

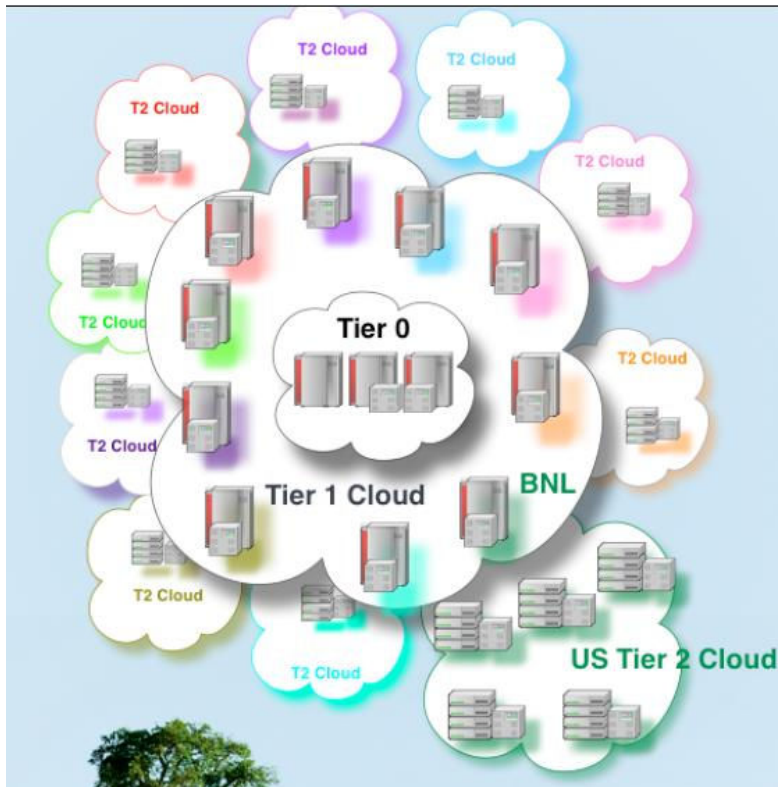
# Submitting jobs to the grid

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# Grid is an operating system



- You should only be sure that the data that you want are on the grid
- Don't need to know where the data is.
- Don't need to know where your job is going to be running.

## that is in principle...

- And to an extent in practice as well..
- In this introduction, we'll mostly stick to the cases where it's true.
- After some experience, you'll probably want (and need) to look under the hood to see what is happening.

## Before you can start:

- First you will need to get a Grid certificate and join the ATLAS VO (virtual organization). This is like a “user account” for the Grid.
- How you do this is explained at <http://atlaswww.hep.anl.gov/asc/working.php>
- At on ascint0y or int1y, set up your account as instructed in <https://atlaswww.hep.anl.gov/twiki/bin/view/UsAtlasTier3/Tier3gUsersGuide>



# Step 1: Get an Athena job running interactively

- The start point is an athena package that makes what you want
- If your **job options** runs, you are basically ready.
- You don't really need to change anything with the Options.py file—but you probably want the messages to be at the “ERROR” level rather than “INFO” to prevent the log files from getting too large.
- Note: input file specified inside the Options.py, number of events, etc. does NOT need to be changed.



## Setting up athena release + grid

```
export ATLAS_LOCAL_ROOT_BASE=/export/share/atlas/ATLASLocalRootBase
alias setupATLAS='source${ATLAS_LOCAL_ROOT_BASE}/user/atlasLocalSetup.sh'
setupATLAS
localSetupGcc --gccVersion=gcc432_x86_64_slc5
export ATLAS_TEST_AREA=~/.testarea/15.6.6
source /export/home/atlasadmin/temp/setupScripts/setupAtlasProduction_15.6.6.sh
localSetupPandaClient
```

Do localSetupDQ2Client  
in a separate session (Python clash with Athena setup)



## Step 2: Find the input data files in the Grid

- I've found that finding useful data or MC in ATLAS is one of the most confusing things.
- In general, you need to sort of know the name of the data you are looking for before you start.
- Rely on your physics group, colleagues, etc..

```
[ryoshida@atlas16 run]$ ls -l AOD.pool.root
lrwxrwxrwx  1 ryoshida atlas 122 Sep  6 18:11 AOD.pool.root -> /data/nas2/users/ryo
shida/sep_jamboree_mc/mc08.005144.PythiaZee.recon.AOD.e323_s400_d99_r474/AOD.023534
.00001.pool.root.2
```

```
[ryoshida@atlas16 run]$ dq2-ls mc08.005144.PythiaZee.recon.AOD.e323_s400_d99_r474/
mc08.005144.PythiaZee.recon.AOD.e323_s400_d99_r474/
```

**dq2-ls** command lets me know that the “**container**” of this data exists. (.../ means container)

**files** are in **datasets** which are in **containers**



## Finding the data (cont)

- Fancier commands (**dq2-list-dataset-replicas-container**) give you more information.

```
[ryoshida@atlas16 run]$ dq2-list-dataset-replicas-container mc08.005144.PythiaZee.recon.AOD.e323_s400_d99_r474/
mc08.005144.PythiaZee.recon.AOD.e323_s400_d99_r474_tid023534:
  INCOMPLETE:
  COMPLETE: AGLT2_MCDISK,BNL-OSG2_MCDISK,FZK-LCG2_MCDISK,IN2P3-CC_MCDISK,INF
N-MILANO-ATLASC_MCDISK,INFN-MILANO_MCDISK,INFN-NAPOLI-ATLAS_MCDISK,MWT2_DATADISK,NE
T2_MCDISK,SLACXRD_MCDISK,SWT2_CPB_MCDISK,WISC

Container name: mc08.005144.PythiaZee.recon.AOD.e323_s400_d99_r474/
Total datasets: 1
Summary:
```

SITE	/ # COMPLETE	/ # INCOMPLETE	/ TOTAL
MWT2_DATADISK	1	0	1
WISC	1	0	1
NET2_MCDISK	1	0	1
AGLT2_MCDISK	1	0	1
INFN-MILANO_MCDISK	1	0	1
FZK-LCG2_MCDISK	1	0	1
SWT2_CPB_MCDISK	1	0	1
INFN-NAPOLI-ATLAS_MCDISK	1	0	1
IN2P3-CC_MCDISK	1	0	1
SLACXRD_MCDISK	1	0	1
INFN-MILANO-ATLASC_MCDISK	1	0	1
BNL-OSG2_MCDISK	1	0	1





# Finding the data (cont)

- Now you can find out what files are in the dataset(s). **dq2-ls -f**

```
[ryoshida@atlas16 run]$ dq2-ls -f mc08.005144.PythiaZee.recon.AOD.e323_s400_d99_r474_tid023534 | less

mc08.005144.PythiaZee.recon.AOD.e323_s400_d99_r474_tid023534
[X]   AOD.023534._00240.pool.root.2  5CDC9202-2150-DD11-90DE-0015C5E3F815  md5:1996248a7ad39ad5a9d63a6817d0b18c  36160335
[X]   AOD.023534._00207.pool.root.2  E8761C00-2350-DD11-A09C-00145EDD7B05  md5:78be2488769725dc4429ccf007441079  37263185
[X]   AOD.023534._00333.pool.root.2  9A49B93B-2A50-DD11-BD56-00145ED6DEC8  md5:f44e6d9e564440e764d05b66e9df73ed  36585137
[X]   AOD.023534._00205.pool.root.6  D2ADCE6E-815A-DD11-AFC4-001D0967D085  md5:12fce35d4c7493875d4a78aa371e877b  37136889
[X]   AOD.023534._00141.pool.root.2  B47E3000-1350-DD11-A9B9-0019B9E48FFC  md5:39e79bb4c9b1cd0d250c07c6fc35f398  36914052
[X]   AOD.023534._00377.pool.root.2  8C47FE71-1E50-DD11-B786-000D604E6524  md5:a2f704d265a284adcc0bd19d0819f155  37467876
[X]   AOD.023534._00398.pool.root.3  4A4D1692-2250-DD11-B445-00145EDD74C1  md5:cf4d716b141c91902111431bc9523e27  35950078
[X]   AOD.023534._00138.pool.root.2  FF1E10E4-1050-DD11-007E-000D604E6524  md5:5f1007a7d325a00035d5f0f7d44a0d02d4  30667758

[X]   AOD.023534._00097.pool.root.3  F673D166-1750-DD11-B3FA-0015C5E3E44B83  md5:021490771697d47711944e243641967  37438078
[X]   AOD.023534._00083.pool.root.3  AA04C16F-2350-DD11-9FC9-00145E6D496A  md5:45b04fe0ebe22da996e2058fa6e1a428  37589924
[X]   AOD.023534._00004.pool.root.2  40FA2AA1-3D50-DD11-8E48-0019BB360420  md5:86b08acd4c85d5e70dfc1e58ad5dc5c1  34465908
[X]   AOD.023534._00104.pool.root.6  F84F1A0F-E65A-DD11-AE08-001D0967C9AA  md5:599f802d2624faf0601402fba21ede14  37024242
[X]   AOD.023534._00314.pool.root.3  5293CD24-1750-DD11-AC20-0015C5E42D3F  md5:119b6f7db49e7b5188a473ba86a729be  37253767
[X]   AOD.023534._00200.pool.root.3  CC78B32A-1750-DD11-AEF7-0015C5F735B4  md5:701cdd6f33ca0f4600b7bdd01e8b185e  38167796
[X]   AOD.023534._00081.pool.root.3  E681A90B-2750-DD11-8B7D-00145ED6DE0E  md5:53ca876f2c069af0ba8ccb338b43809b  34848042
[X]   AOD.023534._00224.pool.root.6  92B2CC10-7C5A-DD11-B3C5-001D0968C880  md5:bb44ae23a5662470502b2b2b9d5ae40d  35914757

total files: 400
local files: 400
total size: 14866439667
date: 2008-07-30 04:18:11
```

There are 400 files in this data set.





# Finding the data (cont)

- Alternately you can use AMI at <http://ami.in2p3.fr/opencms/opencms/AMI/www/>
- Eventually you get to a page like this...

The screenshot shows the AMI web application interface. At the top, there is a navigation bar with links for Home, Searches, Tools, Bookmarks, and Datasets Selection. The ATLAS logo and an atlas Login button are also present. The main content area features the AMI logo and a search section. The search section includes a text input field containing "mc08.005144.PythiaZee.recon.AOD%", a "Search datasets" button, and radio buttons for "Name" (selected) and "Keywords". Below this, there are radio buttons for "AND" (selected) and "OR" search modes, and another "Search datasets" button. To the right of the search input is a link for "Advanced Search Overview". Below the search section, there is a section for configuration tags with a text input field, a "Browse/Search all configuration tags More Nomenclature Functions" link, and an "Interpret config tag" button. At the bottom, there is a section titled "Latest config tag comments" with a table header showing columns for "tag", "description", and "TWIKI link".

Home Searches Tools Bookmarks ? **Datasets Selection** ATLAS atlas Login

**AMI**

Use % for wildcarding:  
example "mc08%RDO%"

mc08.005144.PythiaZee.recon.AOD% **Advanced Search Overview**

Search by  Name  Keywords

Search mode  AND  OR

**Search datasets**

Enter a simple or a compound configuration tag  
examples : "e1", "e1\_s1\_d1\_r1"

**Interpret config tag** **Browse/Search all configuration tags More Nomenclature Functions**

**Latest config tag comments**

tag	description	TWIKI link
-----	-------------	------------



# Finding the data (cont)

- With all sorts of information

mc08\_production

History Result: dataset \* DQ2Info:dataset \*

[FullScreen](#)

DQ2 Dataset Metadata		Existing Replicas	
name	mc08.005144.PythiaZee.recon.AOD.e323_s400_d99_r474/ - PANDA	SITE	Complete datasets
closeddate	None	MWT2_DATADISK Dashboard	1
creationdate	2008-07-30 08:59:03	WISC Dashboard	1
deleteddate	None	NET2_MCDISK Dashboard	1
duid	bffb7619-824f-4845-bab2-6b67437baa51		
frozendate	None	<b>Subscriptions</b>	
lastoperationdn	/DC=org/DC=doegrids/OU=People/CN=Alexei Klimentov 849938	No subscription found	
lastoperationip	ixfs6163.cern.ch	<b>Subscription procedure</b>	
latestversion	0	You must log in AMI to access suscription funct	
latestvuid	bffb7619-824f-4845-bab2-6b67437baa51	<b>Contained datasets (1)</b>	
origin	None	mc08.005144.PythiaZee.recon.AOD.e323_s400_d99_r	
owner	/DC=org/DC=doegrids/OU=People/CN=Alexei Klimentov 849938		
physicsgroup	None		
state	open		
tier0state	None		
tier0type	None		
type	2		
version	0		
versioncreationdate	2008-07-30 08:59:03		
vuid	bffb7619-824f-4845-bab2-6b67437baa51		

Dataset files View 10 records, starting from n° 0 of 400 order by LFN ASC [View](#) ▶

Dataset size: 14866439667

LFN	GUID	md5	Size
AOD.023534_00001.pool.root.2	BA02DBC1-4950-DD11-965D-0019BB366500	md5:85c60e406fa523caee879667550cdca1	36162543
AOD.023534_00002.pool.root.2	A407B199-4850-DD11-B7A2-0019BB362D7E	md5:3727a6bd62aab48fea3c62fbabf8d6e3	365445509
AOD.023534_00003.pool.root.2	CF50E70E-3F50-DD11-B8E5-0019BB367A04	md5:4e8b670c024a093748e4b3e5020	36930200



# Using Pathena to submit to the Grid

- Now we're ready to submit to the Grid

Output dataset I name

```
[ryoshida@atlas16 run]$ pathena --outDS user09.RikutaroYoshida.8SeptTest.V1  
--inDS mc08.005144.PythiaZee.recon.AOD.e323_s400_d99_r474/ --nFiles=50 Ana  
lysisSkeleton_topOptions.py
```

Input container name

run over 50 files (not 400)

Do

➤ `pathena --help`

to get many options you might use..



# Using Pathena to submit to the Grid

- Pathena command submits to the Grid and gives you some info about the job.

```
INFO : use US as default cloud
INFO : extracting run configuration
INFO : ConfigExtractor > Input=POOL
INFO : ConfigExtractor > Output=AANT AANTupleStream AANT
INFO : archiving source files
INFO : archiving InstallArea
INFO : checking symbolic links
INFO : uploading source/job0 files
INFO : query files in mc08.005144.PythiaZee_recon.AOD.e323_s400_d99_r474/
INFO : scanning LFC heroatlas.fas.harvard.edu for ANALY_NET2
INFO : 300 files are missing or skipped at ANALY_NET2
INFO : use 50 files
INFO : submit to ANALY_NET2
=====
JobID   : 294
Status  : 0
> build
PandaID=1021050513
> run
PandaID=1021050514-1021050516
```

Running at Northeast  
Tier 2

Setup, compile etc...

Split into 3 subjobs



# Keeping track of your jobs

- Command pbook shows you what is happening with the job

```
[ryoshida@atlas16 run]$ pbook
INFO : Synchronizing local repository ...
INFO : Got 2 jobs to be updated
INFO : Updating JobID=293 ...
INFO : Updating JobID=294 ...
INFO : Synchronization Completed

Start pBook 0.1.81
>>> show(294)
INFO : Getting status for JobID=294 ...
INFO : Updated JobID=294
=====
      JobID : 294
      type : pathena
PandaID : 1021050513-1021050516
      nJobs : 3 + 1(build)
      site : ANALY_NET2
      cloud : US
      inDS : mc08.005144.PythiaZee.recon.AOD.e323_s400_d99_r474/
      outDS : user09.RikutaroYoshida.8SeptTest.V1
      libDS : user09.RikutaroYoshida.0909040325.820836.lib._000294.lib.
tgz
      retryID : 0
      provenanceID : 0
      creationTime : 2009-09-09 04:03:32
      lastUpdate : 2009-09-09 04:11:52
      params : --outDS user09.RikutaroYoshida.8SeptTest.V1 --inDS mc08.0
05144.PythiaZee.recon.AOD.e323_s400_d99_r474/ "--nFiles=50" AnalysisSkeletc
n_topOptions.py
      jobStatus : running
      defined : 3
      running : 1
```





# Keeping track of your jobs (cont)

- Panda monitor also lets you see the status of your jobs

4 jobs. Click job number to see details.

States: defined:3 running:1

Users: [Rikutarō Yoshida:4](#)

Releases: Atlas-15.4.0:4

Processing type: pathena:4

Sites: ANALY\_NET2:4

Showing 1 jobsets modified from 2009-09-09 04:03 to 2009-09-09 04:03

## Job Sets:

User:jobID	Created	Latest	Jobs	Pre-run	Running	Holding	Finished	Failed	buildJob	Site
<a href="#">Rikutarō Yoshida:294</a>	2009-09-09 04:03	2009-09-09 04:03	4	3	1				<a href="#">1021050513</a> <a href="#">libDS</a>	<a href="#">ANALY_NET2</a>
In: <a href="#">mc08.005144.PythiaZee.recon.AOD.e323_s400_d99_r474/</a> Out: <a href="#">user09.RikutarōYoshida.8SeptTest.V1</a>										

Showing 4 jobs modified from 2009-09-09 04:03 to 2009-09-09 04:03

## Jobs:

<a href="#">PandaID</a> , <a href="#">Owner</a> , Working group	<a href="#">Job</a>	<a href="#">Status</a>	<a href="#">Created</a>	<a href="#">Time to start</a>	<a href="#">Duration</a>	<a href="#">Ended/Modified</a>	<a href="#">Cloud/Site</a> , <a href="#">Type</a>	<a href="#">Priority</a>
<a href="#">1021050516</a> <a href="#">Rikutarō Yoshida</a>	<a href="#">pathena jobID=294</a> <a href="#">runAthena</a>	defined	2009-09-09 04:03	0:00:10		09-09 04:03	<a href="#">US/ANALY_NET2</a> , <a href="#">analysis-run</a>	1000
In: <a href="#">mc08.005144.PythiaZee.recon.AOD.e323_s400_d99_r474/</a> Out: <a href="#">user09.RikutarōYoshida.8SeptTest.V1</a>								
<a href="#">1021050515</a> <a href="#">Rikutarō Yoshida</a>	<a href="#">pathena jobID=294</a> <a href="#">runAthena</a>	defined	2009-09-09 04:03	0:00:11		09-09 04:03	<a href="#">US/ANALY_NET2</a> , <a href="#">analysis-run</a>	1000
In: <a href="#">mc08.005144.PythiaZee.recon.AOD.e323_s400_d99_r474/</a> Out: <a href="#">user09.RikutarōYoshida.8SeptTest.V1</a>								
<a href="#">1021050514</a> <a href="#">Rikutarō Yoshida</a>	<a href="#">pathena jobID=294</a> <a href="#">runAthena</a>	defined	2009-09-09 04:03	0:00:11		09-09 04:03	<a href="#">US/ANALY_NET2</a> , <a href="#">analysis-run</a>	1000
In: <a href="#">mc08.005144.PythiaZee.recon.AOD.e323_s400_d99_r474/</a> Out: <a href="#">user09.RikutarōYoshida.8SeptTest.V1</a>								
<a href="#">1021050513</a> <a href="#">Rikutarō Yoshida</a>	<a href="#">pathena jobID=294</a> <a href="#">buildJob</a>	running	2009-09-09 04:03	0:00:15	0:01:45	09-09 04:03	<a href="#">US/ANALY_NET2</a> , <a href="#">analysis-build</a>	2000
libDS: <a href="#">user09.RikutarōYoshida.0909040325.820836.lib_000294</a>								



# Notification of finished jobs

- Eventually Panda will email you that your job is finished.

**PANDA notification for JobID : 294** Inbox | X

☆ [atlpan@cern.ch](mailto:atlpan@cern.ch) to Rikutarō.Yoshi. [show details](#) 1

Summary of JobID : 294

Created : 2009-09-09 04:03:31 (UTC)

Ended : 2009-09-09 04:57:20 (UTC)

Site : ANALY\_NET2

Total Number of Jobs : 3

Succeeded : 3

Partial : 0

Failed : 0

In : mc08.005144.PythiaZee.recon.AOD.e323\_s400\_d99\_r474/

In : user09.RikutarōYoshida.0909040325.820836.lib.\_000294

Out : user09.RikutarōYoshida.8SeptTest.V1

Report Panda problems of any sort to

the eGroup for help request

[hn-atlas-dist-analysis-help@cern.ch](mailto:hn-atlas-dist-analysis-help@cern.ch)

the Savannah for software bug

<https://savannah.cern.ch/projects/panda/>





# Retrieving your output

- Use dq2-get

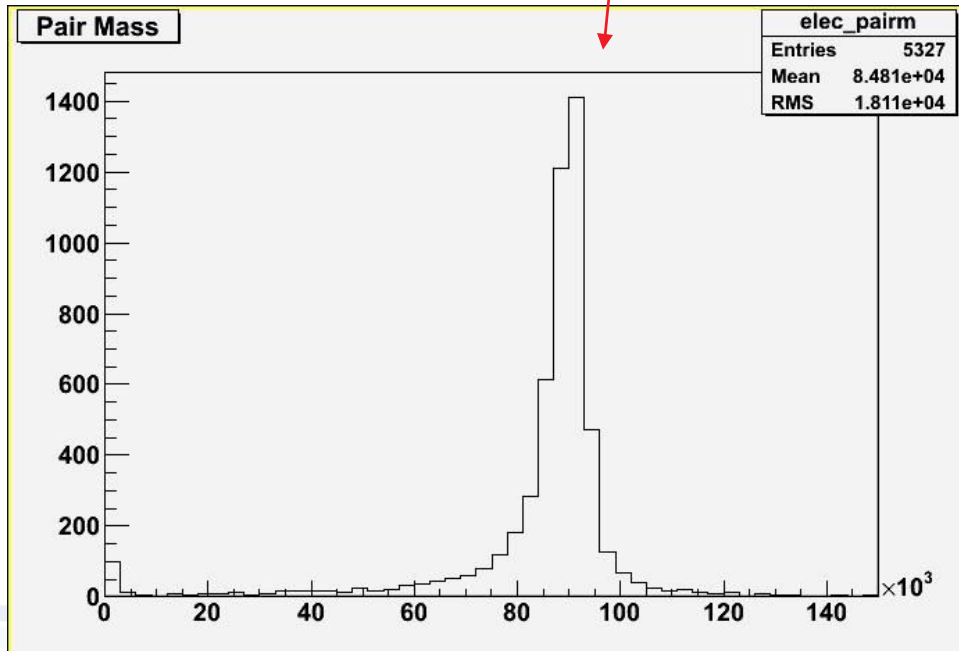
```
[ryoshida@atlas16 ryoshida]$ pwd
/data/nas3/users/ryoshida
[ryoshida@atlas16 ryoshida]$ dq2-get user09.Rikutaroyoshida.8SeptTest.V1
Group of sites selected, skipping domain name check
Querying DQ2 central catalogues to resolve datasetname user09.Rikutaroyoshida.8SeptTest.V1
Datasets found: 1
user09.Rikutaroyoshida.8SeptTest.V1: Querying DQ2 central catalogues for replicas...
Your configured site is not recognised. Make sure you use a ToA site name! Close-sites optimisations is not possible.
Querying DQ2 central catalogues for files in dataset...
user09.Rikutaroyoshida.8SeptTest.V1: No complete replica available, trying to gather pieces from incomplete so

user09.Rikutaroyoshida.8SeptTest.V1/user09.Rikutaroyoshida.8SeptTest.V1.AANT._00002.root: 5242000/9251918 transferred
user09.Rikutaroyoshida.8SeptTest.V1/user09.Rikutaroyoshida.8SeptTest.V1.AANT._00002.root: 9251918/9251918 transferred
user09.Rikutaroyoshida.8SeptTest.V1/user09.Rikutaroyoshida.8SeptTest.V1.AANT._00002.root: validated
Finished
[ryoshida@atlas16 ryoshida]$
[ryoshida@atlas16 ryoshida]$ ls user09.Rikutaroyoshida.8SeptTest.V1/
user09.Rikutaroyoshida.8SeptTest.V1.AANT._00001.root  user09.Rikutaroyoshida.8SeptTest.V1._1021050514.log.tgz
user09.Rikutaroyoshida.8SeptTest.V1.AANT._00002.root  user09.Rikutaroyoshida.8SeptTest.V1._1021050515.log.tgz
user09.Rikutaroyoshida.8SeptTest.V1.AANT._00003.root  user09.Rikutaroyoshida.8SeptTest.V1._1021050516.log.tgz
[ryoshida@atlas16 ryoshida]$ █
```



# Look at the output

```
user09.Rikutaroyoshida.8SeptTest.V1/user09.Rikutaroyoshida.8SeptTest.V1.AANT._00002.root: 9251918/9251918 transferred
user09.Rikutaroyoshida.8SeptTest.V1/user09.Rikutaroyoshida.8SeptTest.V1.AANT._00002.root: 9251918/9251918 transferred
user09.Rikutaroyoshida.8SeptTest.V1/user09.Rikutaroyoshida.8SeptTest.V1.AANT._00002.root: validated
Finished
[ryoshida@atlas16 ryoshida]$
[ryoshida@atlas16 ryoshida]$ ls user09.Rikutaroyoshida.8SeptTest.V1/
user09.Rikutaroyoshida.8SeptTest.V1.AANT._00001.root user09.Rikutaroyoshida.8SeptTest.V1._1021050514.log.tgz
user09.Rikutaroyoshida.8SeptTest.V1.AANT._00002.root user09.Rikutaroyoshida.8SeptTest.V1._1021050515.log.tgz
user09.Rikutaroyoshida.8SeptTest.V1.AANT._00003.root user09.Rikutaroyoshida.8SeptTest.V1._1021050516.log.tgz
[ryoshida@atlas16 ryoshida]$
```



I discovered the Z!



## Now you try it.

- If you follow the instructions from <https://atlaswww.hep.anl.gov/twiki/bin/view/Jamborees/Jamboree2010Mar>
- you should be able to start running on the Grid easily from ANL ASC.
- There are many more things you can do with submission and control of your jobs, but this should get you started.

