Apoorva S
231047026

MPI CLUSTER

In master and client install

step 1: install mpi in both client and server
sudo apt install -y mpich

step 2: add ip address of master and client
-sudo nano /etc/hosts
  -172.16.51.52   master
  -172.16.51.39   client1

```
# The following lines are desirable for IPv6 capable hosts
::1     ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
# mpi setup

172.16.51.49    master
172.16.51.52    client2
```

step 3: add new user
-sudo adduser mpiuser   //eg sudo adduser cam5
-sudo usermod -aG sudo mpiuser //Making mpiuser a sudoer

```
msis@k8worker2:~$ sudo adduser cam5
Adding user `cam5' ...
Adding new group `cam5' (1004) ...
Adding new user `cam5' (1004) with group `cam5' ...
Creating home directory `/home/cam5' ...
Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for cam5
Enter the new value, or press ENTER for the default
        Full Name []:
        Room Number []:
        Work Phone []:
        Home Phone []:
        Other []:
Is the information correct? [Y/n] y
```

step 4 : add openssh-server
-sudo apt install openssh-server

step 5 : Log in to the newly created user by

-su – mpiuser   //switch to mpiuser if needed

step 6: in master

-ssh-keygen -t rsa   //it will generate the key i.e authorized_key
-cd .ssh/
-cat id_rsa.pub >> authorized_keys
-ssh-copy-id client1

```
msis@k8worker2:~$ ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/home/msis/.ssh/id_rsa):
/home/msis/.ssh/id_rsa already exists.
Overwrite (y/n)? y
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /home/msis/.ssh/id_rsa
Your public key has been saved in /home/msis/.ssh/id_rsa.pub
The key fingerprint is:
SHA256:iI7TiFzDWT49AOdFZAqevJSwJONieSpfPcssB5Zz2Y8 msis@k8worker2
The key's randomart image is:
+---[RSA 3072]----+
|oo o .o=         |
|+.* B +          |
|.= B =           |
|o = =+o+          |
|.. *Bo*oS         |
|oo.B.*.o.o         |
|..= + = E .        |
|    . o           |
|                  |
+----[SHA256]-----+
```

step7: in client
-ssh master

```
cam5@k8worker2:~$ ssh master
The authenticity of host 'master (172.16.51.49)' can't be established.
ED25519 key fingerprint is SHA256:4rXne/syCxmCEzjc004T2nHVoBmYOirt73xbBKsZPQU.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? y
Please type 'yes', 'no' or the fingerprint: yes
Warning: Permanently added 'master' (ED25519) to the list of known hosts.
cam5@master's password:
Welcome to Ubuntu 22.04.1 LTS (GNU/Linux 6.2.0-36-generic x86_64)

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

196 updates can be applied immediately.
2 of these updates are standard security updates.
To see these additional updates run: apt list --upgradable


1 updates could not be installed automatically. For more details,
see /var/log/unattended-upgrades/unattended-upgrades.log
Last login: Tue Nov 14 15:00:26 2023 from 172.16.51.39
```

Setting up NFS in master

-sudo apt-get install nfs-kernel-server
-sudo nano /etc/exports
add >>

>> /home/mpiuser/cloud 172.20.36.121(rw,sync,no_root_squash,no_subtree_check)

cloud is the foldername
mpiuser is the username

```
  GNU nano 6.2                        /etc/exports *
# /etc/exports: the access control list for filesystems which may be exported
#               to NFS clients.  See exports(5).
#
# Example for NFSv2 and NFSv3:
# /srv/homes       hostname1(rw,sync,no_subtree_check) hostname2(ro,sync,no_sub>
#
# Example for NFSv4:
# /srv/nfs4        gss/krb5i(rw,sync,fsid=0,crossmnt,no_subtree_check)
# /srv/nfs4/homes  gss/krb5i(rw,sync,no_subtree_check)

/home/cm5/cloud*(rw,sync,no_root_squash,no_subtree_check)




^G Help        ^O Write Out ^W Where Is  ^K Cut       ^T Execute   ^C Location
^X Exit        ^R Read File ^\ Replace   ^U Paste     ^J Justify   ^/ Go To Line
```

-exportfs -a

-sudo service nfs-kernel-server restart

Setting up NFS in client

-sudo apt-get install nfs-common

mkdir cloud

sudo mount -t nfs master:/home/mpiuser/cloud ~/cloud

df -h   //To check the mounted directories

```
0 upgraded, 0 newly installed, 0 to remove and 194 not upgraded.
msis@k8worker2:~$ sudo apt install nfs-common
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
nfs-common is already the newest version (1:2.6.1-1ubuntu1.2).
nfs-common set to manually installed.
The following package was automatically installed and is no longer required:
  python3-resolvelib
Use 'sudo apt autoremove' to remove it.
0 upgraded, 0 newly installed, 0 to remove and 194 not upgraded.
msis@k8worker2:~$ sudo mount -t nfs master:/home/cam5/cloud ~/cloud
msis@k8worker2:~$ ls
```