**Virtual Networking Assignment**

1. **Installing a Virtual Machine:**Download Oracle Virtual Box and install it. System in which Hypervisor is installed is called as Host machine. Hypervisor is a software which acts as a interface between virtual machines and physical Hardwar.
2. **Creating Virtual Machine:**Download Linux iso file from internet and open Hypervisor and start creating virtual machine by clicking   
   New > Give a Name(VM1) > Type > Version > Next >  
   > Memory Size 4GB >   
   > Create a Virtual Hard disk now > Crate >  
   > VDI > Next >   
   > Dynamically allocate > next >   
   > File location and size: 15 GB > Create >  
   > Select created virtual machine > Settings > Storage > Controller: IDE > Add iso file location path > OK   
     
   Create another virtual machine by following above steps and name it as VM2.
3. **Configuring the virtual machine:**The following steps will allow us to connect out virtual machines to the local network.  
   3.1 Hardware configuration:  
    Networking: Select the virtual machine and click on settings and got to network and select Bridged Adapter for Attacked to drop down. Under Advanced Promiscuous Mode: Allow All and click Ok.   
   Launch the virtual machines by clicking start and login through root user and password.   
   3.2 Network configuration:  
    ip configuration: The ip address for the virtual machine must be set to 172.20.34.104. The netmask is 255.255.255.255.0  
    Check the ip and routing table using the ip a and route commands.  
   3.3 Test the network configuration:  
    Use the ping command in the host machine to test the connection with the virtual machine.
4. **Configuring machines:**Machine one has two network interfaces, one connected to the subnet 172.20.34.2 and another one connected to the subnet 172.20.34.3. Since machine 1 will be the default gateway for machines 2 and 3, ip forwarding must be enabled. This will allow machine 2 and 3 to communicate with machines outside the subnet 192.168.1.2.  
   Set machine 1 as the default gateway for both machines 2 and 3. Use the ping command to test the connectivity between all virtual machines, as well as with the host system.
5. **Configuring machine 1 NAT:**During the previous step, the connectivity test between machines 2 or 3 with the host system failed. Since NAT was not enabled in machine 1, the host sent the reply to its gateway, which eventually dropped the packet. Use the iptables command (man iptables) in machine 1 to correct this behaviour.  
   iptables –P FORWARD ACCEPT  
   iptables –F FORWARD  
   iptables –t nat -F  
   iptables –t nat –A POSTROUTING –o eth0 –j MASQUERADE  
   Use machine 3 to run tcpdump and capture all network traffic. Make sure you can detect ICMP packets originating at machine 1 and destined to machine 2.