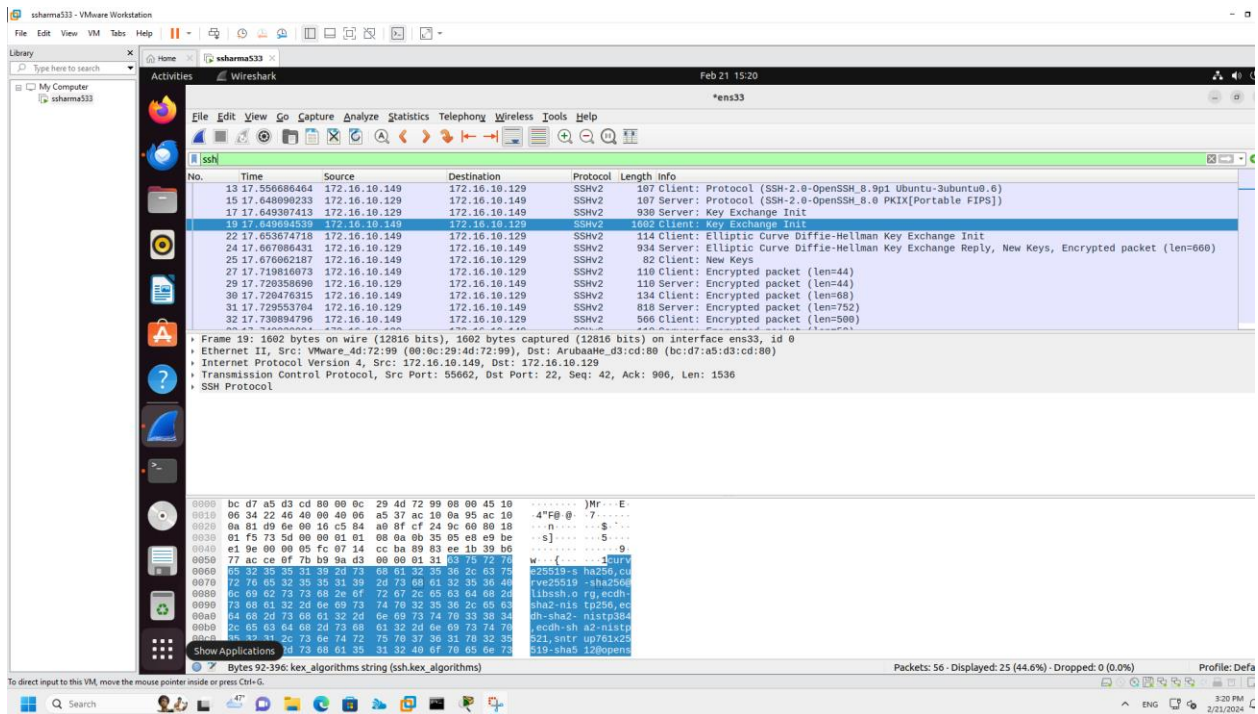
6300#
```

- Screenshots of my filtered .pcap files

1. SSH to Switch



2. SSH to partner's VM





### Script of Project 1

Script that we configured on Aruba 6300 Switch:

```
6300#config t
6300(config)#vlan 42
6300(config-vlan-124)#name vlan42
6300(config-vlan-124)#exit
6300(config)#vlan 34
6300(config-vlan-114)#name vlan34
6300(config-vlan-114)#exit
6300(config)#interface 1/1/1
6300(config-if)#no shutdown
6300(config-if)#no routing
6300(config-if)#vlan access 42
6300(config-if)#exit
6300(config)#interface 1/1/2
6300(config-if)#no shutdown
6300(config-if)#no routing
6300(config-if)#vlan access 34
6300(config-if)#exit
6300(config)#int vlan 42
6300(config-if-vlan)#ip address 172.16.42.2 255.255.255.192
6300(config-if-vlan)#exit
6300(config)#int vlan 34
6300(config-if-vlan)#ip address 172.16.34.2 255.255.255.192
6300(config-if-vlan)#exit
6300(config)#dhcp-server vrf default
6300(config-dhcp-server)#pool ssharma533
6300(config-dhcp-server)#range 172.16.42.1 172.16.42.62
6300(config-dhcp-server)#default-router 172.16.42.1
6300(config-dhcp-server)#exit
6300(config-dhcp-server)#pool apanthi
6300(config-dhcp-server)#range 172.16.34.1 172.16.34.62
6300(config-dhcp-server)#default-router 172.16.34.1
6300(config-dhcp-server)#exit
6300(config-dhcp-server)#authoritative
6300(config-dhcp-server)#enable
6300(config-dhcp-server)#exit
```