

ASSIGNMENT-7

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Q.1 create a partition called "exam partition"; make one compute node a part of it ; on this compute node this will be default partition for wall time 7 days and will be available for 10 minutes for a given job ; execute the job provide detailed information about a job and partition; take screenshots for upload

```

PARTITION AVAIL  TIMELIMIT  NODES  STATE NODELIST
newpartition* up       2:00      3    idle compute[1-2],controller
Test       up       1:00:00     2    idle compute[1-2]
exam_partition up 7-00:00:00  1    idle compute1
root@controller:/home/dhpcsa/slurm-21.08.8/etc# cd ..
root@controller:/home/dhpcsa/slurm-21.08.8# ls
aclocal.m4  build      config.status  CONTRIBUTING.md  etc      libtool      Makefile.in  RELEASE_NOTES  slurm.conf  testsuite
AUTHORS     config.h   configure      COPYING          include  LICENSE.OpenSSL  META         sbin          slurm.spec
auxdir      config.h.in configure.ac    DISCLAIMER       INSTALL  Makefile      NEWS         share         src
bin         config.log contribs       doc              lib      Makefile.am   README.rst   slurm        stamp-h1
root@controller:/home/dhpcsa/slurm-21.08.8# cd build/
root@controller:/home/dhpcsa/slurm-21.08.8/build# ls
fibonnaci_job.sh  newscript.sh  newscript.sh.save
```

```

#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=4 State=UNKNOWN
NodeName=compute[1-2] CPUs=4 State=UNKNOWN
PartitionName=newpartition Nodes=ALL Default=YES MaxTime=00:02:00 State=UP
PartitionName=Test Nodes=compute[1-2] MaxTime=01:00:00 State=UP AllowAccounts=dhpcsa,rma QOS=rmaqos
PartitionName=exam_partition Nodes=compute1 MaxTime=7-00:00:00 State=UP
Mailprog=/usr/bin/mail
```

```

# /bin/bash
#SBATCH --partition=exam_partition      # Specify partition
#SBATCH --time=00:10:00                 # Wall time (10 minutes)
#SBATCH --job-name=exam_job             # Job name
#SBATCH --output=/tmp/exam_job_output.txt # Output file
# Job command
echo "Running on $SLURM_NODELIST"
sleep 600 # Sleep for 600 seconds (10 minutes)

```

```

root@controller:/home/dhpcsa/slurm-21.08.8/build# sbatch assignment7.sh
Submitted batch job 89
root@controller:/home/dhpcsa/slurm-21.08.8/build# squeue
      JOBID PARTITION    NAME    USER  ST       TIME  NODES NODELIST(REASON)
      89 exam_part exam_job   root   R        0:04      1 compute1
root@controller:/home/dhpcsa/slurm-21.08.8/build# squeue
      JOBID PARTITION    NAME    USER  ST       TIME  NODES NODELIST(REASON)
      89 exam_part exam_job   root   R        0:08      1 compute1
root@controller:/home/dhpcsa/slurm-21.08.8/build# sacct
JobID      JobName  Partition      Account  AllocCPUS      State  ExitCode
-----
87          newscrip+      Test          rma        1  TIMEOUT      0:0
87.batch          batch          rma        1  CANCELLED
88          newscrip+      Test          rma        1  TIMEOUT      0:0
88.batch          batch          rma        1  CANCELLED
89          exam_job exam_part+      root        1  RUNNING      0:0
89.batch          batch          root        1  RUNNING      0:0
root@controller:/home/dhpcsa/slurm-21.08.8/build#

```

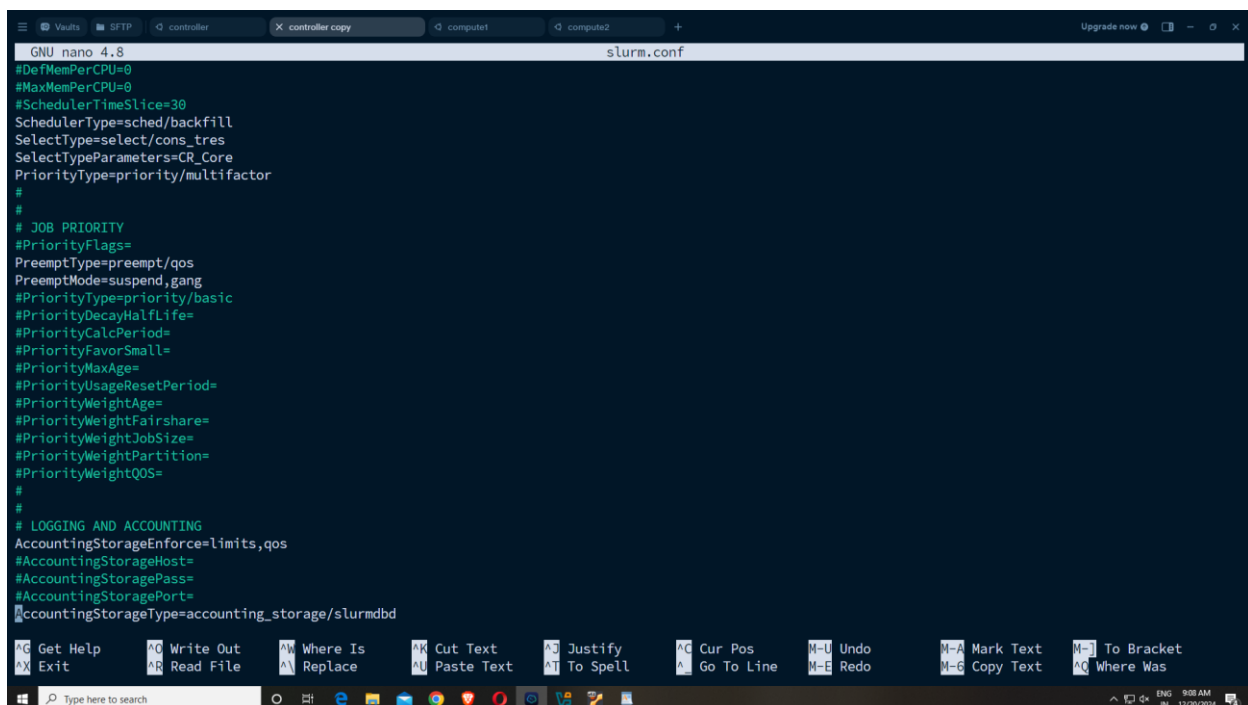
```
dhpcs@compute1:~$ ls /tmp
config-err-r882HR
exam_job_output.txt
snap-private-tmp
ssh-foTlefZaniW3
systemd-private-29c7b2b7c42d4c28b32e0bb062f821b6-colord.service-Jc05if
systemd-private-29c7b2b7c42d4c28b32e0bb062f821b6-ModemManager.service-Ftl49g
systemd-private-29c7b2b7c42d4c28b32e0bb062f821b6-switcheroo-control.service-hEr0xg
systemd-private-29c7b2b7c42d4c28b32e0bb062f821b6-systemd-logind.service-z8DVpf
systemd-private-29c7b2b7c42d4c28b32e0bb062f821b6-systemd-resolved.service-R3JRbg
systemd-private-29c7b2b7c42d4c28b32e0bb062f821b6-systemd-timesyncd.service-L6SFHi
systemd-private-29c7b2b7c42d4c28b32e0bb062f821b6-upower.service-uKPRnf
tracker-extract-files.1000
tracker-extract-files.126
dhpcs@compute1:~$ cat /tmp/exam_job_output.txt
Running on compute1
dhpcs@compute1:~$
```

Q.2 The user "examuser" must be able to submit only two jobs for "exam partition"; validate your output with squeue or scontrol show jobs

1. Create a New User

```
root@controller:/home/dhpcsa/slurm-21.08.8/etc# adduser examuser
Adding user `examuser' ...
Adding new group `examuser' (1010) ...
Adding new user `examuser' (1010) with group `examuser' ...
Creating home directory `/home/examuser' ...
Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for examuser
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
```

2. Editing the Configuration File (**slurm.conf**)



```
GNU nano 4.8 slurm.conf
#DefMemPerCPU=0
#MaxMemPerCPU=0
#SchedulerTimeSlice=30
SchedulerType=sched/backfill
SelectType=select/cons_tres
SelectTypeParameters=CR_Core
PriorityType=priority/multifactor
#
#
# JOB PRIORITY
#PriorityFlags=
PreemptType=preempt/qos
PreemptMode=suspend,gang
#PriorityType=priority/basic
#PriorityDecayHalfLife=
#PriorityCalcPeriod=
#PriorityFavorSmall=
#PriorityMaxAge=
#PriorityUsageResetPeriod=
#PriorityWeightAge=
#PriorityWeightFairshare=
#PriorityWeightJobSize=
#PriorityWeightPartition=
#PriorityWeightQOS=
#
#
# LOGGING AND ACCOUNTING
AccountingStorageEnforce=limits,qos
#AccountingStorageHost=
#AccountingStoragePass=
#AccountingStoragePort=
AccountingStorageType=accounting_storage/slurmdbd

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

```
#
#
# COMPUTE NODES
NodeName=controller CPUs=4 State=UNKNOWN
NodeName=compute[1-2] CPUs=4 State=UNKNOWN
#PartitionName=newpartition Nodes=controller Default=YES MaxTime=INFINITE State=UP
#PartitionName=test Nodes=compute[1-2] MaxTime=01:00:00 State=UP AllowAccounts=dhpcsa,rma QOS=rmaeos
#PartitionName=exam_partition Nodes=compute1 MaxTime=7-00:00:00 State=UP AllowAccounts=examuser QOS=
#PartitionName=fairpart Nodes=controller Default=yes MaxTime=INFINITE State=UP AllowAccounts=root,dhpcsa,dhpcsa1,dhpcsa2
#PartitionName=test Nodes=compute[1-2] MaxTime=01:00:00 State=UP AllowAccounts=root,pravin QOS=rmaeos

PartitionName=exam_partition Nodes=controller Default=YES MaxTime=7-00:00:00 State=UP AllowAccounts=examuser QOS=examuser
Mailprog=/usr/bin/mail
```

3. Make Scripts to Run

```
GNU nano 4.8
#!/bin/bash
#SBATCH --output=/tmp/fibonacci_%j.out
#SBATCH --error=/tmp/fibonacci_%j.err
#SBATCH --odelist=controller
#SBATCH --partition=exam_partition

for i in {1..1000}
do
echo $i
sleep 4
done
```

4. Copy Configuration to System Directories

```
root@controller:/home/dhpcsa/slurm-21.08.8/etc# cp slurm.conf /etc/s
sane.d/          sensors.d/      shadow-        slurm-llnl/    ssl/           subuid-        sysctl.d/
security/        services       shells         snmp/          subgid         sudoers.d/    systemd/
selinux/         sgml/          skel/         speech-dispatcher/ subgid-        subuid
sensors3.conf    shadow         slurm/         ssh/           subuid
root@controller:/home/dhpcsa/slurm-21.08.8/etc# cp slurm.conf /etc/slurm
root@controller:/home/dhpcsa/slurm-21.08.8/etc# cp slurm.conf /etc/slurm-llnl/
root@controller:/home/dhpcsa/slurm-21.08.8/etc# syatemctl restart slurmd

Command 'syatemctl' not found, did you mean:

  command 'systemctl' from deb systemd (245.4-4ubuntu3.24)
  command 'systemctl' from deb systemctl (1.4.3424-2)

Try: apt install <deb name>

root@controller:/home/dhpcsa/slurm-21.08.8/etc# systemctl restart slurmd
root@controller:/home/dhpcsa/slurm-21.08.8/etc# systemctl restart slurmdbd
root@controller:/home/dhpcsa/slurm-21.08.8/etc# systemctl restart slurmctld
root@controller:/home/dhpcsa/slurm-21.08.8/etc# sinfo
PARTITION    AVAIL  TIMELIMIT  NODES  STATE NODELIST
exam_partition* up 7-00:00:00    1   unk controller
root@controller:/home/dhpcsa/slurm-21.08.8/etc# scontrol update NodeName=controller state=idle
root@controller:/home/dhpcsa/slurm-21.08.8/etc# sinfo
PARTITION    AVAIL  TIMELIMIT  NODES  STATE NODELIST
exam_partition* up 7-00:00:00    1   idle controller
```

5. Restarting Slurm Services

After editing the configuration, the Slurm services were restarted:

```
systemctl restart slurmd
systemctl restart slurmdbd
systemctl restart slurmctld
```

6. Create Account and User in **sacctmgr**

```
root@controller:/home/dhpcsa/slurm-21.08.8/etc# sacctmgr add account examuser --immediate
Adding Account(s)
  examuser
Settings
  Description      = Account Name
  Organization     = Parent/Account Name
Associations
  A = examuser    C = cluster
  A = examuser    C = newcluster
root@controller:/home/dhpcsa/slurm-21.08.8/etc# sacctmgr create user examuser defaultaccount=examuser adminlevel=[none] --immediate
Adding User(s)
  examuser
Settings =
  Default Account = examuser
Associations =
  U = examuser    A = examuser    C = cluster
  U = examuser    A = examuser    C = newcluster
```

7. Create QoS for the User

```

root@controller:/home/dhpcsa/slurm-21.08.8/etc# sacctmgr modify qos examuser set MaxJobs=2
Modified qos...
examuser
Would you like to commit changes? (You have 30 seconds to decide)
(N/y): y
root@controller:/home/dhpcsa/slurm-21.08.8/etc# sacctmgr show qos format=name,priority,MaxJobs

```

Name	Priority	MaxJobs
normal	0	
ganesh	0	2
rmaaqs	0	2
examuser	12	2

8. Modify User Settings (MaxJobs)

```

root@controller:/home/dhpcsa/slurm-21.08.8/etc# sacctmgr modify qos examuser set MaxJobs=2
Modified qos...
examuser
Would you like to commit changes? (You have 30 seconds to decide)
(N/y): y
root@controller:/home/dhpcsa/slurm-21.08.8/etc# sacctmgr show qos format=name,priority,MaxJobs

```

Name	Priority	MaxJobs
normal	0	
ganesh	0	2
rmaaqs	0	2
examuser	12	2

9. Check QoS Settings

`sacctmgr show qos format=name,priority,MaxJobs`

10. Submitting Jobs as **examuser**

```
root@controller:/home/dhpcsa/slurm-21.08.8/etc# su - examuser
examuser@controller:~$ sinfo

Command 'sinfo' not found, did you mean:

  command 'info' from deb info (6.7.0.dfsg.2-5)
  command 'sinfo' from deb slurm-client (19.05.5-1)
  command 'anfo' from deb anfo (0.98-7build2)

Try: apt install <deb name>

examuser@controller:~$ export PATH="/home/dhpcsa/slurm-21.08.0/bin:${PATH}"
examuser@controller:~$ export PATH="/home/dhpcsa/slurm-21.08.0/sbin:${PATH}"
examuser@controller:~$ export LD_LIBRARY_PATH="/home/dhpcsa/slurm-21.08.0/lib:${LD_LIBRARY_PATH}"
examuser@controller:~$ sinfo
PARTITION      AVAIL  TIMELIMIT  NODES  STATE NODELIST
exam_partition* up 7-00:00:00      1  idle controller
examuser@controller:~$ squeue
        JOBID PARTITION     NAME     USER ST       TIME  NODES NODELIST(REASON)
-----
149 exam_part  newscrip examuser  R       0:10      1 controller
examuser@controller:~$ sacct
JobID      JobName  Partition  Account  AllocCPUS      State ExitCode
-----
149 exam_part  newscrip  examuser      1      controller
examuser@controller:~$ ls
newscrypt.sh
examuser@controller:~$ sbatch newscrypt.sh
Submitted batch job 149
examuser@controller:~$ squeue
        JOBID PARTITION     NAME     USER ST       TIME  NODES NODELIST(REASON)
-----
149 exam_part  newscrip examuser  R       0:10      1 controller
examuser@controller:~$ sbatch newscrypt.sh
Submitted batch job 150
examuser@controller:~$ squeue
        JOBID PARTITION     NAME     USER ST       TIME  NODES NODELIST(REASON)
-----
150 exam_part  newscrip examuser  R       0:01      1 controller
149 exam_part  newscrip examuser  R       0:14      1 controller
examuser@controller:~$ sbatch newscrypt.sh
Submitted batch job 151
examuser@controller:~$ squeue
        JOBID PARTITION     NAME     USER ST       TIME  NODES NODELIST(REASON)
-----
151 exam_part  newscrip examuser  PD       0:00      1 (QOSMaxJobsPerUserLimit)
150 exam_part  newscrip examuser  R       0:06      1 controller
149 exam_part  newscrip examuser  R       0:19      1 controller
```

11. MaxJobs Exceeded (QoS Limit)

```
examuser@controller:~$ ls
newscrypt.sh
examuser@controller:~$ sbatch newscrypt.sh
Submitted batch job 149
examuser@controller:~$ squeue
        JOBID PARTITION     NAME     USER ST       TIME  NODES NODELIST(REASON)
-----
149 exam_part  newscrip examuser  R       0:10      1 controller
examuser@controller:~$ sbatch newscrypt.sh
Submitted batch job 150
examuser@controller:~$ squeue
        JOBID PARTITION     NAME     USER ST       TIME  NODES NODELIST(REASON)
-----
150 exam_part  newscrip examuser  R       0:01      1 controller
149 exam_part  newscrip examuser  R       0:14      1 controller
examuser@controller:~$ sbatch newscrypt.sh
Submitted batch job 151
examuser@controller:~$ squeue
        JOBID PARTITION     NAME     USER ST       TIME  NODES NODELIST(REASON)
-----
151 exam_part  newscrip examuser  PD       0:00      1 (QOSMaxJobsPerUserLimit)
150 exam_part  newscrip examuser  R       0:06      1 controller
149 exam_part  newscrip examuser  R       0:19      1 controller
examuser@controller:~$
```

Start

Q3) Create a slurm account "exam account" and add "newexamuser" in it and submit a job by specifying account name

```

JOBID PARTITION NAME USER ST TIME NODES NODELIST(REASON)
3 exam_part new1.sh ubuntu PD 0:00 1 (Resources)
4 exam_part al.sh examuser PD 0:00 1 (Nodes required for job are DOWN, DRAINED or reserved for jobs in higher priority partitions)
5 exam_part al.sh examuser PD 0:00 1 (Priority)
2 exam_part new1.sh ubuntu R 1:40 1 compute1

examuser@controller:~$ sudo adduser newexamuser
[sudo] password for examuser:
Adding user `newexamuser' ...
Adding new group `newexamuser' (1003) ...
Adding new user `newexamuser' (1003) with group `newexamuser' ...
Creating home directory `/home/newexamuser' ...
Copying files from `/etc/skel' ...
New password:
Retype new password:
passwd: password updated successfully
Changing the user information for newexamuser
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]
examuser@controller:~$ sudo adduser newexamuser sudo
Adding user `newexamuser' to group `sudo' ...
Adding user newexamuser to group sudo
Done.
examuser@controller:~$ exit
logout
ubuntu@controller:~/slurm-21.08.8/build$ sacctmgr show account
Account Descr Org
-----
exam_accou+ exam_account exam_account
root default root account root
ubuntu@controller:~/slurm-21.08.8/build$ sacctmgr add user newexamuser Account=exam_account
Adding User(s)
newexamuser
Associations =
U = newexamuser A = exam_accou C = cluster
Non Default Settings
Would you like to commit changes? (You have 30 seconds to decide)
(N/y): y
```

```

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

newexamuser@controller:~$ sudo nano f1.sh
[sudo] password for newexamuser:
newexamuser@controller:~$ exit
logout
ubuntu@controller:~/slurm-21.08.8/build$ sacctmgr list user
-----
User      Def Acct      Admin
-----
examuser  exam_acco+    None
newexamus+ exam_acco+    None
root      root Administ+
ubuntu@controller:~/slurm-21.08.8/build$ su - newexamuser
Password:
newexamuser@controller:~$
newexamuser@controller:~$
newexamuser@controller:~$
newexamuser@controller:~$ sbatch --partition=exam_partition --account=exam_account --time=00:05:00 --wrap="echo 'job run in exam_account'"
Submitted batch job 6
newexamuser@controller:~$ squeue -u newexamuser
      JOBID PARTITION     NAME     USER ST       TIME  NODES NODELIST(REASON)
        6 exam_part    wrap newexamu PD      0:00      1 (Resources)
newexamuser@controller:~$ sbatch --partition=exam_partition --account=exam_account --time=00:05:00 --wrap="echo 'job run in exam_account'"
Submitted batch job 7
newexamuser@controller:~$ squeue -u newexamuser
      JOBID PARTITION     NAME     USER ST       TIME  NODES NODELIST(REASON)
        6 exam_part    wrap newexamu PD      0:00      1 (Resources)
        7 exam_part    wrap newexamu PD      0:00      1 (Priority)
newexamuser@controller:~$ sbatch --partition=exam_partition --account=exam_account --time=00:05:00 --wrap="echo 'job run in exam_account'"
Submitted batch job 8
newexamuser@controller:~$ squeue -u newexamuser
      JOBID PARTITION     NAME     USER ST       TIME  NODES NODELIST(REASON)
        6 exam_part    wrap newexamu PD      0:00      1 (Resources)
        7 exam_part    wrap newexamu PD      0:00      1 (Priority)
        8 exam_part    wrap newexamu PD      0:00      1 (Priority)
newexamuser@controller:~$ sinfo
PARTITION  AVAIL  TIMELIMIT  NODES  STATE NODELIST
debug      up    infinite   1      alloc compute1
debug      up    infinite   2      idle  compute2,controller
exam_partition* up  7-00:10:00  1      alloc compute1
newexamuser@controller:~$
```

```

Is the information correct? [Y/n]
examuser@controller:~$ sudo adduser newexamuser sudo
Adding user `newexamuser' to group `sudo' ...
Adding user newexamuser to group sudo
Done.
examuser@controller:~$ exit
logout
ubuntu@controller:~/slurm-21.08.8/build$ sacctmgr show account
  Account          Descr              Org
-----
exam_acco+        exam_account        exam_account
  root default root account          root
ubuntu@controller:~/slurm-21.08.8/build$ sacctmgr add user newexamuser Account=exam_account
Adding User(s)
  newexamuser
Associations =
  U = newexamus A = exam_accou C = cluster
Non Default Settings
Would you like to commit changes? (You have 30 seconds to decide)
(N/y): y
ubuntu@controller:~/slurm-21.08.8/build$ su - new
newexamuser  news
ubuntu@controller:~/slurm-21.08.8/build$ su - new
newexamuser  news
ubuntu@controller:~/slurm-21.08.8/build$ su - newexamuser
Password:
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

newexamuser@controller:~$ sudo nano fl.sh
[sudo] password for newexamuser:
newexamuser@controller:~$ exit
logout
ubuntu@controller:~/slurm-21.08.8/build$ sacctmgr list user
  User  Def Acct  Admin
-----
  examuser exam_acco+  None
newexamus+ exam_acco+  None
  root      root Administ+
ubuntu@controller:~/slurm-21.08.8/build$ su - newexamuser
Password:
newexamuser@controller:~$

```