MICE Collaboration

MCproduction on the grid

Dimitrije Maletic

Institute of Physics, University of Belgrade

MICE collaboration meeting 47, 13th of February 2017.

Outline

- Introduction
- About MCproduction on the grid
- MCproduction on the grid information pages
  - Page about done or running MCproductions
  - MCproduction request page
  - MCproduction scripts on launchpad
  - Http access to MCproductions
- Restarting of the grid G4BL production

Introduction (1/2)

- The MC production on the grid includes G4BeamLine simulation and G4 Detector simulations using MAUS.

- MAUS G4 detector simulation production, using already made G4BL libraries, was done upon request with no delays, since March last year.

- As of last week, the G4BeamLine production was restarted on the grid, and the grid production of Version 4 of the G4BeamLine libraries can be started. Until now one G4BL library with 1k chunks was done.

Introduction (2/2)

- The MC production on the grid starts with the request which includes the information on
  - what should be included in the CDB card (used by simulation),
  - the list of G4BL input files paths
  - the MAUS Software version
  - comment

- The production manager should be informed about the request.

- The production manager inserts the entry about the MC production into the CDB, and submits the grid jobs.
  - In order to be able to continue with the MC production, production manager has to have a valid grid certificate and to be included into MICE VOMS.

About MCproduction on the grid (1/2)

- The MCproduction is using the MAUS software installed on CVMFS on grid sites which support MICE VO.
- In MAUS bin/utilities directory there is a python script for MC detector simulation: **execute_MC.py**.
- The <some>.sh script, with settings for running on the grid environment, is passed to the grid (WMS) by submitting a grid job. This script is used to execute **execute_MC.py** by passing MCSerialNumber and run number.
- Necessary information for the running of the MC simulation are http/srm link **to list of G4Beamline chunks** (where line number in this list represents the run number), **<SW_Version>**, and **a simulation datacard** details.
  - MAUS accesses the CDB to get appropriate configuration and calibrations, defined by reading of the datacard.
  - Each request/start of MCProduction, will be tagged with unique MCSerialNumber.
  - MCSerialNumber is a row number in CDB.

About MCproduction on the grid (2/2)

- MAUS writes a tarball like **<RunNumber>_mc.tar** for each chunk in G4BL list. All **<RunNumber>_mc.tar** are stored on Imperial SE for http access.

  http://gfe02.grid.hep.ph.ic.ac.uk:8301/Simulation/MCproduction/

- To access the files from the grid, the **<RunNumber>_mc.tar** LFN is /grid/mice/Simulation/MCproduction/<TenThousands>/<Century>/MCSerialNumber/<RunNumber>_mc.tar

- When all jobs are done, one job will get all created **<RunNumber>_mc.tar** files and make **<MCSerialNumber>_mc.tar**

- The **<MCSerialNumber>_mc.tar** is to be stored at RAL castor.

MCproduction on the grid information pages

- **Information about finished and running MCproductions on the grid:**
  http://micewww.pp.rl.ac.uk/projects/analysis/wiki/MCProduction

- **Information (and also as examples) of MCproduction Requests**

  http://micewww.pp.rl.ac.uk/projects/analysis/wiki/MCProductionRequests

- Information about MCproduction requests entries in CDB

  You can check MCSerialNumber entries in CDB:

  http://147.91.87.158/cgi-bin/get_mcserial

- The scripts used for MC production on the grid are available on launchpad
  - https://launchpad.net/mice-mc-batch-submission

Page about done or running MCproductions

Link from Software page http://micewww.pp.rl.ac.uk/projects/maus/

http://micewww.pp.rl.ac.uk/projects/analysis/wiki/MCProduction

- Contains information about MCproduction and lists the productions already done.

Example:

Run number 8681. 200 MeV. Status (Done)

- MCSerialNumber: 27
    - comment: Download by run number 8681. 200 MeV. G4BL 3200_p1.
    - softw: 2.6.0
    - data: geometry_download_by="run_number"
    - geometry_download_run_number=8681
- G4BL input list
    - From page http://micewww.pp.rl.ac.uk/attachments/download/6379/3200_p1.txt
- output:
    - HTTP:
    - http://gfe02.grid.hep.ph.ic.ac.uk:8301/Simulation/MCproduction/000000/000000/000027/
    - LFN: /grid/mice/Simulation/MCproduction/000000/000000/000027
    - SRM:srm://gfe02.grid.hep.ph.ic.ac.uk/pnfs/hep.ph.ic.ac.uk/data/mice/Simulation/MCproduction/000000/000000/000027

MCproduction request page

http://micewww.pp.rl.ac.uk/projects/analysis/wiki/MCProductionRequests

Example:

7469 Emittance production (Done)

Cards:

```
-geometry_download_by “run_number"
-geometry_download_run_number 7469
-TOF_calib_by = "date"
-TOF_cabling_by = "date"
-TOF_calib_date_from = '2015-10-07 14:00:00'
-TOF_cabling_date_from = '2015-10-07 14:00:00'
-TOFscintLightSpeed = 134.5 # mm/ns
```

G4BL input: http://www.ppe.gla.ac.uk/~rbayes/MICE/batch_scripts/3182Mu.txt

Software: MAUS-v2.5.0

8154 140 MeV ECE FC44 (Done)

Cards:

```
-geometry_download_by “run_number"
-geometry_download_run_number 8154
```

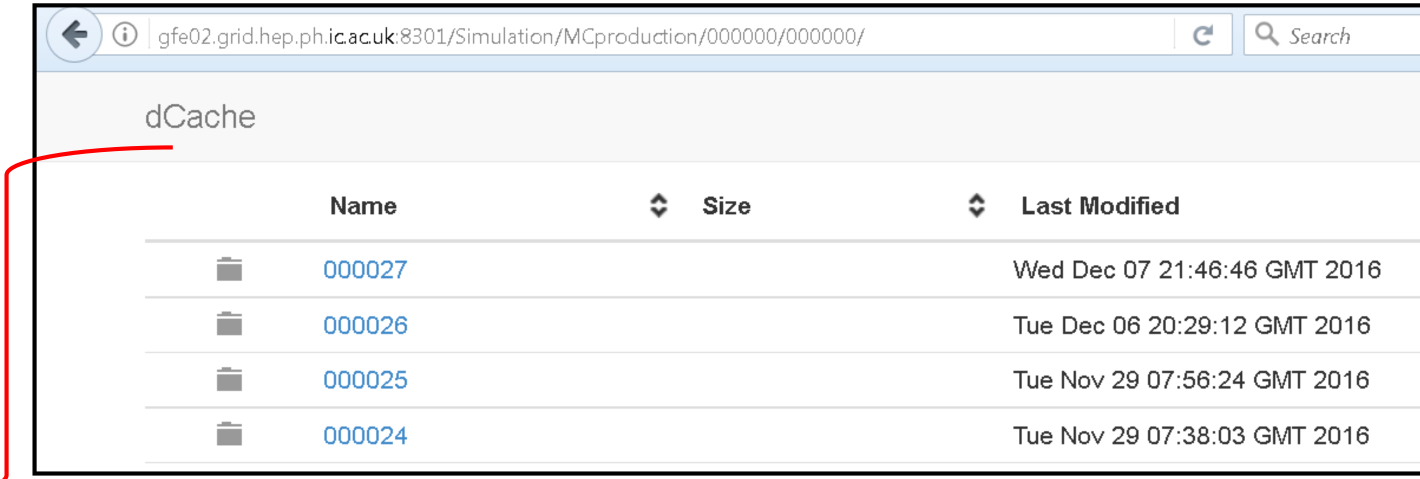
G4BL input: http://micewww.pp.rl.ac.uk/attachments/download/6378/3140_p1.txt

Software: MAUS-v2.6.0

Http access to MCproductions

http://gfe02.grid.hep.ph.ic.ac.uk:8301/Simulation/MCproduction/

30 productions done till March 2016.

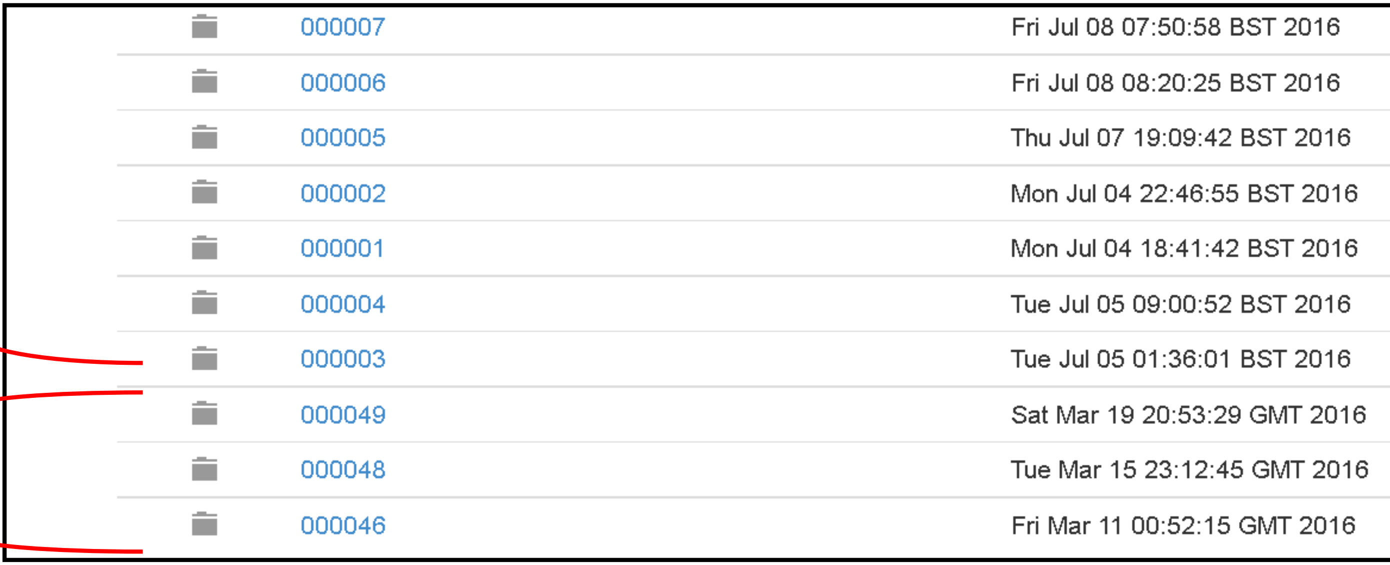


gfe02.grid.hep.ph.ic.ac.uk:8301/Simulation/MCproduction/000000/000000/

dCache

Name	Size	Last Modified
000027		Wed Dec 07 21:46:46 GMT 2016
000026		Tue Dec 06 20:29:12 GMT 2016
000025		Tue Nov 29 07:56:24 GMT 2016
000024		Tue Nov 29 07:38:03 GMT 2016

New MCproductions. **With** MCSerialNumber entries in CDB



000007	Fri Jul 08 07:50:58 BST 2016
000006	Fri Jul 08 08:20:25 BST 2016
000005	Thu Jul 07 19:09:42 BST 2016
000002	Mon Jul 04 22:46:55 BST 2016
000001	Mon Jul 04 18:41:42 BST 2016
000004	Tue Jul 05 09:00:52 BST 2016
000003	Tue Jul 05 01:36:01 BST 2016
000049	Sat Mar 19 20:53:29 GMT 2016
000048	Tue Mar 15 23:12:45 GMT 2016
000046	Fri Mar 11 00:52:15 GMT 2016

Old MCproductions. **WithNO** MCSerialNumber entries in CDB, only in preprodcdb

MCproduction scripts on launchpad

- The scripts used for MC production on the grid are available on launchpad
  - https://launchpad.net/mice-mc-batch-submission
  - The short description would be: MICE MC simulation using g4bl json files as input. Grid jobs submission scripts
    - Scripts helping to submit and monitor status of grid jobs. Developed for MC simulations using G4BeamLine json files as input files for MC simulation in MAUS
  - There is also a detailed README file

- The submission to the grid and monitoring of the jobs is done using bash scripts and local sqlite db stored at the UI of the submitter.
- The cronjob is set up to start the checking of status of grid jobs.
- There are scripts to create job files and submit them, script for checking the status of jobs and some utilities

Restarting of the grid G4BL production

- Durga created a script and sent me files needed to locally run G4BL simulation.

  - simulate_only_G4BL.bash —> main bash driver script — takes 3 args, deck-name, chunk-number, run-number

  - simulate_mice_G4BL.py —> the python script that runs g4bl

  - run_g4bl.py —> the maus module map driver

  - 3140M3.json —> the g4bl deck for generation

- Used like: ./**simulate_only_G4BL.bash** deck-name chunk-number run-number e.g. ./simulate_only_G4BL.bash 3140M3 1 8681
- **simulate_only_G4BL.bash** was modified to work on the grid environment, along with modifying the submission script.
- **Options: we can run** the grid MC simulation like
  - Use several decks, 1k G4BL chunks each —> generate the “G4BL chunk lists” —> run MC against these G4BL chunk lists using the MCProductionRequest mechanism
  - Generate one G4BL chunk -> run simulation using one chunk -> store G4BL chunk and simulation output in appropriate places.

THANK YOU!