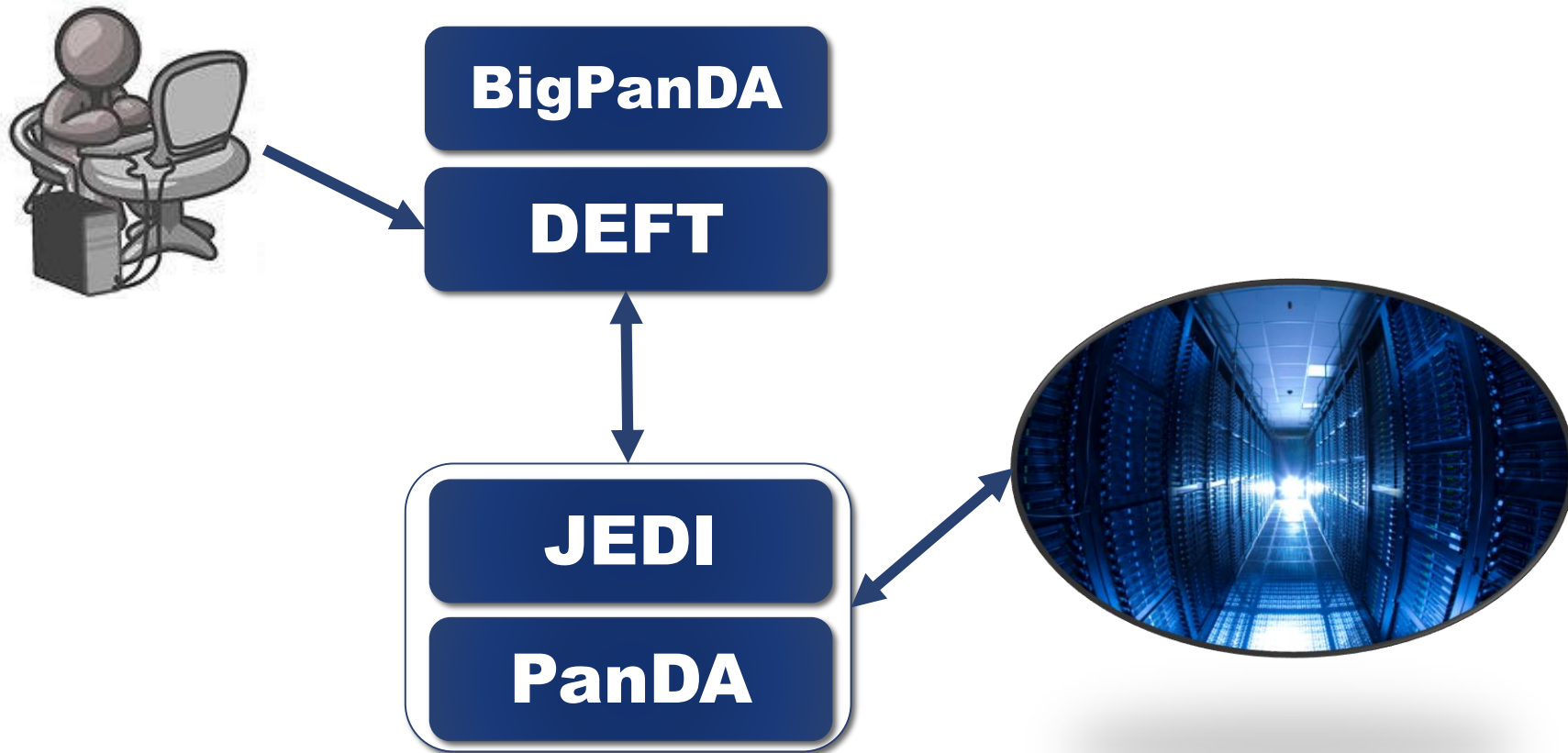


The Production System

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?



Definitions : ProdSys2

DEft – Database Engine for Tasks

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

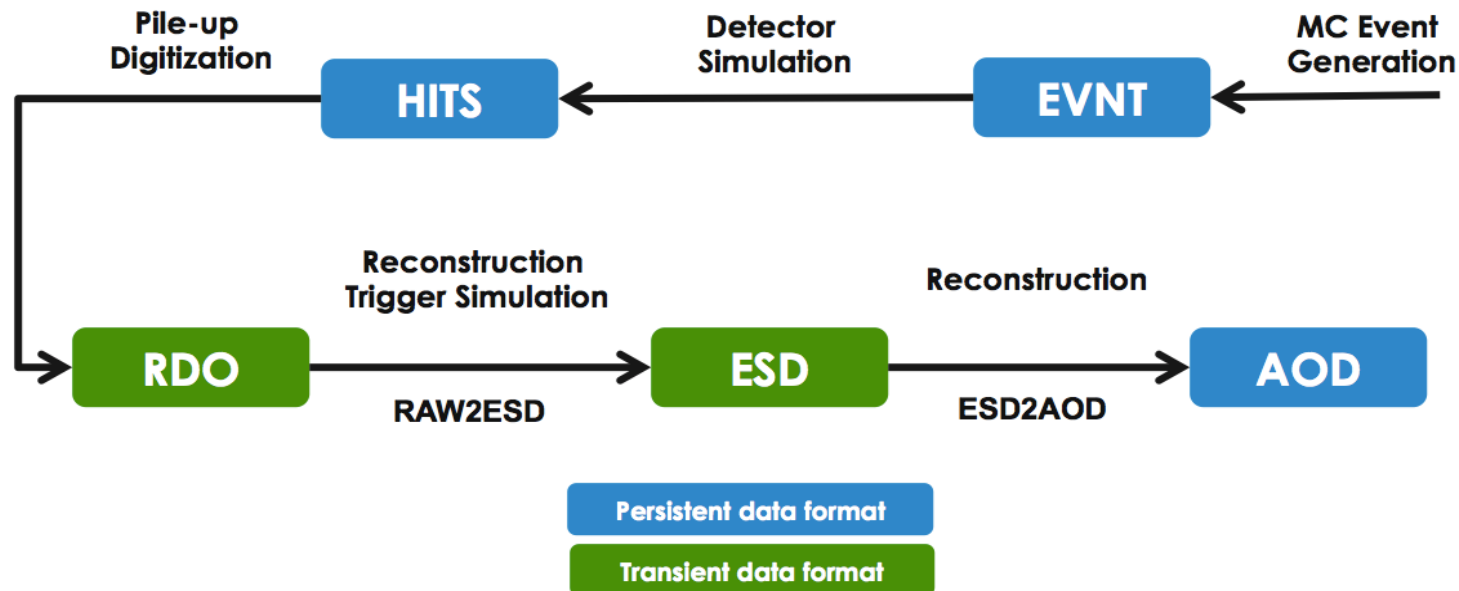
JEDI – Job Execution and Definition Interface

- 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 AML tag templates for the different production types MC15a, MC12,...
 - Final result **AOD**, configuration uses AML 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

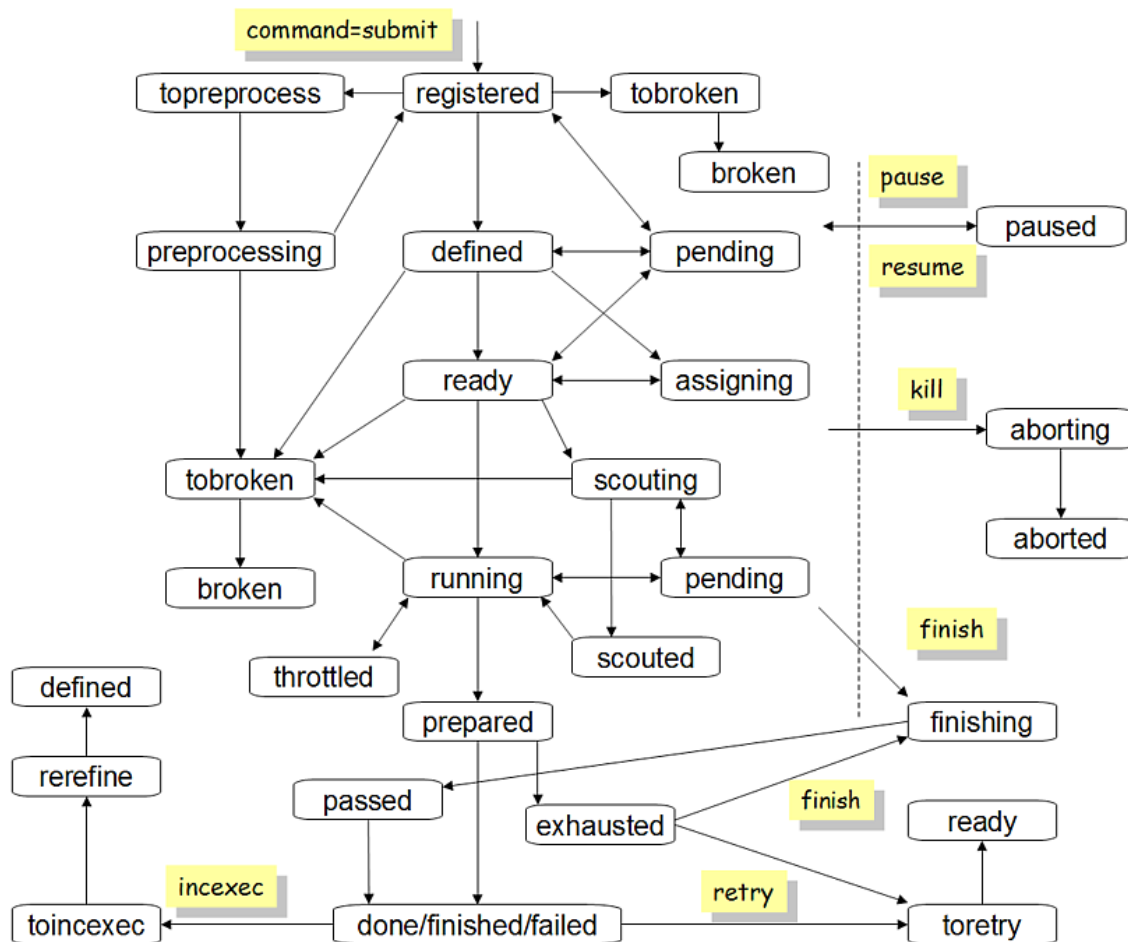
simul : Simulation is usually the longest step of the chain. Runs with lower priority and multicore (except for AtIfast which is serial).

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/>

<input type="checkbox"/>	0	+ MC15.426040.HerwigppEvtGen_UEEE5_CTEQ6L1_jetjet_JZ0W.py							(Fullsim)		events: 2000000	
		e4410	s2608			r6869	r6282	t602			submitted	edit (saved)
T:		done	finished			finished	finished	finished				

<input type="checkbox"/>	1	+ MC15.426041.HerwigppEvtGen_UEEE5_CTEQ6L1_jetjet_JZ1W.py							(Fullsim)		events: 2000000	
		e4410	s2608			r6869	r6282	t602			submitted	edit (saved)
T:		running	running			running	running	running				

<input type="checkbox"/>	10	+ MC15.426050.HerwigppEvtGen_UEEE5_CTEQ6L1_jetjet_JZ10W.py							(Fullsim)		events: 500000	Cloned
		e4410	s2608			r6869	r6282	t602			partially_submitted	edit (saved)
		aborted										

<input type="checkbox"/>	12	+ MC15.426052.HerwigppEvtGen_UEEE5_CTEQ6L1_jetjet_JZ12W.py							(Fullsim)		events: 500000	
		e4410	s2608			r6869	r6282	t602			submitted	edit (saved)
T:		running	running			submitting	register	register				

<input type="checkbox"/>	13	+ MC15.426050.HerwigppEvtGen_UEEE5_CTEQ6L1_jetjet_JZ10W.py							(Fullsim)		events: 500000	
		e4410	s2608			r6869	r6282	t602			partially_submitted	edit (saved)
T:		running										

<input type="checkbox"/>	14	+ MC15.426047.HerwigppEvtGen_UEEE5_CTEQ6L1_jetjet_JZ7W.py							(Fullsim)		events: 2000000	
		e4410	s2608			r6869	r6282	t602			not_submitted	edit (saved)

Failed and
retried

Starting

Waiting for
enough
events to
submit rest
of chain

Needs to be
started

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	<div>Me</div>	TOPQ	mc15_13TeV	finished

New comment

[Show/hide long description](#)
Request was approved for processing by onofrio at Wed Sep 9 22:27:13 2015

Select All

Filter:

Sort:
slice ID

Show

Bind

[illegible]

Replace empty ☐

0	→	MC15.410099.PowhegPythiaEvtGen_P2012radHi_Wt_inclusive_top.py	events: 5000000
	(Attfast)		
		<div> <div>e4403</div> <div>a766</div> <div></div> <div></div> <div></div> <div></div> <div></div> <div>a777</div> <div>r6282</div> <div>t602</div> </div>	submitted edit (saved)
T:		<div> <div>done</div> <div>running</div> <div></div> <div></div> <div></div> <div></div> <div></div> <div>running</div> <div>running</div> <div>running</div> </div>	
1	→	MC15.410100.PowhegPythiaEvtGen_P2012radLo_Wt_inclusive_top.py	events: 5000000
	(Attfast)		
		<div> <div>e4403</div> <div>a766</div> <div></div> <div></div> <div></div> <div></div> <div></div> <div>a777</div> <div>r6282</div> <div>t602</div> </div>	submitted edit (saved)
T:		<div> <div>done</div> <div>finished</div> <div></div> <div></div> <div></div> <div></div> <div></div> <div>finished</div> <div>finished</div> <div>finished</div> </div>	
2	→	MC15.410101.PowhegPythiaEvtGen_P2012radHi_Wt_inclusive_antitop.py	events: 5000000
	(Attfast)		
		<div> <div>e4403</div> <div>a766</div> <div></div> <div></div> <div></div> <div></div> <div></div> <div>a777</div> <div>r6282</div> <div>t602</div> </div>	submitted edit (saved)
T:		<div> <div>done</div> <div>finished</div> <div></div> <div></div> <div></div> <div></div> <div></div> <div>finished</div> <div>finished</div> <div>finished</div> </div>	

Request

ATLAS PanDA

RequestsTasksTrainDatasetsError retryDDMDashSSB

ATLAS PanDA

Request

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	Attfast	Attf Merge	Attf TAG

Replace empty ☐

✓	+ MC15.410099.PowhegPythiaEvtGen_P2012radHI_Wt_inclusive_top.py										events: 5000000
	(Attfast)										
	e4403	a766					a777	r6282	t602		submitted edit (saved)
T:	done	running					running	running	running		
✓	+ MC15.410100.PowhegPythiaEvtGen_P2012radHI_Wt_inclusive_top.py										events: 5000000
	(Attfast)										
	4403	a766					a777	r6282	t602		submitted edit (saved)
T:	one	finished					finished	finished	finished		
✓	2 + MC15.410101.PowhegPythiaEvtGen_P2012radHI_Wt_inclusive_antitop.py										events: 5000000
	(Attfast)										
	4403	766					777	6282	602		submitted edit (saved)
T:	one	finished					finished	finished	finished		

Slice

Chain

Steps

Request

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

88 +
MC15.303349.MadGraphPythia8EvtGen_A14NNPDF23LO_RS_G_hh_bbt_hh_c05_M500.py
(Fullsim)use 19.2.3.8 events: 100000

e4438	s2608			r6869	r6282	t602				partially_submitted edit (saved)
-------	-------	--	--	-------	-------	------	--	--	--	--

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

0 +
MC15.303349.MadGraphPythia8EvtGen_A14NNPDF23LO_RS_G_hh_bbt_hh_c05_M500.py
(Fullsim)use 19.2.3.8 events: 100000 [Cloned](#)

e4438	s2608			r6869	r6282	t602				partially_submitted edit (saved)
T	running									

Click there will get you to the task

Task

ATLAS PanDA

Dash

Tasks

Jobs

Errors

Users

Sites

Incidents

Search

Admin

PanDA task 6544245: mc15_13TeV.303349.MadGraphPythia8EvtGen_A14NNPDF23LO_RS_G_hh_bbtt_hh_c05_M500.evgen.e4438
alpanda058 Built 14:31, cache 3'

Prodsys

Services

VO

Help

Task 6544245: mc15_13TeV.303349.MadGraphPythia8EvtGen_A14NNPDF23LO_RS_G_hh_bbtt_hh_c05_M500.evgen.e4438

Task ID	Request	Type	WorkingGroup	User	Campaign	Task status	Ninputfiles finished failed	Created	Modified	Cores	Priority	Parent
6544245	4151	prod	AP_EXOT	mcfayden	MC15:MC15a	running	20 14 (70%) 4 (20%)	2015-09-24 17:00	09-28 07:51	1	750	

States of jobs in this task (merge jobs excluded)

Show all jobs

defined	waiting	pending	assigned	throttled	activated	sent	starting	running	holding	transferring	finished	failed	cancelled	merging
					1			1			14	4		

Jump to [job parameters](#), [task parameters](#)

Jobs

View:

job list (access to job details and logs)

Show ended jobs

Show active jobs

child tasks

prodsys task page

brokerage logger

JEDI action logger

error summary

4 datasets, show/hide by type: all log(1) output(1) pseudo_input(2)

Dataset, container name	Type	Stream	State	Status	Nfiles	Created	Modified
-------------------------	------	--------	-------	--------	--------	---------	----------

Job parameters

--AMITag=e4438

--omEnergy=13000

Task

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

JOSE ENRIQUE GARCIA NAVARRO

11

Task Search

ATLAS PanDA Requests Tasks Train Datasets Error retry DDMDash SSB Quick search H

Production Tasks Table. Last task: Sept. 29, 2015, 7:43 a.m. UTC. Page was generated Sept. 29, 2015, 7:50 a.m. UTC

Tasks select parameters

Tasks type:

Project:

Owner:

Task name:

Task ID:

Task ID <=

Task ID >=

Request ID:

Request ID <=

Request ID >=

Chain:

Update table

Campaign:

AMI tag exact:

Step name:

Step output format:

Status:

Provenance:

Physics group:

Request type:

Last update time period:

Last update time from:

Last update time to:

Search for tasks, tasks in request, ...

Tasks status statistics

total	failed	assigning	finished	running	pending	broken	ready	done	submitted	obsolete	aborted	submitting
499192	9863	3	21032	1783	9	11115	220	408974	6	8473	32259	4749

Filters:

- Last update time period : all
- Task type : production

(it is a bit slow...)

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_sldem.txt
Wed Sep 23 11:58:31 2015	7790	athena_sldem.txt
Wed Sep 23 11:58:17 2015	61	ATHENA_GenSvc.out
Wed Sep 23 11:26:41 2015	294008	Bdcaytd.dat
Wed Sep 23 11:26:41 2015	916	Bcd.joeph.DEC
Wed Sep 23 11:26:41 2015	113	config.pickle
Wed Sep 23 11:26:41 2015	263484	DECAY.DEC
Wed Sep 23 11:58:24 2015	69	eventLogpHeartBeat.txt
Wed Sep 23 11:26:41 2015	17168	Giparticle_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	53668	jobReport.txt
Wed Sep 23 11:58:31 2015	3688	jobReportExtract.pickle
Wed Sep 23 11:58:19 2015	644360	log.generator
Wed Sep 23 11:26:46 2015	2962	makeurls
Wed Sep 23 09:35:47 2015	548079	MC13L08Cpns-00-01-48_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 11:58:31 2015	864	metadeta-2814803392.xml
Wed Sep 23 11:58:31 2015	633	metadeta-2814803392.xml.PAYLOAD
Wed Sep 23 11:33:20 2015	4332644	M03_Php_v13000_c010_1.db
Wed Sep 23 11:33:21 2015	125	MPL_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
?