HTCondor in KBase

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What is KBase?

Open software and data platform for addressing the grand challenge of systems biology:
Predicting and designing biological function

Unified system that integrates data and analytical tools for comparative functional genomics of microbes, plants, and their communities

Collaborative environment for sharing methods and results and placing those results in the context of knowledge in the field
Integrates a wide range of bioinformatics apps in one environment backed by DOE high-performance computing without having to learn separate systems, and users can add their own.
What is the Narrative Interface?

An easy-to-use Jupyter based interface that lets users customize and execute a set of ordered analyses in the form of “Narratives”
Some basic statistics

- ~375 jobs per day in the last week
  - Vast majority run at ANL
  - MPI apps can run at NERSC
- ~40 nodes for batch cluster
- ~190 official beta/released ‘apps’
- ~1800 Users
  - 30-40 Distinct users/day
Why HTCondor?

- We need fair share queueing
- We want to be able to set resource limits (e.g., wallclock runtime, mem/cpu requirements)
  - AWE does not support either
- Reviewed the following: Slurm, HTCondor, Torque and Cloud Scheduler
- Slurm seemed difficult to hook to our ID system
  - Would have required changes in C code
- Slurm’s integration interface is in C
- HTCondor supports arbitrary accounting groups
  - Just an additional ClassAd in the submit file
HTCondor challenges

- Because our use case is interactive, **low latency** to improve the user experience is a higher priority than high throughput to maximize utilization.
- Need better support and docs for libraries (e.g., java, python)
  - SOAP is better than CORBA, but a fully supported language independent REST service would be ideal.
- Difficult to add remote compute resources, docs hard to find/navigate.
- Limited howto/recipe-like docs for different configurations.
- Logfiles and CLI errors are often cryptic.
- Running HTCondor daemons from Docker (andypohl/condor; no official image) nontrivial.
- Would like native Debian 9 packages.
Future Plans

- Integration with DOE HPC Centers
- Richer workflows within HTCondor - possibly DAGman
  - CWL has been requested by upper management
- Use of HTCondor APIs instead of CLI tools
  - CondorAgent looks interesting
- Leverage HTCondor docker universe
- Public cloud integration/BYOC
Thank you!

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Still trying to debug this one.

**AUTHENTICATE:1005:Failed to securely exchange session key**

**condor_q -debug**
04/20/18 17:21:55 condor_read() failed: recv(fd=3) returned -1, errno = 104 Connection reset by peer, reading 5 bytes from schedd at <128.3.56.133:9618>.
04/20/18 17:21:55 IO: Failed to read packet header
04/20/18 17:21:55 SECMAN: required authentication with schedd at <128.3.56.133:9618> failed, so aborting command QUERY_JOB_ADS_WITH_AUTH.

-- Failed to fetch ads from:
<128.3.56.133:9618?addrs=128.3.56.133-9618+ [--1]-9618&noUDP&sock=19_9c63_3> : ci-dock

**AUTHENTICATE:1005:Failed to securely exchange session key**

**condor_submit -debug**
05/21/18 21:00:42 SECMAN: required authentication with schedd at <128.3.56.133:9618> failed, so aborting command QMGMT_WRITE_CMD.

**ERROR: Failed to connect to local queue manager**

- Often happens immediately after a condor_submit, sometimes for multiple attempts
- Sometimes happens on a condor_submit
- Reproducible with watch “condor_q --debug”
- Might be an 8.6.X bug according to the mailing list.