Enabling Grids for E-sciencE

Monitoring the ATLAS distributed production

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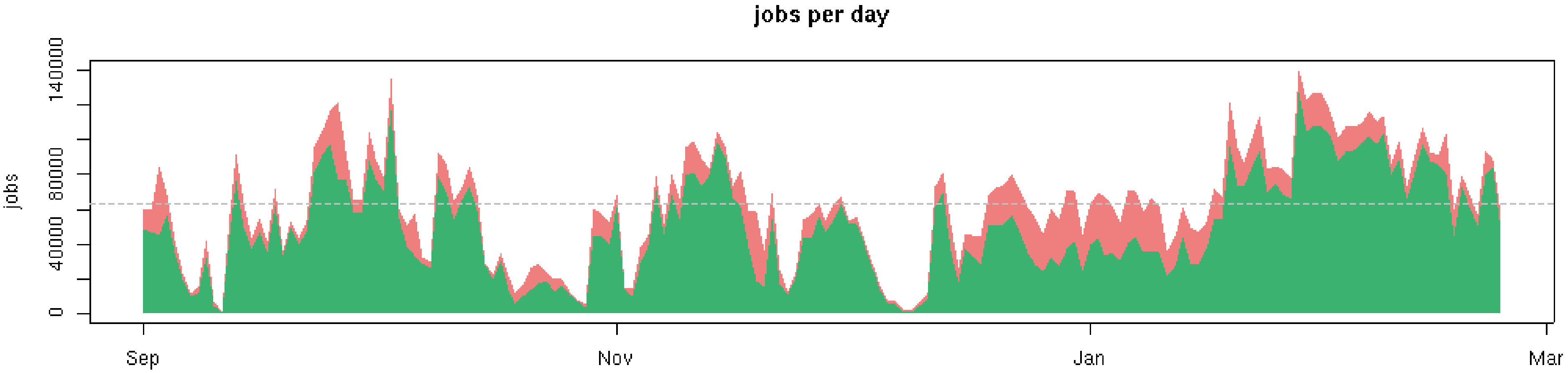
EGEE User Forum 2009

www.eu-egee.org

ATLAS production

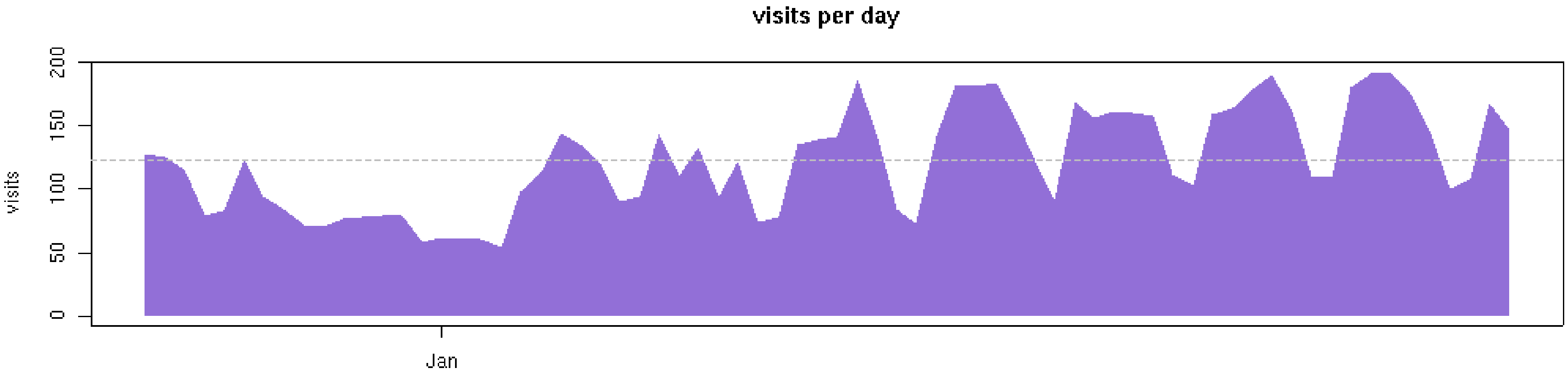
- **ATLAS production**
  - runs on EGEE, OSG (panda) and Nordugrid (Dulcinea),
  - user defined tasks:
    - automatically split and executed:
      - *one ATLAS task ~ 1000 subjobs*
      - *average: 60K jobs per day,*
      - *~ 800 active tasks per day, ~ 125 sites.*



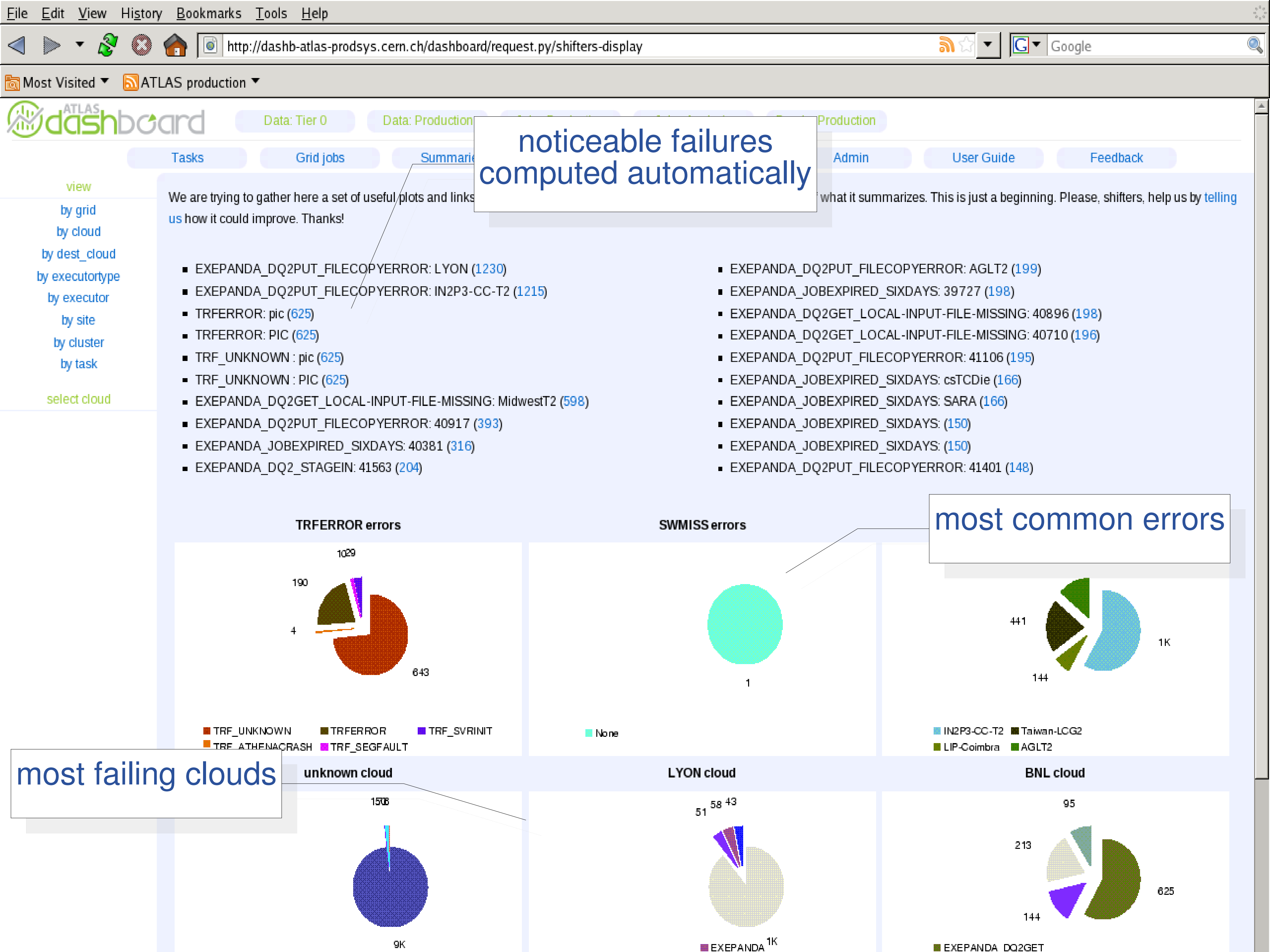
ATLAS shifters

- **ATLAS shifters**
  - spot failures, investigate and report:
    - task error → ATLAS software team
    - site error → GGUS
    - task or site (some errors don't say much)?
  - need:
    - an immediate view of the main problems,
    - a practical interface to get to the details.

- **a python framework for implementing monitoring applications:**
  - team based in IT/CERN
  - http://dashboard.cern.ch
- **usage in ATLAS:**
  - distributed data management monitoring,
  - production monitoring, analysis monitoring,
  - standard tool used by shifters, many tutorials given, etc.



  - http://dashb-atlas-prodsys.cern.ch/dashboard/request.py/overview



noticeable failures computed automatically

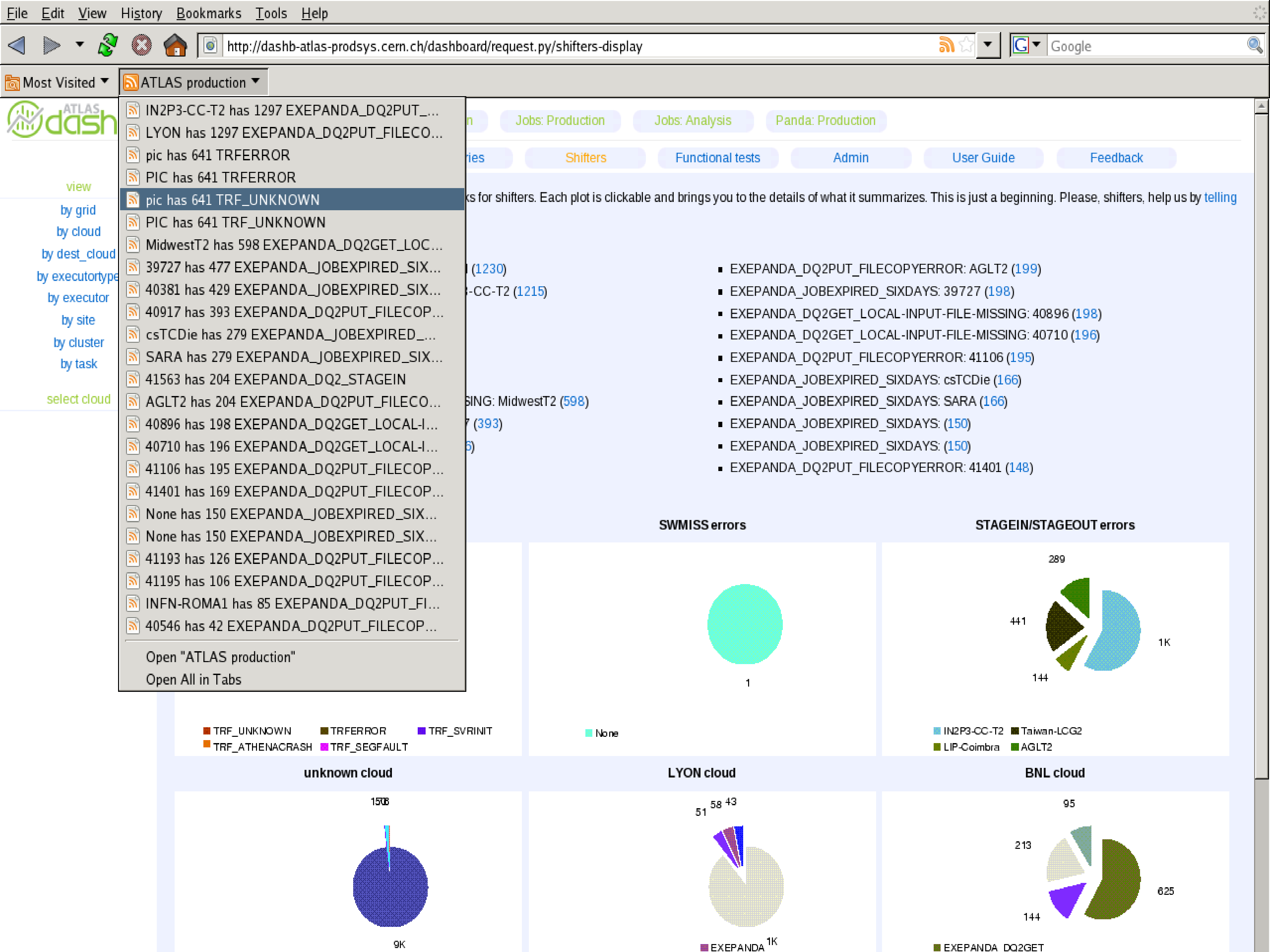
We are trying to gather here a set of useful plots and links

what it summarizes. This is just a beginning. Please, shifters, help us by telling us how it could improve. Thanks!

- EXEPANDA_DQ2PUT_FILECOPYERROR: LYON (1230)
- EXEPANDA_DQ2PUT_FILECOPYERROR: IN2P3-CC-T2 (1215)
- TRFERROR: pic (625)
- TRFERROR: PIC (625)
- TRF_UNKNOWN : pic (625)
- TRF_UNKNOWN : PIC (625)
- EXEPANDA_DQ2GET_LOCAL-INPUT-FILE-MISSING: MidwestT2 (598)
- EXEPANDA_DQ2PUT_FILECOPYERROR: 40917 (393)
- EXEPANDA_JOBEXPIRED_SIXDAYS: 40381 (316)
- EXEPANDA_DQ2_STAGEIN: 41563 (204)
- EXEPANDA_DQ2PUT_FILECOPYERROR: AGLT2 (199)
- EXEPANDA_JOBEXPIRED_SIXDAYS: 39727 (198)
- EXEPANDA_DQ2GET_LOCAL-INPUT-FILE-MISSING: 40896 (198)
- EXEPANDA_DQ2GET_LOCAL-INPUT-FILE-MISSING: 40710 (196)
- EXEPANDA_DQ2PUT_FILECOPYERROR: 41106 (195)
- EXEPANDA_JOBEXPIRED_SIXDAYS: csTCDie (166)
- EXEPANDA_JOBEXPIRED_SIXDAYS: SARA (166)
- EXEPANDA_JOBEXPIRED_SIXDAYS: (150)
- EXEPANDA_JOBEXPIRED_SIXDAYS: (150)
- EXEPANDA_DQ2PUT_FILECOPYERROR: 41401 (148)

most common errors

most failing clouds



- IN2P3-CC-T2 has 1297 EXEPANDA_DQ2PUT_...
- LYON has 1297 EXEPANDA_DQ2PUT_FILECO...
- pic has 641 TRFERROR
- PIC has 641 TRFERROR
- pic has 641 TRF_UNKNOWN
- PIC has 641 TRF_UNKNOWN
- MidwestT2 has 598 EXEPANDA_DQ2GET_LOC...
- 39727 has 477 EXEPANDA_JOBEXPIRED_SIX...
- 40381 has 429 EXEPANDA_JOBEXPIRED_SIX...
- 40917 has 393 EXEPANDA_DQ2PUT_FILECOP...
- csTCDie has 279 EXEPANDA_JOBEXPIRED_...
- SARA has 279 EXEPANDA_JOBEXPIRED_SIX...
- 41563 has 204 EXEPANDA_DQ2_STAGEIN
- AGLT2 has 204 EXEPANDA_DQ2PUT_FILECO...
- 40896 has 198 EXEPANDA_DQ2GET_LOCAL-I...
- 40710 has 196 EXEPANDA_DQ2GET_LOCAL-I...
- 41106 has 195 EXEPANDA_DQ2PUT_FILECOP...
- 41401 has 169 EXEPANDA_DQ2PUT_FILECOP...
- None has 150 EXEPANDA_JOBEXPIRED_SIX...
- None has 150 EXEPANDA_JOBEXPIRED_SIX...
- 41193 has 126 EXEPANDA_DQ2PUT_FILECOP...
- 41195 has 106 EXEPANDA_DQ2PUT_FILECOP...
- INFN-ROMA1 has 85 EXEPANDA_DQ2PUT_FI...
- 40546 has 42 EXEPANDA_DQ2PUT_FILECOP...

Open "ATLAS production"
Open All in Tabs

ks for shifters. Each plot is clickable and brings you to the details of what it summarizes. This is just a beginning. Please, shifters, help us by telling

(1230)
-CC-T2 (1215)
SING: MidwestT2 (598)
7 (393)
6)

- EXEPANDA_DQ2PUT_FILECOPYERROR: AGLT2 (199)
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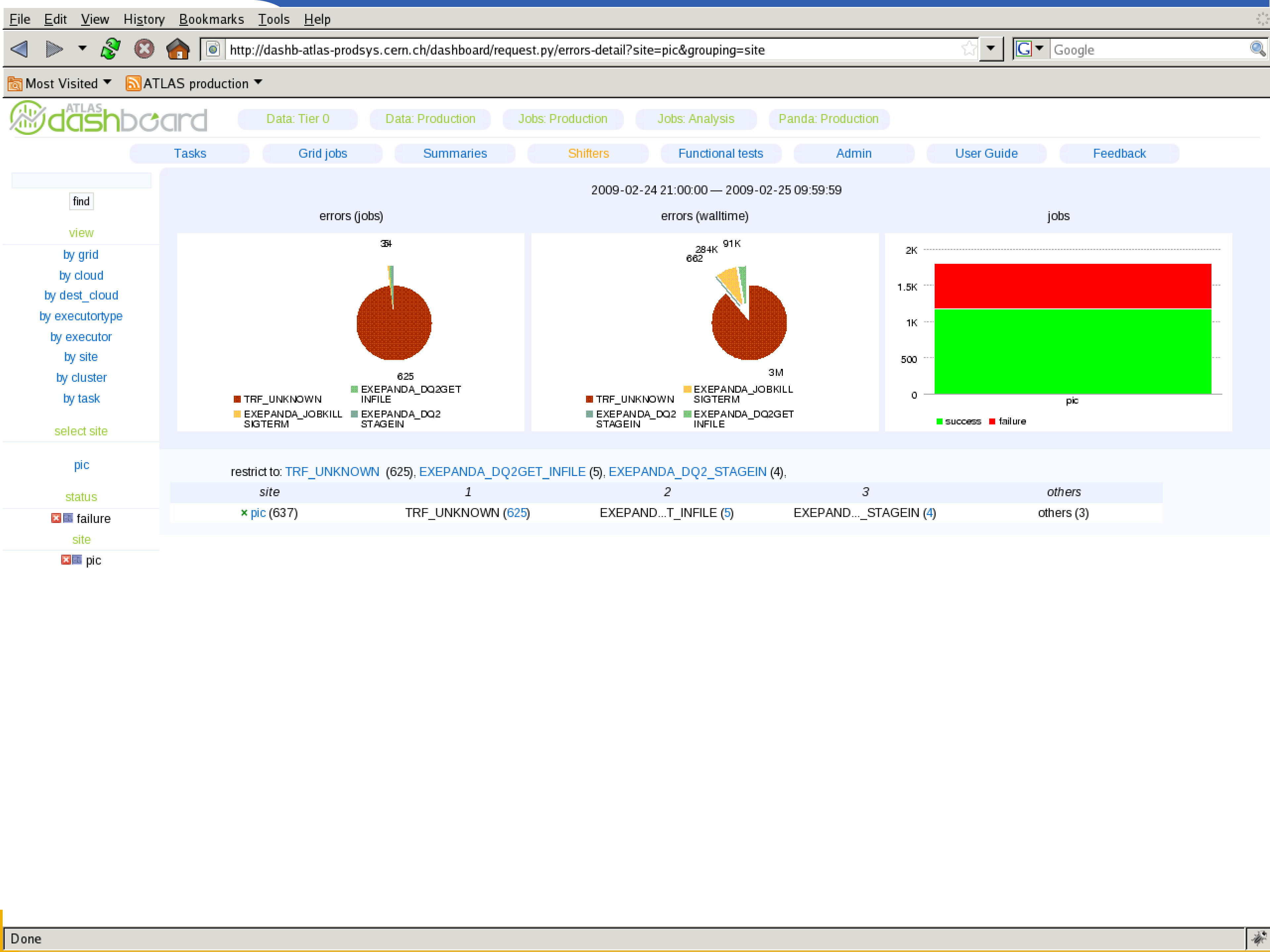
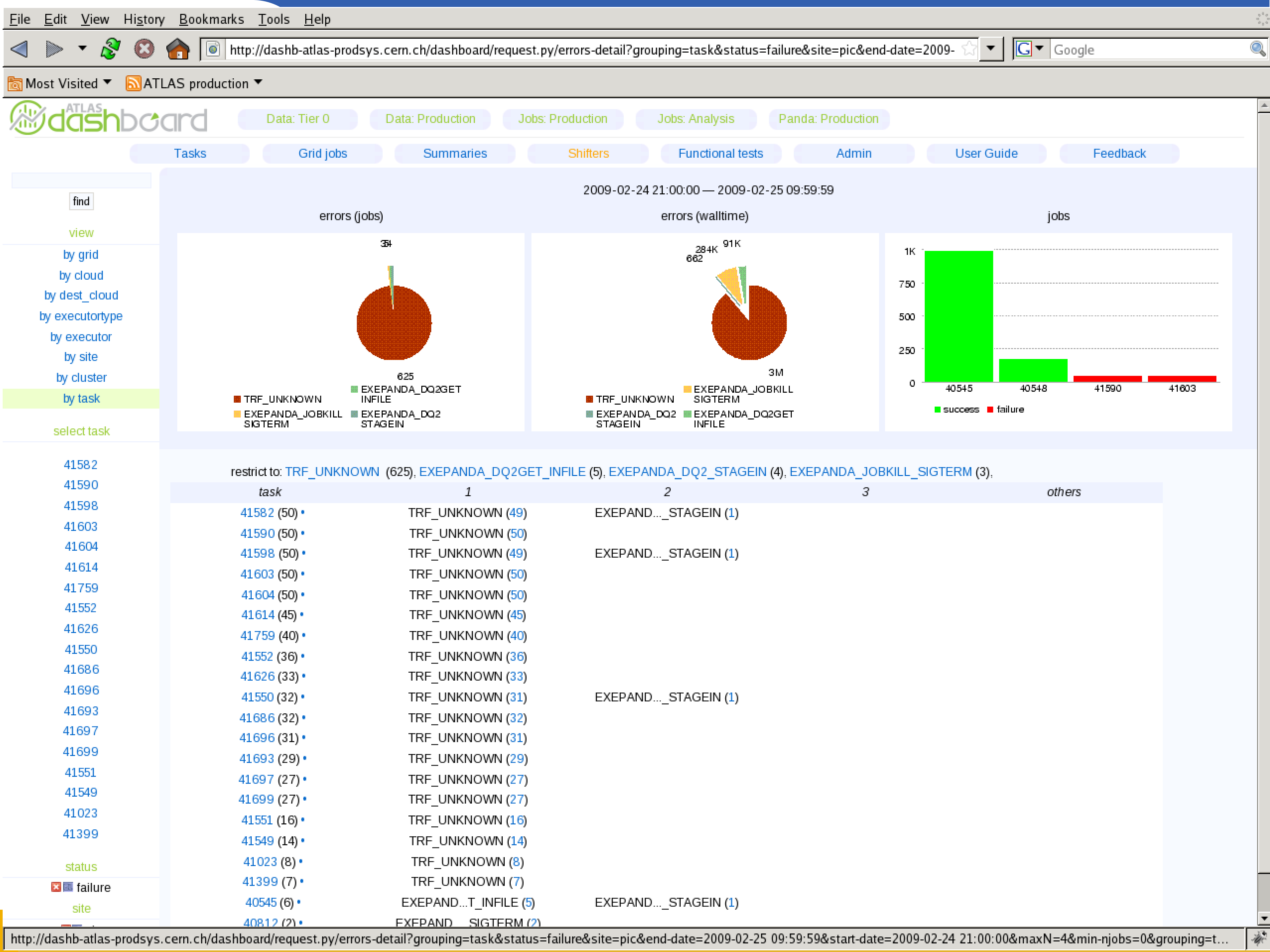


2009-02-24 21:00:00 — 2009-02-25 09:59:59

restrict to: TRF_UNKNOWN (625), EXEPANDA_DQ2GET_INFILE (5), EXEPANDA_DQ2_STAGEIN (4),

site	*1*	*2*	*3*	*others*
× pic (637)	TRF_UNKNOWN (625)	EXEPAND...T_INFILE (5)	EXEPAND..._STAGEIN (4)	others (3)



view

- by grid
- by cloud
- by dest_cloud
- by executortype
- by executor
- by site
- by cluster
- by task

select task

41582
41590
41598
41603
41604
41614
41759
41552
41626
41550
41686
41696
41693
41697
41699
41551
41549
41023
41399

status

☒ failure

site

2009-02-24 21:00:00 — 2009-02-25 09:59:59

errors (jobs)

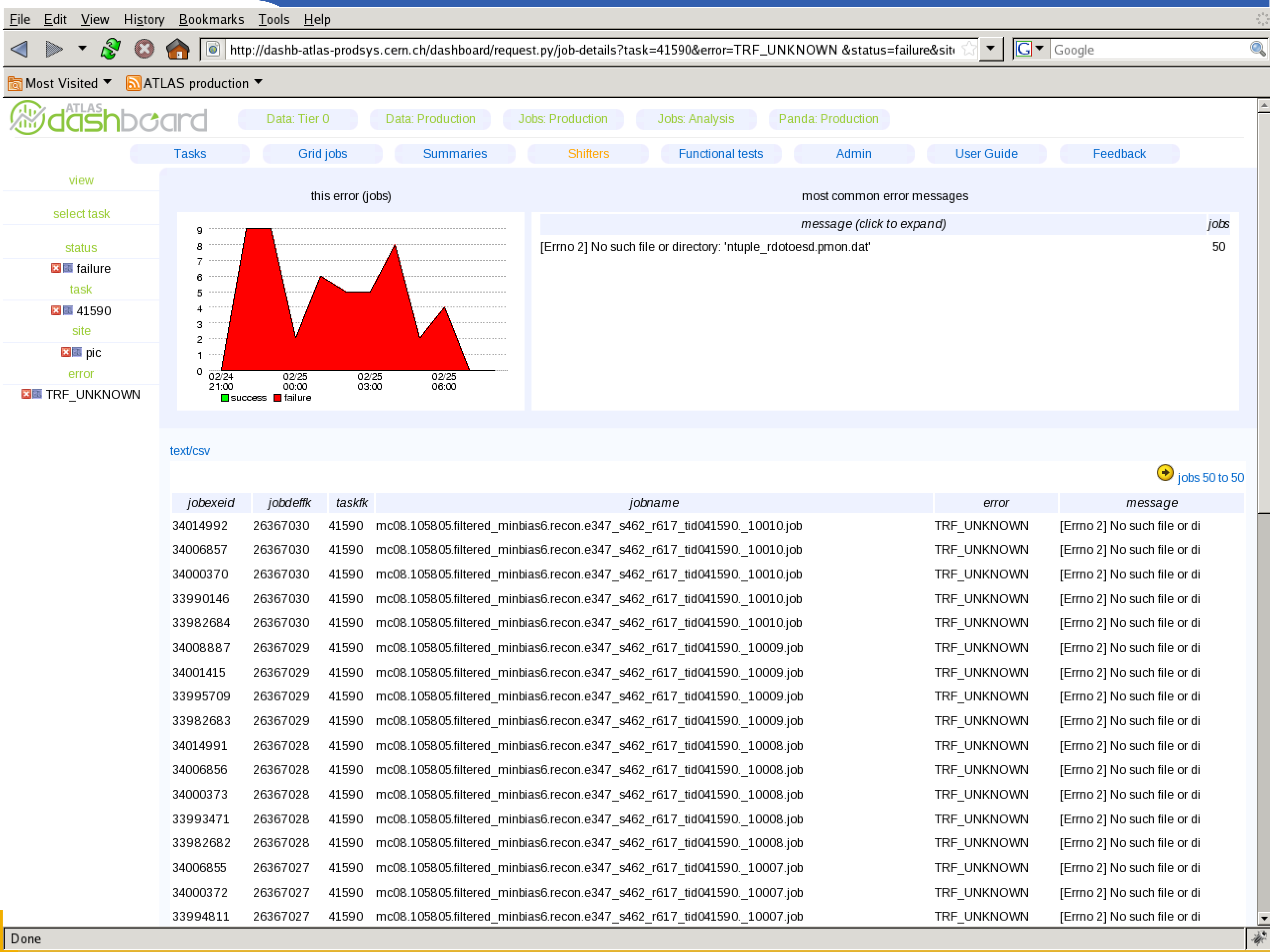
errors (walltime)

jobs

restrict to: TRF_UNKNOWN (625), EXEPANDA_DQ2GET_INFILE (5), EXEPANDA_DQ2_STAGEIN (4), EXEPANDA_JOBKILL_SIGTERM (3),

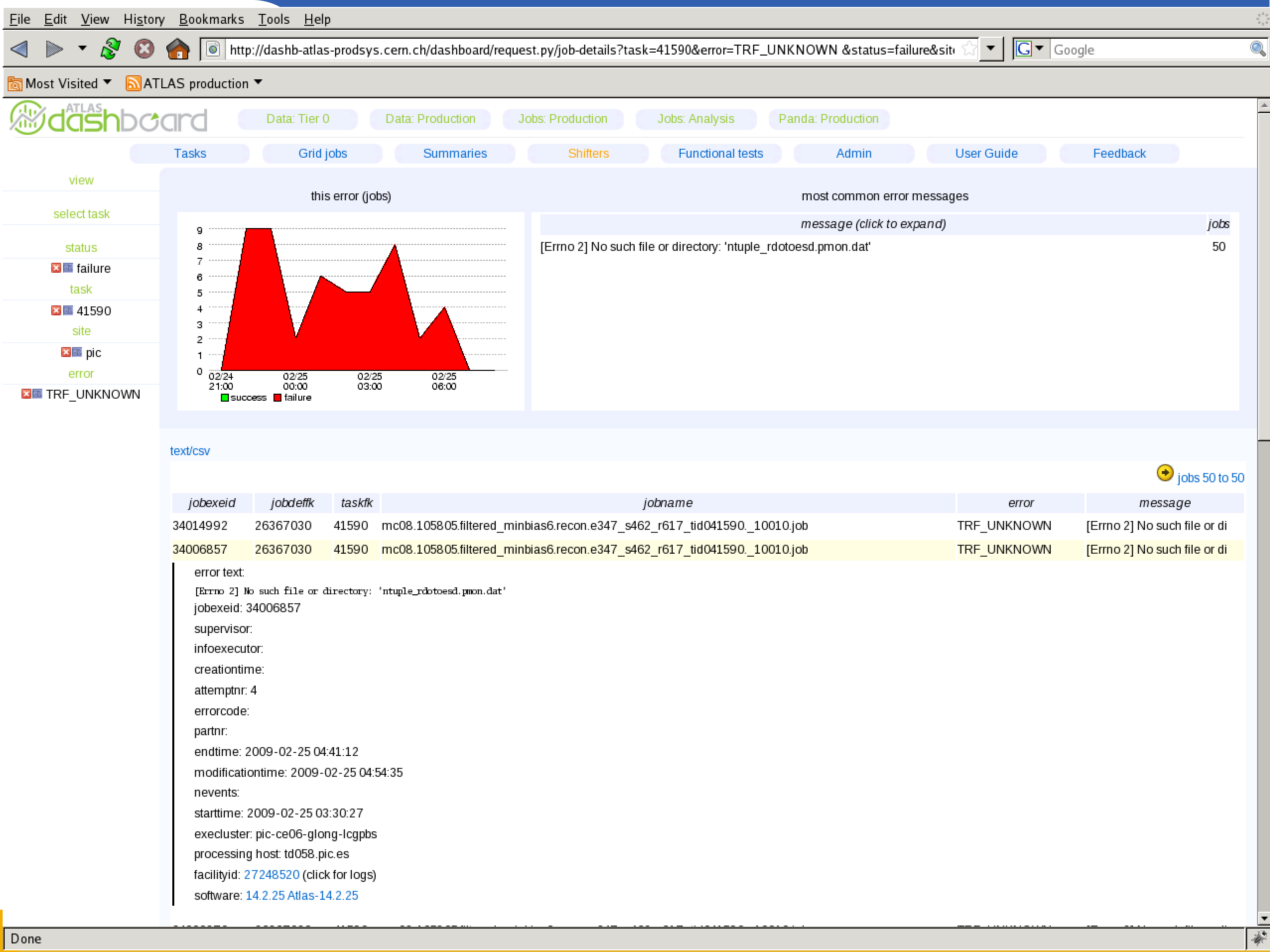
task	1	2	3	others
41582 (50) •	TRF_UNKNOWN (49)	EXEPAND..._STAGEIN (1)		
41590 (50) •	TRF_UNKNOWN (50)			
41598 (50) •	TRF_UNKNOWN (49)	EXEPAND..._STAGEIN (1)		
41603 (50) •	TRF_UNKNOWN (50)			
41604 (50) •	TRF_UNKNOWN (50)			
41614 (45) •	TRF_UNKNOWN (45)			
41759 (40) •	TRF_UNKNOWN (40)			
41552 (36) •	TRF_UNKNOWN (36)			
41626 (33) •	TRF_UNKNOWN (33)			
41550 (32) •	TRF_UNKNOWN (31)	EXEPAND..._STAGEIN (1)		
41686 (32) •	TRF_UNKNOWN (32)			
41696 (31) •	TRF_UNKNOWN (31)			
41693 (29) •	TRF_UNKNOWN (29)			
41697 (27) •	TRF_UNKNOWN (27)			
41699 (27) •	TRF_UNKNOWN (27)			
41551 (16) •	TRF_UNKNOWN (16)			
41549 (14) •	TRF_UNKNOWN (14)			
41023 (8) •	TRF_UNKNOWN (8)			
41399 (7) •	TRF_UNKNOWN (7)			
40545 (6) •	EXEPAND...T_INFILE (5)	EXEPAND..._STAGEIN (1)		
40812 (2) •	EXEPAND..._SIGTERM (2)			

http://dashb-atlas-prodsys.cern.ch/dashboard/request.py/errors-detail?grouping=task&status=failure&site=pic&end-date=2009-02-25 09:59:59&start-date=2009-02-24 21:00:00&maxN=4&min-njobs=0&grouping=t...



message (click to expand)	jobs
[Errno 2] No such file or directory: 'ntuple_rdotoesd.pmon.dat'	50

jobexeid	jobdeffk	taskfk	jobname	error	message
34014992	26367030	41590	mc08.105805.filtered_minbias6.recon.e347_s462_r617_tid041590._10010.job	TRF_UNKNOWN	[Errno 2] No such file or di
34006857	26367030	41590	mc08.105805.filtered_minbias6.recon.e347_s462_r617_tid041590._10010.job	TRF_UNKNOWN	[Errno 2] No such file or di
34000370	26367030	41590	mc08.105805.filtered_minbias6.recon.e347_s462_r617_tid041590._10010.job	TRF_UNKNOWN	[Errno 2] No such file or di
33990146	26367030	41590	mc08.105805.filtered_minbias6.recon.e347_s462_r617_tid041590._10010.job	TRF_UNKNOWN	[Errno 2] No such file or di
33982684	26367030	41590	mc08.105805.filtered_minbias6.recon.e347_s462_r617_tid041590._10010.job	TRF_UNKNOWN	[Errno 2] No such file or di
34008887	26367029	41590	mc08.105805.filtered_minbias6.recon.e347_s462_r617_tid041590._10009.job	TRF_UNKNOWN	[Errno 2] No such file or di
34001415	26367029	41590	mc08.105805.filtered_minbias6.recon.e347_s462_r617_tid041590._10009.job	TRF_UNKNOWN	[Errno 2] No such file or di
33995709	26367029	41590	mc08.105805.filtered_minbias6.recon.e347_s462_r617_tid041590._10009.job	TRF_UNKNOWN	[Errno 2] No such file or di
33982683	26367029	41590	mc08.105805.filtered_minbias6.recon.e347_s462_r617_tid041590._10009.job	TRF_UNKNOWN	[Errno 2] No such file or di
34014991	26367028	41590	mc08.105805.filtered_minbias6.recon.e347_s462_r617_tid041590._10008.job	TRF_UNKNOWN	[Errno 2] No such file or di
34006856	26367028	41590	mc08.105805.filtered_minbias6.recon.e347_s462_r617_tid041590._10008.job	TRF_UNKNOWN	[Errno 2] No such file or di
34000373	26367028	41590	mc08.105805.filtered_minbias6.recon.e347_s462_r617_tid041590._10008.job	TRF_UNKNOWN	[Errno 2] No such file or di
33993471	26367028	41590	mc08.105805.filtered_minbias6.recon.e347_s462_r617_tid041590._10008.job	TRF_UNKNOWN	[Errno 2] No such file or di
33982682	26367028	41590	mc08.105805.filtered_minbias6.recon.e347_s462_r617_tid041590._10008.job	TRF_UNKNOWN	[Errno 2] No such file or di
34006855	26367027	41590	mc08.105805.filtered_minbias6.recon.e347_s462_r617_tid041590._10007.job	TRF_UNKNOWN	[Errno 2] No such file or di
34000372	26367027	41590	mc08.105805.filtered_minbias6.recon.e347_s462_r617_tid041590._10007.job	TRF_UNKNOWN	[Errno 2] No such file or di
33994811	26367027	41590	mc08.105805.filtered_minbias6.recon.e347_s462_r617_tid041590._10007.job	TRF_UNKNOWN	[Errno 2] No such file or di



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jobexeid	jobdeffk	taskfk	jobname	error	message
34014992	26367030	41590	mc08.105805.filtered_minbias6.recon.e347_s462_r617_tid041590._10010.job	TRF_UNKNOWN	[Errno 2] No such file or di
34006857	26367030	41590	mc08.105805.filtered_minbias6.recon.e347_s462_r617_tid041590._10010.job	TRF_UNKNOWN	[Errno 2] No such file or di

error text:

```
[Errno 2] No such file or directory: 'ntuple_rdotoesd.pmon.dat'
```

jobexeid: 34006857

supervisor:

infoexecutor:

creationtime:

attemptnr: 4

errorcode:

partnr:

endtime: 2009-02-25 04:41:12

modificationtime: 2009-02-25 04:54:35

nevents:

starttime: 2009-02-25 03:30:27

execluster: pic-ce06-glong-lcgpbs

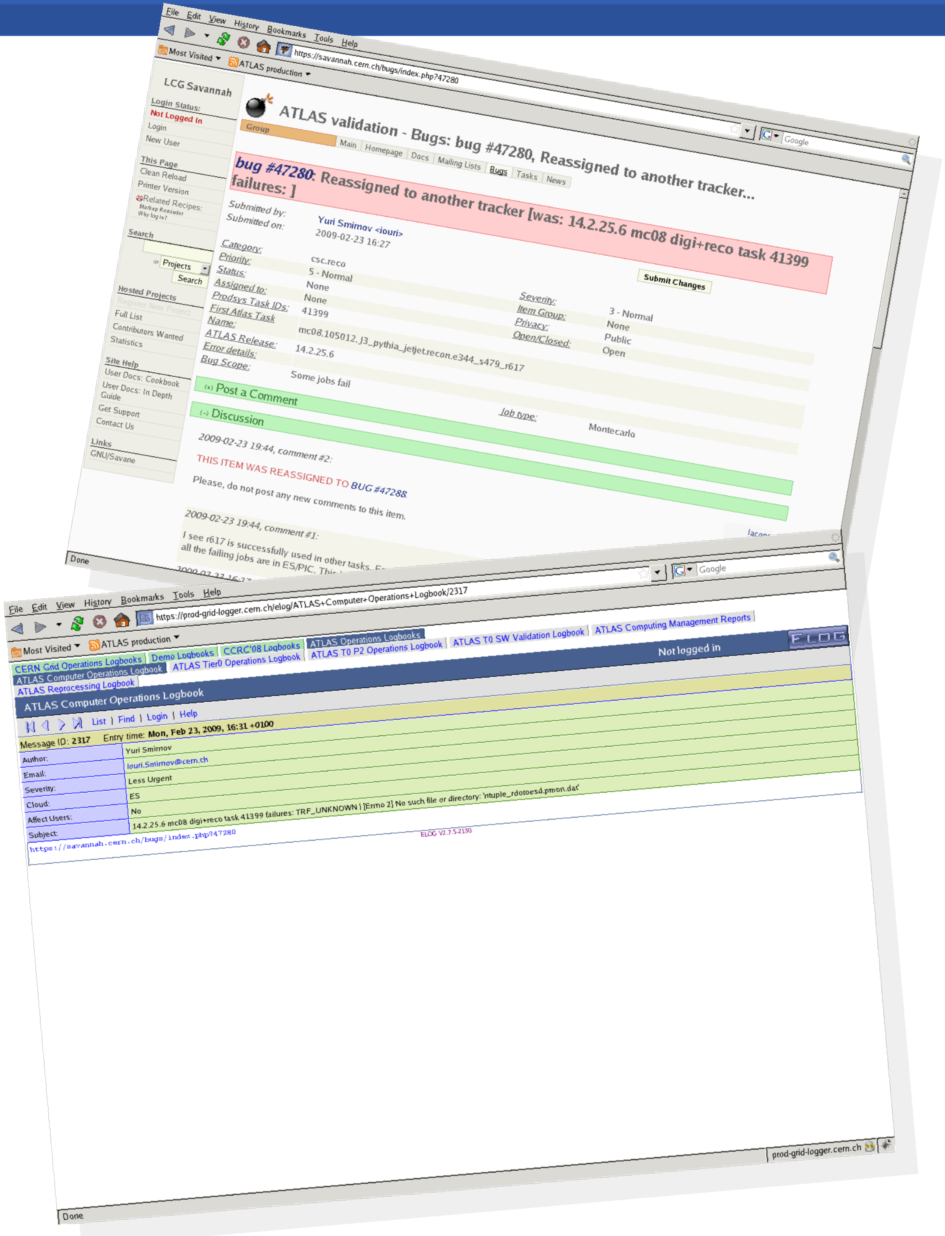
processing host: td058.pic.es

facilityid: 27248520 (click for logs)

software: 14.2.25 Atlas-14.2.25

shifter taking action

- the shifter here submits a savannah bug,
- reports to the ATLAS eLog,
- bug fix will be logged as well,
- similar actions taken for site related errors (GGUS).



https://savannah.cern.ch/bugs/index.php?47280

ATLAS validation - Bugs: bug #47280, Reassigned to another tracker...

bug #47280: Reassigned to another tracker [was: 14.2.25.6 mc08 digi+reco task 41399 failures:]

Submitted by: Yuri Smirnov <iouri>
Submitted on: 2009-02-23 16:27

Category: csc.reco
Priority: 5 - Normal
Status: None
Assigned to: None
Prodsys Task IDs: 41399
First Atlas Task Name: mc08.105012.J3_pythia_jetjet.recon.e344_s479_r617
ATLAS Release: 14.2.25.6
Error details:
Bug Scope: Some jobs fail

Severity: 3 - Normal
Item Group: None
Privacy: Public
Open/Closed: Open
Job type: Montecarlo

2009-02-23 19:44, comment #2:

THIS ITEM WAS REASSIGNED TO BUG #47288.

Please, do not post any new comments to this item.

2009-02-23 19:44, comment #1:

I see r617 is successfully used in other tasks. F…
all the failing jobs are in ES/PIC. This …

2009-02-23 16:27

File Edit View History Bookmarks Tools Help
Most Visited ATLAS production
Google
CERN Grid Operations Logbooks
Demo Logbooks
CCRC'08 Logbooks
ATLAS Operations Logbooks
ATLAS Computer Operations Logbook
ATLAS Tier0 Operations Logbook
ATLAS T0 P2 Operations Logbook
ATLAS T0 SW Validation Logbook
ATLAS Computing Management Reports
ATLAS Reprocessing Logbook
Not logged in
ELOG
List | Find | Login | Help
ELOG V2.7.5-2130
prod-grid-logger.cern.ch
Done

https://prod-grid-logger.cern.ch/elog/ATLAS+Computer+Operations+Logbook/2317

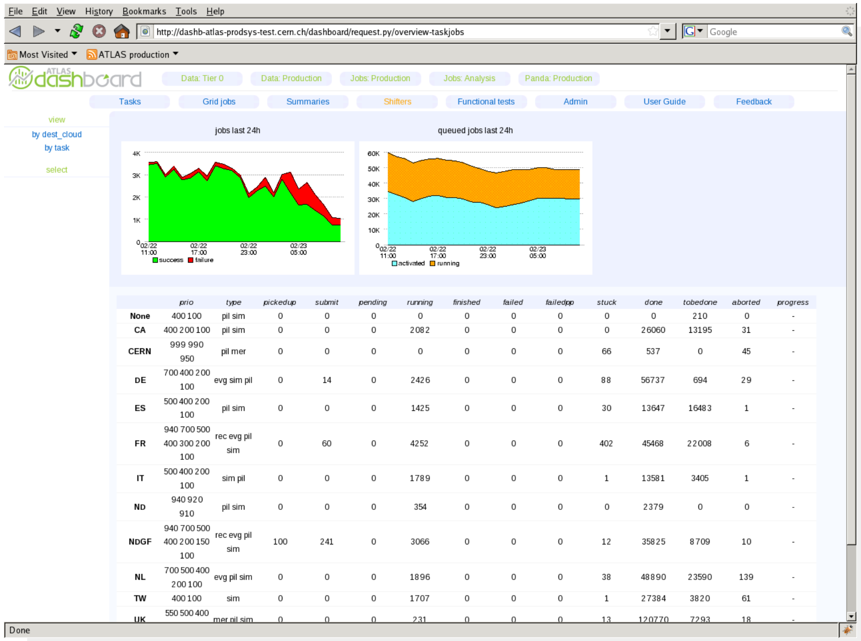
ATLAS Computer Operations Logbook

Message ID: 2317 Entry time: **Mon, Feb 23, 2009, 16:31 +0100**

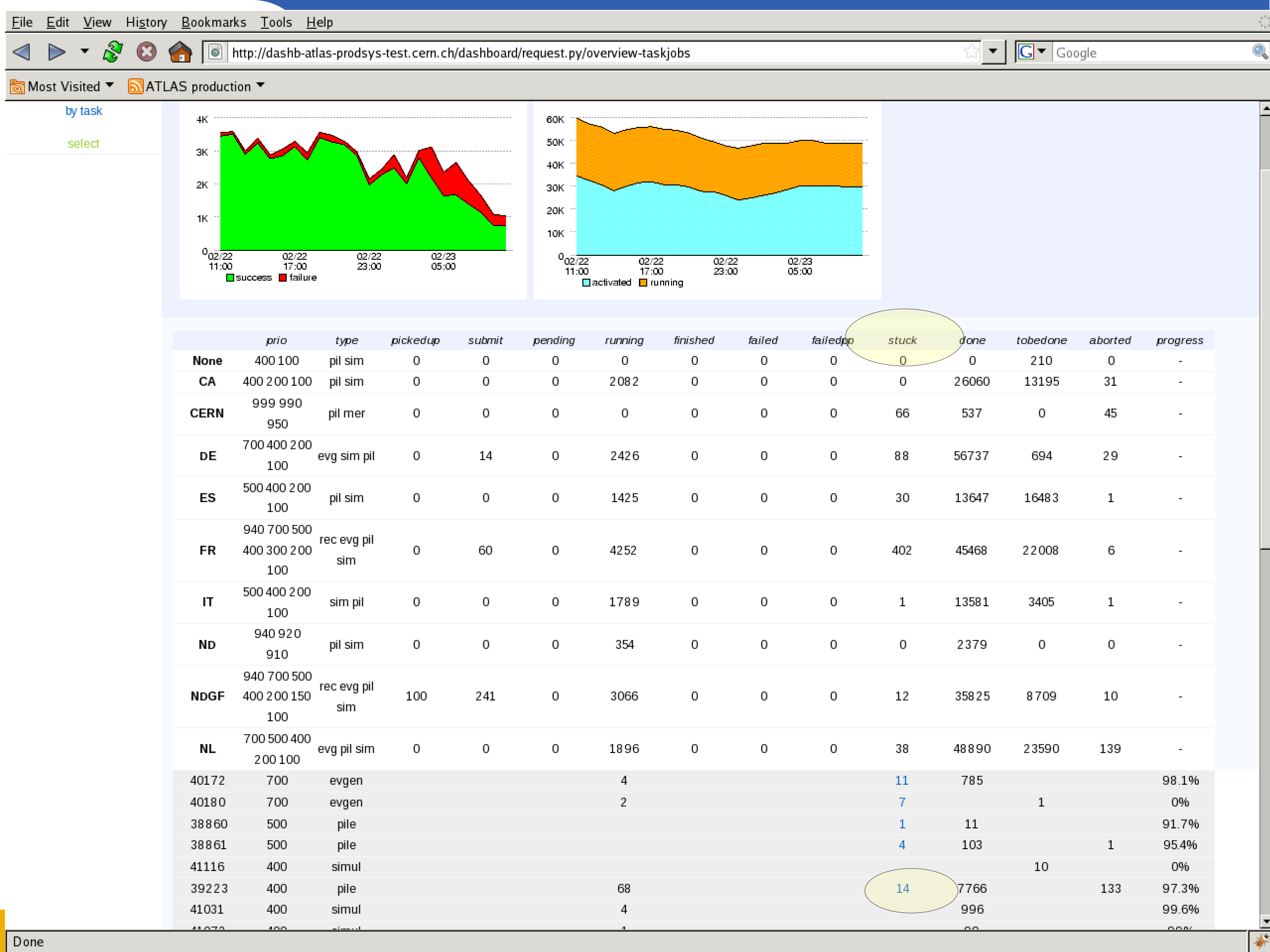
Author:	Yuri Smirnov
Email:	Iouri.Smirnov@cern.ch
Severity:	Less Urgent
Cloud:	ES
Affect Users:	No
Subject:	14.2.25.6 mc08 digi+reco task 41399 failures: TRF_UNKNOWN | [Errno 2] No such file or directory: 'ntuple_rdotoesd.pmon.dat'

https://savannah.cern.ch/bugs/index.php?47280

- **task display**
  - identification of stuck tasks
  - diagnostic page:
    - each stuck subjob:
      - *executed X times,*
      - *always failed.*
    - check common error patterns:
      - *same error in the same site,*
      - *same error in any site,*
      - *etc.*

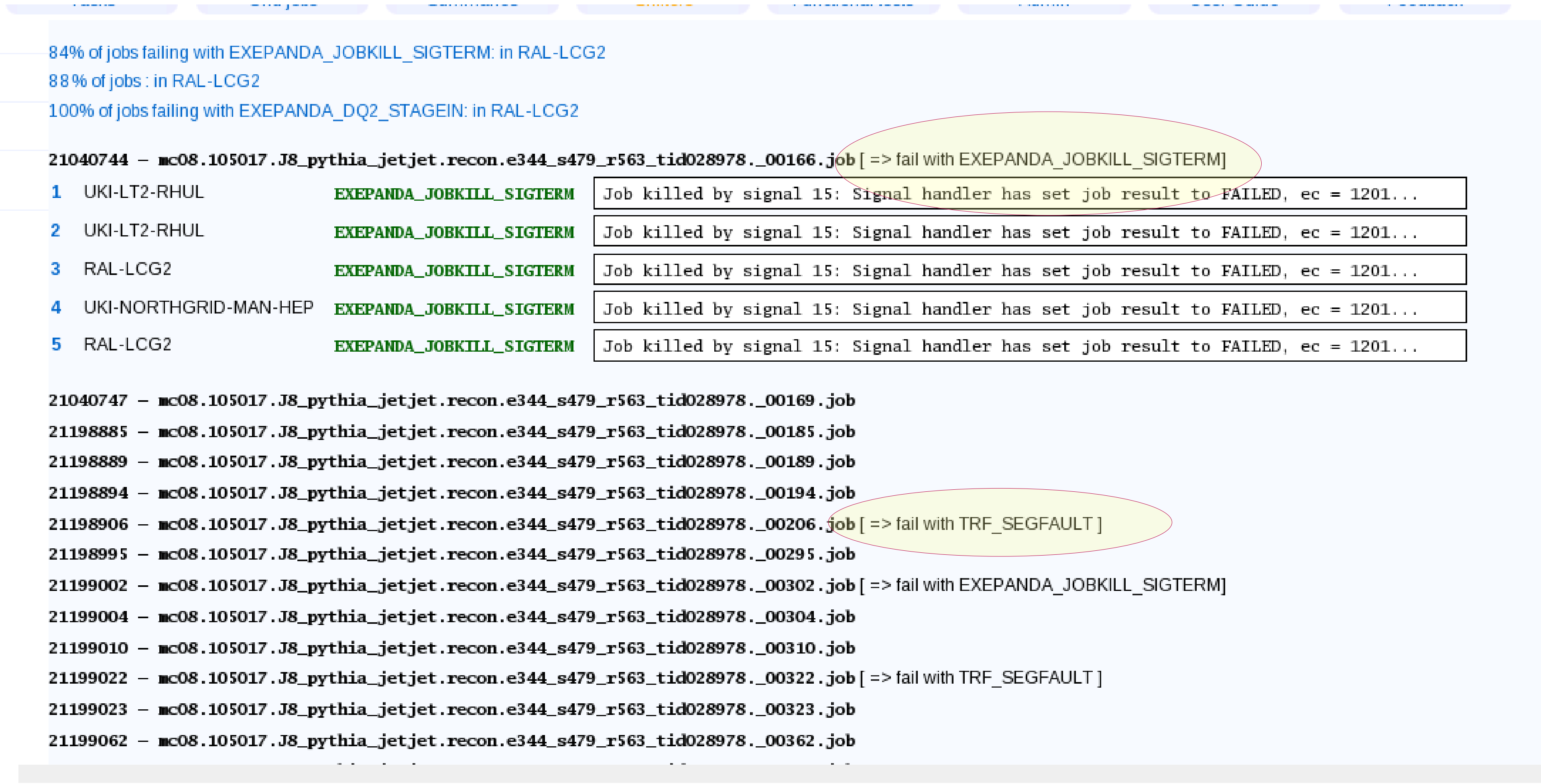


	prio	*type*	*pickedup*	*submit*	*pending*	*running*	*finished*	*failed*	*failedpp*	*stuck*	*done*	*tobedone*	*aborted*	*progress*
None	400 100	pil sim	0	0	0	0	0	0	0	0	0	210	0	-
CA	400 200 100	pil sim	0	0	0	2082	0	0	0	0	26060	13195	31	-
CERN	999 990 950	pil mer	0	0	0	0	0	0	0	66	537	0	45	-
DE	700 400 200 100	evg sim pil	0	14	0	2426	0	0	0	88	56737	694	29	-
ES	500 400 200 100	pil sim	0	0	0	1425	0	0	0	30	13647	16483	1	-
FR	940 700 500 400 300 200 100	rec evg pil sim	0	60	0	4252	0	0	0	402	45468	22008	6	-
IT	500 400 200 100	sim pil	0	0	0	1789	0	0	0	1	13581	3405	1	-
ND	940 920 910	pil sim	0	0	0	354	0	0	0	0	2379	0	0	-
NDGF	940 700 500 400 200 150 100	rec evg pil sim	100	241	0	3066	0	0	0	12	35825	8709	10	-
NL	700 500 400 200 100	evg pil sim	0	0	0	1896	0	0	0	38	48890	23590	139	-
TW	400 100	sim	0	0	0	1707	0	0	0	1	27384	3820	61	-
UK	550 500 400	mer pil sim	0	0	0	231	0	0	0	13	120770	7293	18	-



	prio	type	pickedup	submit	pending	running	finished	failed	failedpp	stuck	done	tobedone	aborted	progress
None	400 100	pil sim	0	0	0	0	0	0	0	0	0	210	0	-
CA	400 200 100	pil sim	0	0	0	2082	0	0	0	0	26060	13195	31	-
CERN	999 990 950	pil mer	0	0	0	0	0	0	0	66	537	0	45	-
DE	700 400 200 100	evg sim pil	0	14	0	2426	0	0	0	88	56737	694	29	-
ES	500 400 200 100	pil sim	0	0	0	1425	0	0	0	30	13647	16483	1	-
FR	940 700 500 400 300 200 100	rec evg pil sim	0	60	0	4252	0	0	0	402	45468	22008	6	-
IT	500 400 200 100	sim pil	0	0	0	1789	0	0	0	1	13581	3405	1	-
ND	940 920 910	pil sim	0	0	0	354	0	0	0	0	2379	0	0	-
NDGF	940 700 500 400 200 150 100	rec evg pil sim	100	241	0	3066	0	0	0	12	35825	8709	10	-
NL	700 500 400 200 100	evg pil sim	0	0	0	1896	0	0	0	38	48890	23590	139	-
40172	700	evgen				4				11	785			98.1%
40180	700	evgen				2				7		1		0%
38860	500	pile								1	11			91.7%
38861	500	pile								4	103		1	95.4%
41116	400	simul										10		0%
39223	400	pile				68				14	7766		133	97.3%
41031	400	simul				4					996			99.6%

quick identification of failure patterns



84% of jobs failing with EXEPANDA_JOBKILL_SIGTERM: in RAL-LCG2

88% of jobs : in RAL-LCG2

100% of jobs failing with EXEPANDA_DQ2_STAGEIN: in RAL-LCG2

21040744 – mc08.105017.J8_pythia_jetjet.recon.e344_s479_r563_tid028978._00166.job [=> fail with EXEPANDA_JOBKILL_SIGTERM]

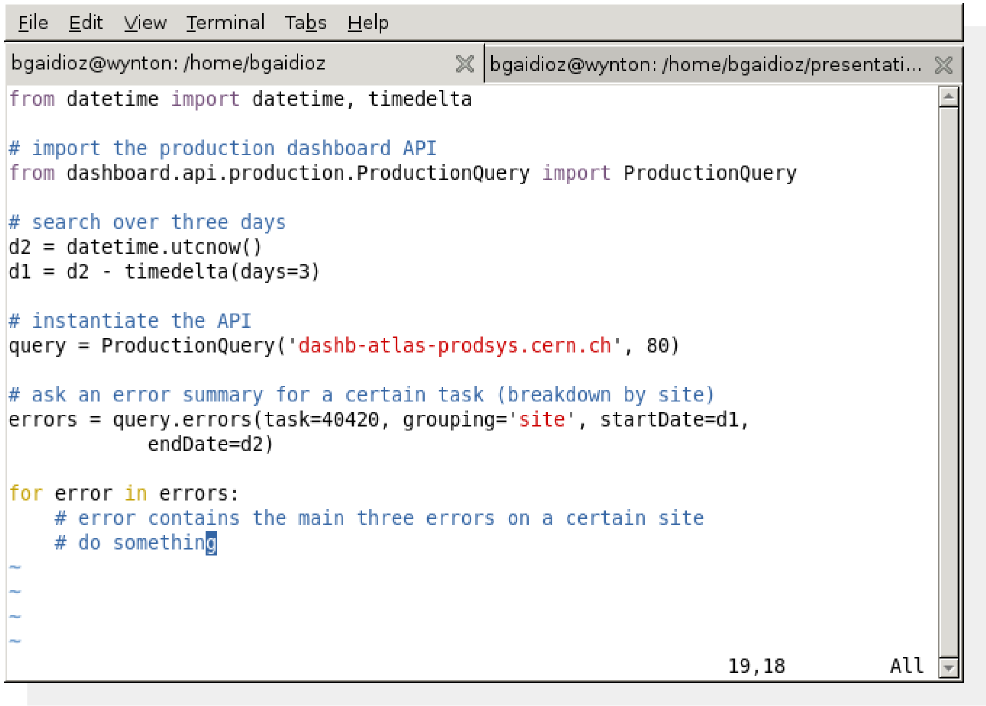
1	UKI-LT2-RHUL	EXEPANDA_JOBKILL_SIGTERM	Job killed by signal 15: Signal handler has set job result to FAILED, ec = 1201...
2	UKI-LT2-RHUL	EXEPANDA_JOBKILL_SIGTERM	Job killed by signal 15: Signal handler has set job result to FAILED, ec = 1201...
3	RAL-LCG2	EXEPANDA_JOBKILL_SIGTERM	Job killed by signal 15: Signal handler has set job result to FAILED, ec = 1201...
4	UKI-NORTHGRID-MAN-HEP	EXEPANDA_JOBKILL_SIGTERM	Job killed by signal 15: Signal handler has set job result to FAILED, ec = 1201...
5	RAL-LCG2	EXEPANDA_JOBKILL_SIGTERM	Job killed by signal 15: Signal handler has set job result to FAILED, ec = 1201...

```
21040747 – mc08.105017.J8_pythia_jetjet.recon.e344_s479_r563_tid028978._00169.job
21198885 – mc08.105017.J8_pythia_jetjet.recon.e344_s479_r563_tid028978._00185.job
21198889 – mc08.105017.J8_pythia_jetjet.recon.e344_s479_r563_tid028978._00189.job
21198894 – mc08.105017.J8_pythia_jetjet.recon.e344_s479_r563_tid028978._00194.job
21198906 – mc08.105017.J8_pythia_jetjet.recon.e344_s479_r563_tid028978._00206.job [ => fail with TRF_SEGFAULT ]
21198995 – mc08.105017.J8_pythia_jetjet.recon.e344_s479_r563_tid028978._00295.job
21199002 – mc08.105017.J8_pythia_jetjet.recon.e344_s479_r563_tid028978._00302.job [ => fail with EXEPANDA_JOBKILL_SIGTERM]
21199004 – mc08.105017.J8_pythia_jetjet.recon.e344_s479_r563_tid028978._00304.job
21199010 – mc08.105017.J8_pythia_jetjet.recon.e344_s479_r563_tid028978._00310.job
21199022 – mc08.105017.J8_pythia_jetjet.recon.e344_s479_r563_tid028978._00322.job [ => fail with TRF_SEGFAULT ]
21199023 – mc08.105017.J8_pythia_jetjet.recon.e344_s479_r563_tid028978._00323.job
21199062 – mc08.105017.J8_pythia_jetjet.recon.e344_s479_r563_tid028978._00362.job
```

action : manager cancels or reschedule jobs

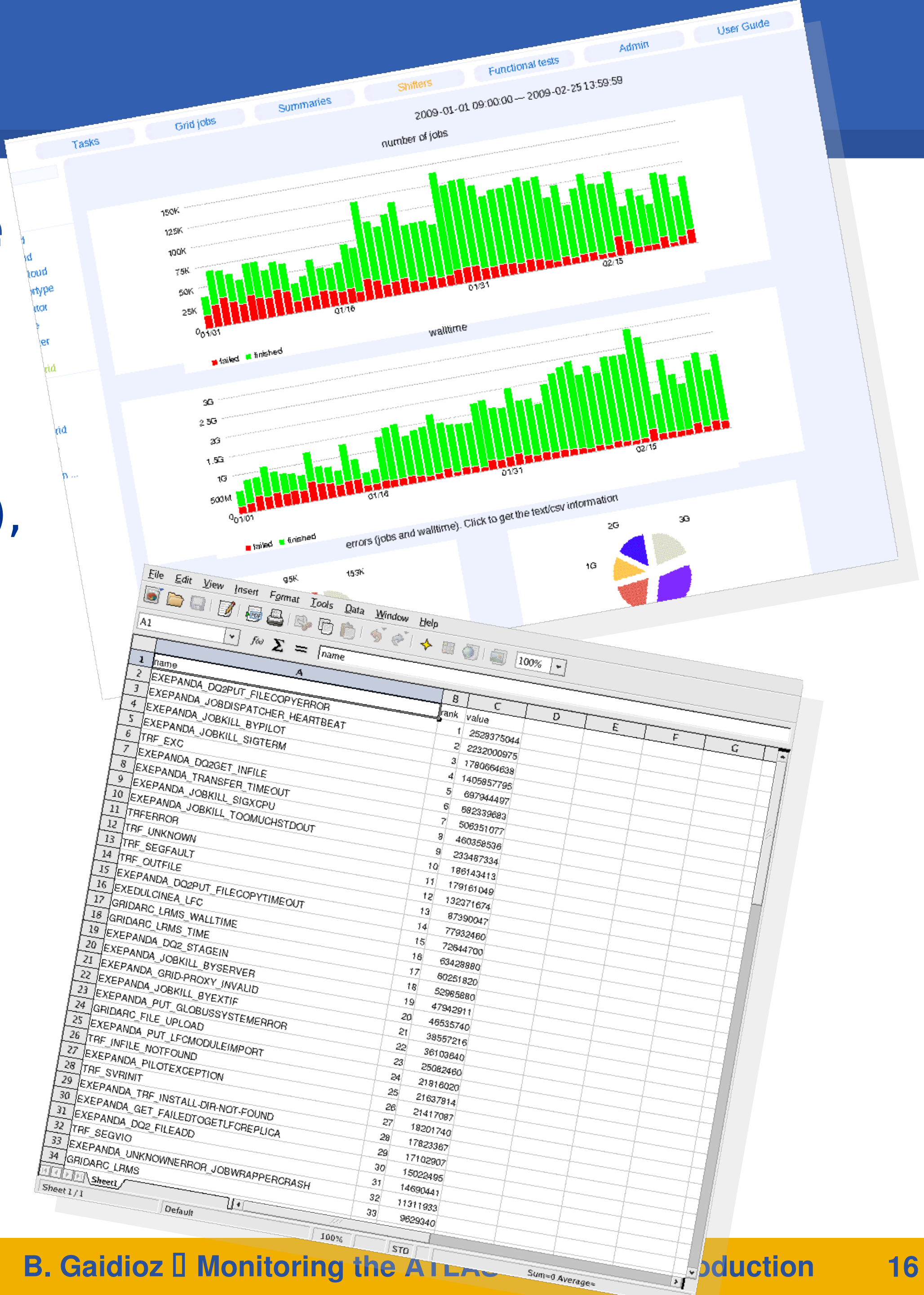
Python APIs

- **Python API to access the monitoring info:**
  - Provided by the dashboard framework
  - Basic operations available (error breakdown, summary),
  - To automate tasks performed by shifters,
  - Not really successful so far… but I still hope.


File Edit View Terminal Tabs Help
bgaidioz@wynton: /home/bgaidioz
bgaidioz@wynton: /home/bgaidioz/presentati…

```
from datetime import datetime, timedelta

# import the production dashboard API
from dashboard.api.production.ProductionQuery import ProductionQuery

# search over three days
d2 = datetime.utcnow()
d1 = d2 - timedelta(days=3)

# instantiate the API
query = ProductionQuery('dashb-atlas-prodsys.cern.ch', 80)

# ask an error summary for a certain task (breakdown by site)
errors = query.errors(task=40420, grouping='site', startDate=d1,
            endDate=d2)

for error in errors:
    # error contains the main three errors on a certain site
    # do something
~
~
~
~
                                                              19,18         All
```

- **also available in the prodsys dashboard:**
  - statistics over a long period
  - site admin page,
  - get data in CSV (Excel),
  - search ATLAS eLog.



name	rank	value
EXEPANDA_DQ2PUT_FILECOPYERROR	1	2528375044
EXEPANDA_JOBDISPATCHER_HEARTBEAT	2	2232000975
EXEPANDA_JOBKILL_BYPILOT	3	1780664638
EXEPANDA_JOBKILL_SIGTERM	4	1405857795
TRF_EXC	5	697944497
EXEPANDA_DQ2GET_INFILE	6	682339683
EXEPANDA_TRANSFER_TIMEOUT	7	506351077
EXEPANDA_JOBKILL_SIGXCPU	8	460358536
EXEPANDA_JOBKILL_TOOMUCHSTDOUT	9	233487334
TRFERROR	10	186143413
TRF_UNKNOWN	11	179161049
TRF_SEGFAULT	12	132371674
TRF_OUTFILE	13	87390047
EXEPANDA_DQ2PUT_FILECOPYTIMEOUT	14	77932460
EXEDULCINEA_LFC	15	72644700
GRIDARC_LRMS_WALLTIME	16	63428880
GRIDARC_LRMS_TIME	17	60251820
EXEPANDA_DQ2_STAGEIN	18	52985880
EXEPANDA_JOBKILL_BYSERVER	19	47942911
EXEPANDA_GRID-PROXY_INVALID	20	46535740
EXEPANDA_JOBKILL_BYEXTIF	21	38557216
EXEPANDA_PUT_GLOBUSSYSTEMERROR	22	36103640
GRIDARC_FILE_UPLOAD	23	25082460
EXEPANDA_PUT_LFCMODULEIMPORT	24	21816020
TRF_INFILE_NOTFOUND	25	21637814
EXEPANDA_PILOTEXCEPTION	26	21417087
TRF_SVRINIT	27	18201740
EXEPANDA_TRF_INSTALL-DIR-NOT-FOUND	28	17823367
EXEPANDA_GET_FAILEDTOGETLFCREPLICA	29	17102907
EXEPANDA_DQ2_FILEADD	30	15022495
TRF_SEGVIO	31	14690441
EXEPANDA_UNKNOWNERROR_JOBWRAPPERCRASH	32	11311933
GRIDARC_LRMS	33	9629340

Future work

- **alerts:**
  - use data-mining techniques
    - successful prototyping
    - see Gerhild Maier's work (was presented on Monday).
  - associate an error pattern to an “action to take”,
- **interface:**
  - include also user analysis jobs (prototype exists),
  - integrate fully with other ATLAS dashboards (DDM, AGIS),
  - assist the submission of GGUS and Savannah tickets.

note

- **dashboard tools for site admins will be presented on Friday:**
  - what are the VO running at my site?
  - what is the success rate of job processing or data transfer of the VO at my site?
  - is the VO happy with my site?
  - Friday at 9am. (room Leopardi.)