Create 3 VM Machines as 1 Master and 2 Client.

1. Add two adapters NAT and HOST only.
2. Stop Firewall and Selinux.
3. Add IP’s in host-file.
4. yum install nfs-utils.x86\_64
5. yum install epel-release.noarch -y

On-Master Node:

1. systemctl start nfs-server.service
2. [root@master ~]# systemctl enable nfs-server.service
3. [root@master ~]# chmod 777 /home/
4. [root@master ~]# vim /etc/exports

/home/ 10.10.10.148(rw,sync,no\_root\_squash)

/home/ 10.10.10.149(rw,sync,no\_root\_squash)

1. [root@master ~]# exportfs –avr

exporting 10.10.10.148:/home

exporting 10.10.10.149:/home

On all 3 Nodes add user admin and set Password to it.

1. [root@client2 ~]# su - admin
2. Ssh-keygen
3. [admin@master ~]$ ssh-copy-id admin@client1
4. [admin@master ~]$ ssh-copy-id admin@client2
5. [root@master ~]# yum install munge munge-libs munge-devel –y
6. [root@master ~]# systemctl start munge.service
7. [root@master ~]# systemctl enable munge.service
8. [root@client1 ~]# chown munge:munge /etc/munge/munge.key

On Node1 and Node2:

1. [root@client1 ~]# mount -t nfs master:/home/ /home/
2. [root@client2 ~]# mount -t nfs master:/home/ /home/

On Master:

1. [root@master ~]# /usr/sbin/create-munge-key -r
2. [root@master ~]# ll /etc/munge/
3. [root@master ~]# scp /etc/munge/munge.key client1:/etc/munge/
4. [root@master ~]# scp /etc/munge/munge.key client2:/etc/munge/
5. [root@master ~]# wget <https://download.schedmd.com/slurm/slurm-20.11.9.tar.bz2>
6. [root@master ~]# yum install rpm-build
7. [root@master ~]# rpmbuild -ta slurm-20.11.9.tar.bz2
8. [root@master ~]# yum install python3 readline-devel perl pam-devel perl-ExtUtils-MakeMaker mysql-devel –y

On All 3 Machines:

1. [root@master ~]# export SLURMUSER=900

2. [root@master ~]# groupadd -g $SLURMUSER slurm

3. [root@master ~]# useradd -m -c "SLURM workload manager" -d /var/lib/slurm -u $SLURMUSER -g slurm -s /bin/bash slurm

On Master Node:

1. [root@master ~]# ll /root/rpmbuild/RPMS/x86\_64/
2. [root@master ~]# mkdir /home/rpms
3. [root@master ~]# cd /root/rpmbuild/RPMS/x86\_64/
4. [root@master x86\_64]# cp \* /home/rpms/
5. [root@master x86\_64]# cd /home/rpms/

On All 3 Machines:

1. [root@master rpms]# yum install localinstall \*
2. [root@master rpms]# mkdir /var/spool/slurm
3. [root@master rpms]# chown slurm:slurm /var/spool/slurm/
4. [root@master rpms]# chmod 755 /var/spool/slurm/
5. [root@master rpms]# mkdir /var/log/slurm
6. [root@master rpms]# chown -R slurm . /var/log/slurm/

On Master Node:

1. [root@master rpms]# touch /var/log/slurm/slurmctld.log
2. [root@master rpms]# chown slurm:slurm /var/log/slurm/slurmctld.log
3. [root@master rpms]# touch /var/log/slurm\_jobacct.log
4. [root@master rpms]# touch /var/log/slurm\_jobcomp.log
5. [root@master rpms]# chown slurm: /var/log/slurm\_jobacct.log /var/log/slurm\_jobcomp.log
6. [root@master rpms]# cp /etc/slurm/slurm.conf.example /etc/slurm/slurm.conf
7. [root@master rpms]# vi /etc/slurm/slurm.conf

11 ClusterName=hpcsa

12 ControlMachine=master

93 NodeName=client1 CPUs=2 Boards=1 SocketsPerBoard=2 CoresPerSocket=1 ThreadsPerCore=1 RealMemory=3770

94 NodeName=client2 CPUs=2 Boards=1 SocketsPerBoard=2 CoresPerSocket=1 ThreadsPerCore=1 RealMemory=3770

1. [root@master rpms]# scp /etc/slurm/slurm.conf client1:/etc/slurm/
2. [root@master rpms]# scp /etc/slurm/slurm.conf client2:/etc/slurm/
3. [root@master rpms]# systemctl start slurmctld.service
4. [root@master rpms]# systemctl enable slurmctld.service

ON BOTH CLIENT MACHINES:

1. [root@client1 rpms]# systemctl start slurmd.service
2. [root@client1 rpms]# systemctl enable slurmd.service
3. [root@client1 rpms]# slurmd –C
4. Slurmd –Dvv ->to debug slurmd service on client

ON Master:

1. Sinfo
2. Scontrol update node=client1 state=idle (if state is down do this, first restart slurmd and munge on client machine).
3. Slurmctld –Dvv -> to debug slurmctld
4. Sinfo –R -> to check unhealthy node
5. [root@master rpms]# srun -w client1 --pty /bin/bash
6. Qstat –f

SBATCH- script on master:

1. [root@client1 rpms]# vim demosbatch.sh
2. [root@client1 rpms]# sbatch demosbatch.sh
3. [root@client1 rpms]# squeue

JOBID PARTITION NAME USER ST TIME NODES NODELIST(REASON)

3 standard bash root R 10:55 1 client1 4 standard myjob root R 0:15 2 client[1-2]

1. [root@client1 rpms]# scontrol show job 3
2. Scancel 3

Configlesss--------------------------------------------------Start

**Setting up MariaDB database: master**

Install MariaDB:

yum install mariadb-server mariadb-devel -y

Start the MariaDB service:

systemctl enable mariadb

systemctl start mariadb

systemctl status mariadb

Create the Slurm database user:

mysql

In mariaDB:

MariaDB[(none)]> GRANT ALL ON slurm\_acct\_db.\* TO 'slurm'@'localhost' IDENTIFIED BY '1234' with grant option;

MariaDB[(none)]> SHOW VARIABLES LIKE 'have\_innodb';

MariaDB[(none)]> FLUSH PRIVILEGES;

MariaDB[(none)]> CREATE DATABASE slurm\_acct\_db;

MariaDB[(none)]> quit;

Verify the databases grants for the *slurm* user:

mysql -p -u slurm

Tpye password for slurm: 1234. In mariaDB:

MariaDB[(none)]> show grants;

MariaDB[(none)]> quit;

Create a new file /etc/my.cnf.d/innodb.cnf containing:

[mysqld]

innodb\_buffer\_pool\_size=1024M

innodb\_log\_file\_size=64M

innodb\_lock\_wait\_timeout=900

To implement this change you have to shut down the database and move/remove logfiles:

systemctl stop mariadb

mv /var/lib/mysql/ib\_logfile? /tmp/

systemctl start mariadb

You can check the current setting in MySQL like so:

MariaDB[(none)]> SHOW VARIABLES LIKE 'innodb\_buffer\_pool\_size';

Create slurmdbd configuration file:

vim /etc/slurm/slurmdbd.conf

Set up files and permissions:

chown slurm: /etc/slurm/slurmdbd.conf

chmod 600 /etc/slurm/slurmdbd.conf

touch /var/log/slurmdbd.log

chown slurm: /var/log/slurmdbd.log

Paste the slurmdbd.conf in Configs and paste it into slurmdbd.conf.

Some variables are:

DbdAddr=localhost

DbdHost=localhost

DbdPort=6819

StoragePass=1234

StorageLoc=slurm\_acct\_db

Try to run *slurndbd* manually to see the log:

slurmdbd -D -vvv

Terminate the process by Control+C when the testing is OK.

Start the slurmdbd service:

systemctl enable slurmdbd

systemctl start slurmdbd

systemctl status slurmdbd

On the **master** node:

systemctl enable slurmctld.service

systemctl start slurmctld.service

systemctl status slurmctld.service

Accounting -------------------------------------------------------------Start-------

1. [root@master rpms]# vim /etc/slurm/slurmdbd.conf

# Database info

StorageType=accounting\_storage/mysql

StorageHost=localhost

#StoragePort=1234

StoragePass=1234

StorageUser=slurm

StorageLoc=slurm\_acct\_db

1. [root@master rpms]# chown slurm:slurm /etc/slurm/slurmdbd.conf
2. mkdir -p /var/log/slurm/ (if created then don’t create it)
3. [root@master rpms]# touch /var/log/slurm/slurmdbd.log
4. [root@master rpms]# vim /etc/slurm/slurm.conf

AccountingStorageType=accounting\_storage/slurmdbd

AccountingStorageHost=localhost

#AccountingStorageLoc=

#AccountingStoragePass=

AccountingStorageUser=slurm

1. [root@master rpms]# systemctl restart slurmdbd.service
2. [root@master rpms]# systemctl restart mariadb.service
3. [root@master rpms]# systemctl restart slurmctld.service
4. [root@master rpms]# sacctmgr

sacctmgr: show cluster

sacctmgr: add cluster shrusti

sacctmgr: show user

sacctmgr: add account account1

sacctmgr: add user admin account=account1

sacctmgr: create qos qos1 maxwall=2-00:00:00

sacctmgr: show qos

sacctmgr: create qos qos2 priority=1000

sacctmgr: list cluster

1. [root@master rpms]# sshare