Aim- Implementation of host based virtualization using KVM. (Test NAT to NAT)

Theory-

→ Host based virtualization allows multiple VMs to share the resources on a single centralized host.

→ Access and control is provided to the user by a client device connected over a network

→ Host based virtualization can be implemented using VMware, Virtual Box and linux kernel based virtual machine

Kernel-based Virtual Machine (KVM)

- KVM lets us is an open source virtualizati. technology to built into linux.

- This hypervisor allows the host machine to run multiple, isolated virtual environments called guests or virtual machines (VMs).

→ KVM converts linux kernel into a type-1 base metal hypervisor.

→ All hypervisors require components like

* Memory manager
* Device driver
* scheduler
* security manager
* I/o stack
* Network stack etc

Teacher's Sign.:

- Every VM is implemented as a regular linux process, scheduled by standard linux scheduler with dedicated virtual h/w like network, gpu, cpu, memory etc.

Features of KVM

→ Security : KVM uses Security-Enhanced-linux and secure-Virtualization (sVirt)

→ storage : All storage formats and devices supported by Linux are supported by KVM.

→ Memory Management : KVM inherits the memory features of linux including non-uniform access and kernel same-page merging.

→ live migration - KVM supports live migration which is the ability to move a running (VM) between hosts without service interception

→ low latency, higher prioritization : The linux kernel features real-time extensions that ensures low latency for VM-based apps with better prioritization.

Implementation :

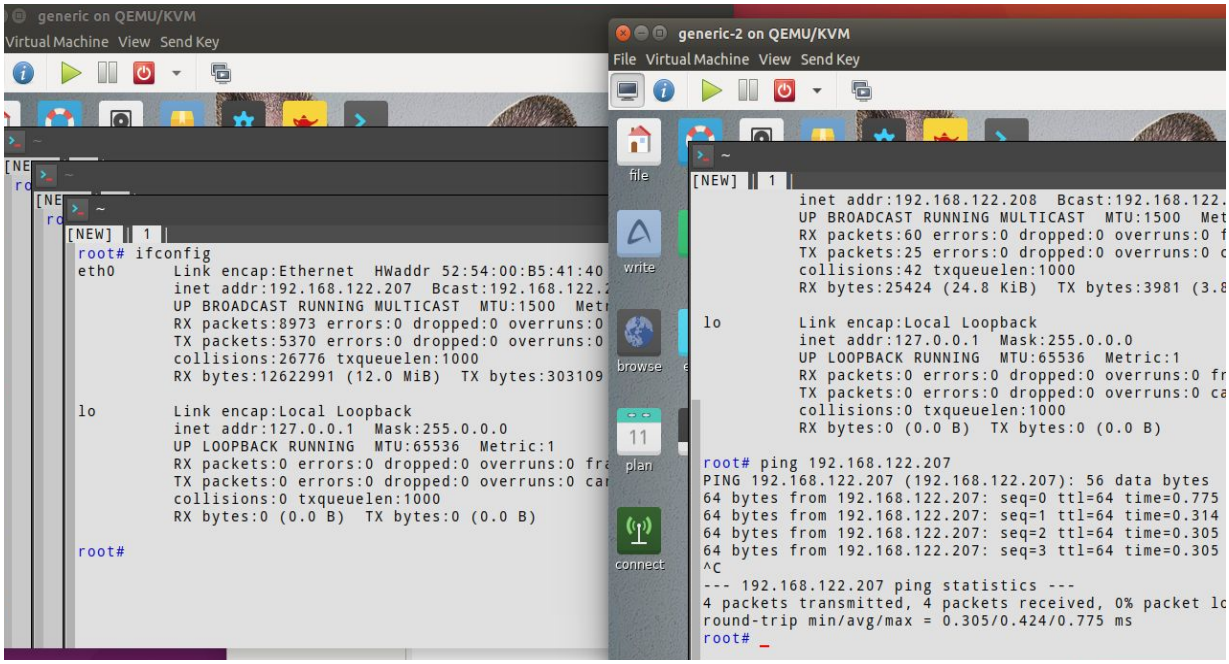
-> A software "virtual Machine Manager" is used to manage VMs more conveniently via a GUI

Teacher's Sign.: _____

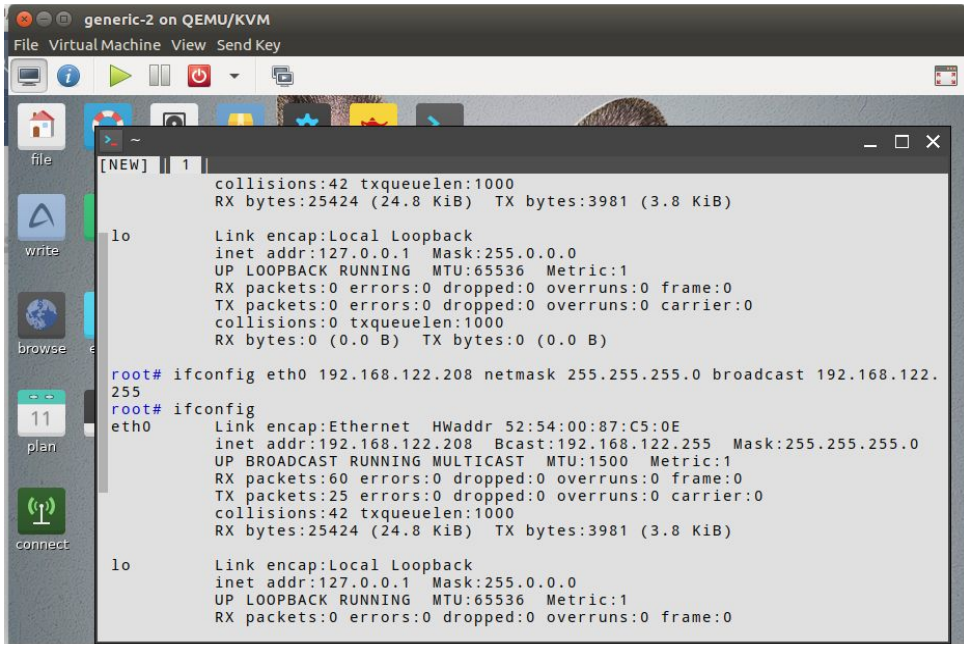
Steps to install KVM & VM :

sudo apt-get install qemu-kvm
sudo adduser <username>
virt-c qemu:///system

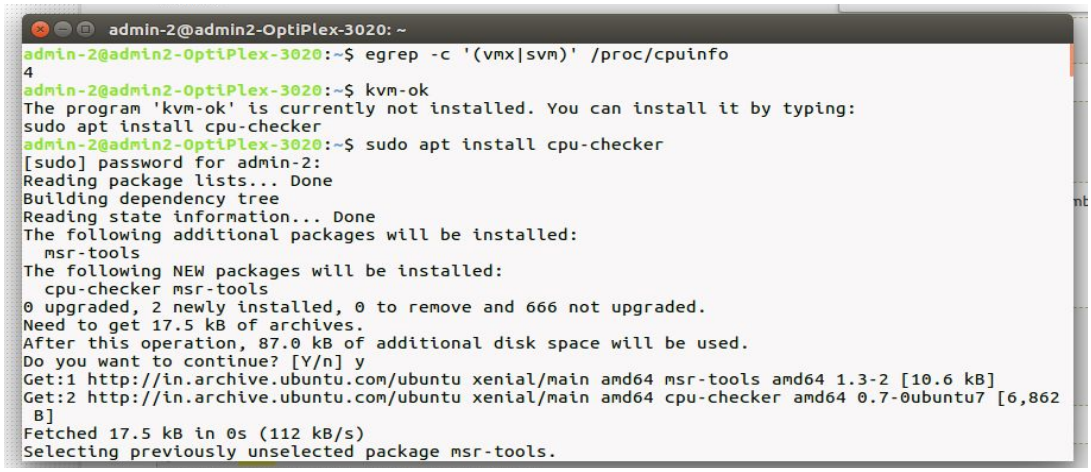
Conclusion - Hence we have succesfully ~~installed~~ implemented hostboard virtualization

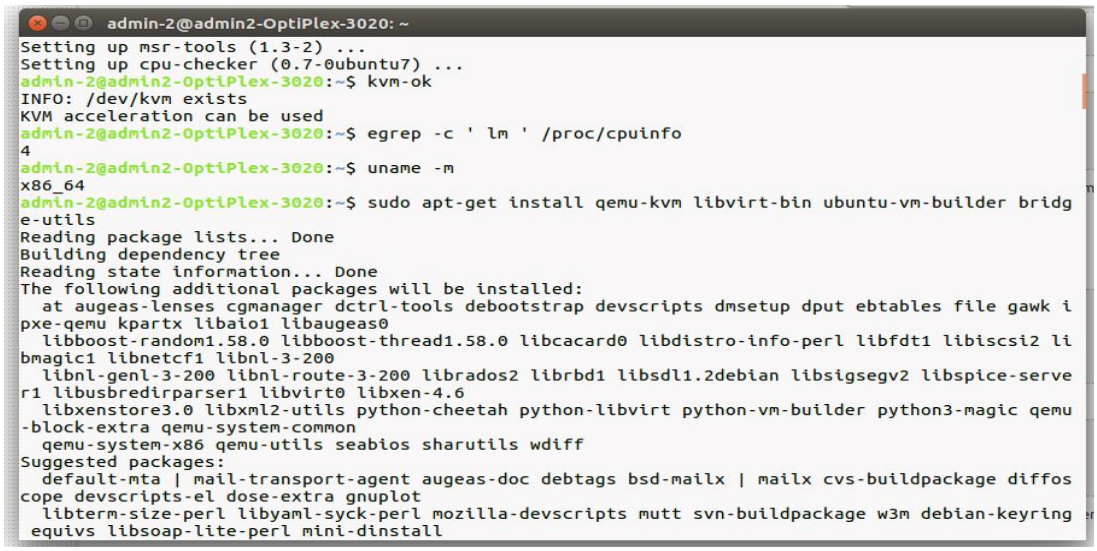


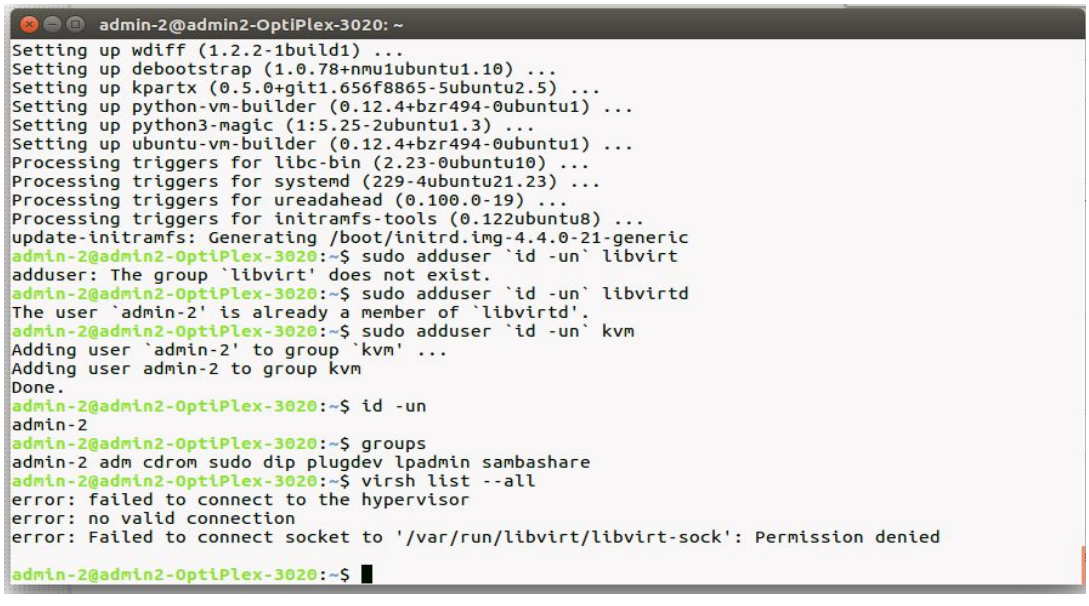
Changing the ip address

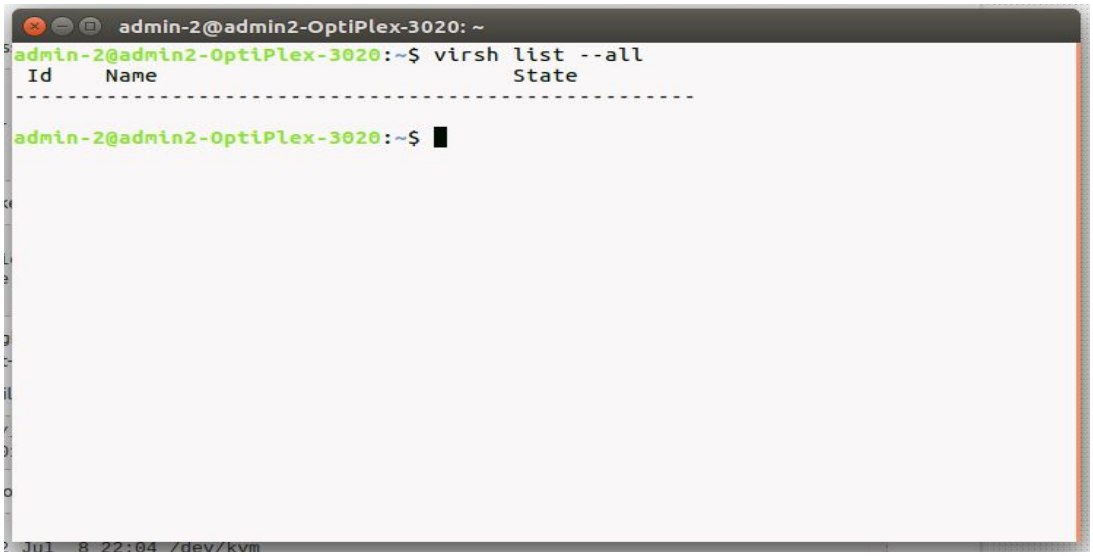


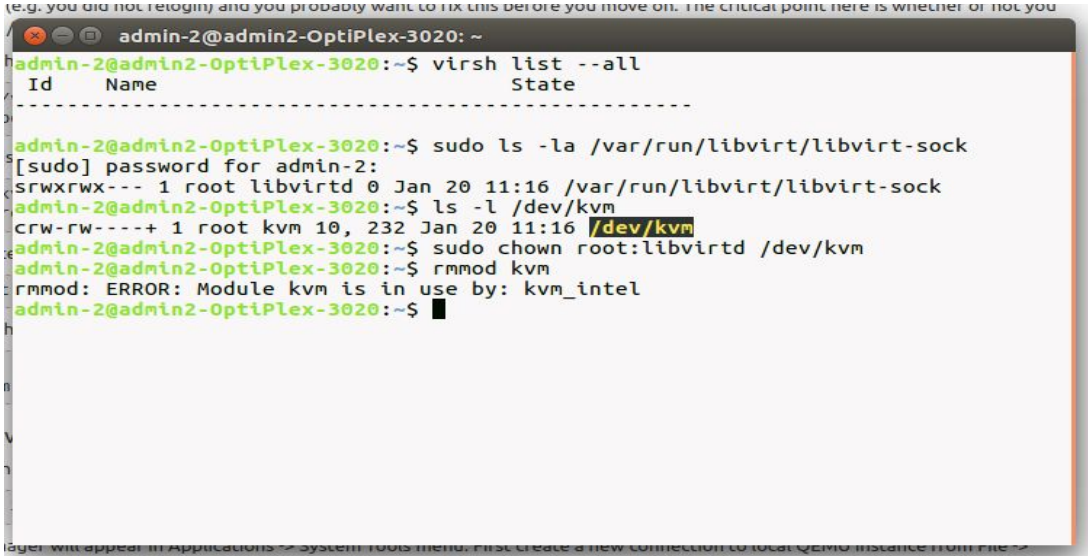
Installation Steps:

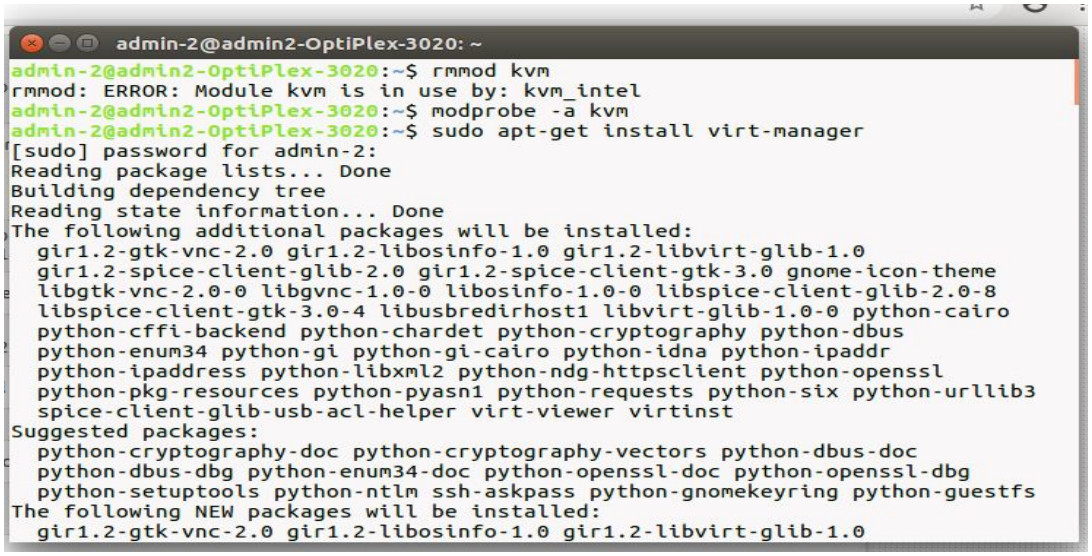







admin-2@admin2-OptiPlex-3020: ~
admin-2@admin2-OptiPlex-3020:~$ virsh list --all
Id Name State
admin-2@admin2-OptiPlex-3020:~$


admin-2@admin2-OptiPlex-3020: ~
admin-2@admin2-OptiPlex-3020:~$ virsh list --all
Id Name State
admin-2@admin2-OptiPlex-3020:~$ sudo ls -la /var/run/libvirt/libvirt-sock
[sudo] password for admin-2:
srwxrwx--- 1 root libvirtd 0 Jan 20 11:16 /var/run/libvirt/libvirt-sock
admin-2@admin2-OptiPlex-3020:~$ ls -l /dev/kvm
crw-rw----+ 1 root kvm 10, 232 Jan 20 11:16 /dev/kvm
admin-2@admin2-OptiPlex-3020:~$ sudo chown root:libvirtd /dev/kvm
admin-2@admin2-OptiPlex-3020:~$ rmmod kvm
rmmod: ERROR: Module kvm is in use by: kvm_intel
admin-2@admin2-OptiPlex-3020:~$


admin-2@admin2-OptiPlex-3020: ~
admin-2@admin2-OptiPlex-3020:~$ rmmod kvm
rmmod: ERROR: Module kvm is in use by: kvm_intel
admin-2@admin2-OptiPlex-3020:~$ modprobe -a kvm
admin-2@admin2-OptiPlex-3020:~$ sudo apt-get install virt-manager
[sudo] password for admin-2:
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
gir1.2-gtk-vnc-2.0 gir1.2-libosinfo-1.0 gir1.2-libvirt-glib-1.0
gir1.2-spice-client-glib-2.0 gir1.2-spice-client-gtk-3.0 gnome-icon-theme
libgtk-vnc-2.0-0 libgvnc-1.0-0 libosinfo-1.0-0 libspice-client-glib-2.0-8
libspice-client-gtk-3.0-4 libusbredirhost1 libvirt-glib-1.0-0 python-cairo
python-cffi-backend python-chardet python-cryptography python-dbus
python-enum34 python-gi python-gi-cairo python-idna python-ipaddr
python-ipaddress python-libxml2 python-ndg-httpsclient python-openssl
python-pkg-resources python-pyasn1 python-requests python-six python-urllib3
spice-client-glib-usb-acl-helper virt-viewer virtinst
Suggested packages:
python-cryptography-doc python-cryptography-vectors python-dbus-doc
python-dbus-dbg python-enum34-doc python-openssl-doc python-openssl-dbg
python-setuptools python-ntlm ssh-askpass python-gnomekeyring python-guestfs
The following NEW packages will be installed:
gir1.2-gtk-vnc-2.0 gir1.2-libosinfo-1.0 gir1.2-libvirt-glib-1.0