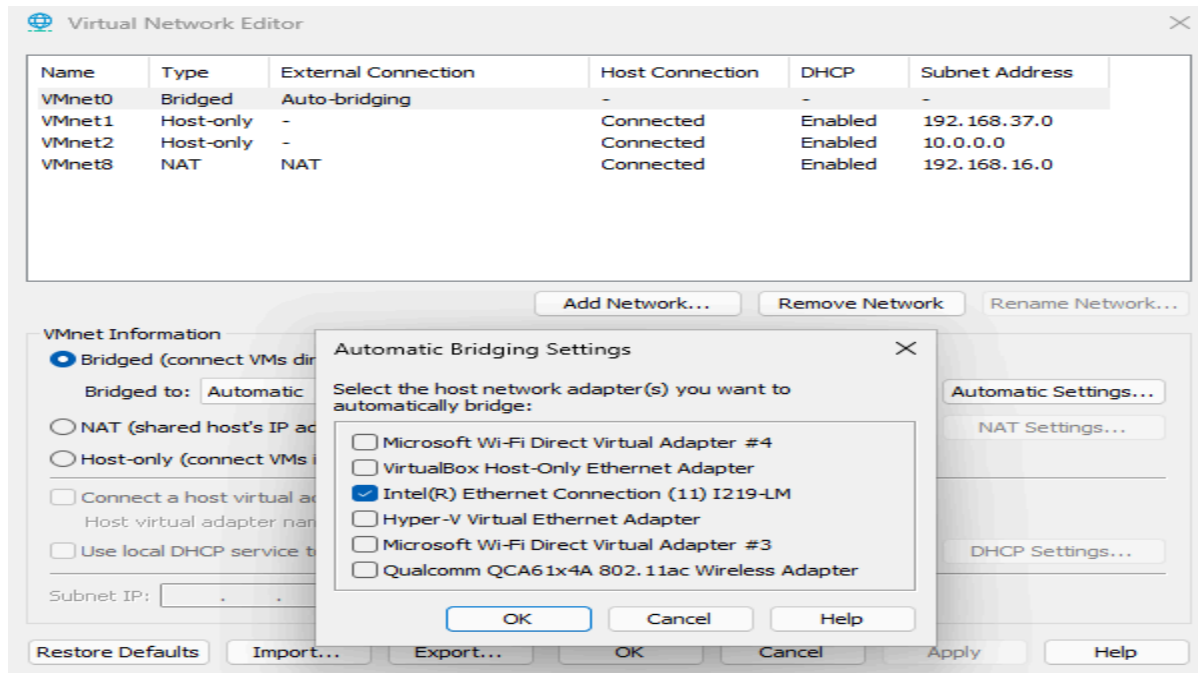


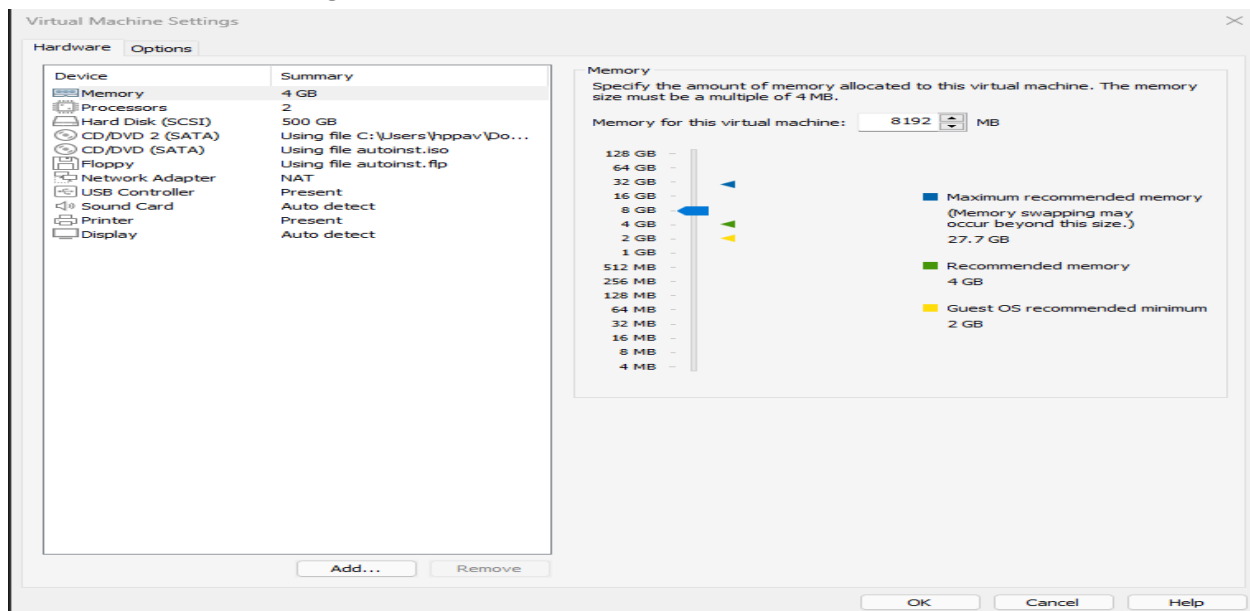
# Assignment 1

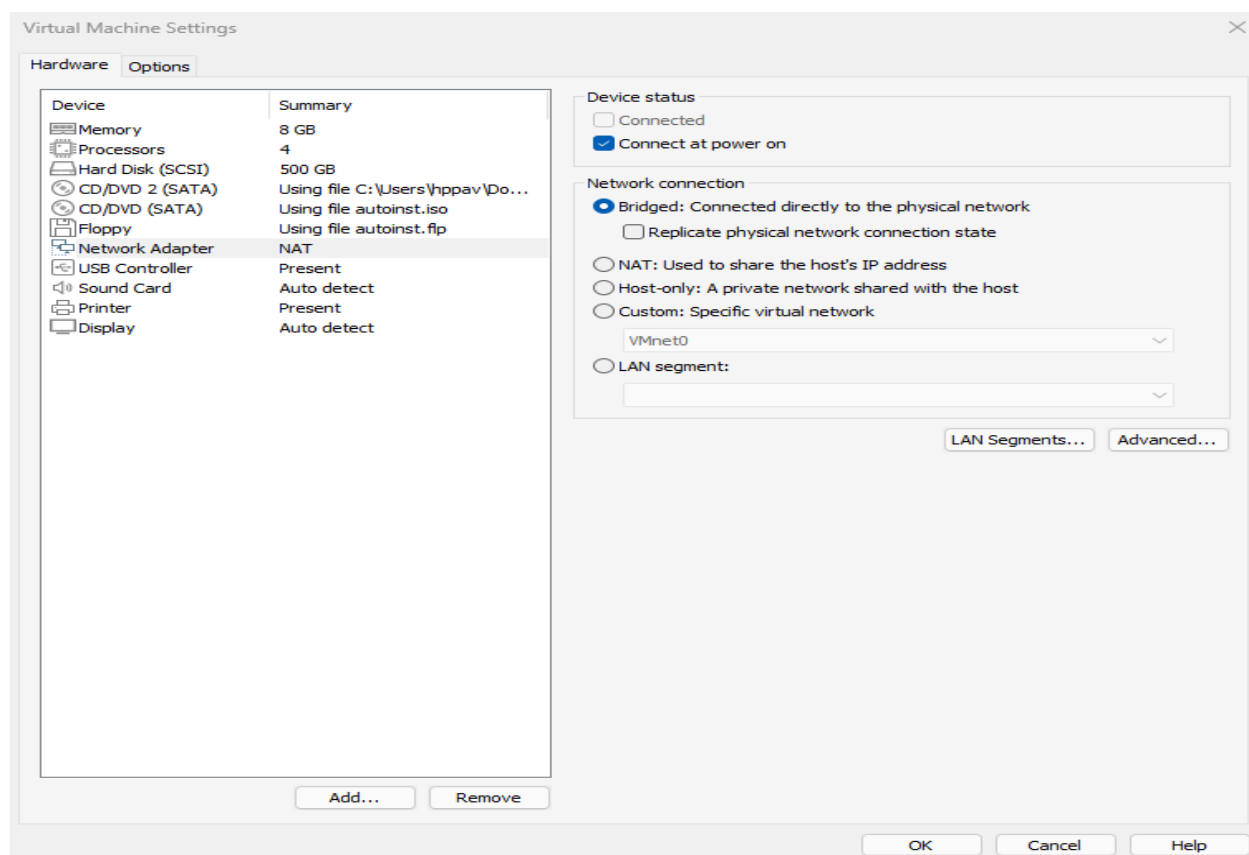
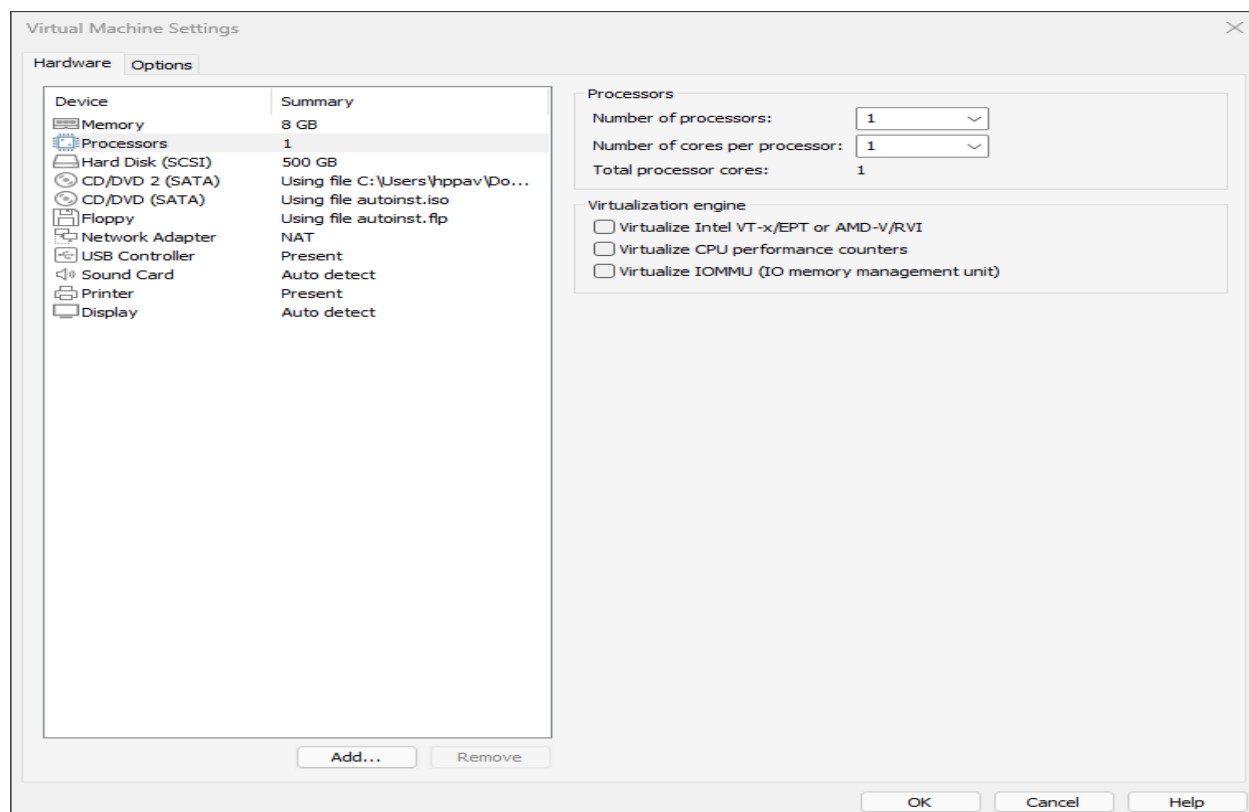
Gaurav Chaudhari  
240840127033

Check whether in bridge network only select external Ethernet connection



Edit virtual machine settings give ram 8gb,processors and co-processors 1 and select bridge network





```
sudo su
apt-get update -y
apt-get upgrade -y
```

```
Controller ip address : 192.168.82.233
sudo hostnamectl set-hostname controller
```

```

ens33: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.82.50 netmask 255.255.255.0 broadcast 192.168.82.255
    inet6 fe80::e786:2879:92f4:58cf prefixlen 64 scopeid 0x20<link>
    ether 00:0c:29:78:f3:29 txqueuelen 1000 (Ethernet)
    RX packets 2850 bytes 503146 (503.1 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 240 bytes 22854 (22.8 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 179 bytes 16394 (16.3 KB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 179 bytes 16394 (16.3 KB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

master@ubuntu:~$ sudo su
root@ubuntu:/home/master# sudo hostnamectl set-hostname controller
root@ubuntu:/home/master# hostname
controller
root@ubuntu:/home/master#

```

```
apt-get install openssh-server
sudo systemctl enable ssh
```

```
Sudo visudo
master ALL=(ALL:ALL) NOPASSWD: ALL
```

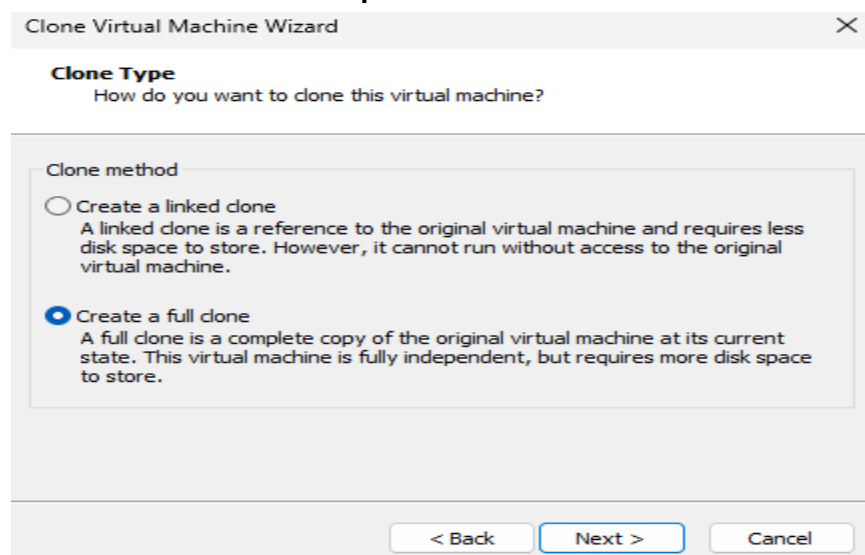
```
master@ubuntu: ~  
GNU nano 4.8 /etc/sudoers.tmp  
#  
# See the man page for details on how to write a sudoers file.  
#  
Defaults      env_reset  
Defaults      mail_badpass  
Defaults      secure_path="/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr  
# Host alias specification  
# User alias specification  
# Cmnd alias specification  
# User privilege specification  
root    ALL=(ALL:ALL) ALL  
master  ALL=(ALL:ALL) NOPASSWD: ALL  
# Members of the admin group may gain root privileges  
%admin   ALL=(ALL) ALL  
# Allow members of group sudo to execute any command  
[ Read 30 lines ]  
^G Get Help  ^O Write Out ^W Where Is  ^K Cut Text  ^J Justify  
^X Exit      ^R Read File ^\ Replace   ^U Paste Text ^T To Spell
```

**Save it and reboot then shutdown the system**

`sudo chmod 700 /home/master/`

`ls -l /home/`

**Clone the machine and create two compute machines**



## Copy ip address of compute machines and set hostname for that

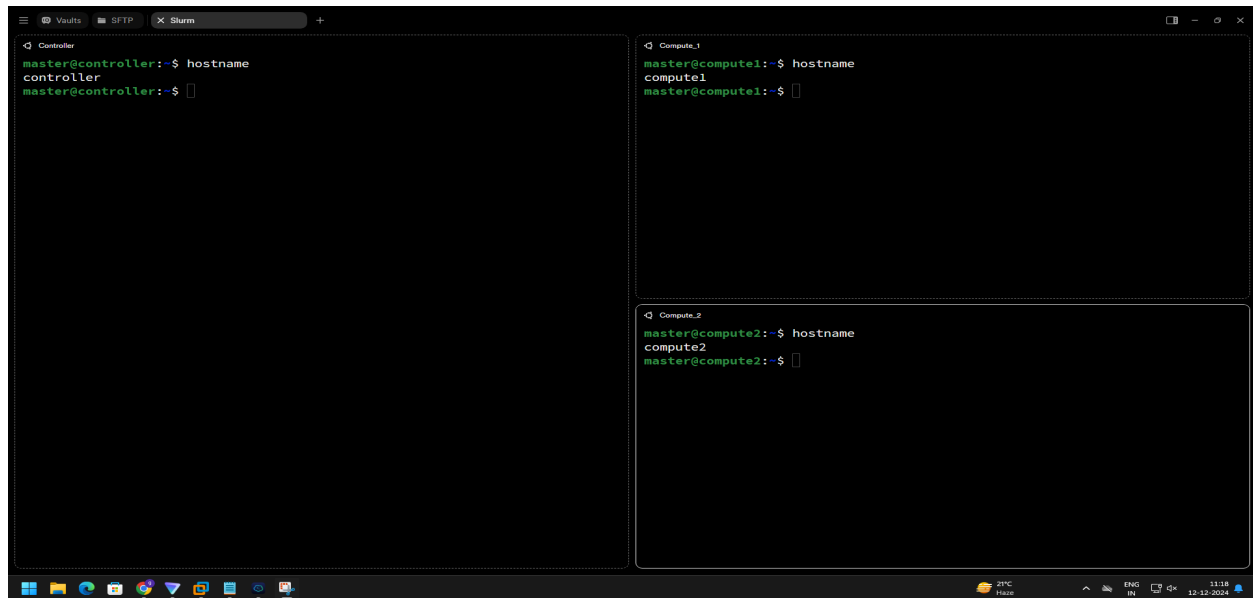
Compute1 ip address : 192.168.82.157

Compute2 ip address : 192.168.82.210

sudo hostnamectl set-hostname compute1

sudo hostnamectl set-hostname compute2

## Ssh all machines from termius



```
Controller
master@controller:~$ hostname
controller
master@controller:~$

Compute_1
master@compute1:~$ hostname
compute1
master@compute1:~$

Compute_2
master@compute2:~$ hostname
compute2
master@compute2:~$
```

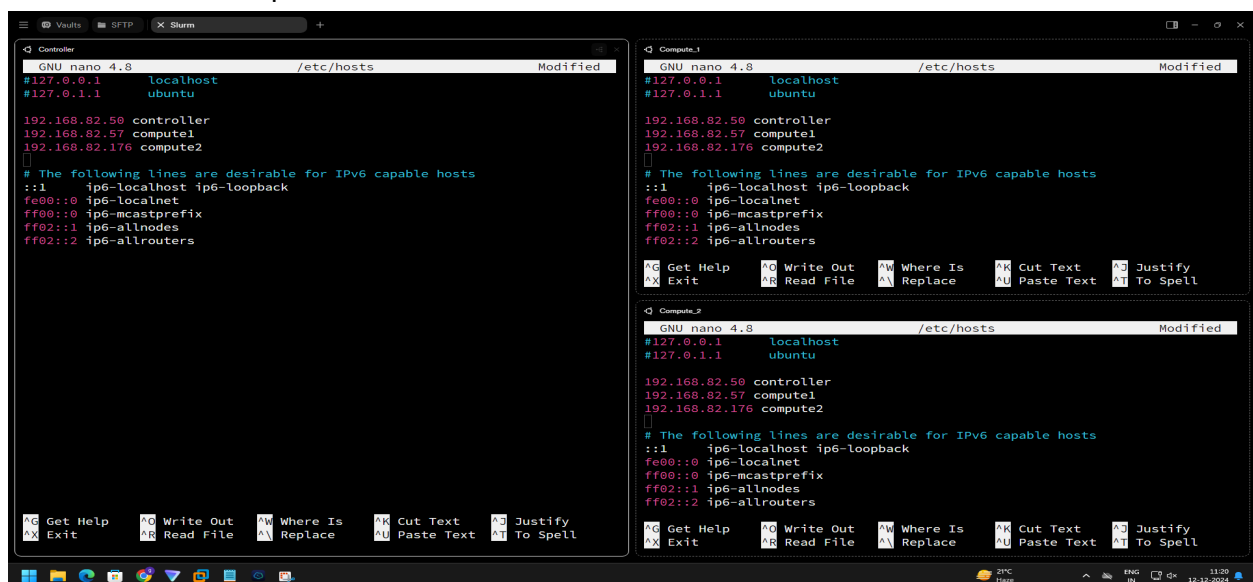
## Edit /etc/hosts file

sudo nano /etc/hosts

192.168.82.233 controller

192.168.82.157 compute1

192.168.82.210 compute2



```
Controller
GNU nano 4.8 /etc/hosts Modified
#127.0.0.1 localhost
#127.0.1.1 ubuntu

192.168.82.50 controller
192.168.82.57 compute1
192.168.82.176 compute2

# 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

Compute_1
GNU nano 4.8 /etc/hosts Modified
#127.0.0.1 localhost
#127.0.1.1 ubuntu

192.168.82.50 controller
192.168.82.57 compute1
192.168.82.176 compute2

# 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

Compute_2
GNU nano 4.8 /etc/hosts Modified
#127.0.0.1 localhost
#127.0.1.1 ubuntu

192.168.82.50 controller
192.168.82.57 compute1
192.168.82.176 compute2

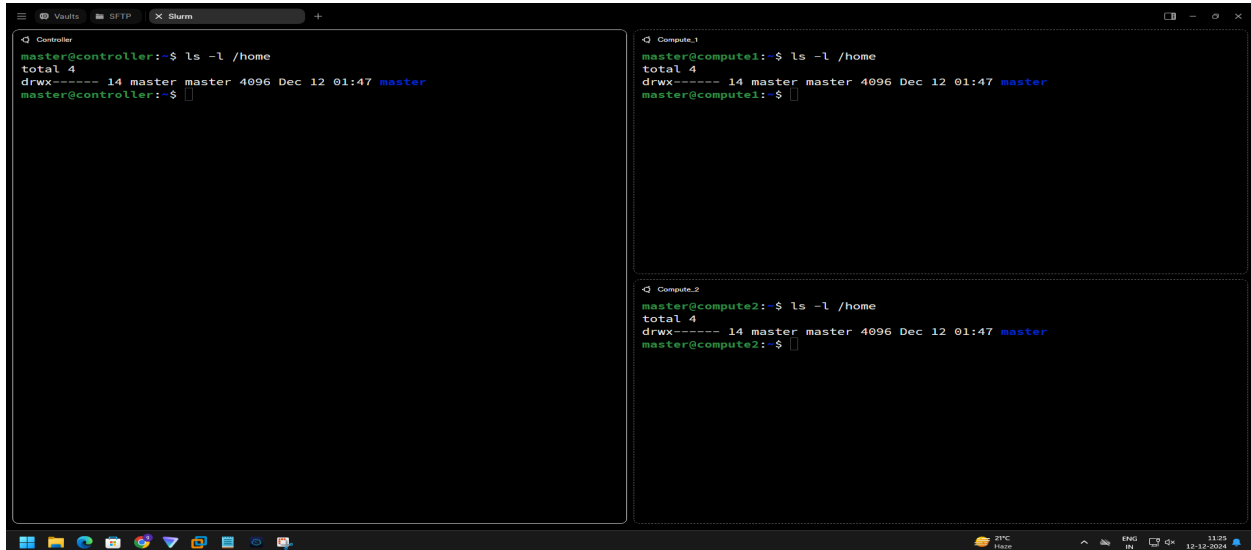
# The following lines are desirable for IPv6 capable hosts
::1 ip6-localhost ip6-loopback
fe00::0 ip6-localnet
ff00::0 ip6-mcastprefix
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
```

# reboot the system and start slurm installation

Check file permission for home directory and owner and group is master if not

chown master:master /home/master

chmod 700 /home/master



```
Controller
master@controller:~$ ls -l /home
total 4
drwx----- 14 master master 4096 Dec 12 01:47 master
master@controller:~$

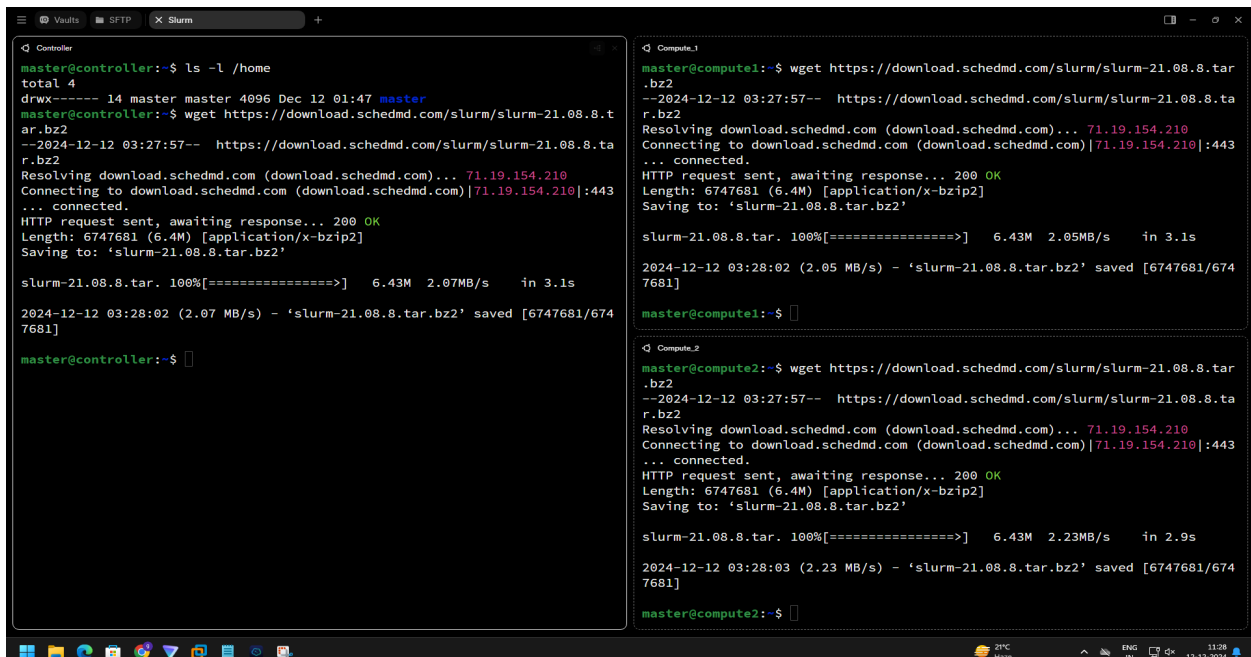
Compute_1
master@compute1:~$ ls -l /home
total 4
drwx----- 14 master master 4096 Dec 12 01:47 master
master@compute1:~$

Compute_2
master@compute2:~$ ls -l /home
total 4
drwx----- 14 master master 4096 Dec 12 01:47 master
master@compute2:~$
```

## Common steps for controller and compute

Download slurm:

wget <https://download.schedmd.com/slurm/slurm-21.08.8.tar.bz2>



```
Controller
master@controller:~$ ls -l /home
total 4
drwx----- 14 master master 4096 Dec 12 01:47 master
master@controller:~$ wget https://download.schedmd.com/slurm/slurm-21.08.8.tar.bz2
--2024-12-12 03:27:57-- https://download.schedmd.com/slurm/slurm-21.08.8.tar.bz2
Resolving download.schedmd.com (download.schedmd.com)... 71.19.154.210
Connecting to download.schedmd.com (download.schedmd.com)|71.19.154.210|:443
... connected.
HTTP request sent, awaiting response... 200 OK
Length: 6747681 (6.4M) [application/x-bzip2]
Saving to: 'slurm-21.08.8.tar.bz2'

slurm-21.08.8.tar. 100%[=====] 6.43M 2.07MB/s in 3.1s

2024-12-12 03:28:02 (2.07 MB/s) - 'slurm-21.08.8.tar.bz2' saved [6747681/6747681]
master@controller:~$

Compute_1
master@compute1:~$ wget https://download.schedmd.com/slurm/slurm-21.08.8.tar.bz2
--2024-12-12 03:27:57-- https://download.schedmd.com/slurm/slurm-21.08.8.tar.bz2
Resolving download.schedmd.com (download.schedmd.com)... 71.19.154.210
Connecting to download.schedmd.com (download.schedmd.com)|71.19.154.210|:443
... connected.
HTTP request sent, awaiting response... 200 OK
Length: 6747681 (6.4M) [application/x-bzip2]
Saving to: 'slurm-21.08.8.tar.bz2'

slurm-21.08.8.tar. 100%[=====] 6.43M 2.05MB/s in 3.1s

2024-12-12 03:28:02 (2.05 MB/s) - 'slurm-21.08.8.tar.bz2' saved [6747681/6747681]
master@compute1:~$

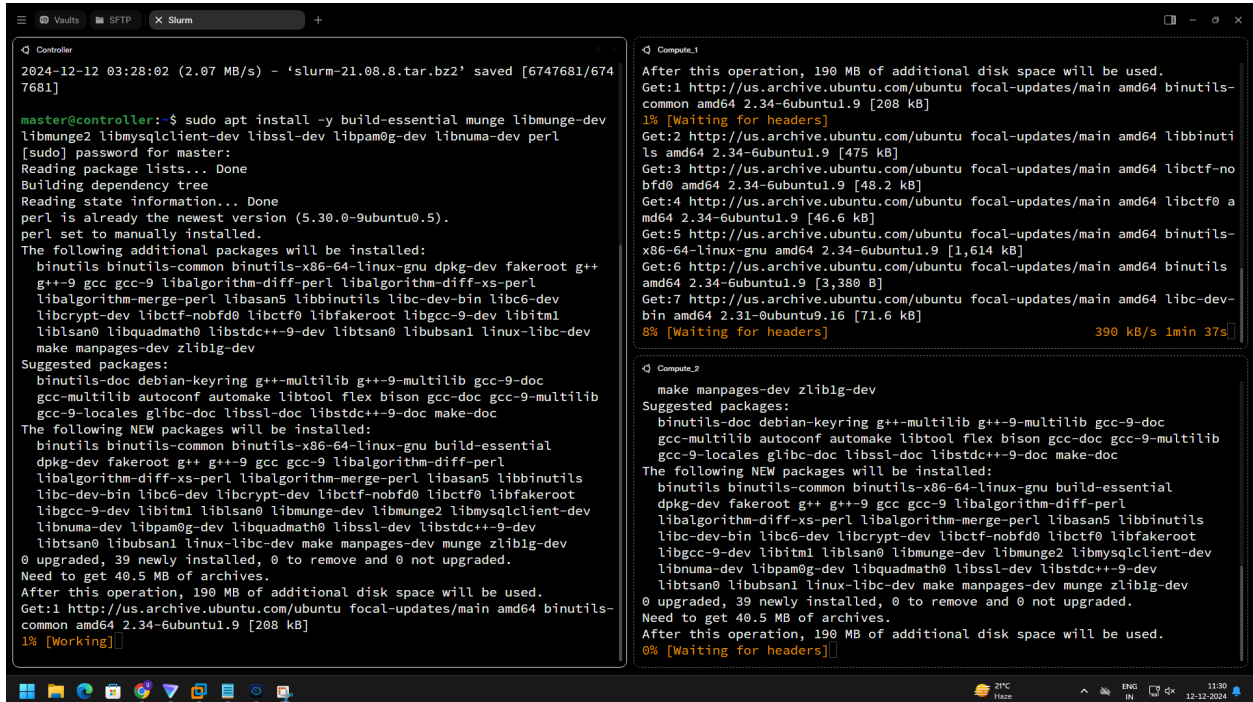
Compute_2
master@compute2:~$ wget https://download.schedmd.com/slurm/slurm-21.08.8.tar.bz2
--2024-12-12 03:27:57-- https://download.schedmd.com/slurm/slurm-21.08.8.tar.bz2
Resolving download.schedmd.com (download.schedmd.com)... 71.19.154.210
Connecting to download.schedmd.com (download.schedmd.com)|71.19.154.210|:443
... connected.
HTTP request sent, awaiting response... 200 OK
Length: 6747681 (6.4M) [application/x-bzip2]
Saving to: 'slurm-21.08.8.tar.bz2'

slurm-21.08.8.tar. 100%[=====] 6.43M 2.23MB/s in 2.9s

2024-12-12 03:28:03 (2.23 MB/s) - 'slurm-21.08.8.tar.bz2' saved [6747681/6747681]
master@compute2:~$
```

## Install required libraries and dependencies

sudo apt install -y build-essential munge libmunge-dev libmunge2 libmysqlclient-dev libssl-dev libpam0g-dev libnuma-dev perl

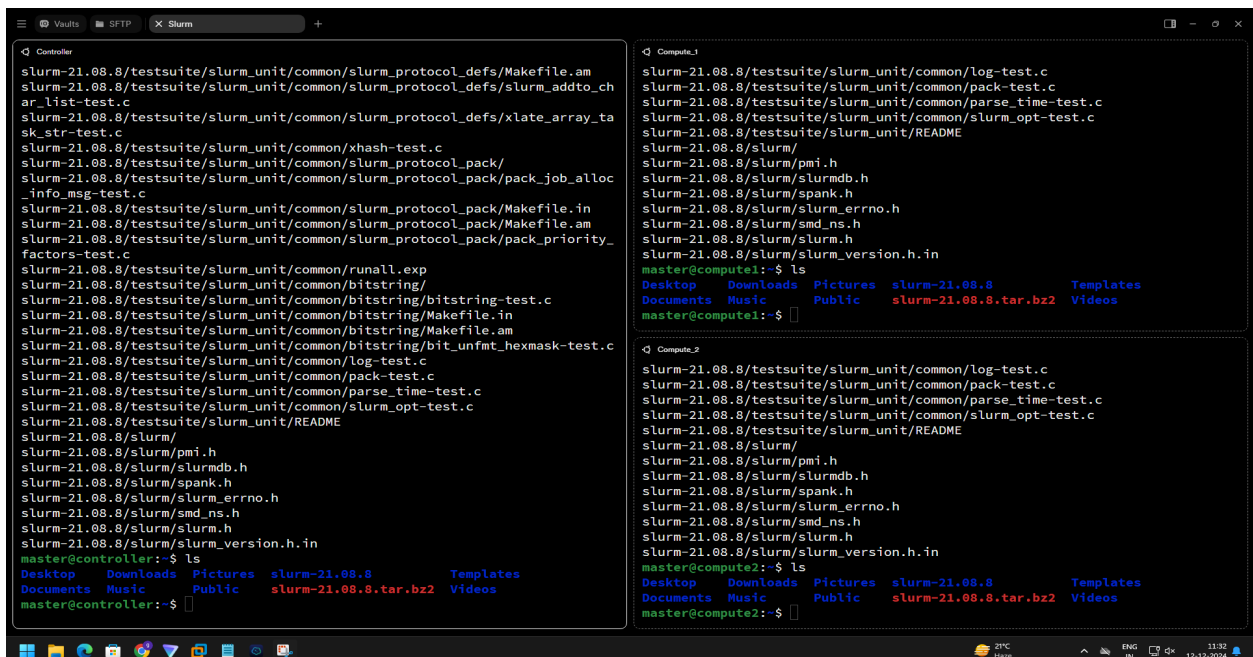


```
Controller
2024-12-12 03:28:02 (2.07 MB/s) - 'slurm-21.08.8.tar.bz2' saved [6747681/6747681]

master@controller:~$ sudo apt install -y build-essential munge libmunge-dev libmunge2 libmysqlclient-dev libssl-dev libpam0g-dev libnuma-dev perl
[sudo] password for master:
Reading package lists... Done
Building dependency tree
Reading state information... Done
perl is already the newest version (5.30.0-9ubuntu0.5).
perl set to manually installed.
The following additional packages will be installed:
  binutils binutils-common binutils-x86-64-linux-gnu dpkg-dev fakeroot g++ g++-9 gcc gcc-9 libalgorithm-diff-perl libalgorithm-diff-xs-perl
  libalgorithm-merge-perl libasan5 libbinutils libc-dev-bin libc6-dev libcrypt-dev libctf-nobfd0 libctf0 libfakeroot libgcc-9-dev libitm1
  liblsan0 libquadmath0 libstdc++-9-dev libtsan0 libubsan1 linux-libc-dev make manpages-dev zlibg-dev
Suggested packages:
  binutils-doc debian-keyring g++-multilib g++-9-multilib gcc-9-doc gcc-multilib autoconf automake libtool flex bison gcc-doc gcc-9-multilib
  gcc-9-locales glibc-doc libssl-doc libstdc++-9-doc make-doc
The following NEW packages will be installed:
  binutils binutils-common binutils-x86-64-linux-gnu build-essential dpkg-dev fakeroot g++ g++-9 gcc gcc-9 libalgorithm-diff-perl
  libalgorithm-diff-xs-perl libalgorithm-merge-perl libasan5 libbinutils libc-dev-bin libc6-dev libcrypt-dev libctf-nobfd0 libctf0 libfakeroot
  libgcc-9-dev libitm1 liblsan0 libmunge-dev libmunge2 libmysqlclient-dev libnuma-dev libpam0g-dev libquadmath0 libssl-dev libstdc++-9-dev
  libtsan0 libubsan1 linux-libc-dev make manpages-dev munge zlibg-dev
0 upgraded, 39 newly installed, 0 to remove and 0 not upgraded.
Need to get 40.5 MB of archives.
After this operation, 190 MB of additional disk space will be used.
Get:1 http://us.archive.ubuntu.com/ubuntu focal-updates/main amd64 binutils-common amd64 2.34-6ubuntu1.9 [208 kB]
1% [Working]
```

## Unzip already downloaded slurm file

tar -xvfj slurm-21.08.8.tar.bz2 slurm-21.08.8/



```
Controller
slurm-21.08.8/testsuite/slurm_unit/common/slurm_protocol_defs/Makefile.am
slurm-21.08.8/testsuite/slurm_unit/common/slurm_protocol_defs/slurm_addto_ch
ar_list-test.c
slurm-21.08.8/testsuite/slurm_unit/common/slurm_protocol_defs/xlate_array_ta
sk_str-test.c
slurm-21.08.8/testsuite/slurm_unit/common/xhash-test.c
slurm-21.08.8/testsuite/slurm_unit/common/slurm_protocol_pack/
slurm-21.08.8/testsuite/slurm_unit/common/slurm_protocol_pack/pack_job_alloc
info_msg-test.c
slurm-21.08.8/testsuite/slurm_unit/common/slurm_protocol_pack/Makefile.in
slurm-21.08.8/testsuite/slurm_unit/common/slurm_protocol_pack/Makefile.am
slurm-21.08.8/testsuite/slurm_unit/common/slurm_protocol_pack/pack_priority_
factors-test.c
slurm-21.08.8/testsuite/slurm_unit/common/runall.exp
slurm-21.08.8/testsuite/slurm_unit/common/bitstring/
slurm-21.08.8/testsuite/slurm_unit/common/bitstring/bitstring-test.c
slurm-21.08.8/testsuite/slurm_unit/common/bitstring/Makefile.in
slurm-21.08.8/testsuite/slurm_unit/common/bitstring/bit_unfmt_hexmask-test.c
slurm-21.08.8/testsuite/slurm_unit/common/log-test.c
slurm-21.08.8/testsuite/slurm_unit/common/pack-test.c
slurm-21.08.8/testsuite/slurm_unit/common/parse_time-test.c
slurm-21.08.8/testsuite/slurm_unit/common/slurm_opt-test.c
slurm-21.08.8/testsuite/slurm_unit/README
slurm-21.08.8/slurm/
slurm-21.08.8/slurm/pmi.h
slurm-21.08.8/slurm/slurddb.h
slurm-21.08.8/slurm/spank.h
slurm-21.08.8/slurm/slurm_errno.h
slurm-21.08.8/slurm/smd_ns.h
slurm-21.08.8/slurm/slurm.h
slurm-21.08.8/slurm/slurm_version.h.in
master@controller:~$ ls
Desktop Downloads Pictures slurm-21.08.8 Templates
Documents Music Public slurm-21.08.8.tar.bz2 Videos
master@controller:~$
```

```
cd slurm-21.08.8
./configure --prefix=/home/master/slurm-21.08.8/
```

The screenshot shows a terminal window with three panes. The left pane is titled 'Controller' and shows the following commands and output:

```
master@controller:~$ cd slurm-21.08.8
master@controller:~/slurm-21.08.8$ ls
aclocal.m4  configure.ac  doc          Makefile.in  slurm
AUTHORS     contribs     etc          META         slurm.spec
auxdir      CONTRIBUTING.md  INSTALL     NEWS         src
config.h.in  COPYING      LICENSE.OpenSSL  README.rst  testsuite
master@controller:~/slurm-21.08.8$ ./configure --prefix=/home/controller/slurm-21.08.8/
```

The right pane is titled 'Compute\_1' and shows the following commands and output:

```
master@compute1:~$ cd slurm-21.08.8
master@compute1:~/slurm-21.08.8$ ls
aclocal.m4  configure.ac  doc          Makefile.in  slurm
AUTHORS     contribs     etc          META         slurm.spec
auxdir      CONTRIBUTING.md  INSTALL     NEWS         src
master@compute1:~/slurm-21.08.8$ ./configure --prefix=/home/compute1/slurm-21.08.8/
```

The bottom pane is titled 'Compute\_2' and shows the following commands and output:

```
master@compute2:~$ cd slurm-21.08.8
master@compute2:~/slurm-21.08.8$ ls
aclocal.m4  configure.ac  doc          Makefile.in  slurm
AUTHORS     contribs     etc          META         slurm.spec
auxdir      CONTRIBUTING.md  INSTALL     NEWS         src
master@compute2:~/slurm-21.08.8$ ./configure --prefix=/home/compute2/slurm-21.08.8/
```

**Then perform make and make install**

Make

Make install

```
sudo mkdir /etc/slurm
```

```
sudo mkdir /etc/slurm-llnl
```

**Different installation first on controller**

**Create a munge key:**

```
Sudo create-munge-key
```

**Change owner and Change permission for munge key**

```
sudo chown munge: /etc/munge/munge.key
```

```
chmod 400 /etc/munge/munge.key
```

**Copy munge key to the compute nodes:**

```
sudo scp -r /etc/munge/munge.key master@compute1:/tmp
```

```
sudo scp -r /etc/munge/munge.key master@compute2:/tmp
```



```
Do you want to overwrite it? (y/N) y
Generating a pseudo-random key using /dev/urandom completed.
master@controller:~$ ls
Desktop  Downloads  Music  Pictures  Public  slurm-21.08.8  slurm-21.08.8.tar.bz2  Templates  Videos
master@controller:~$ cd slurm-21.08.8/
master@controller:~/slurm-21.08.8$ ls
acllocal.m4  config.h  config.status  contribs  DISCLAIMER  INSTALL  Makefile  META  RELEASE_NOTES  src
AUTHORS      config.h.in  configure  CONTRIBUTING.md  doc  libtool  Makefile.am  NEWS  slurm  stamp-h1
auxdir       config.log  configure.ac  COPYING      etc  LICENSE  Makefile.in  README.rst  slurm.spec  test suite
master@controller:~/slurm-21.08.8$ sudo create-munge-key
The munge key /etc/munge/munge.key already exists
Do you want to overwrite it? (y/N) y
Generating a pseudo-random key using /dev/urandom completed.
master@controller:~/slurm-21.08.8$ sudo chmod 400 /etc/munge/munge.key
master@controller:~/slurm-21.08.8$ sudo chown munge: /etc/munge/munge.key
chown: cannot access '/etc/munge/munge.key': Permission denied
master@controller:~/slurm-21.08.8$ sudo chown munge: /etc/munge/munge.key
master@controller:~/slurm-21.08.8$ sudo chown munge: /etc/munge/munge.key^C
master@controller:~/slurm-21.08.8$ ^C
master@controller:~/slurm-21.08.8$ sudo scp -r /etc/munge/munge.key master@com
pute1:/tmp
The authenticity of host 'compute1 (192.168.82.57)' can't be established.
ECDSA key fingerprint is SHA256:yR2zdg2SLDvAxvb3DlsoL+ixWn4KAuDLwtD7JI9Hi88.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'compute1,192.168.82.57' (ECDSA) to the list of kno
wn hosts.
master@compute1's password:
munge.key                               100% 1024   824.2KB/s   00:00
master@controller:~/slurm-21.08.8$ sudo scp -r /etc/munge/munge.key master@com
pute2:/tmp
The authenticity of host 'compute2 (192.168.82.176)' can't be established.
ECDSA key fingerprint is SHA256:yR2zdg2SLDvAxvb3DlsoL+ixWn4KAuDLwtD7JI9Hi88.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'compute2,192.168.82.176' (ECDSA) to the list of kn
own hosts.
master@compute2's password:
munge.key                               100% 1024   750.3KB/s   00:00
master@controller:~/slurm-21.08.8$
```

sudo chown -R munge: /etc/munge /var/log/munge

sudo chmod 0700 /etc/munge /var/log/munge

sudo systemctl enable munge

sudo systemctl start munge

sudo systemctl status munge

```
master@controller:~/slurm-21.08.8$ sudo systemctl enable munge
Synchronizing state of munge.service with SysV service script with /lib/systemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable munge
master@controller:~/slurm-21.08.8$ sudo systemctl start munge
master@controller:~/slurm-21.08.8$ sudo systemctl status munge
● munge.service - MUNGE authentication service
   Loaded: loaded (/lib/systemd/system/munge.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2024-12-12 03:31:15 PST; 21min ago
     Docs: man:munged(8)
  Main PID: 1915 (munged)
    Tasks: 4 (limit: 9371)
   Memory: 592.0K
    CGroup: /system.slice/munge.service
            └─1915 /usr/sbin/munged

Dec 12 03:31:15 controller systemd[1]: Starting MUNGE authentication service...
Dec 12 03:31:15 controller systemd[1]: Started MUNGE authentication service.
master@controller:~/slurm-21.08.8$
```

Go into the slurm etc folder

Cd /home/master/slurm-21.08.8/etc

## Create or copy of the slurm.conf file

```
cp slurm.conf.example slurm.conf
```

## Edit the slurm.conf file and change or add the following content in the file

```
Sudo nano slurm.conf
```

```
ClusterName=cluster
```

```
SlurmctldHost=controller
```

```
AuthType=auth/munge
```

```
SlurmUser=master
```

```
AccountingStorageType=accounting_storage/slurmdbd
```

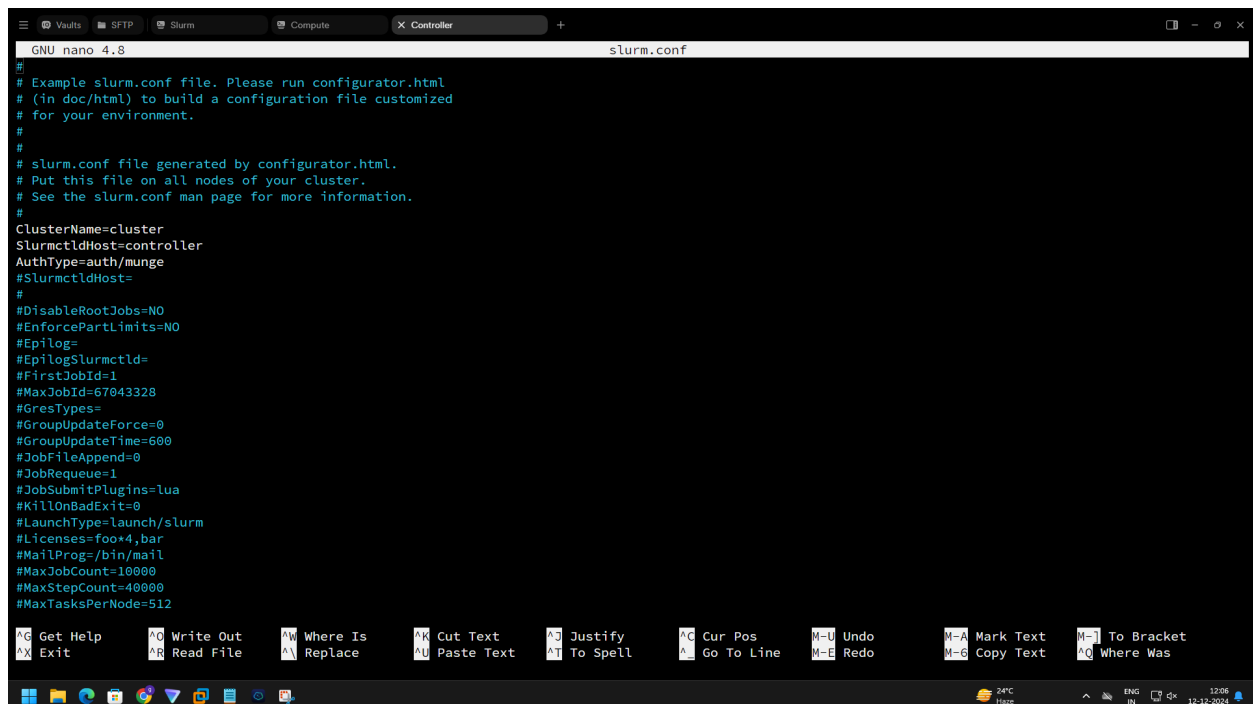
```
NodeName=controller CPUs=1 State=UNKNOWN
```

```
NodeName=compute1 CPUs=1 State=UNKNOWN
```

```
NodeName=compute2 CPUs=1 State=UNKNOWN
```

```
PartitionName=partition Nodes=ALL Default=YES MaxTime=INFINITE State=up
```

```
MailProg=/usr/bin/mail
```

A screenshot of a terminal window titled 'GNU nano 4.8' showing the contents of the 'slurm.conf' file. The file contains configuration parameters for a Slurm cluster, including ClusterName, SlurmctldHost, AuthType, and various resource management settings. The terminal window has a dark background with light-colored text. At the bottom, there is a taskbar with various application icons and a system tray showing the date and time (12:12:2024).

```
GNU nano 4.8 slurm.conf
#
# Example slurm.conf file. Please run configurator.html
# (in doc/html) to build a configuration file customized
# for your environment.
#
# slurm.conf file generated by configurator.html.
# Put this file on all nodes of your cluster.
# See the slurm.conf man page for more information.
#
ClusterName=cluster
SlurmctldHost=controller
AuthType=auth/munge
#SlurmctldHost=
#
#DisableRootJobs=NO
#EnforcePartLimits=NO
#Epilog=
#EpilogSlurmctld=
#FirstJobId=1
#MaxJobId=67843328
#GresTypes=
#GroupUpdateForce=0
#GroupUpdateTime=600
#JobFileAppend=0
#JobRequeue=1
#JobSubmitPlugins=lua
#KillOnBadExit=0
#LaunchType=launch/slurm
#Licenses=foo*4,bar
#MailProg=/bin/mail
#MaxJobCount=10000
#MaxStepCount=40000
#MaxTasksPerNode=512
^G Get Help      ^O Write Out    ^W Where Is     ^K Cut Text     ^J Justify      ^G Cur Pos     M-U Undo       M-A Mark Text   M-] To Bracket
^X Exit          ^R Read File    ^_ Replace      ^U Paste Text   ^T To Spell     ^_ Go To Line  M-E Redo       M-G Copy Text   ^Q Where Was
```

```
GNU nano 4.8 slurm.conf
#MaxTasksPerNode=512
MpiDefault=none
#MpiParams=ports=-#
#PluginDir=
#PlugStackConfig=
#PrivateData=jobs
ProctrackType=proctrack/cgroup
#Prolog=
#PrologFlags=
#PrologSlurmctld=
#PropagatePrioProcess=0
#PropagateResourceLimits=
#PropagateResourceLimitsExcept=
#RebootProgram=
ReturnToService=1
SlurmctldPidFile=/var/run/slurmctld.pid
SlurmctldPort=6817
SlurmdPidFile=/var/run/slurmd.pid
SlurmdPort=6818
SlurmdSpoolDir=/var/spool/slurmd
SlurmUser=controller
#SlurmdUser=root
#SrunEpiLog=
#SrunProlog=
StateSaveLocation=/var/spool/slurmctld
SwitchType=switch/none
#TaskEpiLog=
TaskPlugin=task/affinity
#TaskProlog=
#TopologyPlugin=topology/tree
#TmpFS=/tmp
#TrackWCKey=no
#TreeWidth=
#UnkillableStepProgram=

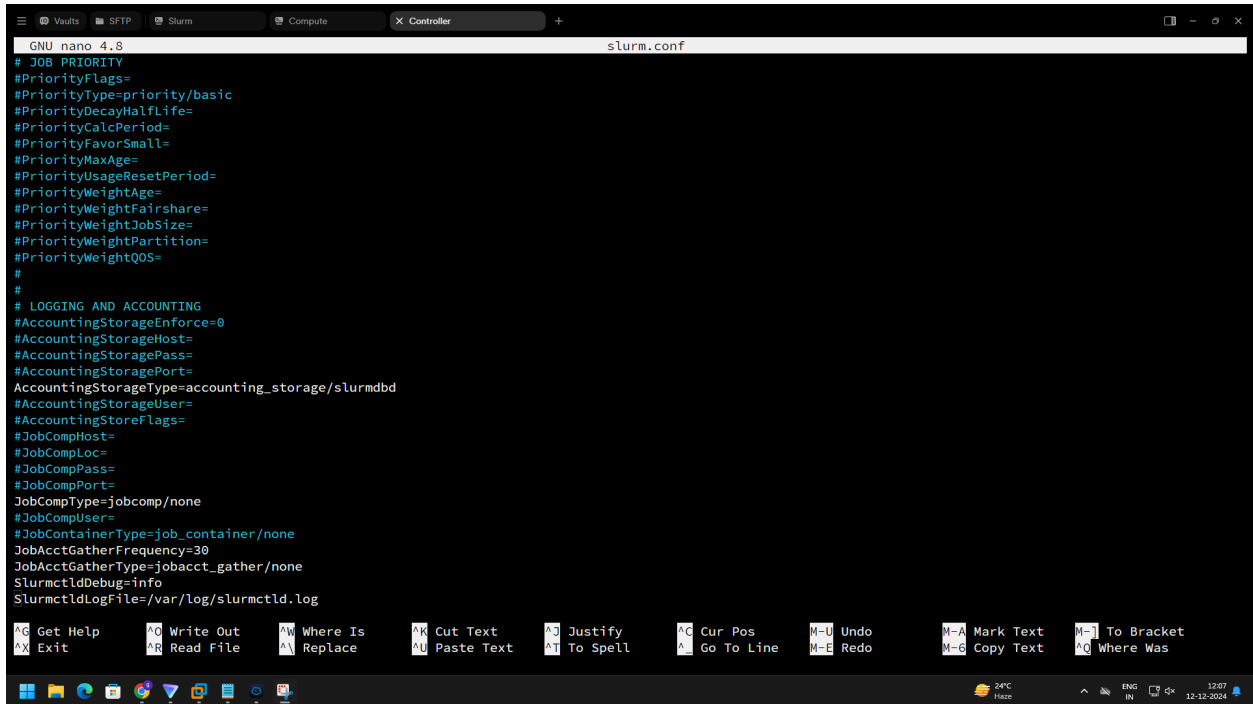
^G Get Help      ^O Write Out    ^W Where Is     ^K Cut Text     ^J Justify      ^C Cur Pos      M-U Undo        M-A Mark Text    M-] To Bracket
^X Exit          ^R Read File    ^_ Replace      ^U Paste Text   ^T To Spell     ^_ Go To Line   M-E Redo        M-G Copy Text    ^Q Where Was

24°C
Haze
12:06
12-12-2024
```

```
GNU nano 4.8 slurm.conf
#UnkillableStepProgram=
#UsePAM=0
#
#
# TIMERS
#BatchStartTimeout=10
#CompleteWait=0
#EpiLogMsgTime=2000
#GetEnvTimeout=2
#HealthCheckInterval=0
#HealthCheckProgram=
InactiveLimit=0
KillWait=30
#MessageTimeout=10
#ResvOverRun=0
MinJobAge=300
#OverTimeLimit=0
SlurmctldTimeout=120
SlurmdTimeout=300
#UnkillableStepTimeout=60
#VSizeFactor=0
Waittime=0
#
#
# SCHEDULING
#DefMemPerCPU=0
#MaxMemPerCPU=0
#SchedulerTimeSlice=30
SchedulerType=sched/backfill
SelectType=select/cons_tres
SelectTypeParameters=CR_Core
#
#
# JOB PRIORITY

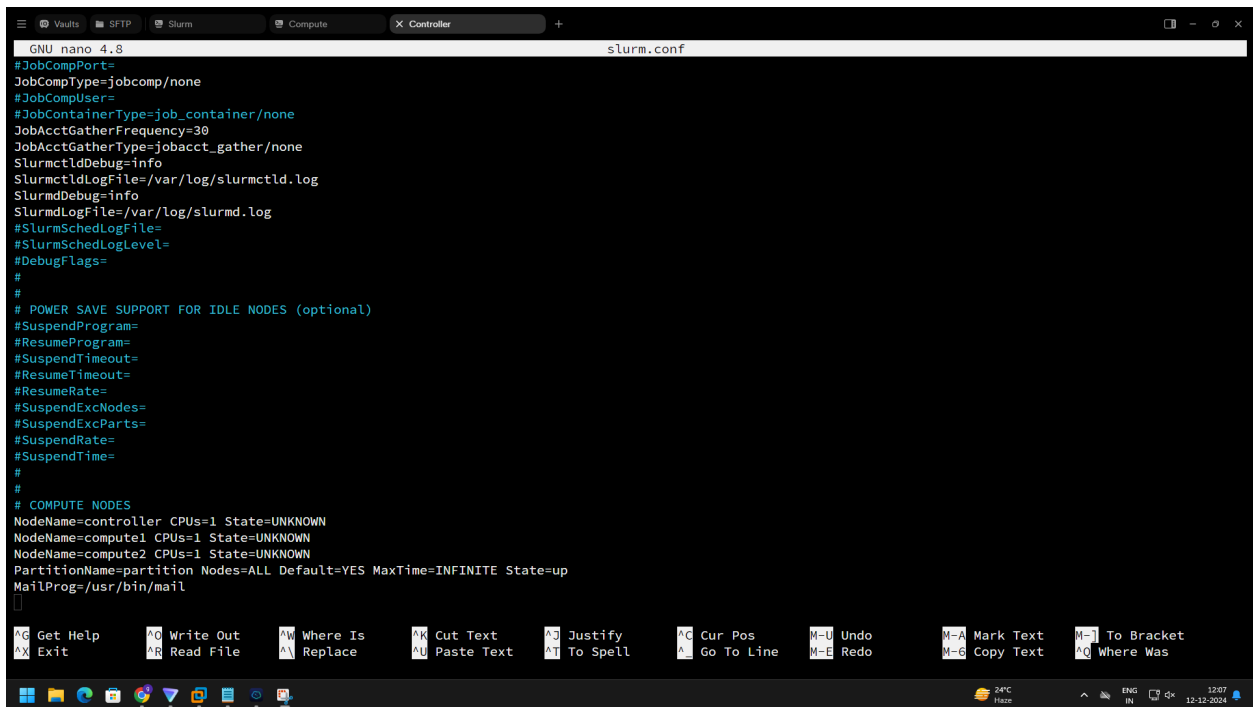
^G Get Help      ^O Write Out    ^W Where Is     ^K Cut Text     ^J Justify      ^C Cur Pos      M-U Undo        M-A Mark Text    M-] To Bracket
^X Exit          ^R Read File    ^_ Replace      ^U Paste Text   ^T To Spell     ^_ Go To Line   M-E Redo        M-G Copy Text    ^Q Where Was

24°C
Haze
12:06
12-12-2024
```



```
GNU nano 4.8 slurm.conf
# JOB PRIORITY
#PriorityFlags=
#PriorityType=priority/basic
#PriorityDecayHalfLife=
#PriorityCalcPeriod=
#PriorityFavorSmall=
#PriorityMaxAge=
#PriorityUsageResetPeriod=
#PriorityWeightAge=
#PriorityWeightFairshare=
#PriorityWeightJobSize=
#PriorityWeightPartition=
#PriorityWeightQOS=
#
#
# LOGGING AND ACCOUNTING
#AccountingStorageEnforce=0
#AccountingStorageHost=
#AccountingStoragePass=
#AccountingStoragePort=
AccountingStorageType=accounting_storage/slurmdb
#AccountingStorageUser=
#AccountingStoreFlags=
#JobCompHost=
#JobCompLoc=
#JobCompPass=
#JobCompPort=
JobCompType=jobcomp/none
#JobCompUser=
#JobContainerType=job_container/none
JobAcctGatherFrequency=30
JobAcctGatherType=jobacct_gather/none
SlurmctldDebug=info
SlurmctldLogFile=/var/log/slurmctld.log

^G Get Help      ^O Write Out    ^W Where Is     ^K Cut Text     ^J Justify     ^C Cur Pos     M-U Undo       M-A Mark Text   M-] To Bracket
^X Exit          ^R Read File    ^_ Replace      ^U Paste Text   ^T To Spell    ^_ Go To Line  M-E Redo       M-G Copy Text  ^Q Where Was
```



```
GNU nano 4.8 slurm.conf
#JobCompPort=
JobCompType=jobcomp/none
#JobCompUser=
#JobContainerType=job_container/none
JobAcctGatherFrequency=30
JobAcctGatherType=jobacct_gather/none
SlurmctldDebug=info
SlurmctldLogFile=/var/log/slurmctld.log
SlurmdDebug=info
SlurmdLogFile=/var/log/slurmd.log
#SlurmSchedLogFile=
#SlurmSchedLogLevel=
#DebugFlags=
#
#
# POWER SAVE SUPPORT FOR IDLE NODES (optional)
#SuspendProgram=
#ResumeProgram=
#SuspendTimeout=
#ResumeTimeout=
#ResumeRate=
#SuspendExcNodes=
#SuspendExcParts=
#SuspendRate=
#SuspendTime=
#
#
# COMPUTE NODES
NodeName=controller CPUs=1 State=UNKNOWN
NodeName=compute1 CPUs=1 State=UNKNOWN
NodeName=compute2 CPUs=1 State=UNKNOWN
PartitionName=partition Nodes=ALL Default=YES MaxTime=INFINITE State=up
MailProg=/usr/bin/mail
[]

^G Get Help      ^O Write Out    ^W Where Is     ^K Cut Text     ^J Justify     ^C Cur Pos     M-U Undo       M-A Mark Text   M-] To Bracket
^X Exit          ^R Read File    ^_ Replace      ^U Paste Text   ^T To Spell    ^_ Go To Line  M-E Redo       M-G Copy Text  ^Q Where Was
```

Install mailutils  
apt-get install mailutils

```
selinux/      services      shadow-      snmp/         ssl/          subuid        sudoers.d/
master@controller:~/slurm-21.08.8$ sudo mkdir /etc/s
master@controller:~/slurm-21.08.8$ sudo mkdir /etc/slurm-llnl
master@controller:~/slurm-21.08.8$ sudo mkdir /etc/slurmsudo mkdir /etc/slurm-llnl^C
master@controller:~/slurm-21.08.8$ cd etc
master@controller:~/slurm-21.08.8/etc$ cp slurm.conf.example etc/slurm.conf
cp: cannot create regular file 'etc/slurm.conf': No such file or directory
master@controller:~/slurm-21.08.8/etc$ sudo cp slurm.conf.example etc/slurm.conf
cp: cannot create regular file 'etc/slurm.conf': No such file or directory
master@controller:~/slurm-21.08.8/etc$ sudo cp slurm.conf.example slurm.conf
master@controller:~/slurm-21.08.8/etc$ pwd
/home/master/slurm-21.08.8/etc
master@controller:~/slurm-21.08.8/etc$ sudo nano slurm.conf
master@controller:~/slurm-21.08.8/etc$ sudo nano slurm.conf
master@controller:~/slurm-21.08.8/etc$ sudo apt-get install mailutils
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  guile-2.2-libs libgcl2 libgsasl7 libkyotocabinet16v5 libmailutils6 libntlm0 mailutils-common postfix
Suggested packages:
  mailutils-mh mailutils-doc procmail postfix-mysql postfix-pgsql postfix-ldap postfix-pcre postfix-lmdb postfix-sqlite sasl2-bin
  | dovecot-common resolvconf postfix-cdb postfix-doc
The following NEW packages will be installed:
  guile-2.2-libs libgcl2 libgsasl7 libkyotocabinet16v5 libmailutils6 libntlm0 mailutils mailutils-common postfix
0 upgraded, 9 newly installed, 0 to remove and 0 not upgraded.
Need to get 7,542 kB of archives.
After this operation, 56.3 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://us.archive.ubuntu.com/ubuntu focal/main amd64 libgcl2 amd64 1:7.6.4-0.4ubuntu1 [83.9 kB]
Get:2 http://us.archive.ubuntu.com/ubuntu focal/main amd64 guile-2.2-libs amd64 2.2.7+1-4 [4,962 kB]
Get:3 http://us.archive.ubuntu.com/ubuntu focal-updates/universe amd64 libntlm0 amd64 1.5-2ubuntu0.1 [14.7 kB]
Get:4 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 libgsasl7 amd64 1.8.1-1 [114 kB]
Get:5 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 libkyotocabinet16v5 amd64 1.2.76-4.2build1 [318 kB]
```

Go in to slurm etc and copy or create cgroup.conf file  
cp cgroup.conf.example cgroup.conf

```
GNU nano 4.8 cgroup.conf
###
#
# Slurm cgroup support configuration file
#
# See man slurm.conf and man cgroup.conf for further
# information on cgroup configuration parameters
#--
CgroupAutomount=yes

ConstrainCores=no
ConstrainRAMspace=no

Read 11 lines
Get Help  Write Out  Where Is  Cut Text  Justify  Cur Pos  M-U Undo  M-A Mark Text  M- To Bracket
Exit      Read File  Replace  Paste Text  To Spell  Go To Line  M-E Redo  M-G Copy Text  M- Where Was
```

### Copy slurm.conf into /etc/slurm and /etc/slurm-llnl

```
sudo cp slurm.conf /etc/slurm
```

```
sudo cp slurm.conf /etc/slurm-llnl
```

### Copy slurm.conf to compute nodes also

```
scp slurm.conf master@compute1:/tmp
```

```
scp slurm.conf master@compute2:/tmp
```

### Copy slurmdbd.conf file or create it and edit it and made following changes

```
AuthType=auth/munge
```

```
DbdAddr=192.168.82.223
```

```
DbdHost=controller
```

```
SlurmUser=master
```

```
DebugLevel=verbose
```

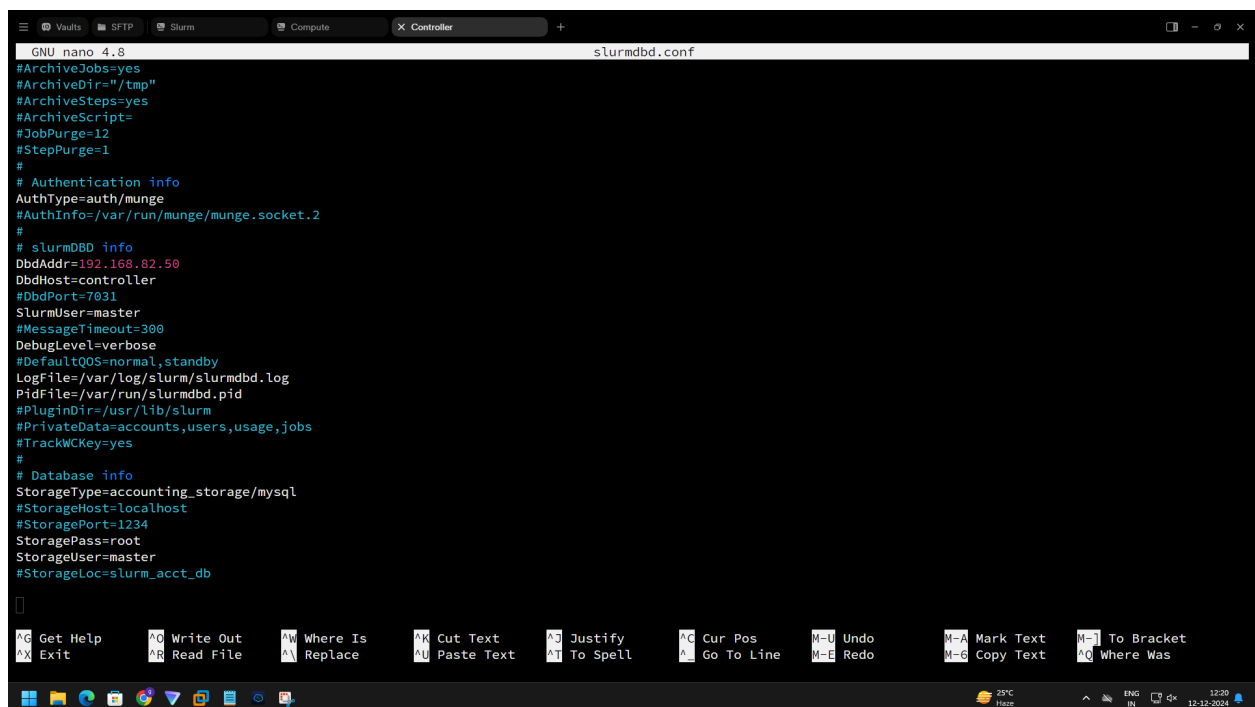
```
LogFile=/var/log/slurm/slurmdbd.log
```

```
PidFile=/var/run/slurmdbd.pid
```

```
StorageType=accounting_storage/mysql
```

```
StoragePass=root
```

```
StorageUser=master
```



The screenshot shows a terminal window with a nano editor editing the file `slurmdbd.conf`. The configuration includes settings for authentication, database connection, and logging. The terminal window has tabs for 'Vaults', 'SFTP', 'Slurm', 'Compute', and 'Controller'. The nano editor's status bar at the bottom shows various keyboard shortcuts like 'Get Help', 'Write Out', 'Where Is', 'Cut Text', 'Justify', 'Cur Pos', 'Undo', 'Mark Text', and 'To Bracket'.

```
GNU nano 4.8 slurmdbd.conf
#ArchiveJobs=yes
#ArchiveDir="/tmp"
#ArchiveSteps=yes
#ArchiveScripts=
#JobPurge=12
#StepPurge=1
#
# Authentication info
AuthType=auth/munge
#AuthInfo=/var/run/munge/munge.socket.2
#
# slurmDBD info
DbdAddr=192.168.82.50
DbdHost=controller
#DbdPort=7031
SlurmUser=master
#MessageTimeout=300
DebugLevel=verbose
#DefaultQOS=normal,standby
LogFile=/var/log/slurm/slurmdbd.log
PidFile=/var/run/slurmdbd.pid
#PluginDir=/usr/lib/slurm
#PrivateData=accounts,users,usage,jobs
#TrackWCKey=yes
#
# Database info
StorageType=accounting_storage/mysql
#StorageHost=localhost
#StoragePort=1234
StoragePass=root
StorageUser=master
#StorageLoc=slurm_acct_db
[]
^G Get Help      ^O Write Out    ^W Where Is     ^K Cut Text     ^J Justify      ^C Cur Pos      M-U Undo        M-A Mark Text   M-] To Bracket
^X Exit          ^R Read File    ^_ Replace      ^U Paste Text   ^T To Spell     ^G Go To Line   M-E Redo        M-G Copy Text   ^Q Where Was
```

## Install mariadb-server start and enable it

apt-get install mariadb-server

sudo systemctl start mysql

sudo systemctl enable mysql

```
Setting up mariadb-server-10.3 (1:10.3.39-0ubuntu0.20.04.2) ...
Created symlink /etc/systemd/system/mysql.service → /lib/systemd/system/mariadb.service.
Created symlink /etc/systemd/system/mysqld.service → /lib/systemd/system/mariadb.service.
Created symlink /etc/systemd/system/multi-user.target.wants/mariadb.service → /lib/systemd/system/mariadb.service.
Setting up mariadb-server (1:10.3.39-0ubuntu0.20.04.2) ...
Processing triggers for systemd (245.4-4ubuntu3.24) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for libc-bin (2.31-0ubuntu9.16) ...
master@controller:~/slurm-21.08.8/etc$ sudo systemctl restart mysql
master@controller:~/slurm-21.08.8/etc$ sudo systemctl enable mysql
Synchronizing state of mysql.service with SysV service script with /lib/systemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable mysql
Failed to enable unit: Refusing to operate on alias name or linked unit file: mysql.service
master@controller:~/slurm-21.08.8/etc$ sudo systemctl status mysql
Unknown operation status.
master@controller:~/slurm-21.08.8/etc$ sudo systemctl status mysql
* mariadb.service - MariaDB 10.3.39 database server
   Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; vendor preset: enabled)
   Active: active (running) since Thu 2024-12-12 04:21:54 PST; 51s ago
     Docs: man:mysqld(8)
           https://mariadb.com/kb/en/library/systemd/
   Main PID: 57844 (mysqld)
   Status: "Taking your SQL requests now..."
    Tasks: 31 (limit: 9371)
   Memory: 63.4M
   CGroup: /system.slice/mariadb.service
           └─57844 /usr/sbin/mysqld

Dec 12 04:21:54 controller systemd[1]: Starting MariaDB 10.3.39 database server...
Dec 12 04:21:54 controller systemd[1]: Started MariaDB 10.3.39 database server.
Dec 12 04:21:54 controller /etc/mysql/debian-start[57879]: Upgrading MySQL tables if necessary.
Dec 12 04:21:54 controller /etc/mysql/debian-start[57882]: Looking for 'mysql' as: /usr/bin/mysql
Dec 12 04:21:54 controller /etc/mysql/debian-start[57882]: Looking for 'mysqlcheck' as: /usr/bin/mysqlcheck
Dec 12 04:21:54 controller /etc/mysql/debian-start[57882]: This installation of MariaDB is already upgraded to 10.3.39-MariaDB.
Dec 12 04:21:54 controller /etc/mysql/debian-start[57882]: There is no need to run mysql_upgrade again for 10.3.39-MariaDB.
Dec 12 04:21:54 controller /etc/mysql/debian-start[57882]: You can use --force if you still want to run mysql_upgrade
Dec 12 04:21:54 controller /etc/mysql/debian-start[57890]: Checking for insecure root accounts.
master@controller:~/slurm-21.08.8/etc$
```

## Login to mysql and add user and give the permission

sudo mysql -u root

CREATE USER 'root'@'controller' identified by 'root';

CREATE USER 'root'@'localhost' identified by 'root';

CREATE USER 'root'@'%' identified by 'root';

GRANT ALL PRIVILEGES ON \*.\* TO 'root'@'controller';

GRANT ALL PRIVILEGES ON \*.\* TO 'root'@'localhost';

GRANT ALL PRIVILEGES ON \*.\* TO 'root'@'%';

```

master@controller:~/slurm-21.08.8/etc$ sudo mysql -u root
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 37
Server version: 10.3.39-MariaDB-0ubuntu0.20.04.2 Ubuntu 20.04

Copyright (c) 2000, 2018, Oracle, MariaDB Corporation Ab and others.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

MariaDB [(none)]> CREATE USER 'master'@'controller' identified by 'root';
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> CREATE USER 'master'@'localhost' identified by 'root';
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> CREATE USER 'master'@'%' identified by 'root';
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> GRANT ALL PRIVILEGES ON *.* TO 'master'@'controller';
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> GRANT ALL PRIVILEGES ON *.* TO 'master'@'localhost';
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> GRANT ALL PRIVILEGES ON *.* TO 'master'@'%';
Query OK, 0 rows affected (0.000 sec)

MariaDB [(none)]> exit
Bye
master@controller:~/slurm-21.08.8/etc$

```

## Copy the service files

```

sudo cp slurmctld.service /etc/systemd/system/
sudo cp slurmd.service /etc/systemd/system/
sudo cp slurmdbd.service /etc/systemd/system/

```

```

sudo mkdir /var/spool/slurmctld

```

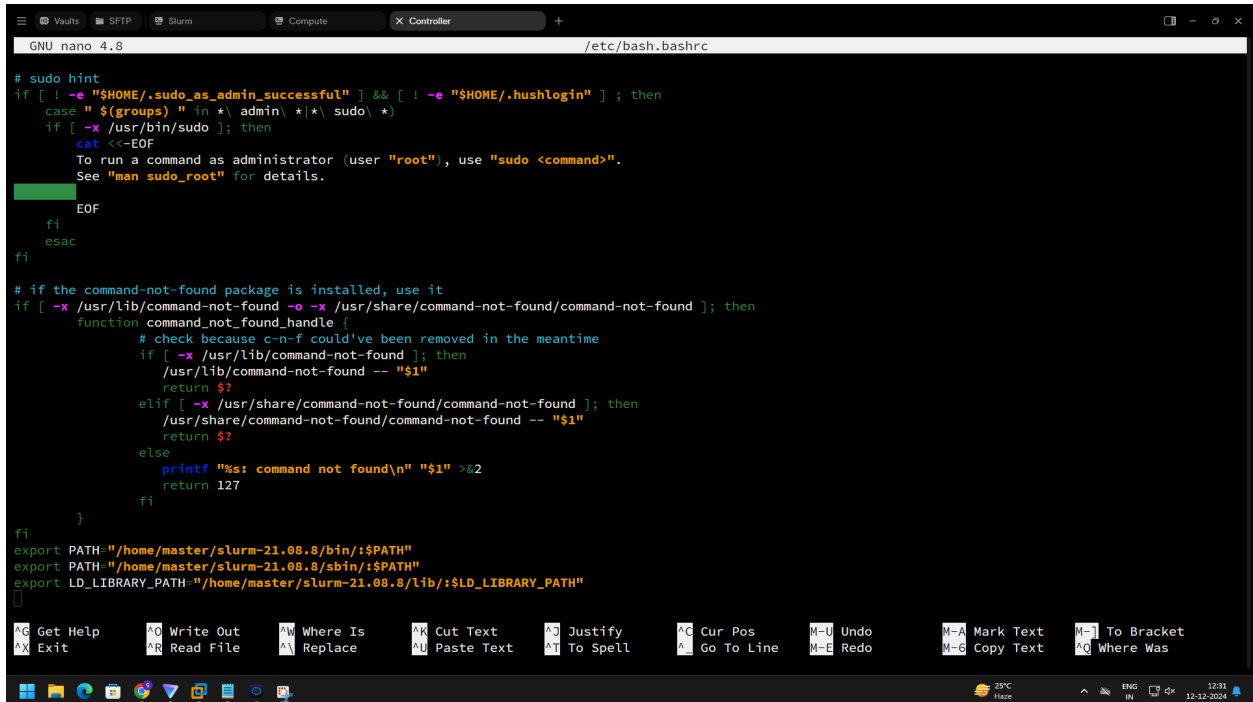
## Add the paths in /etc/bash.bashrc

```

nano /etc/bash.bashrc
export PATH="/home/master/slurm-21.08.8/bin:$PATH"
export PATH="/home/master/slurm-21.08.8/sbin:$PATH"
export LD_LIBRARY_PATH="/home/master/slurm-21.08.8/lib:$LD_LIBRARY_PATH"

```





```
GNU nano 4.8 /etc/bash.bashrc

# sudo hint
if [ ! -e "$HOME/.sudo_as_admin_successful" ] && [ ! -e "$HOME/.hushlogin" ]; then
    case " $(groups) " in *\ admin\ *|\ sudo\ *)
        if [ -x /usr/bin/sudo ]; then
            cat <-EOF
            To run a command as administrator (user "root"), use "sudo <command>".
            See "man sudo_root" for details.
            EOF
        fi
    esac
fi

# if the command-not-found package is installed, use it
if [ -x /usr/lib/command-not-found -o -x /usr/share/command-not-found/command-not-found ]; then
    function command_not_found_handle {
        # check because c-n-f could've been removed in the meantime
        if [ -x /usr/lib/command-not-found ]; then
            /usr/lib/command-not-found -- "$1"
            return $?
        elif [ -x /usr/share/command-not-found/command-not-found ]; then
            /usr/share/command-not-found/command-not-found -- "$1"
            return $?
        else
            printf "%s: command not found\n" "$1" >&2
            return 127
        fi
    }
fi

export PATH="/home/master/slurm-21.08.8/bin:$PATH"
export PATH="/home/master/slurm-21.08.8/sbin:$PATH"
export LD_LIBRARY_PATH="/home/master/slurm-21.08.8/lib:$LD_LIBRARY_PATH"
]
```

## Restart the services

Sudo systemctl restart munge  
Sudo systemctl restart slurmd  
Sudo systemctl restart slurmd  
Sudo systemctl restart dbd

## Enable the servies

Sudo sytemctl enable munge  
Sudo systemctl enable slurmd  
Sudo systemctl enable slurmd  
Sudo systemctl enable slurddb

## On Compute

### Copy munge key from tmp to slurm etc

cp -r /tmp/munge.key /etc/munge/

chown -R munge: /etc/munge /var/log/munge

chmod 0700 /etc/munge /var/log/munge

systemctl enable munge  
systemctl start munge  
systemctl status munge

## Copy slurm.conf from tmp to slurm etc

```
cp -r /tmp/slurm.conf /home/compute1/slurm-21.08.8/etc/  
cp -r /tmp/slurm.conf /home/compute2/slurm-21.08.8/etc/  
mkdir /etc/slurm  
cp -r /tmp/slurm.conf /etc/slurm/  
mkdir /etc/slurm-llnl  
Cp -r /tmp/slurm.conf /etc/slurm-llnl/
```

## Then stop the firewall

```
systemctl stop ufw  
iptables -F
```

## Copy slurm service files

```
cp slurmd.service /etc/systemd/system
```

## Copy cgroup.conf to slurm etc

```
cp /tmp/cgroup.conf .
```

## Start the services

```
Sudo systemctl start munge  
Sudo systemctl start slurmd
```

## Enable the services

```
Sudo systemctl enable munge  
Sudo systemctl enable slurmd
```

# Output on Compute:

## Mysql service:

```
master@controller:~$ sudo systemctl status mysql  
[sudo] password for master:  
● mariadb.service - MariaDB 10.3.39 database server  
   Loaded: loaded (/lib/systemd/system/mariadb.service; enabled; vendor preset: enabled)  
   Active: active (running) since Fri 2024-12-13 09:59:59 PST; 22min ago  
     Docs: man:mysqld(8)  
           https://mariadb.com/kb/en/library/systemd/  
Process: 771 ExecStartPre=/usr/bin/install -m 755 -o mysql -g root -d /var/run/mysqld (code=exited, status=0/SUCCESS)  
Process: 794 ExecStartPre=/bin/sh -c systemctl unset-environment _WSREP_START_POSITION (code=exited, status=0/SUCCESS)  
Process: 802 ExecStartPre=/bin/sh -c [ ! -e /usr/bin/galera_recovery ] && VAR= || VAR=`cd /usr/bin/..; /usr/bin/galera_recovery`; [ $? -eq 0 ] && systemctl set-env  
Process: 1340 ExecStartPost=/bin/sh -c systemctl unset-environment _WSREP_START_POSITION (code=exited, status=0/SUCCESS)  
Process: 1344 ExecStartPost=/etc/mysql/debian-start (code=exited, status=0/SUCCESS)  
Main PID: 870 (mysqld)  
Status: "Taking your SQL requests now..."  
Tasks: 32 (limit: 10797)  
Memory: 104.8M  
CGroup: /system.slice/mariadb.service  
└─870 /usr/sbin/mysqld
```

## Munge service:

```
master@controller:~$ sudo systemctl status munge
● munge.service - MUNGE authentication service
   Loaded: loaded (/lib/systemd/system/munge.service; enabled; vendor preset: enabled)
   Active: active (running) since Fri 2024-12-13 09:59:54 PST; 23min ago
     Docs: man:munged(8)
  Process: 773 ExecStart=/usr/sbin/munged (code=exited, status=0/SUCCESS)
 Main PID: 797 (munged)
    Tasks: 4 (limit: 10797)
   Memory: 1.7M
    CGroup: /system.slice/munge.service
            └─797 /usr/sbin/munged

Dec 13 09:59:54 controller systemd[1]: Starting MUNGE authentication service...
Dec 13 09:59:54 controller systemd[1]: Started MUNGE authentication service.
```

## Slurmd service:

```
master@controller:~$ sudo systemctl status slurmd
● slurmd.service - Slurm node daemon
   Loaded: loaded (/etc/systemd/system/slurmd.service; disabled; vendor preset: enabled)
   Active: active (running) since Fri 2024-12-13 10:00:57 PST; 23min ago
 Main PID: 2049 (slurmd)
    Tasks: 1
   Memory: 5.7M
    CGroup: /system.slice/slurmd.service
            └─2049 /home/master/slurm-21.08.8/sbin/slurmd -D -s

Dec 13 10:00:57 controller systemd[1]: Started Slurm node daemon.
Dec 13 10:00:57 controller slurmd[2049]: slurmd: slurmd version 21.08.8 started
Dec 13 10:00:58 controller slurmd[2049]: slurmd: slurmd started on Fri, 13 Dec 2024 10:00:58 -0800
Dec 13 10:00:58 controller slurmd[2049]: slurmd: CPUs=1 Boards=1 Sockets=1 Cores=1 Threads=1 Memory=9089 TmpDisk=199995 Uptime=75 CPUSpecList=(null) FeaturesAvail=(null) Fb
```

## Slurmctld service:

```
master@controller:~$ sudo systemctl status slurmctld
● slurmctld.service - Slurm controller daemon
   Loaded: loaded (/etc/systemd/system/slurmctld.service; disabled; vendor preset: enabled)
   Active: active (running) since Fri 2024-12-13 10:01:11 PST; 23min ago
 Main PID: 2056 (slurmctld)
    Tasks: 18
   Memory: 7.3M
    CGroup: /system.slice/slurmctld.service
            └─2056 /home/master/slurm-21.08.8/sbin/slurmctld -D -s
                └─2057 slurmctld: slurmscriptd

Dec 13 10:01:11 controller systemd[1]: Started Slurm controller daemon.
Dec 13 10:01:11 controller slurmctld[2056]: slurmctld: No memory enforcing mechanism configured.
Dec 13 10:01:11 controller slurmctld[2056]: slurmctld: No parameter for mcs plugin, default values set
Dec 13 10:01:11 controller slurmctld[2056]: slurmctld: mcs: MCSParameters = (null). ondemand set.
Dec 13 10:01:14 controller slurmctld[2056]: slurmctld: SchedulerParameters=default_queue_depth=100,max_rpc_cnt=0,max_sched_time=2,partition_job_depth=0,sched_max_job_start
```

## Slurmdbd service:

```
master@controller:~$ sudo systemctl status slurmdbd
● slurmdbd.service - Slurm DBD accounting daemon
   Loaded: loaded (/etc/systemd/system/slurmdbd.service; disabled; vendor preset: enabled)
   Active: active (running) since Fri 2024-12-13 10:01:19 PST; 26min ago
 Main PID: 2085 (slurmdbd)
    Tasks: 6
   Memory: 5.7M
    CGroup: /system.slice/slurmdbd.service
            └─2085 /home/master/slurm-21.08.8/sbin/slurmdbd -D -s

Dec 13 10:01:19 controller systemd[1]: Started Slurm DBD accounting daemon.
Dec 13 10:01:19 controller slurmdbd[2085]: (null): _log_init: Unable to open logfile '/var/log/slurm/slurmdbd.log': No such file or directory
Dec 13 10:01:19 controller slurmdbd[2085]: WARNING: MYSQL_OPT_RECONNECT is deprecated and will be removed in a future version.
Dec 13 10:01:19 controller slurmdbd[2085]: slurmdbd: accounting_storage/as_mysql: _check_mysql_concat_is_sane: MySQL server version is: 5.5.5-10.3.39-MariaDB-0ubuntu0.20.0
```

## Sinfo and scontrol ping:

```
master@controller:~$ sinfo
PARTITION AVAIL TIMELIMIT NODES STATE NODELIST
partition* up infinite 3 idle compute[1-2],controller
master@controller:~$ scontrol ping
Slurmctld(primary) at controller is UP
master@controller:~$
```

# Output of Compute nodes

## Service munge:

```
Compute_1
master@compute1:~$ sudo systemctl status munge
● munge.service - MUNGE authentication service
   Loaded: loaded (/lib/systemd/system/munge.service; enabled; vendor preset: en
   Active: active (running) since Fri 2024-12-13 09:56:58 PST; 32min ago
     Docs: man:munged(8)
    Main PID: 790 (munged)
      Tasks: 4 (limit: 10797)
     Memory: 1.5M
        CGroup: /system.slice/munge.service
                └─790 /usr/sbin/munged

Dec 13 09:56:58 compute1 systemd[1]: Starting MUNGE authentication service...
Dec 13 09:56:58 compute1 systemd[1]: Started MUNGE authentication service.
master@compute1:~$

Compute_2
master@compute2:~$ sudo systemctl status munge
● munge.service - MUNGE authentication service
   Loaded: loaded (/lib/systemd/system/munge.service; enabled; vendor preset: en
   Active: active (running) since Fri 2024-12-13 09:57:02 PST; 32min ago
     Docs: man:munged(8)
    Main PID: 790 (munged)
      Tasks: 4 (limit: 10797)
     Memory: 1.5M
        CGroup: /system.slice/munge.service
                └─790 /usr/sbin/munged

Dec 13 09:57:02 compute2 systemd[1]: Starting MUNGE authentication service...
Dec 13 09:57:02 compute2 systemd[1]: Started MUNGE authentication service.
master@compute2:~$
```

## Service slurmd:

```
Compute_1
master@compute1:~$ sudo systemctl status slurmd
● slurmd.service - Slurm node daemon
   Loaded: loaded (/etc/systemd/system/slurmd.service; disabled; vendor preset:
   Active: active (running) since Fri 2024-12-13 10:02:29 PST; 28min ago
    Main PID: 1406 (slurmd)
      Tasks: 1
     Memory: 5.8M
        CGroup: /system.slice/slurmd.service
                └─1406 /home/master/slurm-21.08.8/sbin/slurmd -D -s

Dec 13 10:02:29 compute1 systemd[1]: Started Slurm node daemon.
Dec 13 10:02:30 compute1 slurmd[1406]: slurmd: slurmd version 21.08.8 started
Dec 13 10:02:30 compute1 slurmd[1406]: slurmd: slurmd started on Fri, 13 Dec 2024
Dec 13 10:02:30 compute1 slurmd[1406]: slurmd: CPUs=1 Boards=1 Sockets=1 Cores=1 T
master@compute1:~$

Compute_2
master@compute2:~$ sudo systemctl status slurmd
● slurmd.service - Slurm node daemon
   Loaded: loaded (/etc/systemd/system/slurmd.service; disabled; vendor preset:
   Active: active (running) since Fri 2024-12-13 10:02:30 PST; 28min ago
    Main PID: 1411 (slurmd)
      Tasks: 1
     Memory: 5.8M
        CGroup: /system.slice/slurmd.service
                └─1411 /home/master/slurm-21.08.8/sbin/slurmd -D -s

Dec 13 10:02:30 compute2 systemd[1]: Started Slurm node daemon.
Dec 13 10:02:30 compute2 slurmd[1411]: slurmd: slurmd version 21.08.8 started
Dec 13 10:02:30 compute2 slurmd[1411]: slurmd: slurmd started on Fri, 13 Dec 2024
Dec 13 10:02:30 compute2 slurmd[1411]: slurmd: CPUs=1 Boards=1 Sockets=1 Cores=1 T
master@compute2:~$
```