HTCondor-CE Overview

Brian Lin

OSG Software

University of Wisconsin — Madison

Troubleshooting Jobs: HTCondor Edition

CE Host

CE Schedd → 1. Grid Job → Job Router → 2. Routed Job → Local Schedd

Firewall

Auth
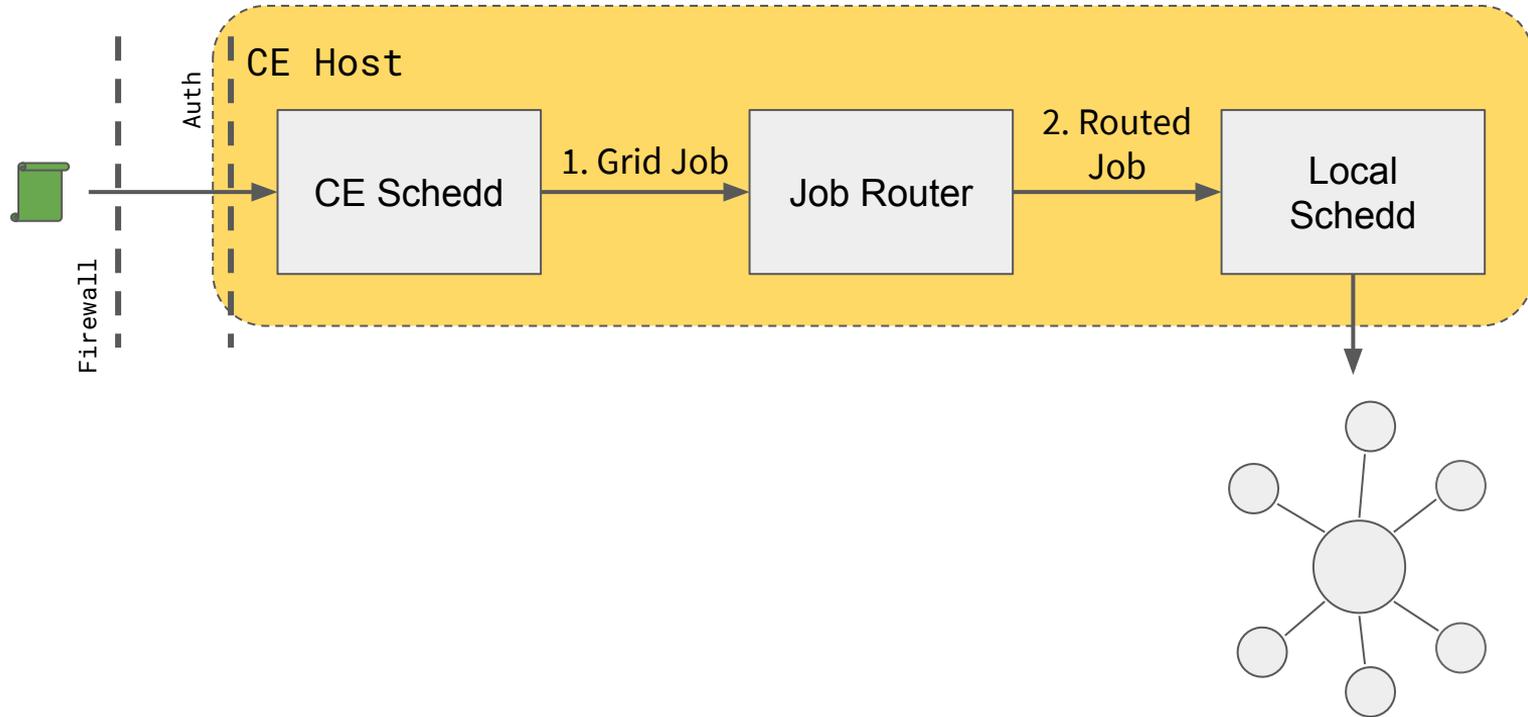
Troubleshooting Jobs: Non-HTCondor Edition
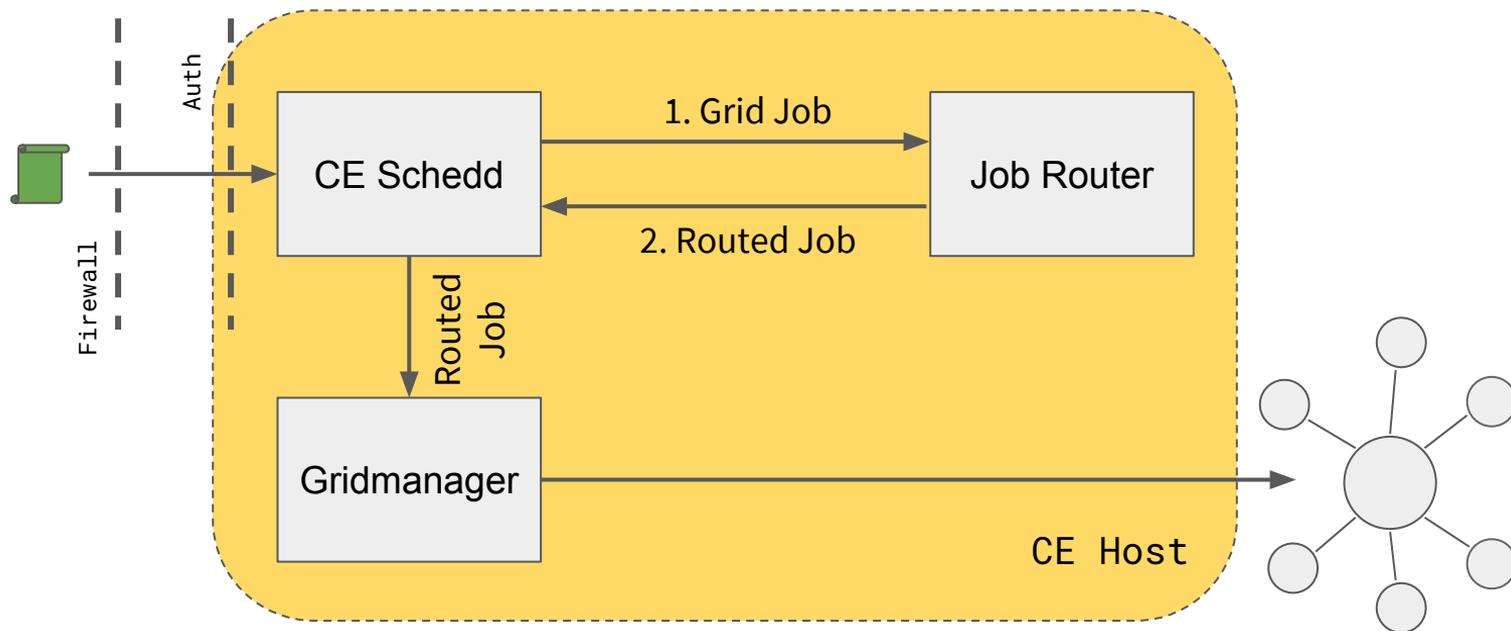
HTCondor-CE Requirements

- Installation details: https://opensciencegrid.github.io/docs/compute-element/install-htcondor-ce/
- Open port (TCP) 9619
- Shared FS for non-HTCondor batch systems for file transfer
- Ensure mapped users exist
  http://opensciencegrid.github.io/docs/security/lcmaps-voms-authentication/
- Minimal hardware requirements
  - Handful of cores
  - HTCondor backends should plan on ~½ MB RAM per job
  - Expecting high rates of jobs? HTCondor-CE SPOOL dir should live on an SSD
    - Default `/var/lib/condor-ce/spool` (`condor_ce_config_val -v SPOOL`)
    - Same thing applies for HTCondor backends
      Default: `/var/lib/condor/spool` (`condor_config_val -v SPOOL`)
- For example, our Hosted CEs run on 2 vCPUs/2GB RAM

Configuring Authentication

- HTCondor-CE maps incoming pilot x509 credentials to unix users using LCMAPS
  http://opensciencegrid.github.io/docs/security/lcmaps-voms-authentication/
- Default VO to unix account mappings live in
  `/usr/share/osg/voms-mapfile-default`
- For opportunistic usage, create the following unix accounts on your CE and cluster: cmsuser, fnalgrid, glow, gluex, hcc, osg, usatlas3

HTCondor-CE Configuration

- Our configuration tool, osg-configure, handles most of the complicated configuration
  - Configuration files for osg-configure live in `/etc/osg/config.d/*.ini`
  - Run `osg-configure -v` then `osg-configure -c`
- Site policy (max walltime, number of cores, etc.) are described in the HTCondor-CE Job Router configuration
  - https://opensciencegrid.github.io/docs/compute-element/job-router-recipes/
  - Job router filters and transforms incoming grid jobs into "routed" jobs
  - Configured using declarative ClassAds with the `JOB_ROUTER_ENTRIES` variable
  - Each entry in `JOB_ROUTER_ENTRIES` is combined with the `JOB_ROUTER_DEFAULTS` configuration variable to create each job route

Alice has an HTCondor pool and she wants CMS jobs submitted to her CE to be forwarded to her pool and requesting x86_64 Linux machines and setting the attribute "foo" on her routed job to "bar". All other jobs should be submitted to the pool without any changes.

```
JOB_ROUTER_ENTRIES = [ \
    name = "condor_pool_cms"; \
    TargetUniverse = 5; \
    Requirements = target.x509UserProxyVOName =?= "cms"; \
    set_requirements = (Arch == "X86_64") && (TARGET.OpSys == "LINUX"); \
    set_foo = "bar"; \
] \
[ \
    name = "condor_pool_other"; \
    TargetUniverse = 5; \
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]
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Bob has a Slurm pool and he wants ATLAS jobs submitted to his CE to be forwarded to his pool. All other jobs should be submitted to his pool with a 1GB memory limit.

```
JOB_ROUTER_ENTRIES = [ \
    name = "slurm_pool_cms"; \
    TargetUniverse = 9; \
    GridResource = "batch slurm"; \
    Requirements = target.x509UserProxyVOName =?= "atlas"; \
] \
[ \
    name = "slurm_pool_other"; \
    TargetUniverse = 9; \
    GridResource = "batch slurm"; \
    Requirements = target.x509UserProxyVOName =!= "atlas"; \
    set_default_maxMemory = 1000; \
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    name = "slurm_pool_other"; \
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HTCondor-CE Monitoring

- For graphs showing pilot jobs and CE load:

  `yum install htcondor-ce-view`

- Configuration lives in /etc/condor-ce/config.d/05-ce-view.conf
  - Uncomment `DAEMON_LIST`
  - Defaults to port 80 but can be configured by changing `HTCONDOR_VIEW_PORT`
  - Restart `condor-ce` service after config changes

https://opensciencegrid.github.io/docs/compute-element/install-htcondor-ce/#install-and-run-the-htcondor-ce-view

Validation

From the CE host:

1. Verify that local job submissions complete successfully from the CE host, e.g. sbatch, condor_submit, qsub, etc.
2. Verify that all required daemons are running with `condor_ce_status`
3. Verify the CE's network configuration with `condor_ce_host_network_check`
4. Verify end-to-end job submission with `condor_ce_trace`
   a. First, from the CE host
   b. Next, from a remote host with the `htcondor-ce-client` tools

https://opensciencegrid.org/docs/compute-element/install-htcondor-ce/#validating-htcondor-ce

Troubleshooting Startup

Legend:

→ Startup
→ Authorization
→ Command/Logs

```
systemctl start condor-ce
service condor start
condor_ce_on
```

Master

/var/log/condor-ce/MasterLog

Schedd

Collector

Job Router

/var/log/condor-ce/SchedLog

/var/log/condor-ce/CollectorLog

/var/log/condor-ce/JobRouterLog
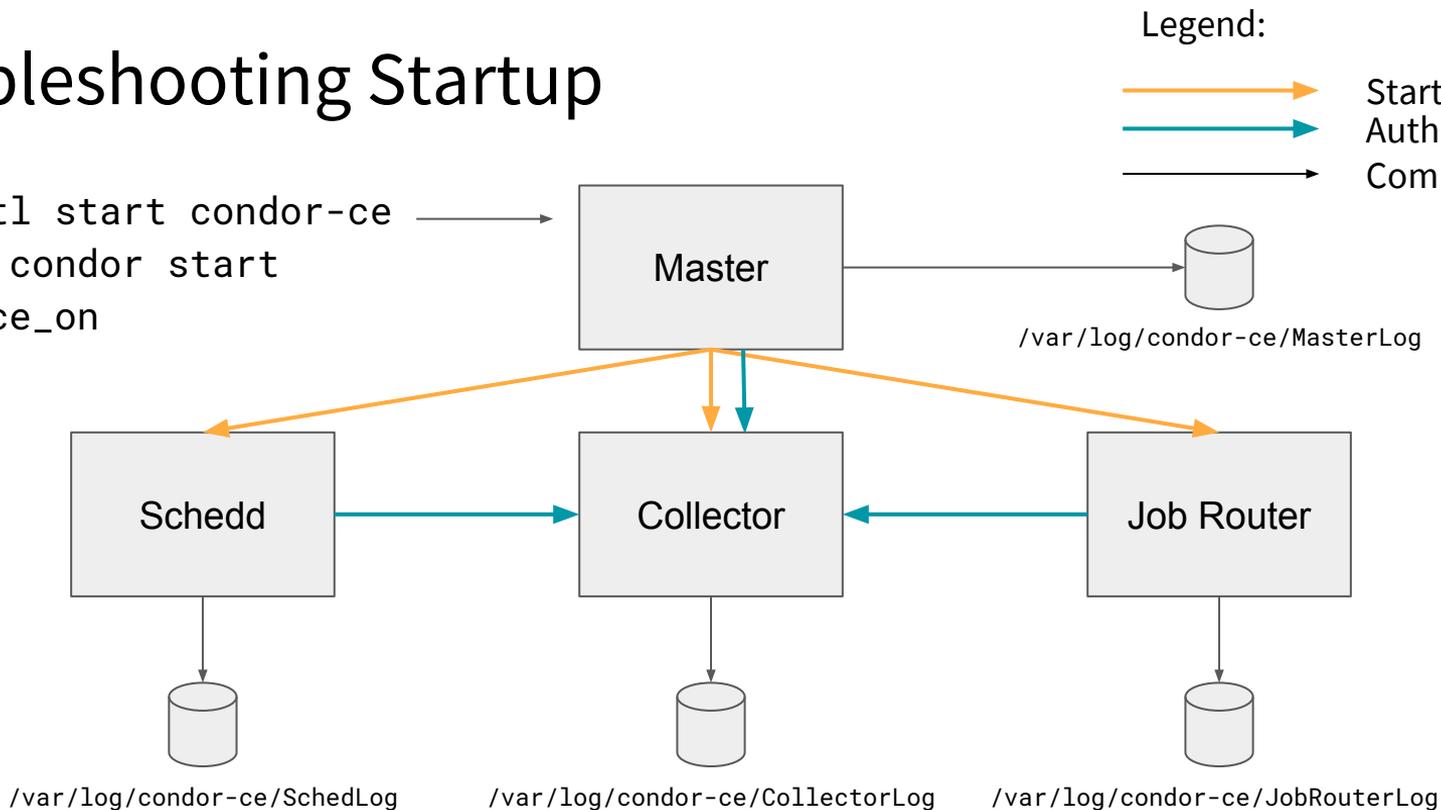
Troubleshooting Startup

```
# condor_ce_status -any
MyType              TargetType        Name

Collector           None              My Pool - fermicloud068.fnal.gov@fermiclo
Scheduler           None              fermicloud068.fnal.gov
DaemonMaster        None              fermicloud068.fnal.gov
Job_Router          None              htcondor-ce@fermicloud068.fnal.gov
```

Troubleshooting Startup

Startup
Failed AuthZ
Command/Logs

```
systemctl start condor-ce
service condor start
condor_ce_on
```

Master

/var/log/condor-ce/MasterLog

Schedd

Collector

Job Router

/var/log/condor-ce/SchedLog

/var/log/condor-ce/CollectorLog

/var/log/condor-ce/JobRouterLog
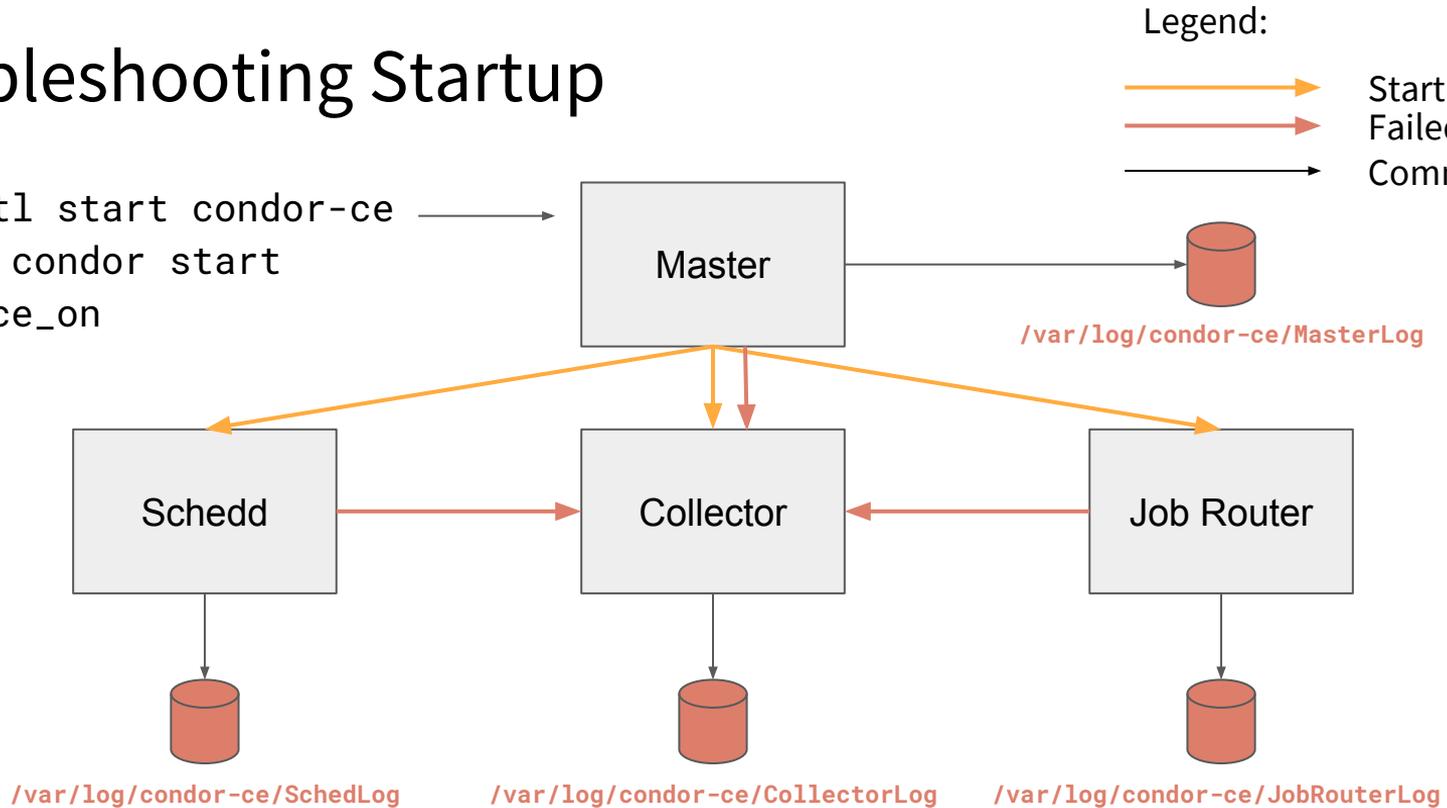
03/20/19 16:05:58 ERROR: AUTHENTICATE:1003:Failed to authenticate with any method
Potential Solutions: Run fetch-crl, update osg-ca-certs, verify host cert validity, verify system time

Troubleshooting Jobs

```
# condor_ce_q -nobatch

-- Schedd: lhcb-ce.chtc.wisc.edu : <128.104.100.65:9618?... @ 03/20/19 21:31:19
 ID         OWNER          SUBMITTED       RUN_TIME  ST PRI  SIZE    CMD
153501.0    nu_lhcb        3/18 13:30    2+07:56:31  R   0   733.0  DIRAC_clpM0A_pilotwrapper.py
154043.0    nu_lhcb        3/19 13:43    1+07:41:29  R   0  1709.0  DIRAC_RpJK9Q_pilotwrapper.py
154066.0    nu_lhcb        3/19 13:43    1+07:41:31  R   0  1465.0  DIRAC_RpJK9Q_pilotwrapper.py
154088.0    nu_lhcb        3/19 14:09    1+07:14:33  R   0  1709.0  DIRAC_ekQezG_pilotwrapper.py
154091.0    nu_lhcb        3/19 14:09    1+07:14:32  R   0  1709.0  DIRAC_ekQezG_pilotwrapper.py
154258.0    nu_lhcb        3/19 17:36    1+03:37:18  R   0  1221.0  DIRAC_lIr4FB_pilotwrapper.py
```

Troubleshooting Jobs

```
# condor_ce_q -help status
[...]
    JobStatus codes:
    1 I IDLE
    2 R RUNNING
    3 X REMOVED
    4 C COMPLETED
    5 H HELD
    6 > TRANSFERRING_OUTPUT
    7 S SUSPENDED
```

See hold reasons with `condor_ce_q -held`

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Troubleshooting Jobs: HTCondor Edition

`/var/log/condor/SchedLog`

CE Schedd → 1. Grid Job → Job Router → 2. Routed Job → Local Schedd

Firewall | Auth

`/var/log/condor-ce/SchedLog`

`/var/log/condor-ce/JobRouterLog`

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Troubleshooting Jobs: Non-HTCondor Edition

Firewall | Auth

CE Schedd → 1. Grid Job → Job Router

Job Router → 2. Routed Job → CE Schedd

CE Schedd → Routed Job → Gridmanager
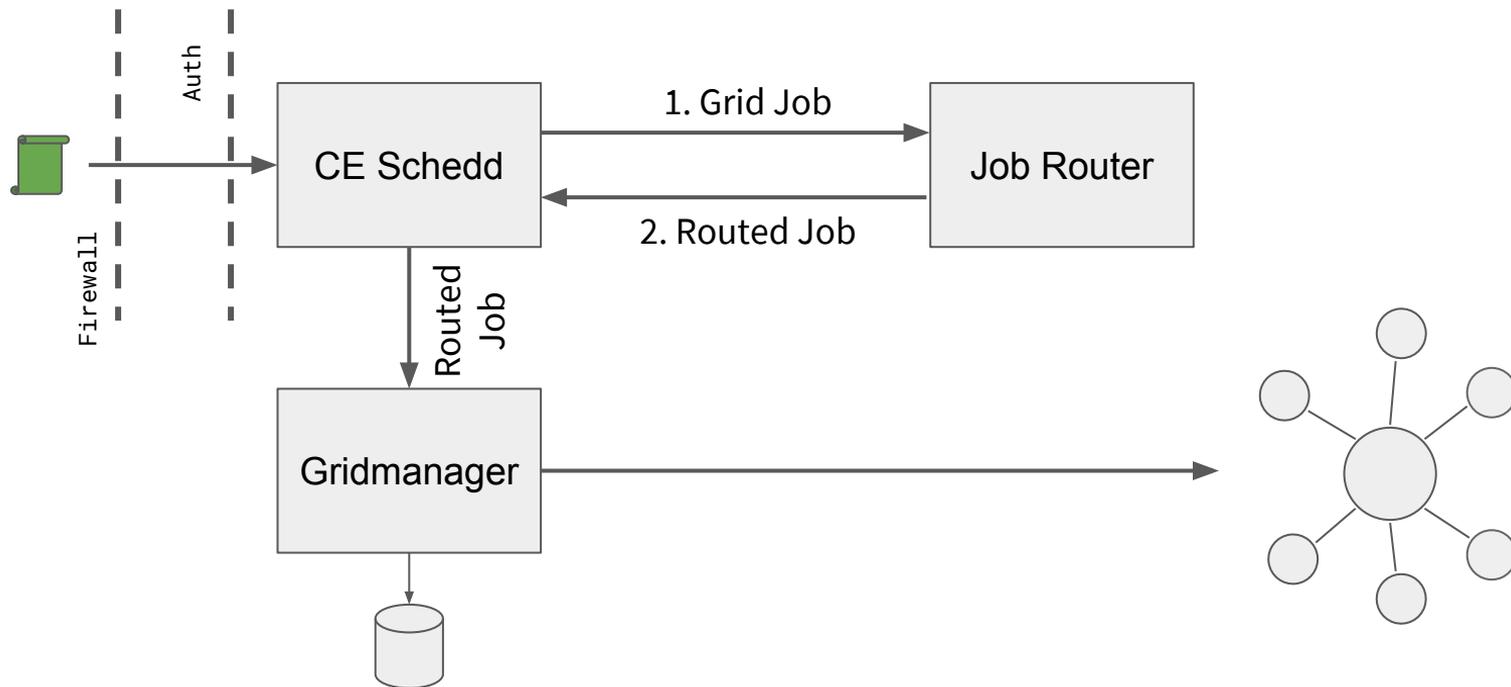
Gridmanager →

`/var/log/condor-ce/GridmanagerLog`

Additional Resources

- Overview

  https://opensciencegrid.org/docs/compute-element/htcondor-ce-overview/

- Install Guide

  https://opensciencegrid.org/docs/compute-element/install-htcondor-ce/#validating-htcondor-ce

- Job Router Configuration Guide

  https://opensciencegrid.org/docs/compute-element/job-router-recipes/

- Troubleshooting Guide

  https://opensciencegrid.org/docs/compute-element/troubleshoot-htcondor-ce/

- Additional Help

  https://opensciencegrid.org/docs/common/help/

Questions?

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