CS302 Computer Network Lab

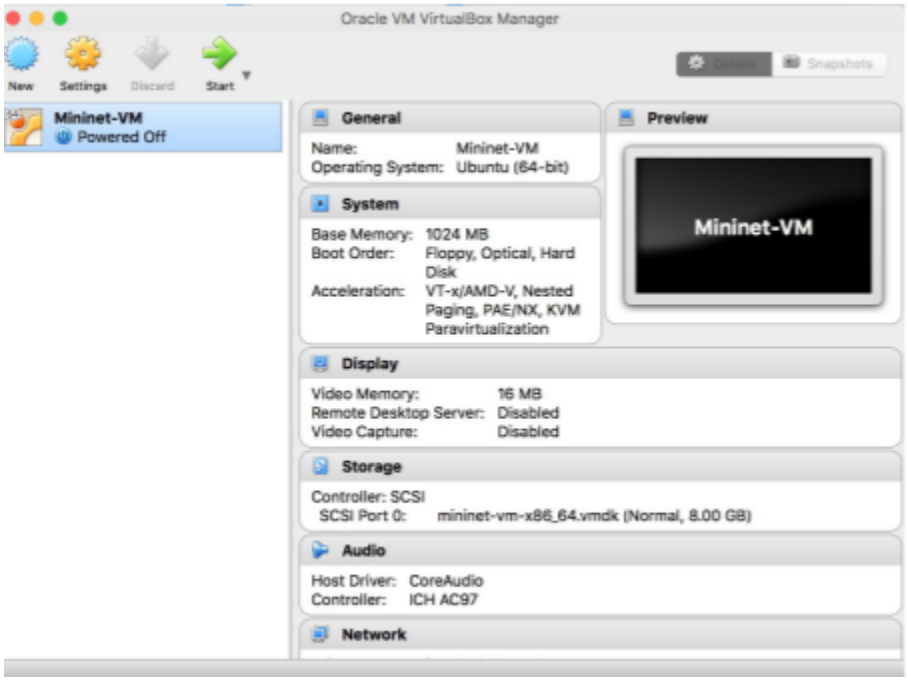
Assignment 6

Introduction to Mininet

- Setup Mininet in a VirtualBox VM
- Familiarize with Linux and basic networking tools in Linux
- Exploring Mininet

Setting up Mininet:

- Download the latest Mininet VM image
- Download and install virtualbox on your laptop
- Start the virtual box application and import the mininet VM image in the virtual box. You can either click on the VM image or import via the menu in the virtual box window.



- Click on the imported VM to start it. Login to Mininet using following credentials:
  Username: mininet
  Password: mininet

Basic networking commands in Linux

Try the below commands in the mininet-vm terminal (install using sudo apt-get install if not available).

1. ifconfig
2. ping
3. arp
4. nslookup
5. whois
6. traceroute
7. hostname
8. route
9. netstat
10. tcpdump

More information for these commands can be obtained using: man <commandname>

Commands:

- https://www.tecmint.com/linux-network-configuration-and-troubleshooting-commands/
- https://tldp.org/LDP/GNU-Linux-Tools-Summary/html/c8319.htm
- https://devopscube.com/list-linux-networking-troubleshooting-and-commands-beginners/

Mininet walkthrough

Repeat the networking commands after you have created a network in mininet as explained below.

Display Startup Options:

```
sudo mn -h
```

Start Wireshark:

```
sudo wireshark &
```

Interact with hosts and switches:

```
sudo mn
```

Display nodes:

```
mininet> nodes
```

Display links:

```
mininet> net
```

Ping h1 to h2:

```
mininet> h1 ping -c 1 h2
```

Questions:

Part A

1. Print the list of network interfaces, their MAC addresses and their assigned IP addresses, if any.
2. Calculate the latency between mininet vm and www.rutgers.edu for 10 packets. Repeat the result for stanford.edu and www.google.co.in and compare the difference in latency.

Part B

Create a simple two node network using "sudo mn" and do the following

a. Print the MAC address of host h1. Print the MAC addresses of switch s1. Explain the different interfaces that s1 has.
b. Ping h1 from h2 and view the ARP entries stored at hosts h1 and h2. 3. Measure the TCP throughput from h1 to h2 using iperf

References:

Installation:
https://www.youtube.com/watch?v=3VY7KMPmEVo

Creating a simple network in mininet:

- Mininet Walkthrough
- Mininet Sample Workflow
- https://webcms3.cse.unsw.edu.au/files/894894253a9d7bb9b3575af5092c2d80c9382bbbf860e4a9364cfae2bcf04cd6/attachment

- Introduction to Mininet
- Mininet Basics Tutorial - Essentials You Need to Know
- Mininet Tutorials
- Mininet Tutorials
- https://drive.google.com/drive/folders/14WnnJ3kPqQ79bwvEAFZcxUnE9OybIhWA?usp=sharing