Using HTCondor Glideins to Run in IceCube Heterogeneous Resources

David Schultz
IceCube
Overview

- Grid sites: GlideinWMS
- Non-grid sites: pyglidein
- Various resource types:
  CPUs, GPUs, large memory
Grid sites: GlideinWMS

IceCube

OSG
Grid sites: GlideinWMS

Since 2013, IceCube has used the GLOW VO on the Open Science Grid, through CHTC
Grid sites: GlideinWMS

- Moving to icecube VO
- Still leveraging CHTC / OSG
- Adding more sites:
  - Germany
  - Canada
  - Other IceCube grid sites
Non-grid sites: pyglidein

https://github.com/WIPACrepo/pyglidein
Non-grid sites: pyglidein

- Standard HTCondor server
  - Shared port and CCB to make networking easier

- `server.py` user script
  - Query HTCondor every X minutes
  - Aggregate idle job resource requests
  - Present requests via http / jsonrpc
Non-grid sites: pyglidein

- **client.py** user script
  - Query **server.py** for requests
  - Check local queue for # idle
  - Submit new requests
- **submit.py**
  - Handles abstraction of different job schedulers
Non-grid sites: pyglidein

- **Glidein job**
  - Get resources allocated by scheduler
    - Environment variables from `submit.py`
    - Auto-sense for assigned GPU(s)
  - Pass resources to HTCondor Startd
Non-grid sites: pyglidein

- Started in 2015
  - Simple, non-optimized, yet ran 20% of production
- Can be deployed in minutes by a non-expert
- Because we host it, updates are fast
  - GPU errors at a new site fixed in a day
  - Latest parrot version needed for our OpenCL code
Non-grid sites: pyglidein

- Several collaboration sites have small, local clusters
  - Pyglidein gives them a way to contribute in a non-monetary way
Non-grid sites: pyglidein

- Used for IceCube supercomputer allocations through XSEDE:
  - Comet (>10,000 GPU hours used so far)
  - Bridges (coming soon)
Heterogeneous Resources

- IceCube jobs need (variously):
  - Large memory
  - Large scratch disk
  - GPUs
Heterogeneous Resources

- HTCondor partitionable/dynamic slots
  - A regular single slot:
  - PBS high memory:
  - Whole node:
Questions?