++++++++++ Accounting ++++++++++
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

=>**Slurm can be configured to collect accounting information for every job and job step executed**. Accounting records can be written to a simple text file or a database. Information is available about both currently executing jobs and jobs which have already terminated.

change the file name
mv /etc/slurm/slurmdbd.conf.example /etc/slurm/slurmdbd.conf

edit slurmdbd.conf file
vi /etc/slurm/slurmdbd.conf

```
33 StorageType=accounting_storage/mysql
34 StorageHost=localhost
35 #StoragePort=1234
36 #StoragePass=password
37 StorageUser=slurm
38 StorageLoc=slurm_acct_db
```

    33 StorageType=accounting_storage/mysql
    34 StorageHost=localhost
    35 #StoragePort=1234
    36 #StoragePass=password
    37 StorageUser=slurm
    38 StorageLoc=slurm_acct_db

create a directory
mkdir -p /var/log/slurm

create a file
touch /var/log/slurm/slurmdbd.log

start slurmdbd
systemctl start slurmdbd

enable slurmdbd
systemctl enable slurmdbd

check status of slurmdbd
systemctl status slurmdbd

again edit slurm.comf file
vi /etc/slurm/slurm.conf

```
AccountingStorageHost=localhost
#AccountingStoragePass=
#AccountingStoragePort=
AccountingStorageType=accounting_storage/slurmdbd
AccountingStorageUser=slurm
```

AccountingStorageHost=localhost
AccountingStorageType=accounting_storage/slurmdbd
AccountingStorageUser=slurm
:wq

restart slurmdbd
systemctl restart slurmdbd

restart slurmctld
systemctl restart slurmctld

start mariadb service
systemctl start mariadb

check status of maridb service
systemctl status mariadb

```
[root@master slurm]# systemctl status mariadb
● mariadb.service - MariaDB database server
   Loaded: loaded (/usr/lib/systemd/system/mariadb.service; enabled; vendor preset: disabled)
   Active: active (running) since Wed 2023-02-01 20:41:53 IST; 4h 54min ago
 Main PID: 1162 (mysqld_safe)
    Tasks: 20
   Memory: 0B
   CGroup: /system.slice/mariadb.service
           ├─1162 /bin/sh /usr/bin/mysqld_safe --basedir=/usr
           └─1334 /usr/libexec/mysqld --basedir=/usr --datadir=/var/lib/mysql --plugin-dir=/usr/lib64/...

Feb 01 20:41:43 master systemd[1]: Starting MariaDB database server...
Feb 01 20:41:43 master mariadb-prepare-db-dir[1038]: Database MariaDB is probably initialized in /v...ne.
Feb 01 20:41:43 master mariadb-prepare-db-dir[1038]: If this is not the case, make sure the /var/li...ir.
Feb 01 20:41:43 master mysqld_safe[1162]: 230201 20:41:43 mysqld_safe Logging to '/var/log/mariadb...og'.
Feb 01 20:41:44 master mysqld_safe[1162]: 230201 20:41:44 mysqld_safe Starting mysqld daemon with ...ysql
Feb 01 20:41:53 master systemd[1]: Started MariaDB database server.
Hint: Some lines were ellipsized, use -l to show in full.
```

slurm database

#Create user in mariadb database
[root@master~]# mysql

MariaDB [(none)]> create user 'slurm'@'localhost';
MariaDB [(none)]> grant all on slurm_acct_db.* TO
'slurm'@'localhost';
MariaDB [(none)]> show databases;
MariaDB [(none)]> exit

create account in database
acctmgr

```
[root@master ~]# mysql
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 193
Server version: 5.5.68-MariaDB MariaDB Server

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

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

create user in mariadb
 create user 'slurm'@'localhost';

```
MariaDB [(none)]> create user 'slurm'@'localhost';
Query OK, 0 rows affected (0.00 sec)
```

Give all permission to slurm_loacalhost
MariaDB [(none)]> grant all on slurm_acct_db.* TO
'slurm'@'localhost';

```
MariaDB [(none)]> grant all on slurm_acct_db.* TO 'slurm'@'localhost';
Query OK, 0 rows affected (0.00 sec)
```

show database
MariaDB [(none)]> show databases;

```
MariaDB [(none)]> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mysql              |
| performance_schema |
| slurm_acct_db      |
| test               |
+--------------------+
5 rows in set (0.01 sec)
```

exit from mariadb database
MariaDB [(none)]> exit

```
MariaDB [(none)]> exit
Bye
[root@master slurm]#
```

```
[root@master ~]# mysql
Welcome to the MariaDB monitor.  Commands end with ; or \g.
Your MariaDB connection id is 193
Server version: 5.5.68-MariaDB MariaDB Server

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 'slurm'@'localhost';
Query OK, 0 rows affected (0.00 sec)

MariaDB [(none)]> grant all on slurm_acct_db.* To 'slurm'@'localhost';
Query OK, 0 rows affected (0.00 sec)

MariaDB [(none)]> show databases;
+--------------------+
| Database           |
+--------------------+
| information_schema |
| mysql              |
| performance_schema |
| slurm_acct_db      |
| test               |
+--------------------+
5 rows in set (0.00 sec)

MariaDB [(none)]>
```

for create user in mysql database

[root@master ~]# sacctmgr
sacctmgr:

```
[root@master ~]# sacctmgr
sacctmgr: █
```

Show cluster in database
sacctmgr: show cluster

```
sacctmgr: show cluster
   Cluster        ControlHost  ControlPort   RPC     Share GrpJobs       GrpTRES GrpSubmit MaxJobs       Max
TRES MaxSubmit      MaxWall                  QOS   Def QOS
---------- --------------- ------------- ----- --------- ------- ------------- --------- ------- ---------
---- --------- ----------- ------------------- ---------
sacctmgr: █
```

show user in database
sacctmgr: show user

```
sacctmgr: show user
      User    Def Acct       Admin
---------- ---------- ---------
      root               Administ+
sacctmgr: █
```

add cluster in mysql database
add cluster 'hpcsa'

```
sacctmgr: add cluster hpcsa
 Adding Cluster(s)
   Name            = hpcsa
Would you like to commit changes? (You have 30 seconds to decide)
(N/y): y
```

Show cluster in database
sacctmgr: show cluster

```
sacctmgr: show cluster
   Cluster        ControlHost  ControlPort   RPC     Share GrpJobs       GrpTRES GrpSubmit MaxJobs       Max
TRES MaxSubmit      MaxWall                  QOS   Def QOS
---------- --------------- ------------- ----- --------- ------- ------------- --------- ------- ---------
---- --------- ----------- ------------------- ---------
    hpcsa                              0     0         1
                                            normal
sacctmgr: █
```

add and show account in cluster
sacctmgr: add account pnb

```
sacctmgr: add account pnb
 Adding Account(s)
  pnb
 Settings
  Description      = Account Name
  Organization     = Parent/Account Name
 Associations
  A = pnb          C = hpcsa
Would you like to commit changes? (You have 30 seconds to decide)
(N/y): y
sacctmgr: show account
```

sacctmgr: show account

```
sacctmgr: show account
   Account                    Descr                  Org
---------- -------------------- --------------------
      pnb                       pnb                  pnb
      root default root account                      root
sacctmgr: []
```

add user with account
Sacctmgr: add user 'user_name' account='created_account_name'

```
sacctmgr: add user surya account=pnb
 Adding User(s)
  surya
 Associations =
  U = surya      A = pnb          C = hpcsa
 Non Default Settings
Would you like to commit changes? (You have 30 seconds to decide)
(N/y): y
```

add qos
sacctmgr: create 'qos_name' sqos maxwall=2-00:00:00

```
sacctmgr: create   qos sqos maxwall=2-00:00:00
 Adding QOS(s)
  sqos
 Settings
  Description     = sqos
  MaxWall                  = 2-00:00:00
Would you like to commit changes? (You have 30 seconds to decide)
(N/y): y
sacctmgr:
```

show qos

```
sacctmgr: show qos
     Name    Priority GraceTime    Preempt    PreemptExemptTime PreemptMode
        Flags UsageThres UsageFactor        GrpTRES    GrpTRESMins GrpTRESRunMin GrpJobs GrpSubmit      GrpWal
1       MaxTRES MaxTRESPerNode   MaxTRESMins     MaxWall     MaxTRESPU MaxJobsPU MaxSubmitPU      MaxTRESP
A MaxJobsPA MaxSubmitPA       MinTRES
---------- ---------- ---------- ---------- ------------------- ----------- ----------------------------
---------- ---------- ----------- ------------ ------------- ------------- ------------- ------- --------- ----------
- ------------- -------------- ------------- ----------- ------------- --------- ----------- -----------
- --------- ----------- -------------
    normal        0   00:00:00                                    cluster
                       1.000000


     sqos        0   00:00:00                                    cluster
                       1.000000
                                             2-00:00:00

sacctmgr:
```

modified user or qos

sacctmgr: modify user 'user_name' set qos+='qos_name'

```
sacctmgr: modify user surya set qos+=sqos
 Modified user associations...
  C = hpcsa       A = pnb                 U = surya
Would you like to commit changes? (You have 30 seconds to decide)
(N/y): y
sacctmgr:
```