

RAL Report for DUNE-UK meeting

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Workload management system (WMS)

- DUNE currently uses fife / poms as WMS
- Aim : Test out DIRAC as an alternative WMS for DUNE
 - ➔ For now, only proof-of-concept
 - Run DUNE jobs on “the WLCG grid” using a DIRAC system
 - WLCG : Computing grid originally developed for LHC
 - Talk to various file catalog databases
 - SAM
 - RUCIO
 - DFC (Dirac File Catalog)
 - Also run a full production chain for a Monte Carlo simulation
 - Generation, reconstruction ...
 - Any other interesting feature considered potentially useful
- Following slides in chronological order of work done



DUNE on WLCG grid

- DUNE job definition
 - ➔ “lar” jobs for everything
 - Do the same on the grid
- Pick up fcl files as needed
 - ➔ All software on cvmfs
- Run some generic analysis job
 - Use SAM to find a DUNE file while running on the grid
 - Read the file
- Use DIRAC instance at Imperial



Dirac as WMS

➤ Run a full chain MC simulation

➔ Use old simulation production

- `mcc11_DP_RITM0761645`

➔ 4 steps

- Generation, Geant4, Detector simulation, Reconstruction

➔ 5 events / job

➔ Retain only final root file for output

- At RAL-PPD (Tier-2) storage

➔ Register file in DFC and SAM

- Easy and automatic in DIRAC

➔ Able to perform basic rucio operations

➤ Automatically recovered from various site failures

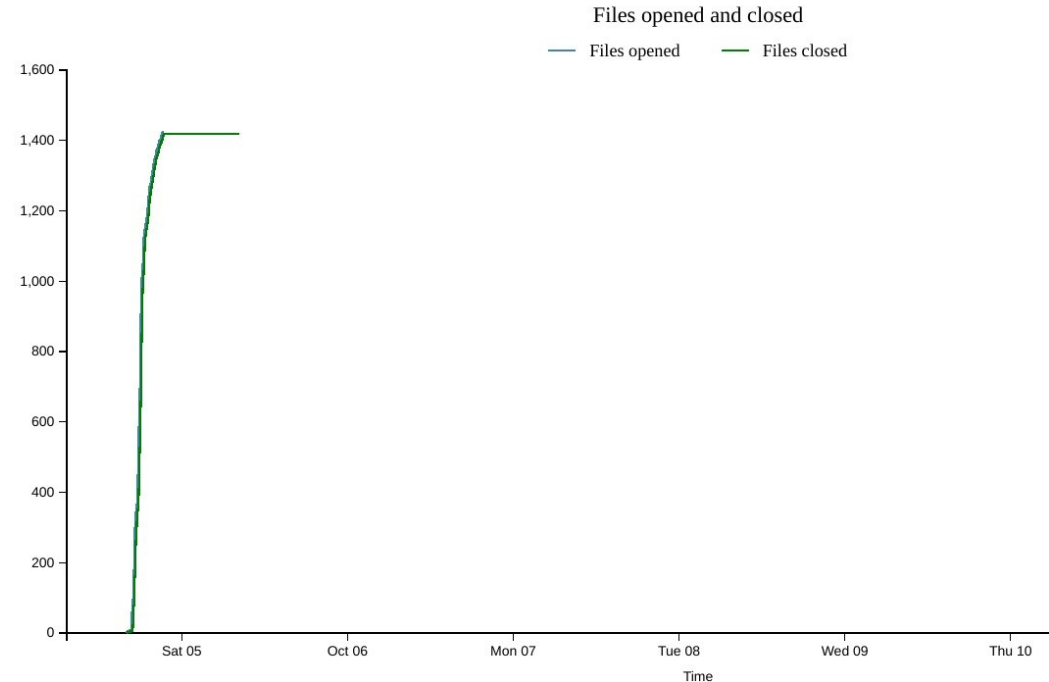
➔ No application failures seen so far

<input type="checkbox"/>	JobId ▾	Status	MinorStatus	ApplicationStatus	Site
<input type="checkbox"/>	18541504	Done	Execution Complete	Is -I successful	LCG.UKI-NORTHGRID-LIV-HEP.uk
<input type="checkbox"/>	18537575	Done	Execution Complete	Is -I successful	LCG.SARA-MATRIX.nl
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<input type="checkbox"/>	18520499	Done	Execution Complete	Is -I successful	LCG.UKI-LT2-IC-HEP.uk
<input type="checkbox"/>	18520498	Done	Execution Complete	Is -I successful	LCG.IN2P3-CC.fr
<input type="checkbox"/>	18520497	Done	Execution Complete	Is -I successful	LCG.SARA-MATRIX.nl
<input type="checkbox"/>	18520496	Done	Execution Complete	Is -I successful	LCG.UKI-LT2-IC-HEP.uk
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<input type="checkbox"/>	18519029	Done	Execution Complete	Is -I successful	LCG.UKI-NORTHGRID-SHEF-HEP.uk
<input type="checkbox"/>	18517501	Done	Execution Complete	Is -I successful	LCG.UKI-SOUTHGRID-OX-HEP.uk
<input type="checkbox"/>	18517431	Done	Execution Complete	Is -I successful	LCG.UKI-LT2-IC-HEP.uk
<input type="checkbox"/>	18514886	Done	Execution Complete	Is -I successful	LCG.UKI-NORTHGRID-MAN-HEP.uk



DIRAC and SAM

- Integrated SAM delivery into DIRAC jobs
 - Run lar jobs for processing data
 - Query SAM for input data at Run time
 - Used test dataset present at FNAL
 - Ran over 1426 files
 - All jobs ran overnight
 - Also tested separately with data at RAL



Summary

- Demonstrated usability of DIRAC as a WMS for DUNE
 - ➔ Run simple user jobs
 - <https://indico.fnal.gov/event/21328/session/0/contribution/7/material/slides/0.pdf>
 - ➔ Full chain MC test “production”
 - <https://indico.fnal.gov/event/21506/session/0/contribution/8/material/slides/0.pdf>
 - ➔ Use SAM for delivering data
 - http://samweb.fnal.gov:8480/station_monitor/dune/stations/dune/projects/test_nraja-5770
 - https://docs.dunescience.org/cgi-bin/sso/RetrieveFile?docid=12982&filename=DUNE_MonthlyReport_201909.pdf&version=10
 - ➔ Rucio also usable
- Awaiting metrics to be defined for comparing different WMS systems

