

Status of middleware: usability for ATLAS users

CHIPP - LHC computing and analysis workshop
CSCS, Manno, 25/8-26/8 2005

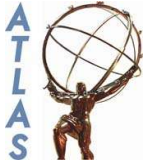
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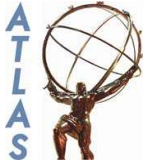
- Use case: small scale user production in ATLAS
 - Steps involved with NorduGrid, LCG, ...
- Conclusion

Use case: Rome data reconstruction



- Task: reconstruct the dataset “rome.004201.digit.ZeeJimmy” using your own (Manuel's) code and job options
- Finding the files
 - Official data management tool of ATLAS: DQ3 ok
 - `/afs/cern.ch/atlas/offline/external/DQClient/dms3/dms3.py search 'rome.004201.digit.ZeeJimmy._*.pool.root'`
 - After ~3 minutes, fails, retry returns list of 2000 LPNs like e.g. `"/datafiles/rome/digit/rome.004201.digit.ZeeJimmy/rome.004201.digit.ZeeJimmy._01999.pool.root"`
 - choosing one results in a URL
`sfn://castorgrid.cern.ch/castor/cern.ch/grid/atlas/datafiles/rome/digit/rome.004201.digit.ZeeJimmy/rome.004201.digit.ZeeJimmy._00001.pool.root.1`
 - Google
 - Succes: list of 2000 URLs, each file has 50 events ~ 100MB, in total ~ 200 GB

Use case: Rome data reconstruction



- Running a job on LCG
 - Checking available resources

```
[fjob@grid01]/home/fjob/run% edg-job-list-match rome.004201.digit.ZeeJimmy._00001.jdl
```

Selected Virtual Organisation name (from JDL): atlas

Connecting to host gdrb01.cern.ch, port 7772

```
*****
```

COMPUTING ELEMENT IDs LIST

The following CE(s) matching your job requirements have been found:

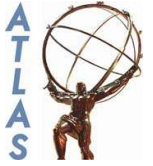
CEId

ce01-lcg.cr.cnaf.infn.it:2119/jobmanager-lcglsf-atlas

ce01-lcg.projects.cscs.ch:2119/jobmanager-lcgpbs-atlas

```
*****
```

Use case: Rome data reconstruction



- Job script:

```
tar -xzf InstallArea.tar.gz
```

```
export LD_LIBRARY_PATH=${PWD}/InstallArea/i686-slc3-gcc323-opt/lib:${LD_LIBRARY_PATH}
```

```
my_athena_release=$1 # 10.0.1
```

```
source $VO_ATLAS_SW_DIR/software/10.0.1/setup.sh
```

```
source $SITEROOT/dist/10.0.1/Control/AthenaRunTime/*/cmt/setup.sh
```

```
my_input_file=$2 # dc2.003007.digit.A1_z_ee._00001.pool.root.4
```

```
my_output_file=`echo $my_input_file | awk -F. '{print $1"."$2"."$3"."$4"."$5}`.root
```

```
my_job_options=$3 # Trigger_topOptions_rome_grid.py
```

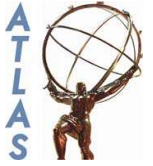
```
pool_insertFileToCatalog $my_input_file
```

```
get_files -copy -jo $my_job_options
```

```
get_files PDGTABLE.MeV
```

```
athena.py -c 'PoolRDOInput=[""$my_input_file""]; RootNtupleOutput=""$my_output_file"" $my_job_options
```

Use case: Rome data reconstruction



- Job description file (JDL)

[

```
Executable = "ge-nordwrapper.sh";
```

```
InputSandbox = {"/home/fjob/run/Trigger_topOptions_rome_grid.py",
```

```
"/home/fjob/run/jobOfragment_TrigElectronHypo.py",
```

```
"/home/fjob/run/jobOfragment_TrigSteerMonitor.py",
```

```
"/home/fjob/run/HLTsequence.xml",
```

```
"/home/fjob/run/InstallArea.tar.gz"};
```

```
InputData = "lfn:rome.004201.digit.ZeeJimmy._00001.pool.root";
```

```
DataAccessProtocol = "gsiftp";
```

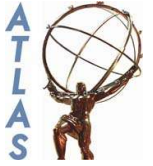
```
OutputSandbox = {"atlasreco.out","atlasreco.err"};
```

```
stdoutoutput = "atlasreco.out";
```

```
stderr = "atlasreco.err";
```

```
Arguments = "10.0.1 rome.004201.digit.ZeeJimmy._00001.pool.root Trigger_topOptions_rome_grid.py";
```

Use case: Rome data reconstruction



```
Environment = {"T_LCG_GFAL_INFOSYS=atlas-bdii.cern.ch:2170"};  
VirtualOrganisation = "atlas";  
Requirements = ( ( ( Member("VO-atlas-release-  
10.0.1",other.GlueHostApplicationSoftwareRunTimeEnvironment) ) ) &&  
  ( other.GlueHostNetworkAdapterOutboundIP == TRUE ) ) &&  
  ( other.GlueHostMainMemoryRAMSize >= 1024 );  
Rank = ( -other.GlueCEStateEstimatedResponseTime );  
]  
~
```

Use case: Rome data reconstruction

- Submitting the job and retrieving the output

```
edg-job-submit --vo atlas rome.004201.digit.ZeeJimmy._00001.jdl
```

```
*****
```

JOB SUBMIT OUTCOME

The job has been successfully submitted to the Network Server.

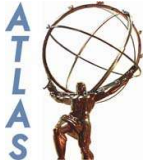
Use edg-job-status command to check job current status. Your job identifier (edg_jobId) is:

- <https://gdrb03.cern.ch:9000/qhDKAfCnti-GtPzPUBSiRg>

```
*****
```

- Can be directed to specific resource (CSCS); seems to increase time in queue...
- Checking and retrieving: no stdout/stderr while running
- Much waiting time involved: >10 minutes before failed job enters :”Done” state and can be checked

Use case: Rome data reconstruction



- Running a job on NorduGrid

- Job description file (XRSL):

```
&(executable="ge-norduwrapper.sh")
```

```
(arguments="10.0.1" "rome.004201.digit.ZeeJimmy._00001.pool.root" "Trigger_topOptions_rome_grid.py")
```

```
(stdout=atlasreco.out)
```

```
(stderr=atlasreco.err)
```

```
(inputFiles=(Trigger_topOptions_rome_grid.py "" )(jobOfragment_TrigElectronHypo.py "" )
```

```
  (jobOfragment_TrigSteerMonitor.py "" )(HLTsequence.xml "" )(HLTsignature.xml "" )
```

```
  (rome.004201.digit.ZeeJimmy._00001.pool.root "gsiftp://se01-
```

```
  lcg.projects.cscs.ch/storage/atlas/datafiles/rome/digit/rome.004201.digit.ZeeJimmy/rome.004201.digit.ZeeJimmy.  
  _00001.pool.root" )(InstallArea.tar.gz "" )
```

```
(outputFiles=(rome.004201.digit.ZeeJimmy._00001.root "" ))
```

```
(gridtime="30 minutes")
```

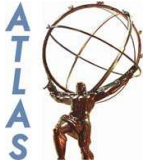
```
(jobname="ATLAS dc2 Zee reconstruction, rome.004201.digit.ZeeJimmy._00001.pool.root")
```

```
(gmlog=log)
```

```
(runTimeEnvironment=APPS/HEP/ATLAS-10.0.1)
```

```
(memory=1512)
```

Use case: Rome data reconstruction



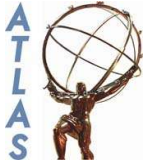
- Submitting the job and retrieving the output

```
ngsub -f jobs/rome.004201.digit.ZeeJimmy._00001.xrsl -d1
```

Job submitted with jobid gsiftp://lheppc10.unibe.ch:2811/jobs/913311249108571521569230

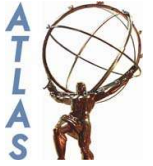
- Can be directed to specific resource (CSCS); runs immediately
- Checking and retrieving: stdout/stderr available while running

Use case: Rome data reconstruction



- Running the jobs with remote files
 - Required certificate in ATLAS VO
 - Italian GRIDFTP server was unstable and failure rate too high
- Replicating the files to Switzerland
 - Naive attempt: script with simple loop, using LCG replication tools (lcg-rep) → failed on many files. 1834 of 2000 files replicated after days of retrying regularly

Use case: Rome data reconstruction



- DQ3 (official ATLAS data management tool): replication failed after 5 tries with 'Cannot find DQ server with source file'
- Old DQ2: replication works, but simply uses LCG tools, so same problem as with naive script
- Conclusion: home-made script using basic grid tools needs to be made more sophisticated
- Running the jobs with “local” files
 - No problems

Conclusion



- The limited usage of grid tools by physicists is not due to any lack of resources; many resources are available on several grids
- It is also not due to complicated user commands; submitting jobs is quite easy
- Identified problems
 - data location problems
 - data access instability
 - large waiting times for the case of LCG