Troubleshooting real resources



OSG Summer School July 27-31, 2015

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
 - Generally don't need to recompile your code for other architectures
- HTTP proxy and scratch directory locations are abstracted away
 - OSG_WN_TMP
 - OSG_SQUID_LOCATION

How do we deal with this?



- Jobs can be steered to resources with ClassAd requirements, e.g.,
 - HAS_CVMFS_oasis_opensciencegrid_org =?= True
 - HAS_NUMPY =?= True
 - OpSysMajorVer > 5



What if OSG kills my job?

OSG has many sites



What happens if one preempts your job?



What happens if a site goes away?



What happens to the job?



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



Troubleshooting real examples



• 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
```



An hour later...

```
[bryant@osg-ss-submit ~]$ condor_q bryant
-- Submitter: osg-ss-submit.chtc.wisc.edu : <128.105.244.152:
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```

● Use: condor q -better-analyze



[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

0 HaveJava is true

[0]



[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@osq-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
```

Did your job finish?

[bryant@osg-ss-submit ~]\$ condor q bryant



Sometimes you may see your jobs "Held"

```
-- 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
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 state mean?

```
[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 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 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: transfer_output_files = analysis.out
- The job executable never created analysis.
 out
- HTCondor put the job into Held state when it couldn't find analysis.out to transfer back



- How to find out if a job failed?
 - O Did the job run too fast?
 - o 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



- If you are running a wrapper script, you can force output on every step
 - o #!/bin/bash -x
- The wrapper will then output every step to standard error
 - specified by the error parameter in the submit file

Remote diagnostics



- You may find that your job seems to be stuck in some way
- Or your job seems to work locally, but fails remotely
- How to diagnose?
 - o condor_ssh_to_job

Remote diagnostics



```
[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: Troubleshooting exercise