

# Running, Using, and Maintaining a Cluster

From a software viewpoint  
Andrew Fitz Gibbon



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Oklahoma University, August 2010

# What's involved?

- A cluster.
  - People to use that cluster.
  - Software for those people to use.
  - Ways to keep the cluster working.
- 
- Libraries and User applications
  - Schedulers and resource managers
  - Monitoring and Maintenance tools



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# Goals?

1. Reliability

2. Availability

3. Efficient\*

4. Secure\*\*

5. AFAP\*\*\*

\* Maintains high utilization by people getting “real” work done, and not by system time. Should also be optimized for your users’ work load.

\*\* But not so secure as to lock out users.

\*\*\* A.F.A.P: As Fast As Possible



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# Compilers

- GNU Compiler suite
- Intel Compiler suite
- Portland Group Compilers
- Cray Compilers
- ....



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# Libraries

- mpiBLAST
- BLAS
- LAPACK
- ScaLAPACK
- PETSc
- MPI
- ATLAS
- ScalaBLAST
- CUDA
- Gaussian

Ad nauseum...



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# Job Managers

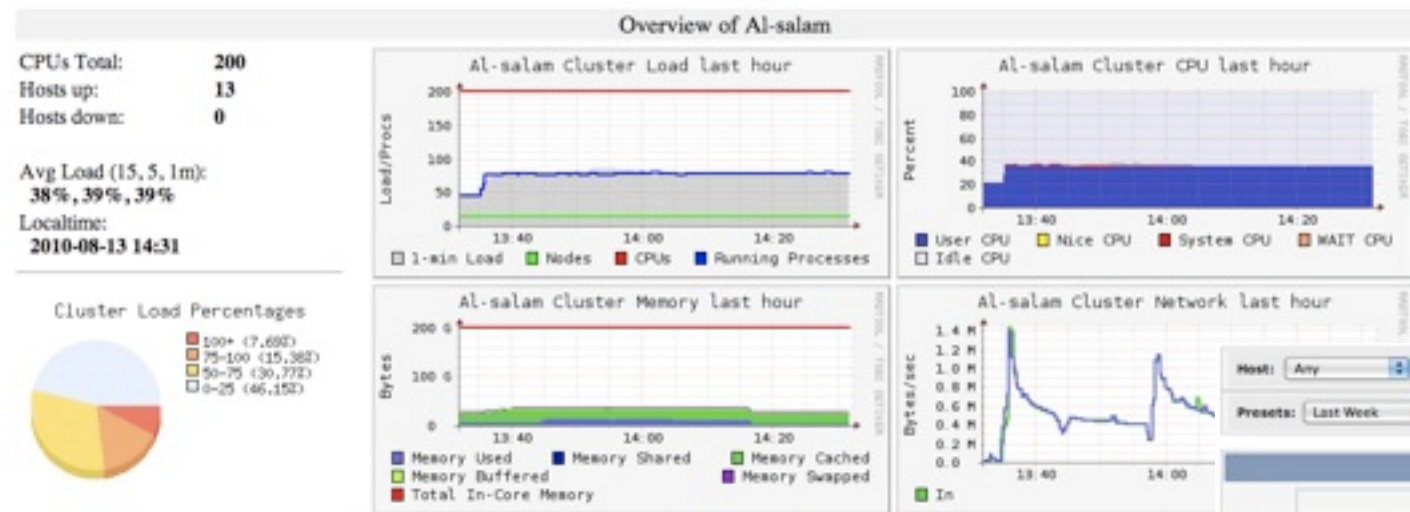
- TORQUE/PBS, LSF, LoadLeveler, Condor, Sun Grid Engine
- Usually tied into scheduler like FIFO, Maui
- Separate queues based on needs
  - E.g., CUDA, Debug, “normal,” intpar



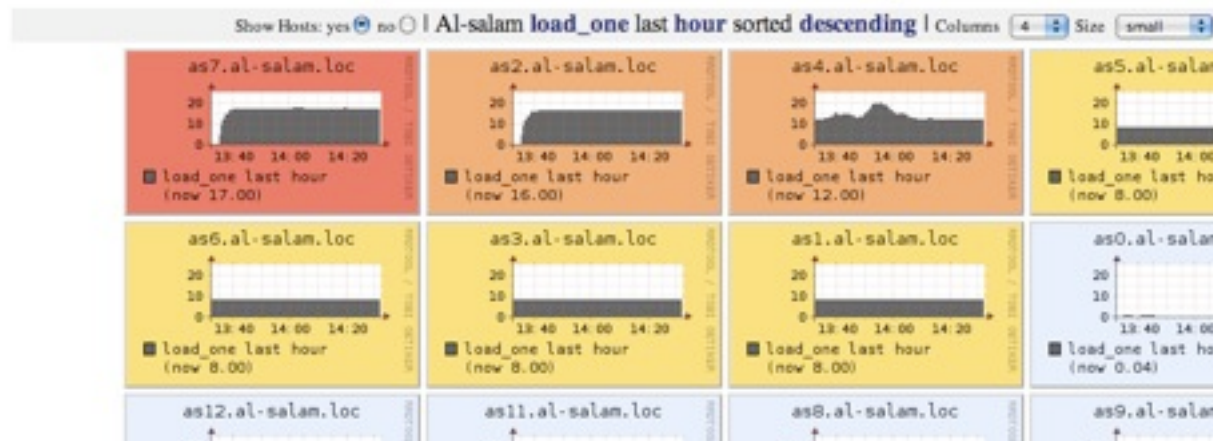
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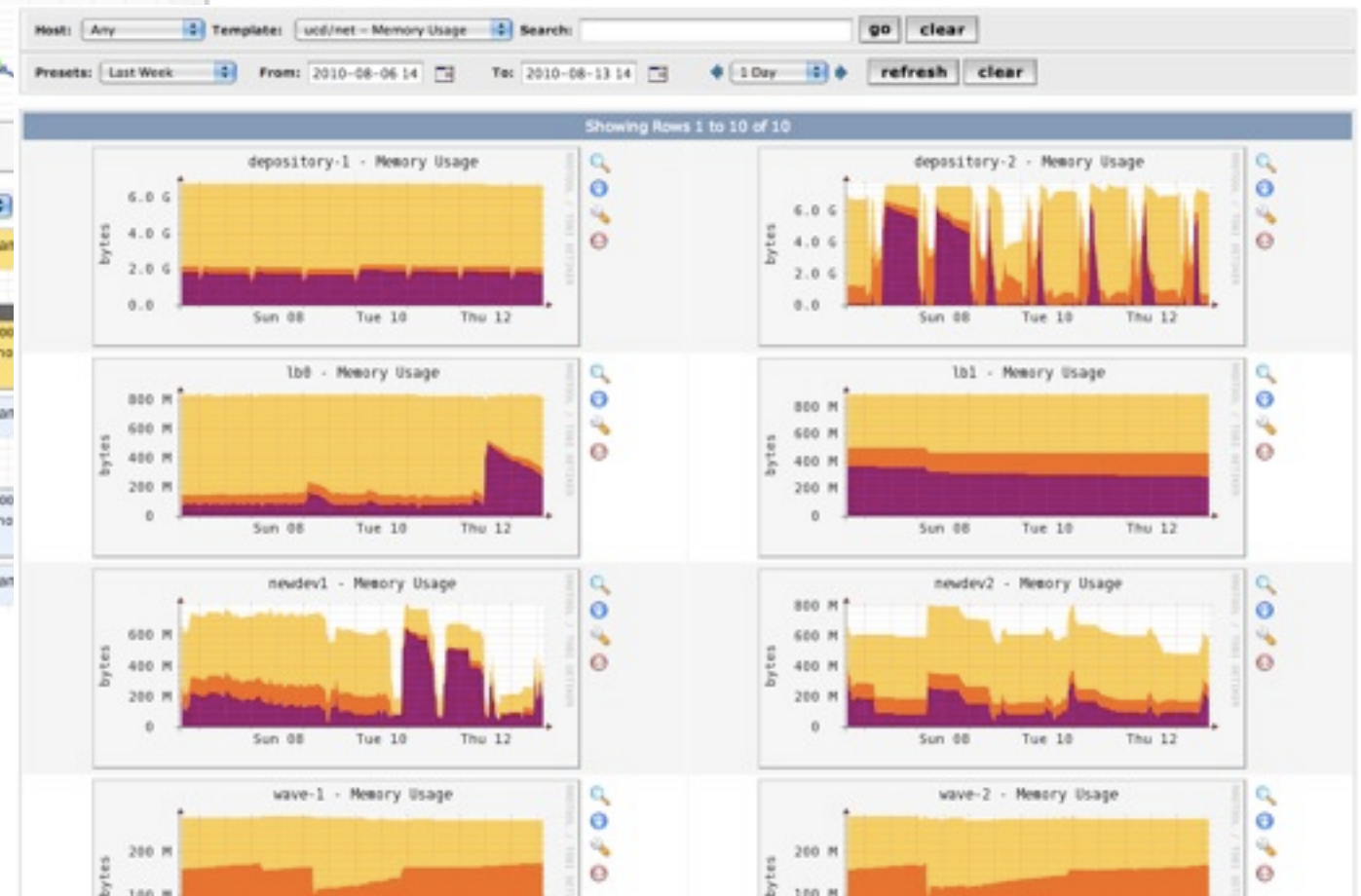
# Monitoring tools



Cacti



Ganglia



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# Maintenance tools

- C3 Tools
- Nagios
- Cron
- IPMI
- Modules
- ...



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# Questions?



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