Open Science Grid

glideinWMS
The OSG overlay DHTC system

Tuesday morning session

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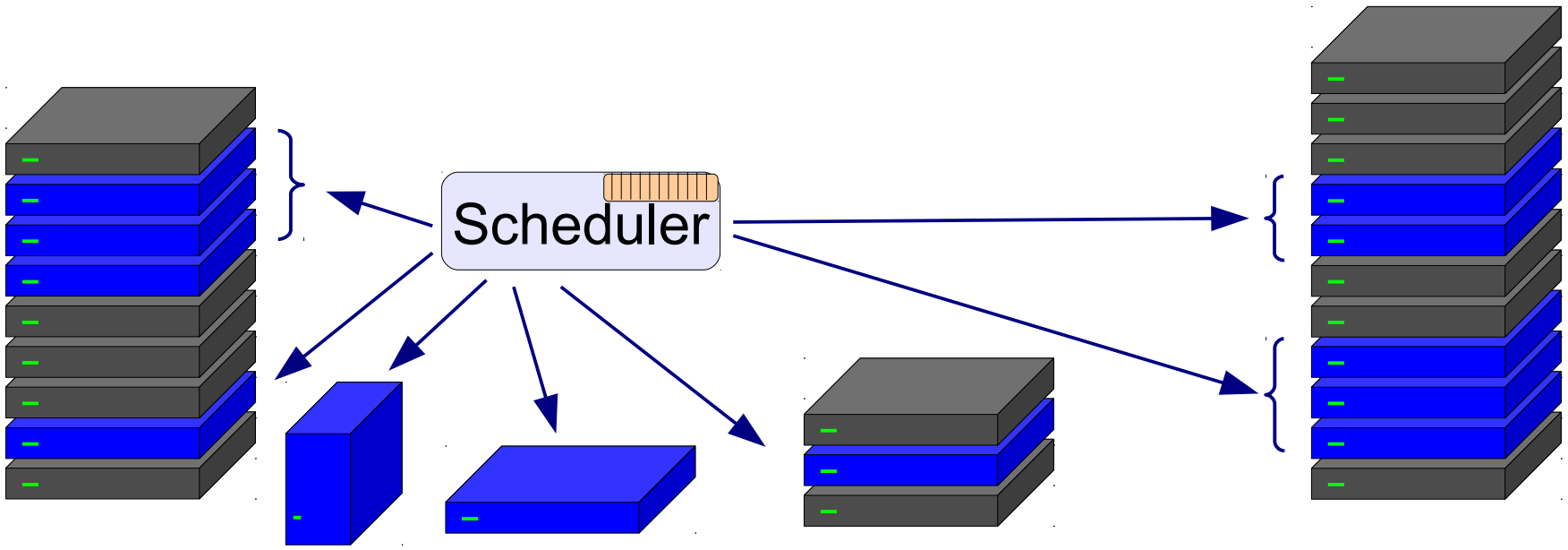
University of California
San Diego

Logistical reminder

- It is OK to ask questions
  - During the lecture
  - During the demos
  - During the exercises
  - During the breaks
- If I don't know the answer,
  I will find someone who likely does

Creating a dynamic overlay sys

- We can lease a subset of other's nodes
- And instantiate our HTC system on them



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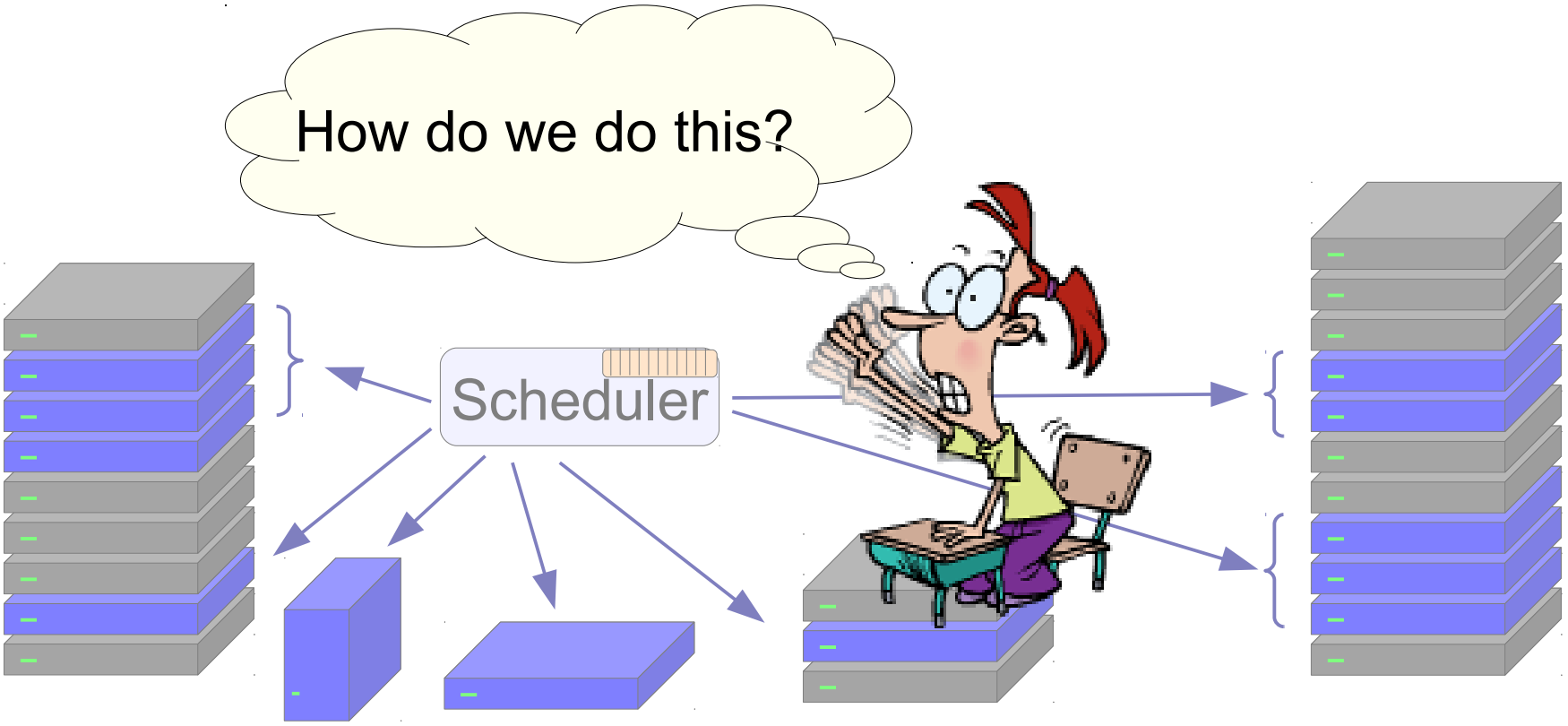
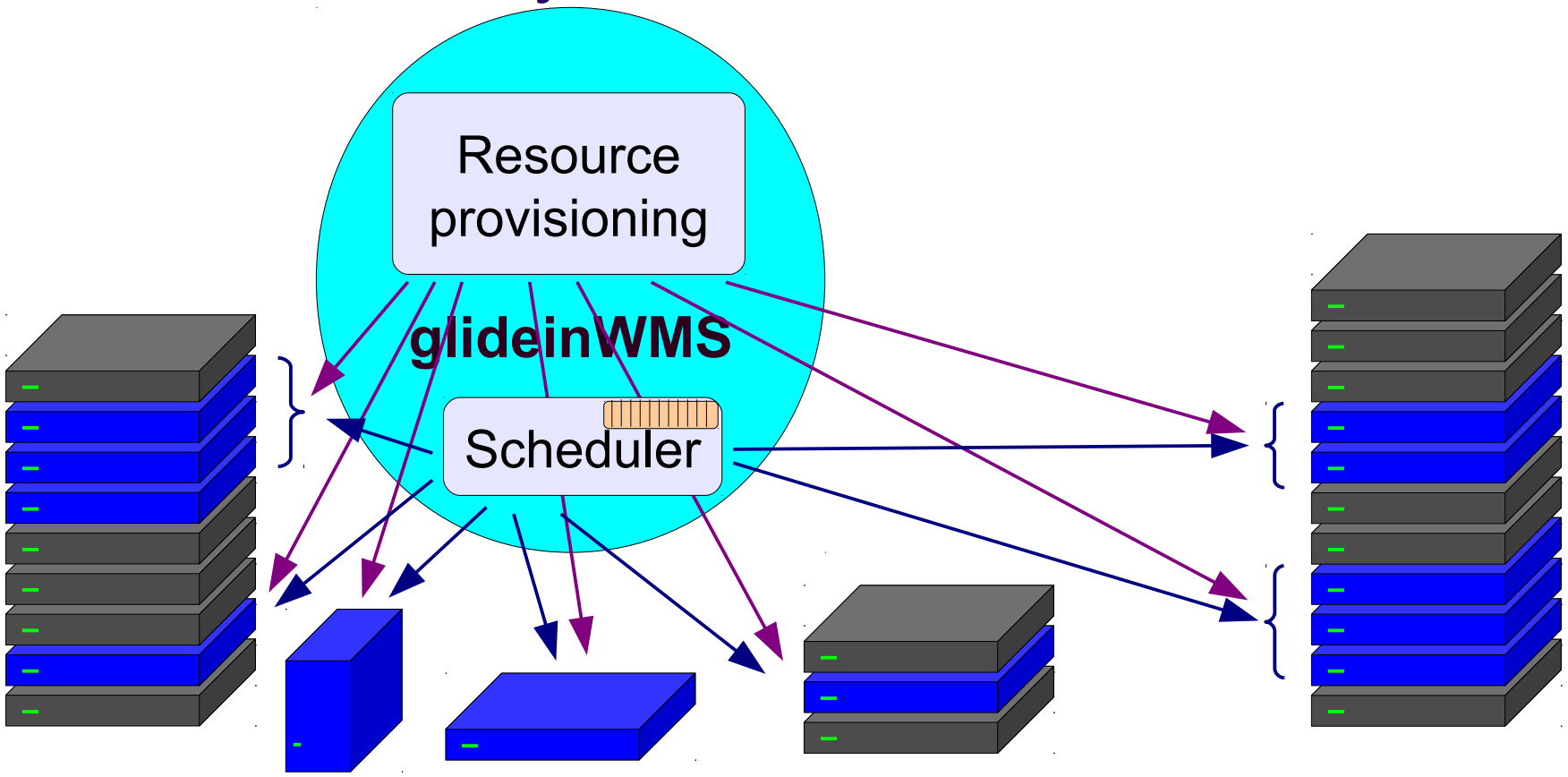


Lecture content

- Brief overview of how the glideinWMS works
  - You hopefully will never need to deal with back-end details
  - But knowing them will help you troubleshoot problems with your jobs
- Some hands-on advise on how to use it

glideinWMS as an overlay sys

- glideinWMS leases a subset of other's nodes
- Acts as a HTC system on them



Two components

- The resource provisioning

Two components

- The resource provisioning
  - Implements the logic
    - Decides when more resources are needed
    - Decides where to get them from
    - Decides when to get rid of them
  - Implements the technical bits
    - Grid resources (e.g. GRAM, CREAM, ARC)
    - Cloud (EC2, OpenStack, Google Engine)
    - BOSCO (i.e. HTC-over-ssh)

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    - BOSCO (i.e. ...TC...

As users, you don't really need to know any more details.

But if you are interested in details we do have more training material.

Two components

- The resource provisioning
- The HTC scheduler proper

Two components

- The resource provisioning
- The HTC scheduler proper
  - Which happens to be HTCondor!
  - HTCondor on all the nodes
    - User-facing Scheduler
    - The execute processes on leased nodes
    - The central manager

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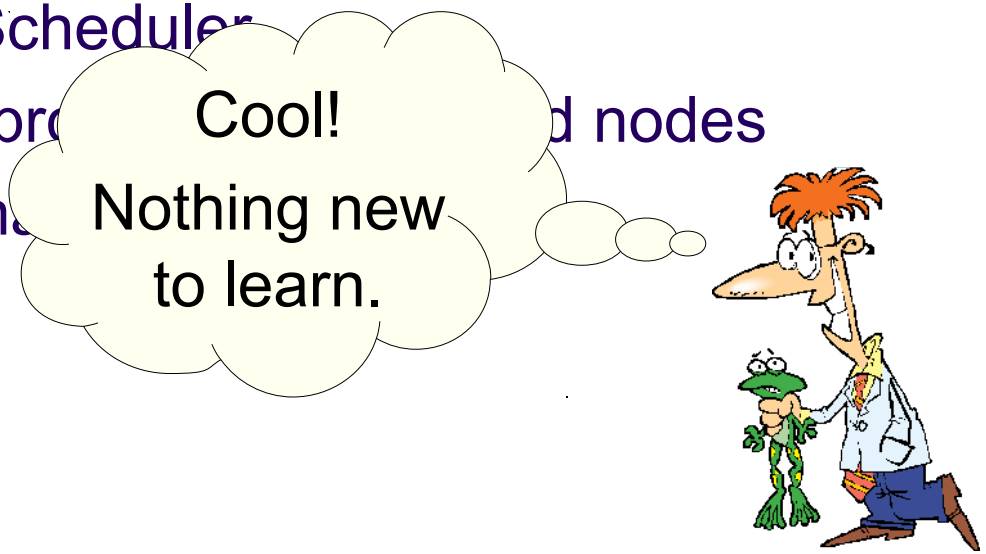

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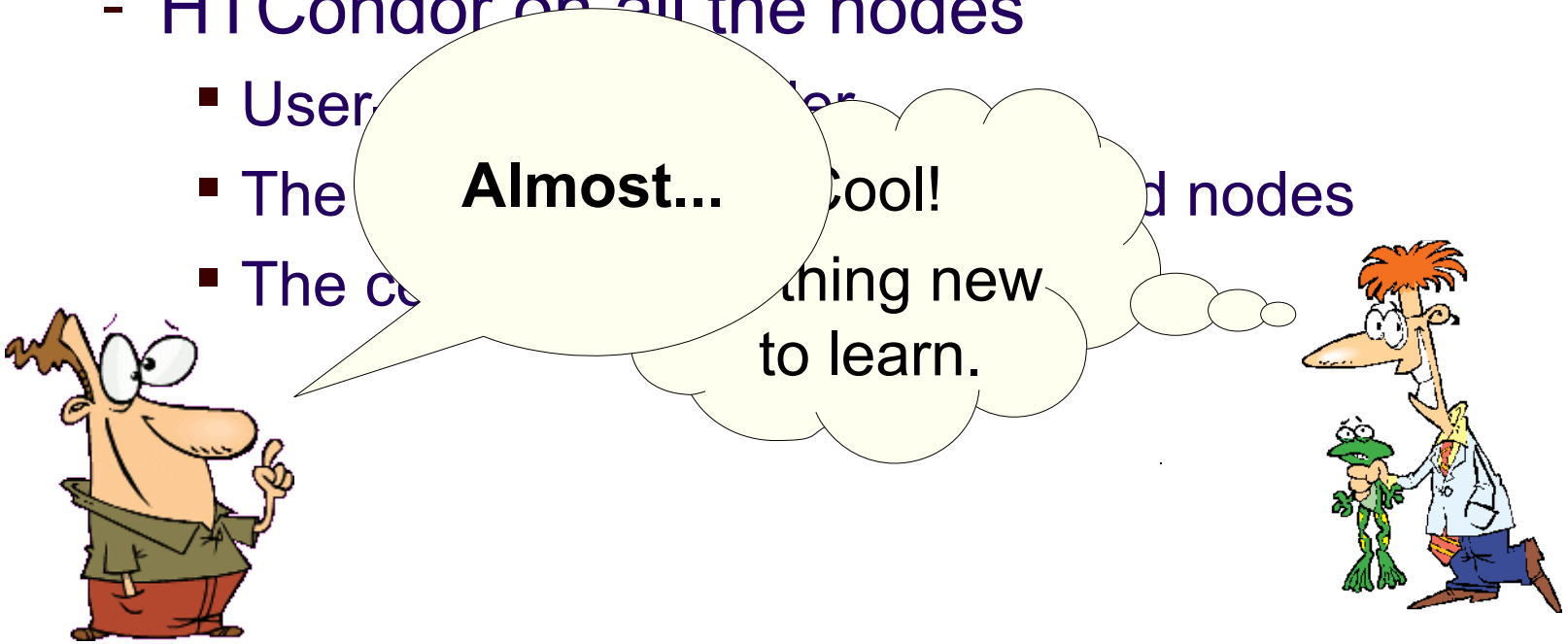

Steering the provisioning

- Your jobs will likely want to run only on a subset of possible resources, due to e.g.
  - Data locality
  - Platform restrictions
- The usual
  `requirements`
  attribute is not good enough
  - Attributes of the provisioned machines not known in advance

Two level matchmaking

- The system has **two matchmaking points**
  - The glideinWMS decides **when and where** to provision resources
  - The HTCondor negotiator decides **which job runs on which node** (after the nodes have been provisioned)
- The two operate independently
  - You will need to provide information to both

Standard convention

- The glideinWMS convention is for users to just publish the list of desired properties, e.g.
  - `+DESIRED_Sites="UCSD,UW"`
- The provisioning policy engine then does the right thing behind the scenes

- Please notice that there is no "standard glideinWMS policy"
  - See your local instance for details

Runtime limits

- Resource leases often come with runtime limits associated with them
  - In the Grid world, it is typical to be between 24h and 48h
- glideinWMS will not start a job on a resource that needs to be returned before your job finishes
  - Since it would have to **kill** your job on deadline, else

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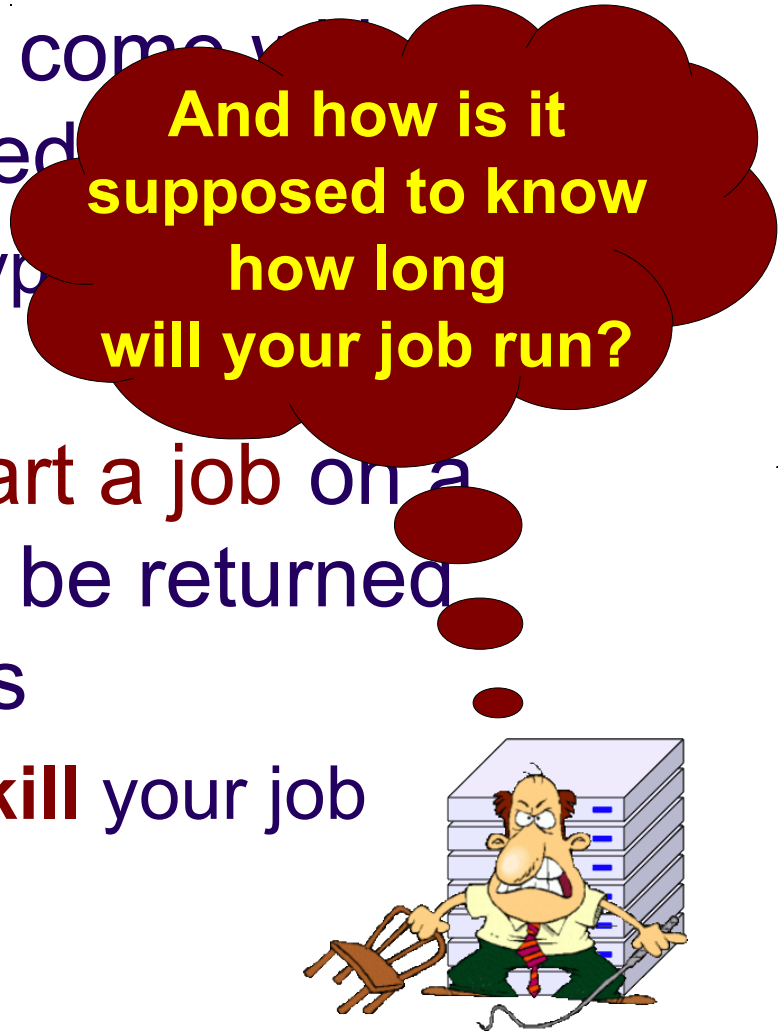

Runtime limits

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- glideinWMS will not start a job on a resource that needs to be returned before your job finishes
- You need to tell glideinWMS how long will the job run
  - As close to the worst-case as you can
  - But don't over-estimate
    - There may be very few resources willing to run jobs with long estimated runtimes

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    - See your local installation instructions
- Else, there is a system default
  - Which may not be appropriate for you!

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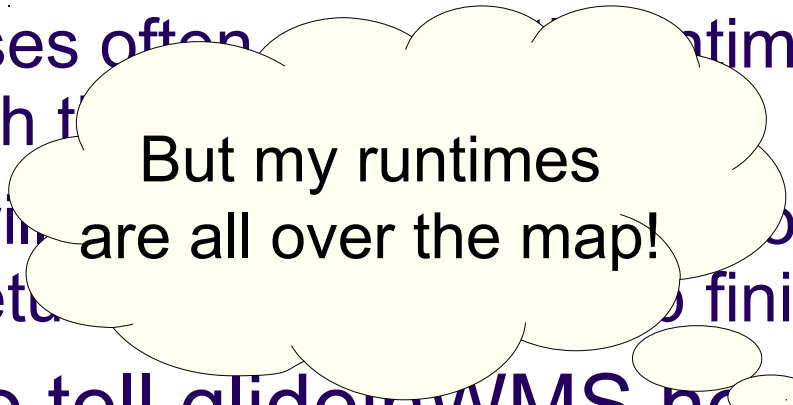

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But my runtimes
…over the map!

Indeed, it may not be trivial.

But it is needed.

Using glideinWMS

- Pretty much “just a HTCondor system”
- Use the standard commands
  - `condor_submit`
  - `condor_q`
  - `condor_rm`

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But the number of slots grows and shrinks very often.

Not-yet provisioned resources

- There may be resources available that don't have a single node provisioned yet
  - So std. **`condor_status`** will not show them

Not-yet provisioned resources

- There may be resources available that don't have a single node provisioned yet
  - So std. **`condor_status`** will not show them
- glideinWMS does publish the list
  - But no pretty tool available
  - Requires a bit of condor_status magic

```
$ condor_status -any -const 'MyType=="glideresource"' -af Name \
     -af GLIDEIN_Site -af GLIDEIN_Max_Walltime -af GLIDEIN_MaxMemMBs
CMS_T2_US_UCSD_gw7@osgedu.main          UCSD      171000 2500
CMS_T2_US_Wisc_cms02@osgedu.main        Wisconsin 114840 2500
...
```

Anything else?

- Being a DHTC system, there is no shared file system
  - You will have to explicitly move files around
- Being a DHTC system, different sites likely have different libraries installed
  - Minimize dependencies
  - Be flexible

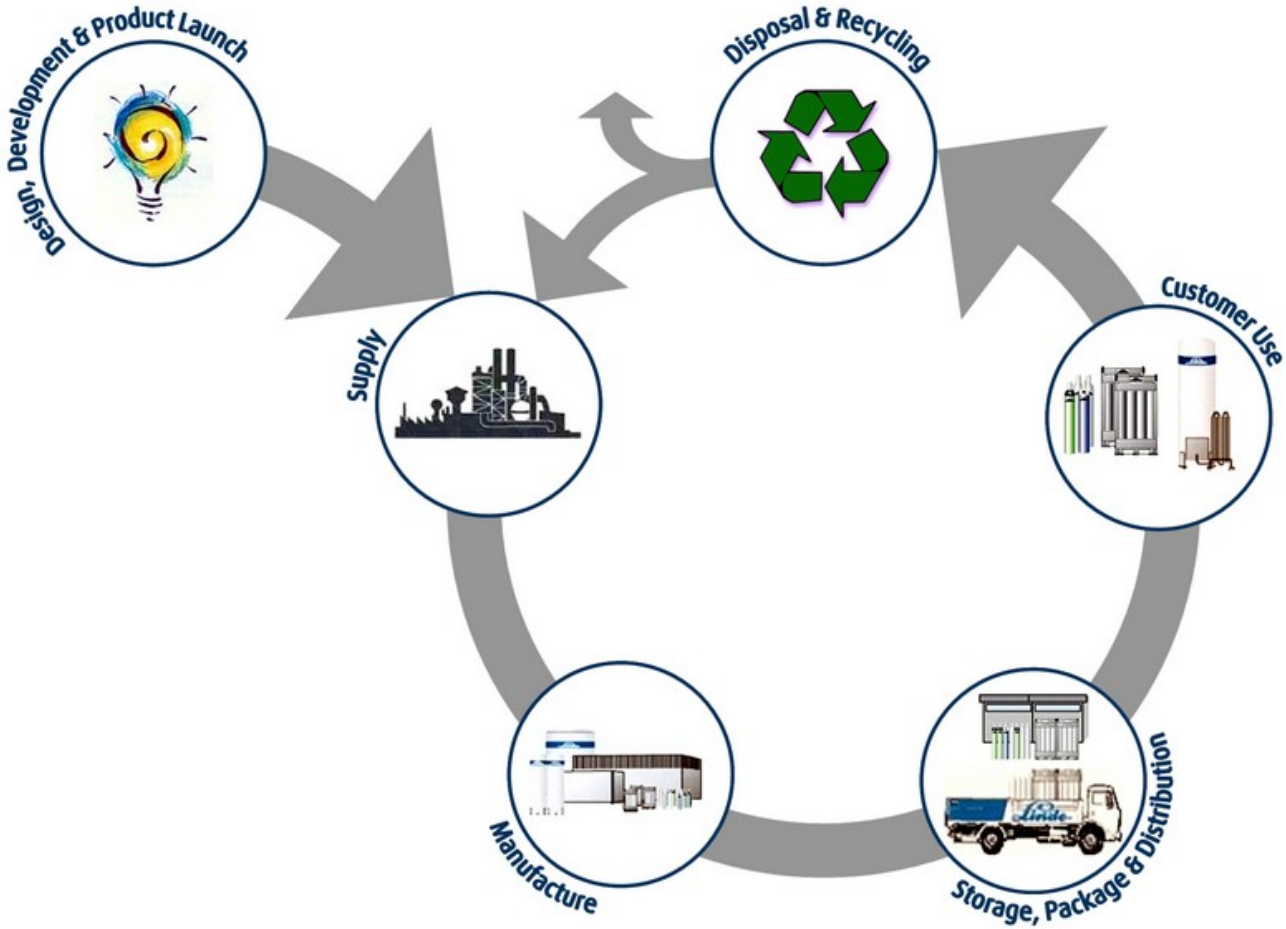
Open Science Grid

Questions?

- Questions? Comments?
  - Feel free to ask me questions later:

    Igor Sfiligoi <isfiligoi@ucsd.edu>
- Upcoming sessions
  - Hands-on exercises
  - Tour
  - Security in OSG

Computing mimics real life



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