Custom accounting for Simple Linux Utility for Resource Management

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Introduction
The focus of this research was to develop a user interface to the accounting data in the Simple Linux Utility for Resource Management (SLURM) batch system. NERSC users submit numerous jobs into the high performance computing systems, so they need a quick and easy way to recall their job information. The accounting tool is qqacct, which allows users to query the accounting database.

Motivation
Qqacct: a consistent user interface to access batch job history over different systems.

Background
High Performance Computing plays a significant role in scientific research. The National Energy Research Scientific Computing Center (NERSC) is the world leader in accelerating scientific discovery through computation. This project is involved with Carver, a NERSC’s supercomputer. Carver has 1200 compute nodes, 9000 process cores and its peak performance is 106.5 teraflops. On carver, SLURM is installed in the testbed subsystem.

Contribution
The code is written in Python using the MySQLdb module to make queries to the accounting database. The accounting tool is created by the following steps:
1. Connect to the slurm accounting database through a UNIX socket
2. Using the user arguments to qqacct, create an appropriate SQL query
3. Get information from the database
4. Take arguments by using argparse in python to create each argument, such as username, jobname, partition, end time and more
5. Change time format
Change Unix time to local time

Future Work
- Organize the print output
- Error checking
- Accept more arguments and switches
- Create a web interface with equivalent functionality
- Adapt qqacct into other batch systems

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Results
bash-3.2$ python qacct.py -u 57309 [-] xpl1.sh -- 2014-07-28
Jobs associated with this user 57309
0 jobs associated with this user
174 rows
1273 | xpl1.sh | reg_big | 02-10-2014 | 14:39:44
...
66 | xpl1.sh | reg_big | 10-01-2014 | 14:39:08
7 | xpl1.sh | reg_med | 03-21-2014 | 14:14:34
8 | xpl1.sh | reg_med | 03-21-2014 | 14:13:52
11 | xpl1.sh | reg_med | 03-21-2014 | 14:13:05
534 | xpl1.sh | reg_turbo | 07-05-2014 | 14:38:27
...
21687 | xpl1.sh | reg_big | 07-05-2014 | 15:19:29

Qqacct: a consistent user interface to access batch job history over different systems.

Genepool/Univa GridEngine
Carver/SLURM
Hopper/Torque and Moab
Edison/Torque and Moab

Simple Linux Utility for Resource Management (SLURM)

User commands (partial list)
- scontrol
- sinfo
- squeue
- saccount
- srun
- slurmd
- slurmd (optional)
- slurmd (primary)
- slurmd (backup)

Controller daemons

Database

Other clusters

Slurm accounting database

Results

Database information

Users

Qqacct

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