



Research
Computing

Ryan & Paul

REVIEW:
What Is A
Cluster?

Sun Grid
Engine

Conclusion

Cluster func'd

How to use use the cluster's functions

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Clusters: Werner & Solvay

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- Five Compute Nodes
- 32 × 2.3Ghz Processors (per node)
- 160 CPU's total
- 128 GB Ram per compute node (640 GB Total)

Intended Usage:

- Multithreaded jobs
- Multicore jobs
- Multiple instance jobs
- Multicore use machine!

Question: How do you utilize the cluster?

Answer: Sun Grid Engine



Commands

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Sun Grid Engine is a collection of commands used for managing cluster jobs.

- qsub - Submitting batch jobs
- qdel - Deleting jobs
- qstat - Checking the Job Queue
- qlogin - Doing interactive jobs
- qacct - “Accounting” data



qstat shows you the current status of the cluster

```
[rhl6856@werner ~]$ qstat
job-ID prior name user state submit/start at queue slots ja-task-ID
-----
246338 0.55500 Silvaco csu4881 r 04/13/2010 09:11:19 all.q@heisenberg.rc.rit.edu 8
246360 0.55500 Silvaco csu4881 r 04/14/2010 13:01:12 all.q@heisenberg.rc.rit.edu 8
[rhl6856@werner ~]$
```

qacct shows you –detailed– historical status of the cluster

```
[rhl6856@werner ~]$ qacct -d 10 -o
OWNER WALLCLOCK UTIME STIME CPU MEMORY IO IOW
-----
ajs5539 4356816 3558024.321 261550.232 4167558.229 1826642.299 587.194 0.000
csu4881 399460 33339.446 2023.360 35362.806 0.000 0.000 0.000
jtkadiml 1610 0.757 0.476 1.233 0.000 0.000 0.000
pfmeec 36263 162484.003 1939.645 164423.571 8922.328 100.940 0.000
rhl6856 165533 20064.097 753.371 20817.468 0.000 0.000 0.000
[rhl6856@werner ~]$
```



qsub: SGE Submit Files

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qsub allows us to submit batch jobs. We tell SGE how to run our job using a special “submit script.”

Example submit scripts are located in **/shared/sge/examples**

- parallel-mpi-job.sge (Traditional message passing parallelism)
- single-serial-array-job.sge (High Throughput type jobs, running the same **serial** job with many different inputs)
- single-multiprocessor-job.sge (When you want to have on program use threading)
- single-serial-job.sge (When you just have a single boring serial job)



Watch Me!

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– Demonstrate submitting batch jobs–



Go TRY it!

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Cluster Usage Policy is found at : **<http://wiki.rc.rit.edu>**
Example mpi codes are found in:
[/home/pub/rhl6856/mpi-examples](#)



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Any Questions?
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