Open Science Grid

Troubleshooting real resources

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OSG User School

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What are real resources like?

- Wide variety of CPUs of various vintage
- Amount of RAM per slot is variable
- Shared filesystems may or may not exist
- Scratch disk for temporary files not always in the same place
- And many many other differences...

OSG nodes are not homogenous!

But we try to get close ☺

How do we deal with this?

- 99.9% of CPUs on OSG are x86_64
  - You generally don't need to recompile your code for other architectures
- We abstract away things like nearest HTTP proxy and scratch directory locations, e.g.,

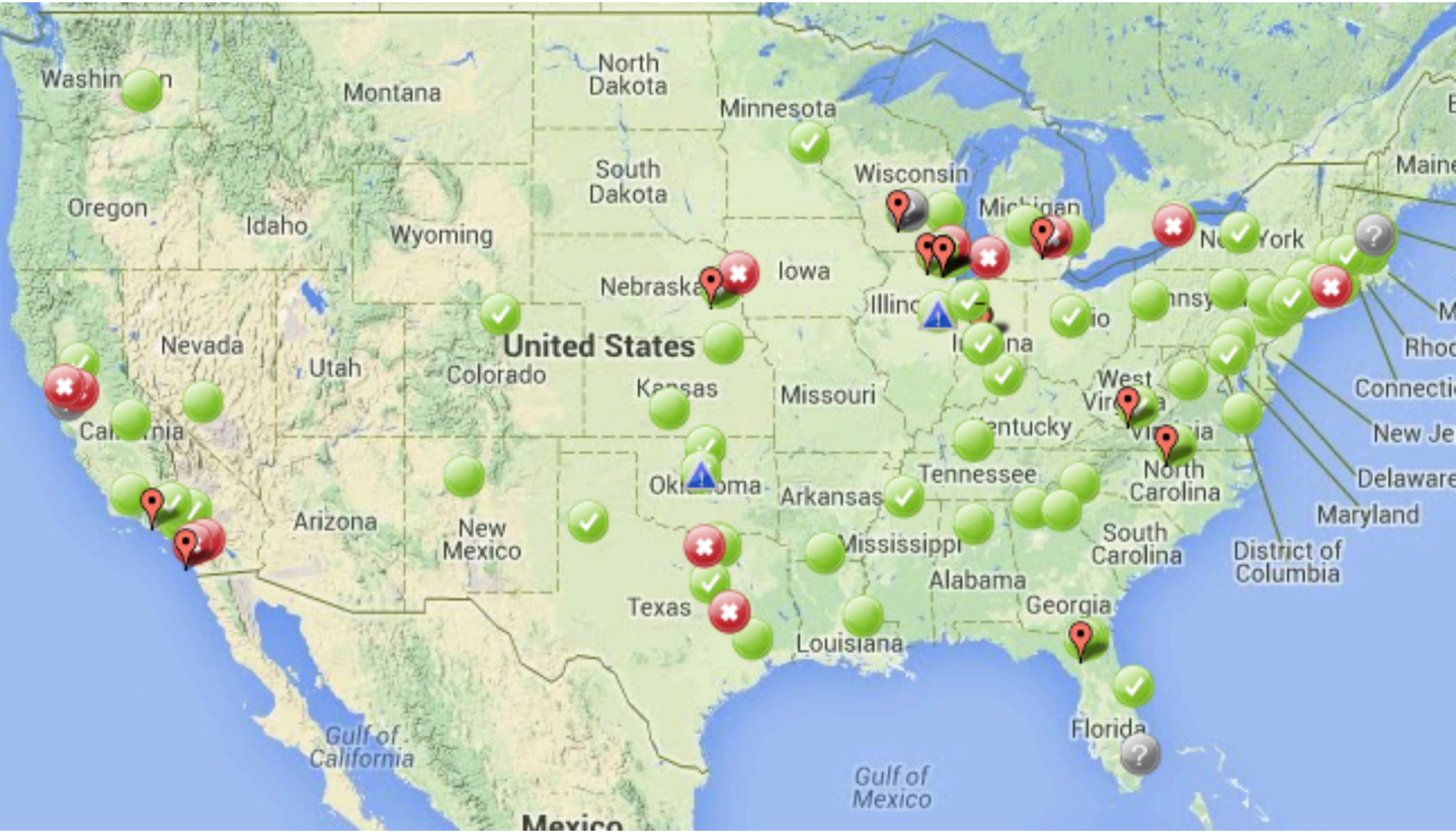
  `OSG_WN_TMP` → **Scratch area**

  `OSG_SQUID_LOCATION` → **HTTP Proxy**
- Jobs can be steered to resources with ClassAd requirements, e.g.,

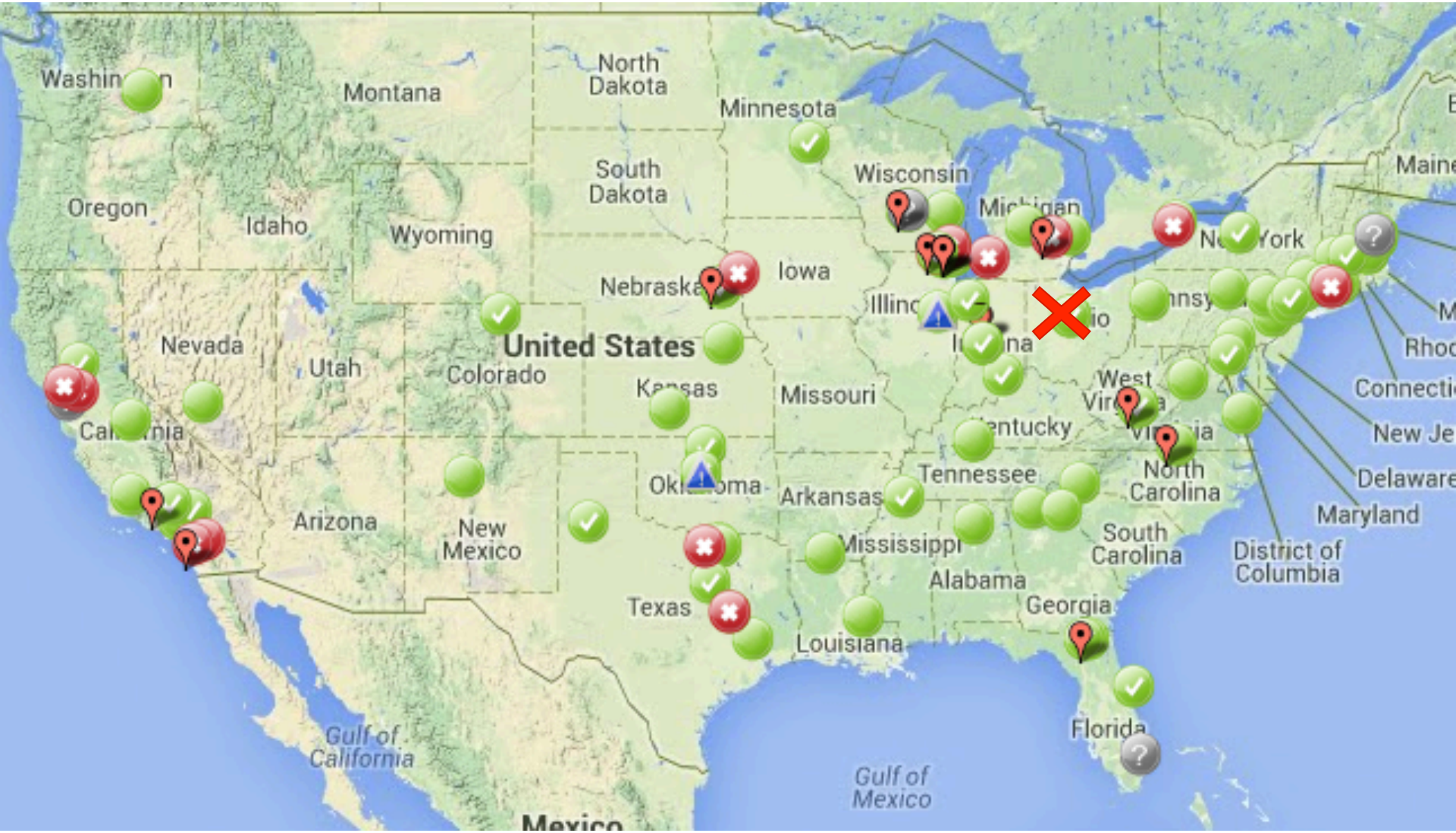
  `HAS_CVMFS_oasis_opensciencegrid_org`

What if OSG kills my job?

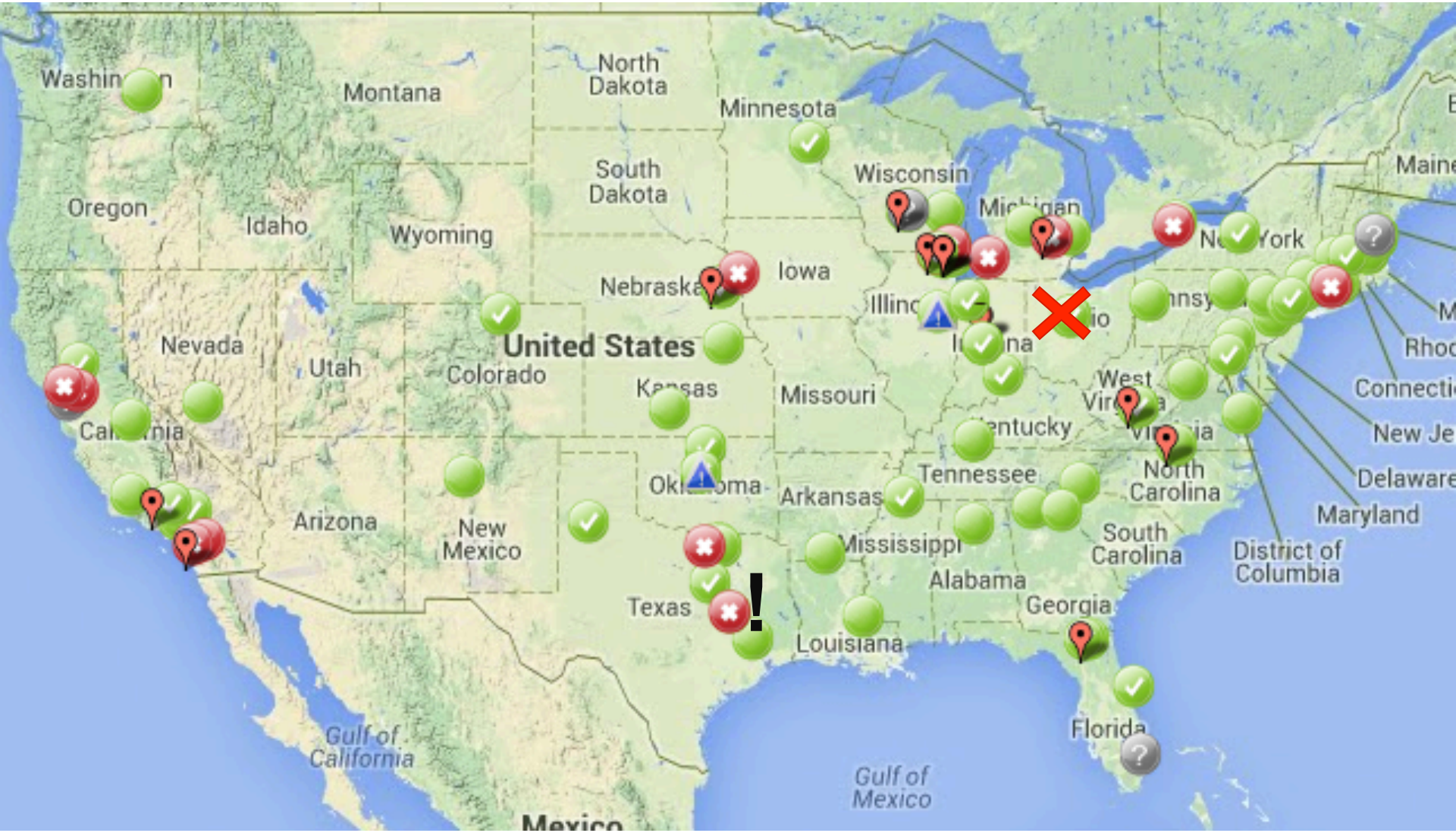
OSG has many sites



What happens if a site preempts your job?



What happens if a site goes away?



What happens to the job?

- With GlideinWMS, the jobs stick around.
  - Preempted jobs?
  - Site disappears?
  - No problem!
- Condor will send the jobs to other remaining sites

Troubleshooting examples

Diagnosing idle jobs

- Why does my job never start?

```
[bryant@osg-ss-submit ~]$ condor_q bryant


-- Submitter: osg-ss-submit.chtc.wisc.edu :
<128.105.244.152:9618?sock=5868_8e75_3> : osg-ss-
submit.chtc.wisc.edu
 ID      OWNER            SUBMITTED     RUN_TIME ST PRI SIZE CMD
2078.0   bryant          7/8  09:11   0+00:00:00 I  0   0.0  java
```

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```

- Use:

```
condor_q -better-analyze
```

Diagnosing idle jobs

```
[bryant@osg-ss-submit ~]$ condor_q -better-analyze 2078.0

-- Submitter: osg-ss-submit.chtc.wisc.edu :
<128.105.244.152:9618?sock=5868_8e75_3> : osg-ss-
submit.chtc.wisc.edu
User priority for bryant@osg-ss-submit.chtc.wisc.edu is not
available, attempting to analyze without it.
---
2078.000:  Run analysis summary.  Of 7183 machines,
   7183 are rejected by your job's requirements
<snip>
The Requirements expression for your job reduces to these
conditions:

         Slots
Step    Matched  Condition
-----  --------  ---------
[0]           0  HaveJava is true
```

Diagnosing idle jobs

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Did your job finish?

- Sometimes you might see your jobs stuck in Held state.

```
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<128.105.244.152:9618?sock=5868_8e75_3> : osg-ss-
submit.chtc.wisc.edu
 ID      OWNER            SUBMITTED     RUN_TIME ST PRI SIZE CMD
1498.0   bryant          7/7  15:56   0+00:00:01 H  0   0.0
test.sh

1 jobs; 0 completed, 0 removed, 0 idle, 0 running, 1 held, 0
suspended
```

Did your job finish?

- What does Held mean? Each case is different

```
[bryant@osg-ss-submit ~]$ condor_q -hold 1498


-- Submitter: osg-ss-submit.chtc.wisc.edu :
<128.105.244.152:9618?sock=5868_8e75_3> : osg-ss-
submit.chtc.wisc.edu
 ID      OWNER            HELD_SINCE  HOLD_REASON
1498.0   bryant            7/7  15:57 Error from
slot1@e243.chtc.wisc.edu: STARTER at 128.105.245.43 failed to
send file(s) to <128.105.244.152:9618>: error reading from /var/
lib/condor/execute/slot1/dir_842/test.out: (errno 2) No such file
or directory; SHADOW failed to receive file(s) from
<128.105.245.43:55597>
```

...what?

```
Error from slot1@e243.chtc.wisc.edu: STARTER at 128.105.245.43
failed to send file(s) to <128.105.244.152:9618>: error reading
from /var/lib/condor/execute/slot1/dir_842/analysis.out: (errno
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failed to send file(s) to <128.105.244.152:9618>: error reading
from /var/lib/condor/execute/slot1/dir_842/analysis.out: (errno
2) No such file or directory; SHADOW failed to receive file(s)
from <128.105.245.43:55597>
```

- In this case, the user's job specified an output file:

```
transfer_output_files = analysis.out
```

- The job executable never created the analysis.out file
  - HTCondor put the job into held state when it couldn't find analysis.out to transfer back

Diagnosing failed jobs

- How to find out if a job failed?
  - Did the job run too fast?
  - Is the output unexpected?
- What happens when your job fails?
  - Check the Output and Error files from your job.
    - Any logging that your program does to the console will end up here

Diagnosing failed jobs

- If you are running a wrapper script, you can force output on every step

```
#!/bin/sh
```

```
#!/bin/sh -x
```

- It then outputs every step to the stderr, or ‘error’ in your submit file.

Diagnosing stuck jobs

- Other times, you may that your job has been running for an abnormally long time, or works on your local machine but fails on a worker node.
- Use:

```
condor_ssh_to_job
```

Diagnosing stuck jobs

```
[bryant@osg-ss-submit ~]$ condor_ssh_to_job 2080.0
Welcome to slot1@c025.chtc.wisc.edu!
Your condor job is running with pid(s) 605.
[slot5@c025 dir_591]$ whoami
[slot5@c025 dir_591]$ ps x
  PID TTY      STAT   TIME COMMAND
  605 ?        Ss     0:00 condor_exec.exe 36000
  745 ?        Ss     0:00 sshd: slot5 [priv]
  748 ?        S      0:00 sshd: slot5@pts/0
  749 pts/0    Ss     0:00 -/bin/bash
 1230 pts/0    R+     0:00 ps x
[slot5@c025 dir_591]$ ls
condor_exec.exe  _condor_stderr  _condor_stdout
```

Questions?

- Next: on your own