The Production System

What is the production system? How do jobs run? What does "multi-core" mean? Job to data model, new systems. What's a pilot? If I have a problem, how do I know who to talk to? What are all these log files, and what do they mean?

Jose Enrique Garcia Navarro

What is ProdSys2?

BigPanDA

DEFT

JEDI

PanDA

Definitions : ProdSys2

DEfT – Database Engine for Tasks

- Includes interface for placing requests and defines tasks.
  - https://prodtask-dev.cern.ch/

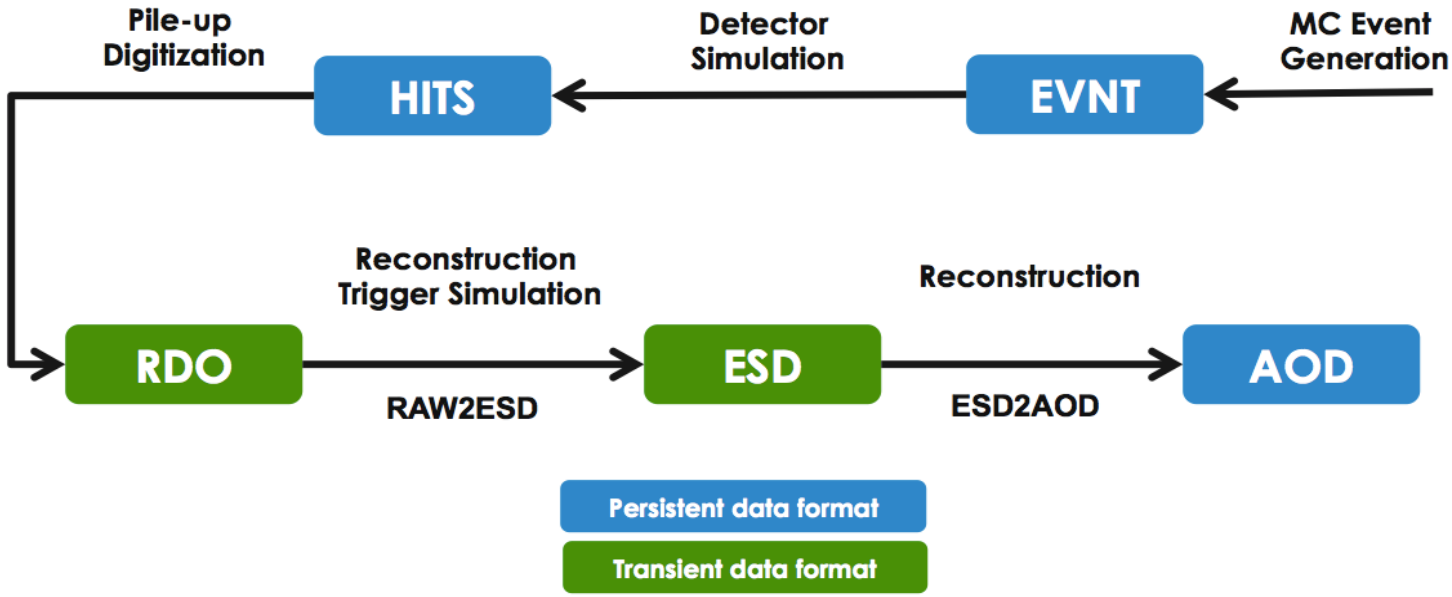
JEDI – Job Execution and Definition Interface

- Integrated with PanDA, provides a dynamic job definition tailored to the site's capabilities.

BigPanDA – PanDA Monitoring

- Display and Monitoring of the status of jobs
  - http://bigpanda.cern.ch/

Definitions : MC Production Chain



- **evgen :** JobOptions provided by requesters.
  - Most common point of failure for the chain
- **simul + digi+reco :** using AMI tag templates for the different production types MC15a, MC12,…
  - Final result **AOD**, configuration uses AMI tags validated by physics validation

Derivation is handled by Group Production

MC Production Standard Configurations

evgen: MC generators runs in single core (serial) and with high priority

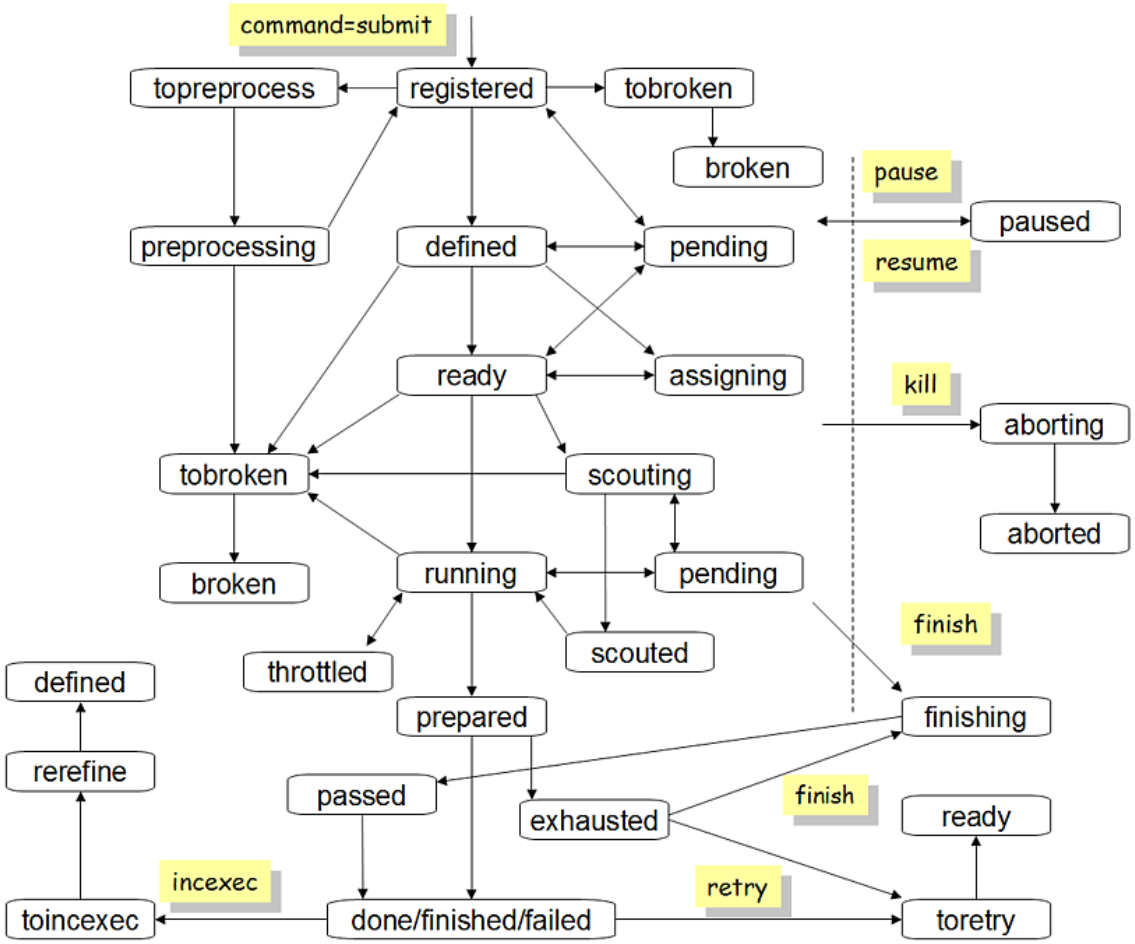
simul : Simulation is usually the longest step of the chain. Runs with lower priority and multicore (except for Atlfast which is serial).

digi+reco: Reconstruction is now much faster in MC15 but requires large inputs (which may cause troubles) and multi-core due to memory requirements. Runs with higher priority than simulation but lower than evgen.

- ***Multi-core:*** the queue system is optimized for 8-cores. It uses AthenaMP which allows to share memory (for common algorithms) between workers. It is defined during task definition by production managers.

Task Status (I)

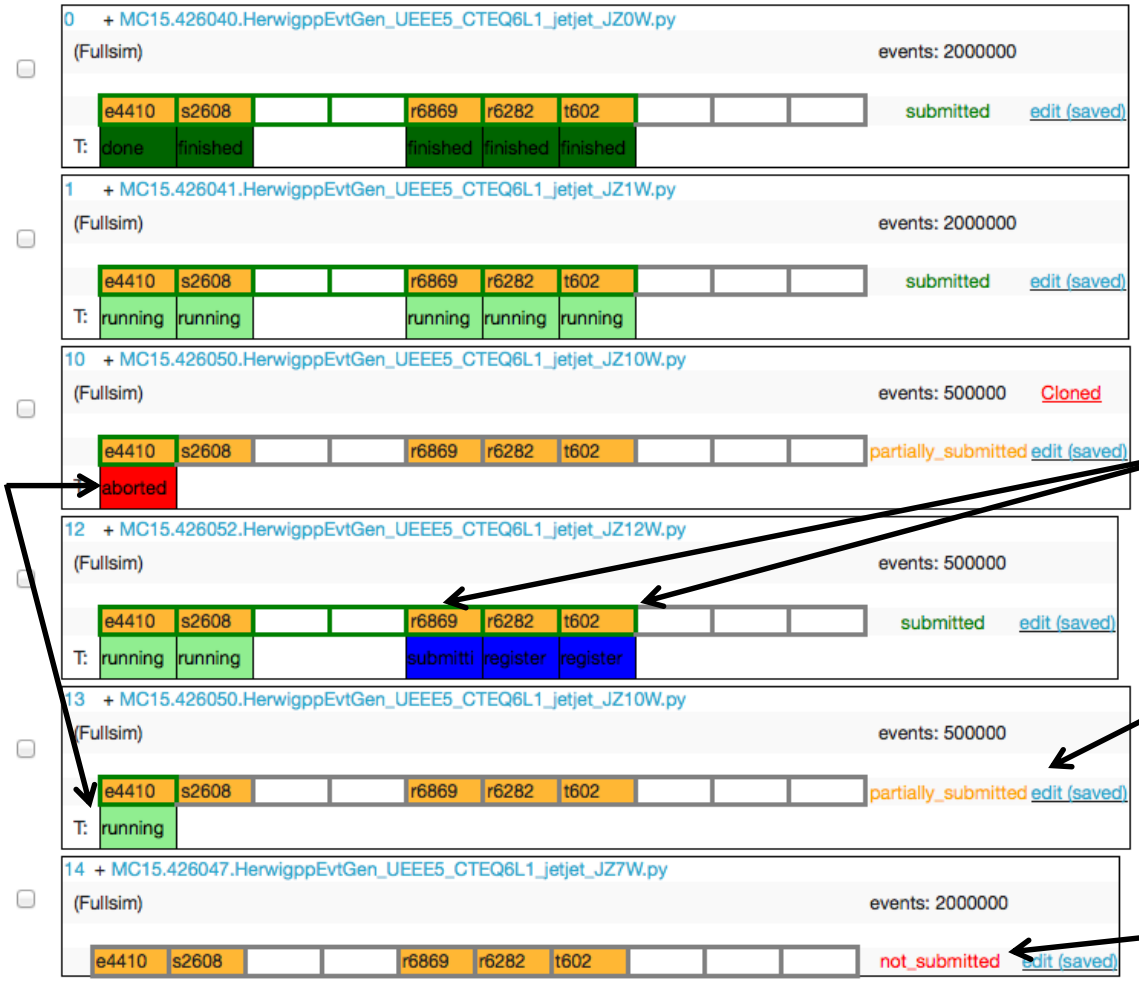
What happens when a task is submitted ?



simplified version next slides …

Task Status (II)

https://prodtask-dev.cern.ch/



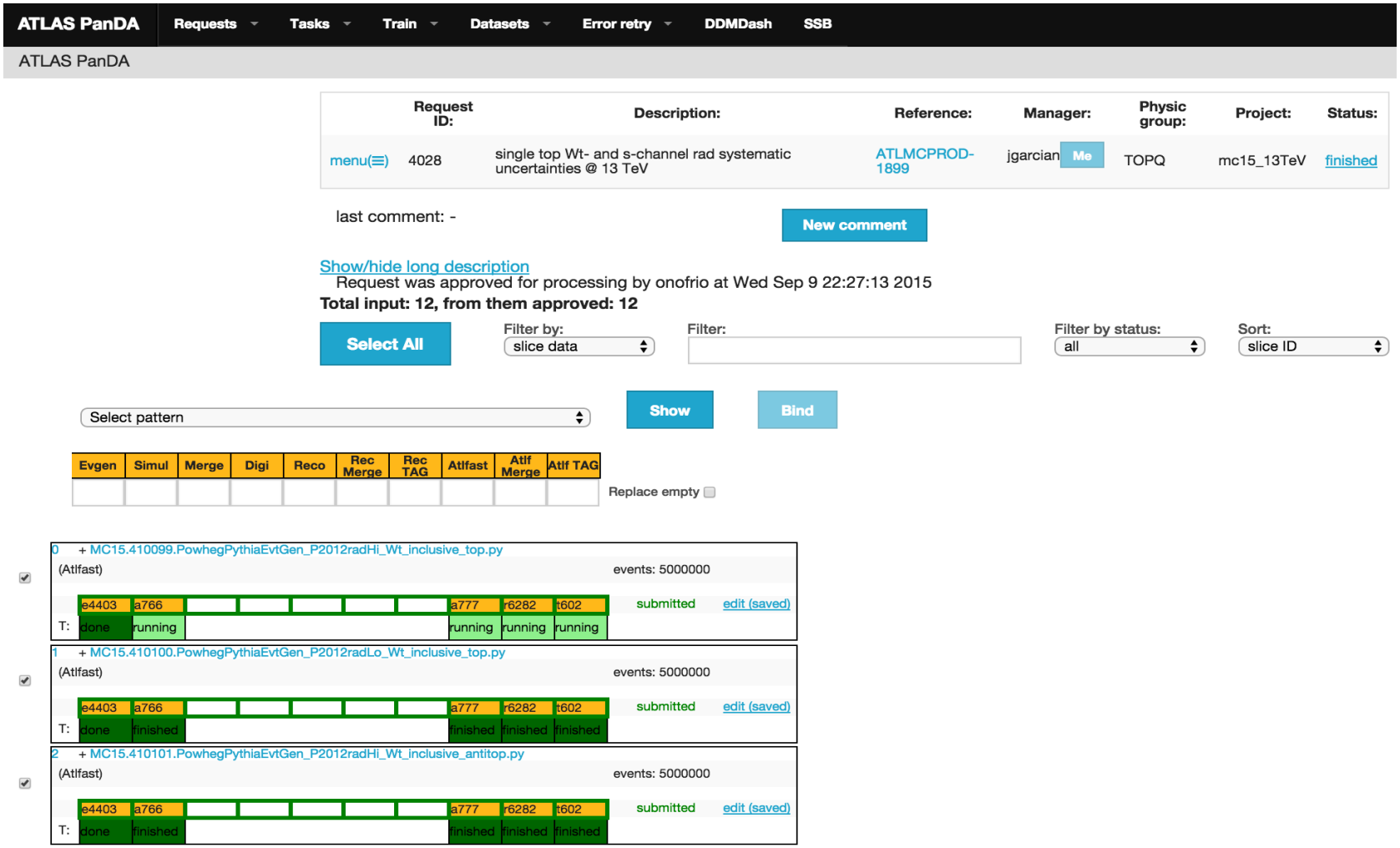
Failed and retried

Starting

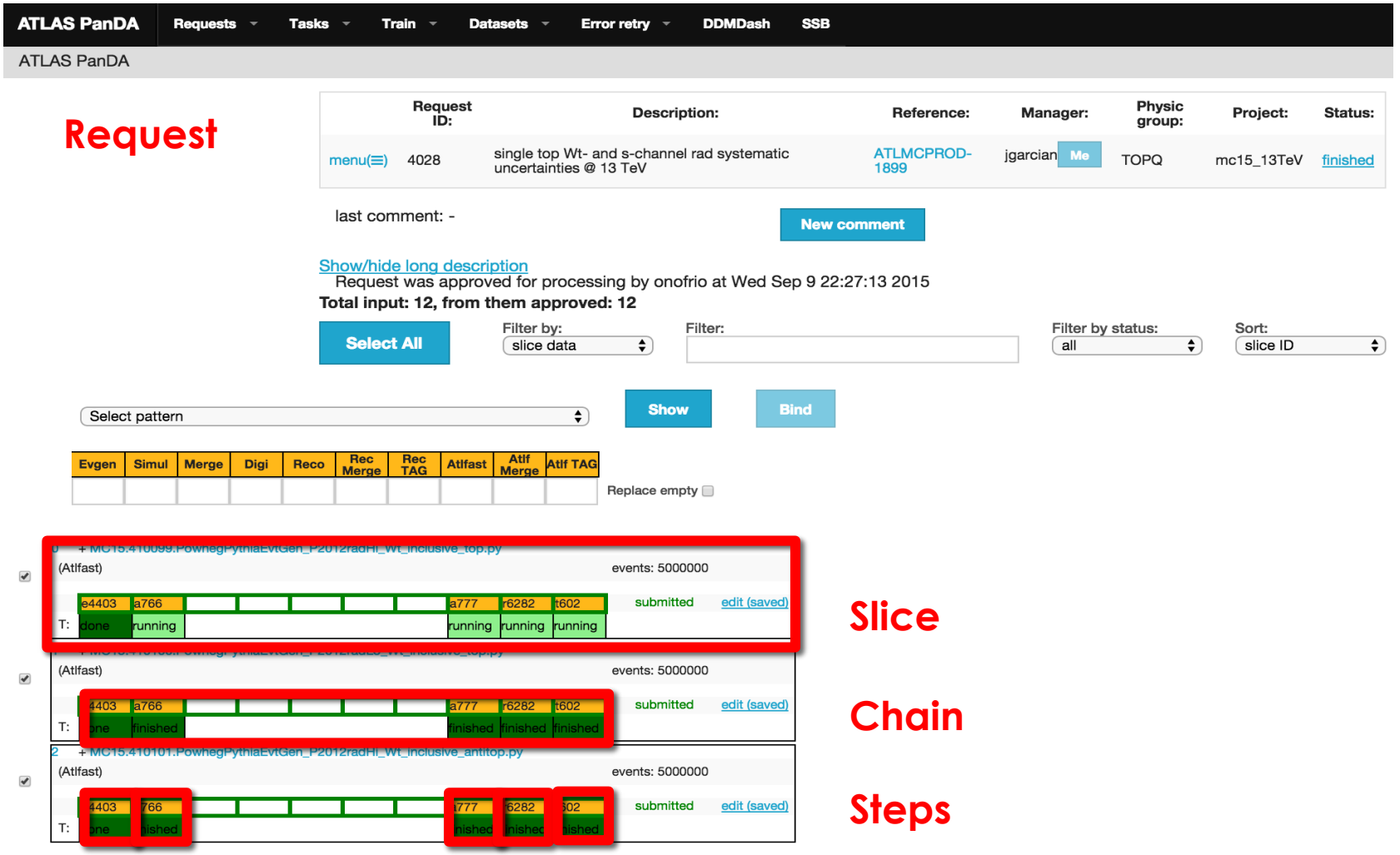
Waiting for enough events to submit rest of chain

Needs to be started

Request


ATLAS PanDA
Requests
Tasks
Train
Datasets
Error retry
DDMDash
SSB
ATLAS PanDA
Request ID:
Description:
Reference:
Manager:
Physic group:
Project:
Status:
menu(≡)
4028
single top Wt- and s-channel rad systematic uncertainties @ 13 TeV
ATLMCPROD-1899
jgarcian
Me
TOPQ
mc15_13TeV
finished
last comment: -
New comment
Show/hide long description
Request was approved for processing by onofrio at Wed Sep 9 22:27:13 2015
Total input: 12, from them approved: 12
Select All
Filter by:
slice data
Filter:
Filter by status:
all
Sort:
slice ID
Select pattern
Show
Bind
Evgen
Simul
Merge
Digi
Reco
Rec Merge
Rec TAG
Atlfast
Atlf Merge
Atlf TAG
Replace empty
0 + MC15.410099.PowhegPythiaEvtGen_P2012radHi_Wt_inclusive_top.py
(Atlfast)
events: 5000000
e4403 a766 a777 r6282 t602
submitted
edit (saved)
T: done running running running running
1 + MC15.410100.PowhegPythiaEvtGen_P2012radLo_Wt_inclusive_top.py
(Atlfast)
events: 5000000
e4403 a766 a777 r6282 t602
submitted
edit (saved)
T: done finished finished finished finished
2 + MC15.410101.PowhegPythiaEvtGen_P2012radHi_Wt_inclusive_antitop.py
(Atlfast)
events: 5000000
e4403 a766 a777 r6282 t602
submitted
edit (saved)
T: done finished finished finished finished

Request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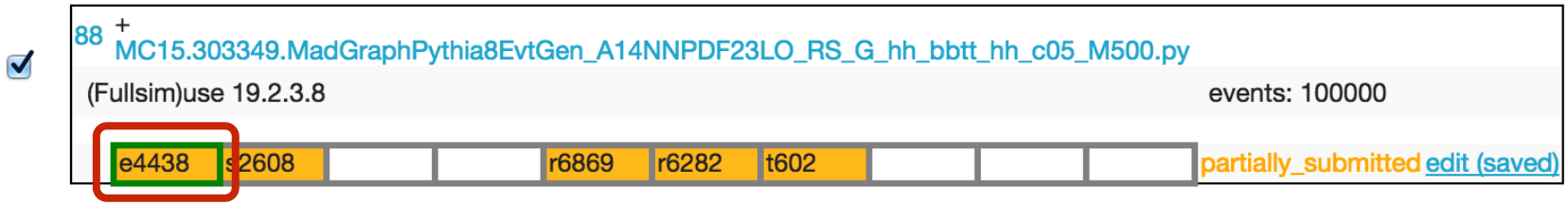
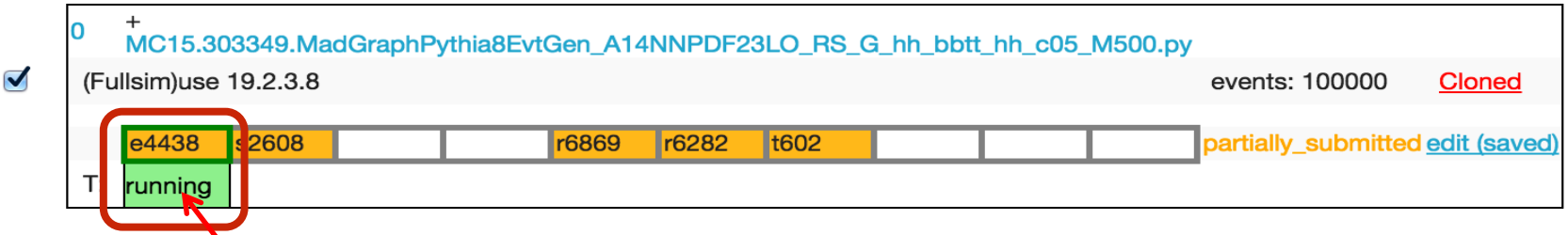
Select pattern
Show
Bind
Evgen
Simul
Merge
Digi
Reco
Rec Merge
Rec TAG
Atlfast
Atlf Merge
Atlf TAG
Replace empty
(Atlfast)
events: 5000000
submitted
edit (saved)
T:
done
running
finished
Slice
Chain
Steps

Request

Green border means step is submitted (but task not yet created)

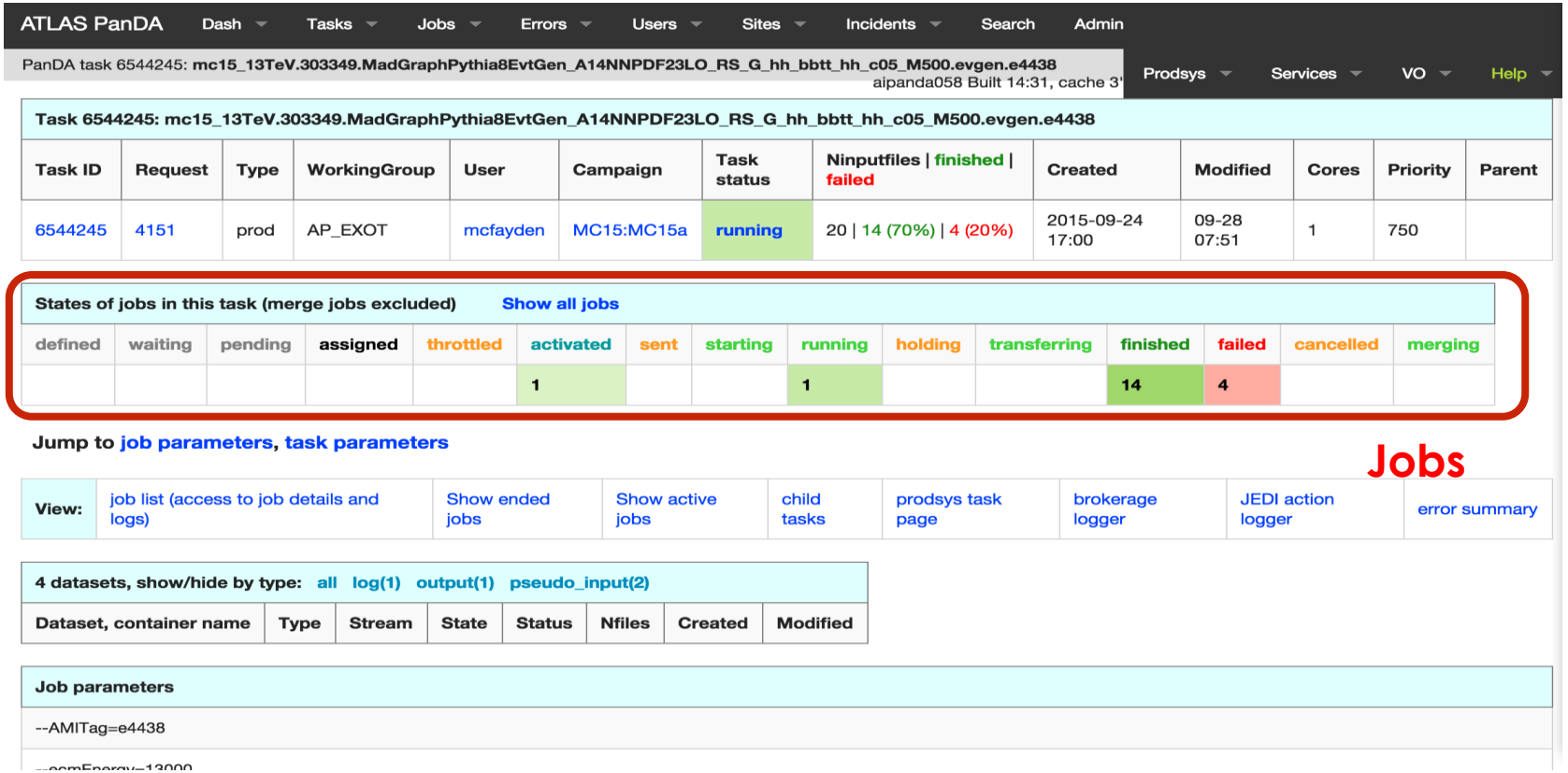


Box below step means the task has been created(also a link to task)



Click there will get you to the task

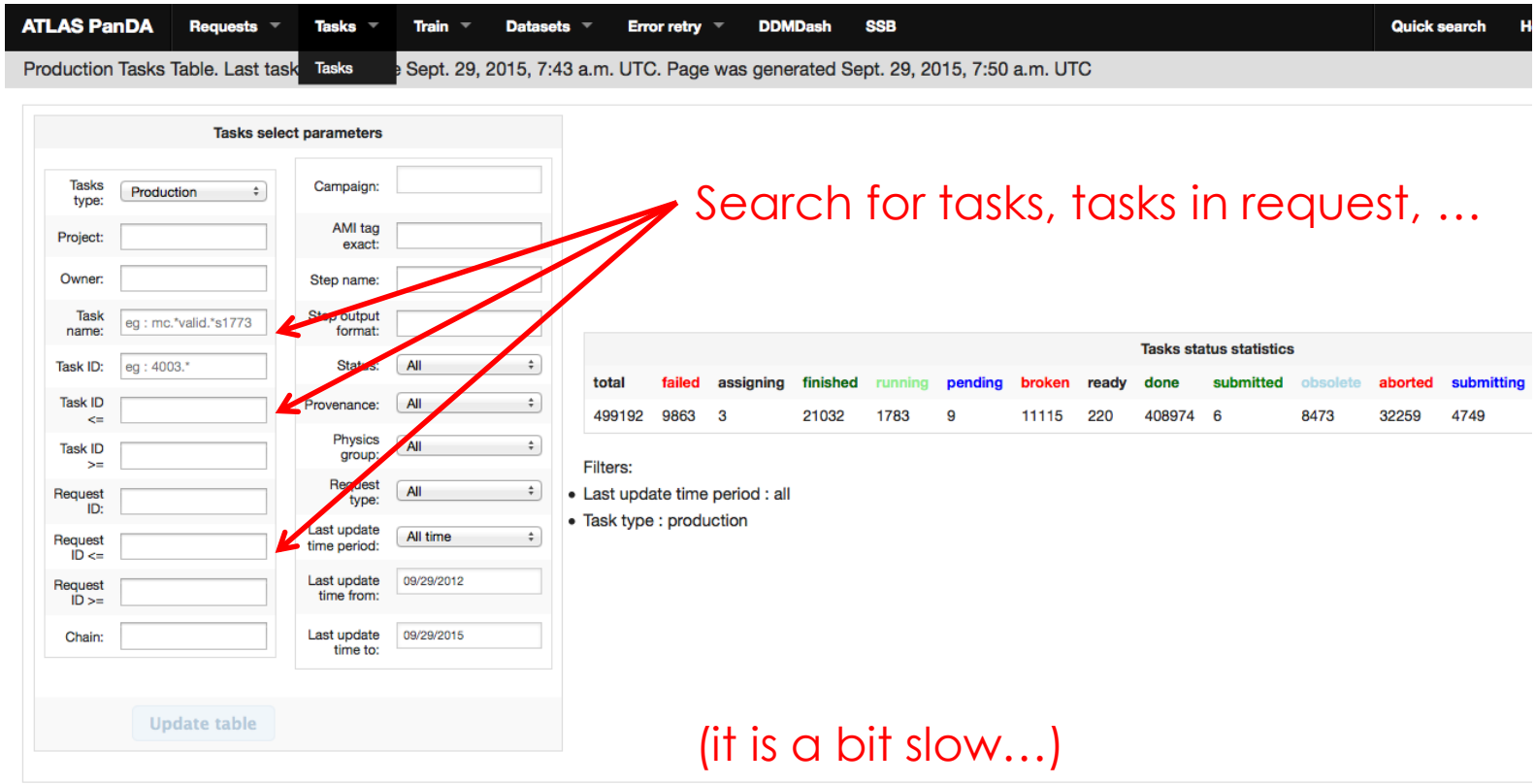
Task



Task

http://bigpanda.cern.ch/task/6544245/

Task Search



https://prodtask-dev.cern.ch/prodtask/task_table/

Task Status (III)

Waiting and Registered : Tasks is waiting for slot to run.

- If grid is busy they may stay in this state (waiting) until some slots are freed.
- Each task will compete with similar tasks queuing : priority and serial vs multi-core needs.

Submitting : Each task goes through **10 scouts**. This initial jobs test if the configuration has problems (if they fail the task is **aborted/broken**). But also they are used to compute the resources (memory, CPU) needed by the task.

Running : Once the scouts finish (or about to) tasks change to this state and then many more jobs are submitted.

Finished : Tasks is finished but not the whole statistics requested has been achieved (some jobs even retried they were not successful). Task may have finished too early (should not happen in future).

Done : Task has finished successfully the exact statistics required.

Job Submission

The Pilot

"The Panda pilot is an execution environment used to prepare the computing element, request the actual payload (a production or user analysis job), execute it, and clean up when the payload has finished. The pilot jobs are broadcasted from the Job Scheduler to the batch systems and the grid sites."

Pilot Twiki

- One of the functions is to create a tarball with log files : important for debugging problems.
  - Log files are available through bigpanda monitoring.

Modification time	Size (B)	File
Wed Sep 23 11:59:01 2015	0	ALLFILESTRANSFERRED
Wed Sep 23 11:26:27 2015	130	athena_stderr.txt
Wed Sep 23 11:58:31 2015	7790	athena_stdout.txt
Wed Sep 23 11:58:17 2015	61	AtlRndmGenSvc.out
Wed Sep 23 11:26:41 2015	294008	Bdecays0.dat
Wed Sep 23 11:26:41 2015	916	Bs2Jpsiphi.DEC
Wed Sep 23 11:26:41 2015	113	config.pickle
Wed Sep 23 11:26:41 2015	263494	DECAY.DEC
Wed Sep 23 11:58:24 2015	69	eventLoopHeartBeat.txt
Wed Sep 23 11:26:41 2015	17168	G4particle_whitelist.txt
Wed Sep 23 11:26:27 2015	1041	job_setup.sh
Wed Sep 23 11:58:31 2015	4156	jobReport.json
Wed Sep 23 11:58:31 2015	53868	jobReport.txt
Wed Sep 23 11:58:31 2015	3688	jobReportExtract.pickle
Wed Sep 23 11:58:18 2015	644350	log.generate
Wed Sep 23 11:26:45 2015	2962	makelibs
Wed Sep 23 09:35:47 2015	546079	MC15JobOpts-00-01-49_v2.tar.gz
Wed Sep 23 11:58:25 2015	1143	memory_monitor_output.txt
Wed Sep 23 11:58:36 2015	142	memory_monitor_summary.json
Wed Sep 23 11:58:51 2015	864	metadata-2614603392.xml
Wed Sep 23 11:58:31 2015	633	metadata-2614603392.xml.PAYLOAD
Wed Sep 23 11:33:20 2015	4332544	MIG_P+P+_13000_ct10_1.db
Wed Sep 23 11:33:21 2015	125	MPI_Cross_Sections.dat

Log files

- How to get to the log files :
  - Pick a task (like http://bigpanda.cern.ch/task/6534701/)
  - Click on "job list"
  - Select one of the jobs
  - Click on "logfiles":
    - this brings up a list with the contents of the logs tarball.

- Which ones are important :
  - log.generate for evgen jobs
  - log.EVNTtoHITS for simulation jobs
  - log.HITtoRDO, log.RDOtoRDOTrigger, log.RAWtoESD, log.ESDtoAOD for digi+reco

- Jobs with log files :
  - only terminated jobs will have log files available (finished or failed).

What to do when … (assuming request placed)

- **How do I find my request ?**
  - Go to the prodtask site where all requests are listed.
  - Filter for MC Requests type MC, there are many different filter options available :
    - If you already know the ID of your request use it at Request ID
    - Other ways to search are JIRA ticket number (Reference link), words in the name of the request (Description), requesting group (Physics group)

- **Has my request been submitted to the grid ?**
  - As long as steps have some (any) status below it means they have been sent to the grid.

- **Steps have a green box and no status :**
  - If it has been like this for a while then there maybe an issue. If there is a **ERROR** message in the request page, you can point to it to the MC Production manager.

What to do when … (assuming request placed)

- **Why not all the steps have a status?**
  - We would usually send samples in steps, first "*evgen*" then "*simul*" + "digi+reco". This is to make sure there are no problems with *evgen*. The steps require human intervention but it will be made more automated soon.

- **Is my request running or stuck ?**
  - If all steps are **running**/**submitting** then things are going fine.
  - If task status is in **waiting** for long then it maybe some issue with grid load making it to stall, better to contact the MC Production managers unless you know the grid is busy.
  - If all but one of the samples are in **finished**/**done**, if the sample stays like that for long it maybe worth contacting MC Production managers.

- **Some of the samples are failed/broken, what should I do?**
  - Check if they have not been resubmitted later in the same request.
  - If they have not been resubmitted :
    - **evgen** : Check if you can debug or know the reason do it an add it to the JIRA.
    - **other** : ask the MC Production managers.

What to do when … (assuming request placed)

- **We need the request in a short time but it is not finished :**
  - You can ask for an increase of priority such that things proceed faster.
- **How should I contact the MC Production managers ?**
  - Preferred way is to comment in JIRA and mention the manager taking care of the request in the JIRA way "@username".
  - Another option is to send a mail to atlas-phys-mcprod-team@cern.ch

More information in the MC Production Twiki :

https://twiki.cern.ch/twiki/bin/view/AtlasProtected/AtlasProductionGroup

ANY
QUESTIONS
?