



grid production system

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ILD Software and Integration Workshop 2010
Desy, 6th June 2010

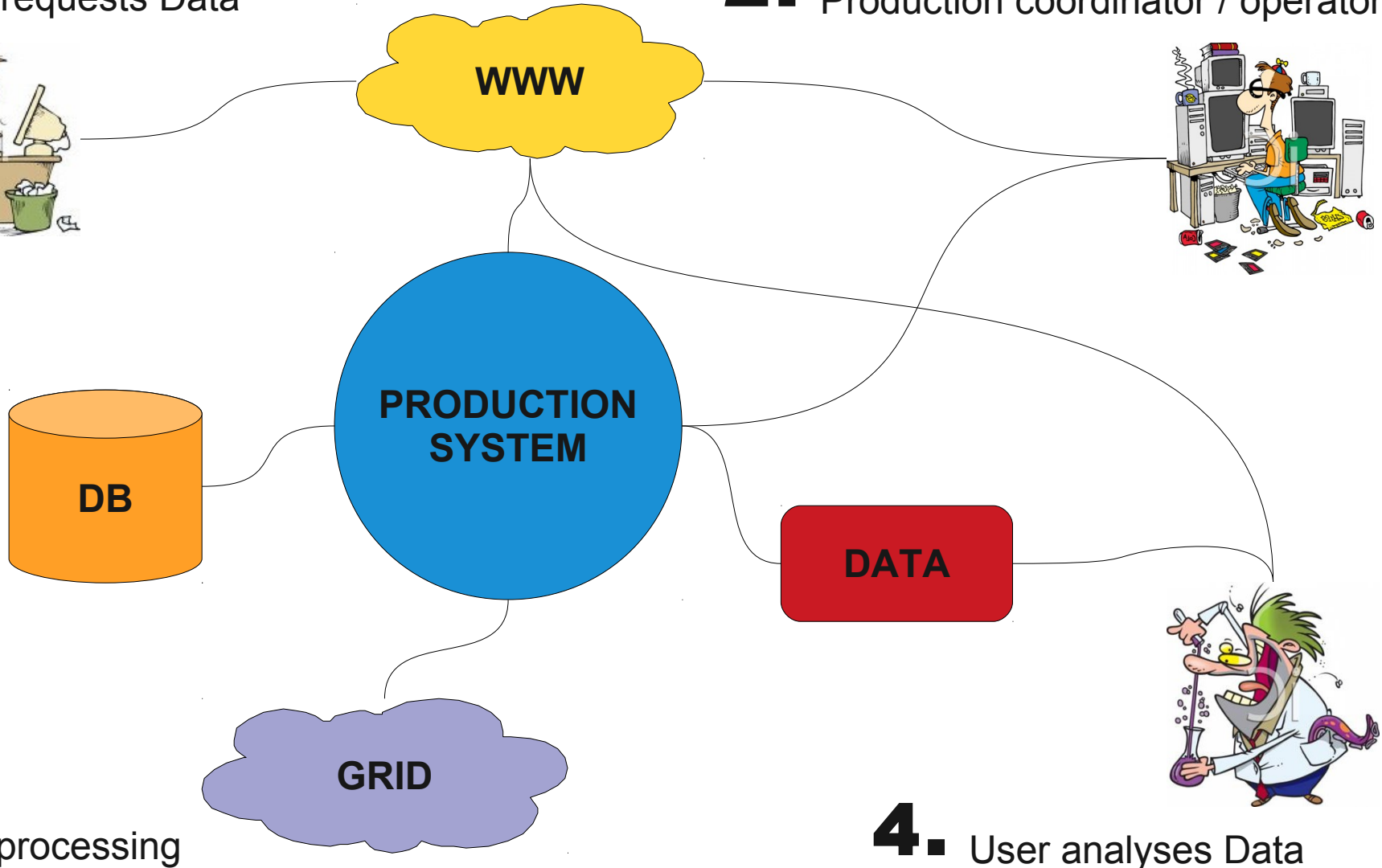
Chain of data processing



1. User requests Data



2. Production coordinator / operator

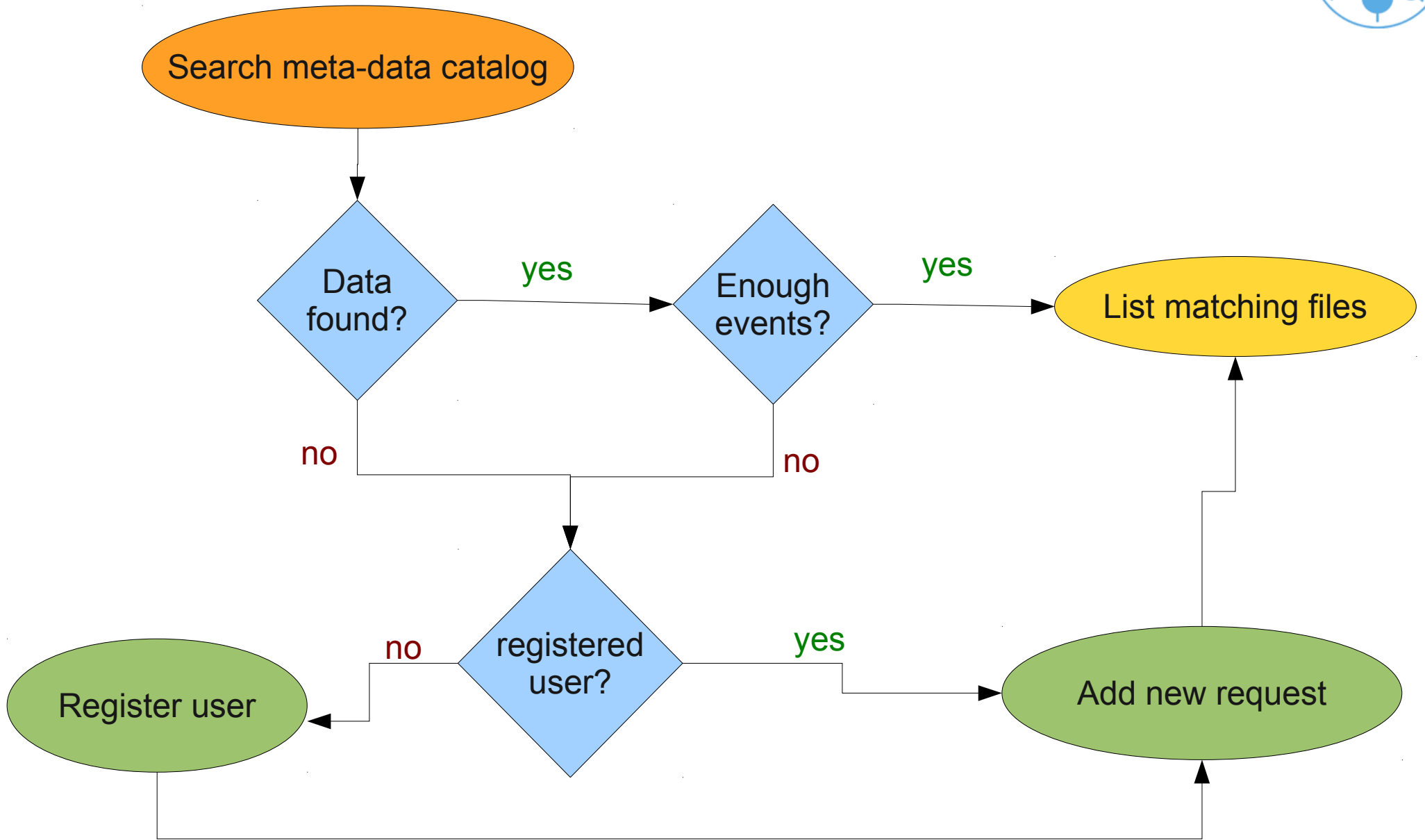


3. Data processing

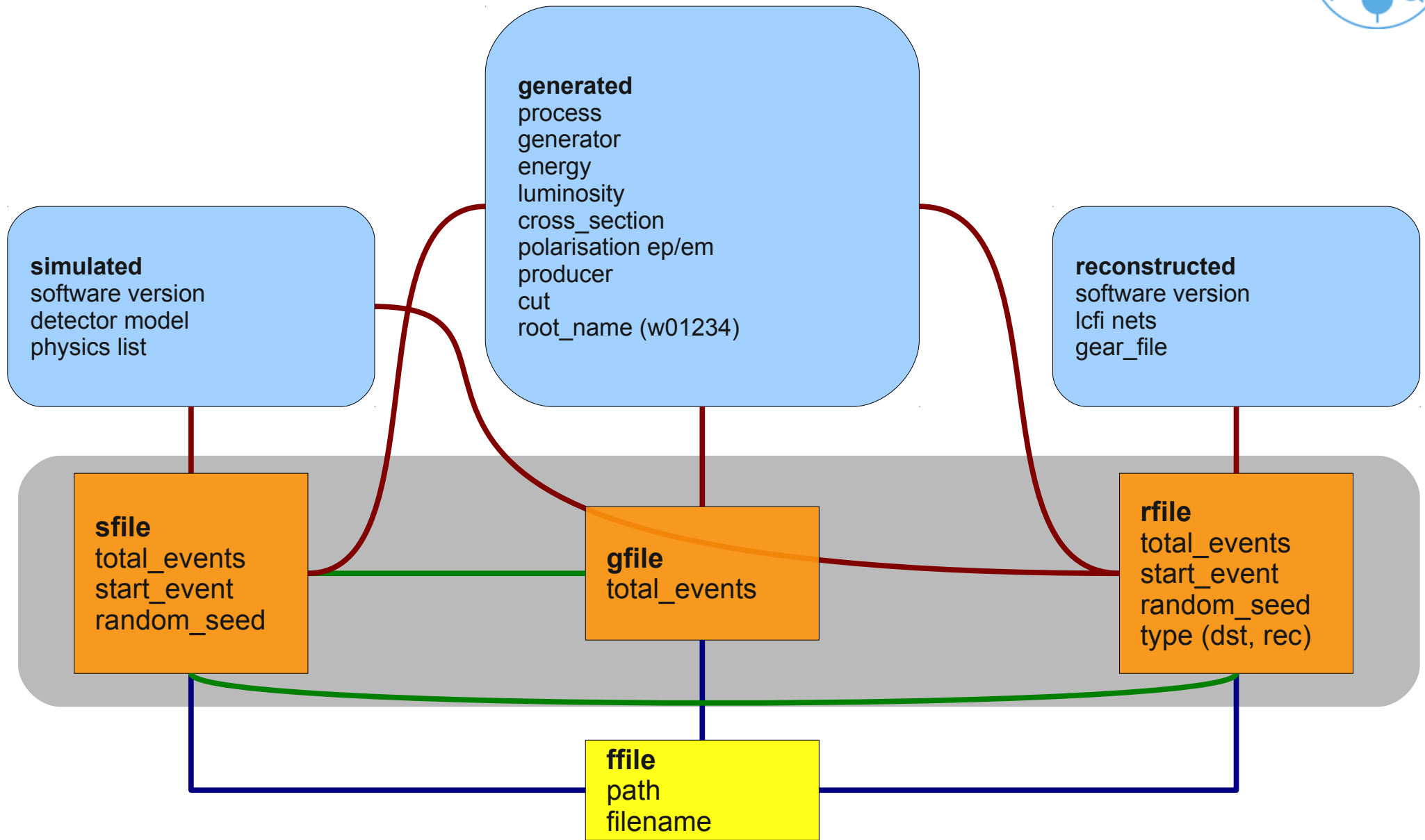
4. User analyses Data



1. Typical use-case



ILD MC Production System (Database Model)



1. User request (search data catalog - metadata)



Gen id	Process	Generator	Energy	Luminosity	Cross section	Pol ep	Pol em	Producer	Cut	Root name	Total events
1	n1n1a	Whizard	500.000	255.7	34381.7000000	1.0	-1.0	Slac_SM		w11739	8790678
2	n1n1a	Whizard	500.000	1000.0	632.1560000	-1.0	1.0	Slac_SM		w11740	632157
3	n2n2a	Whizard	500.000	1000.0	989.4840000	1.0	-1.0	Slac_SM		w11743	989485
4	n2n2a	Whizard	500.000	1000.0	630.1760000	-1.0	1.0	Slac_SM		w11744	630177
5	n3n3a	Whizard	500.000	1000.0	987.5470000	1.0	-1.0	Slac_SM		w11747	987548
6	n3n3a	Whizard	500.000	1000.0	631.5610000	-1.0	1.0	Slac_SM		w11748	631562
7	n1n1aa	Whizard	500.000	1000.0	3010.3300000	1.0	-1.0	Slac_SM		w11751	3010334
8	n1n1aa	Whizard	500.000	1000.0	98.2396000	-1.0	1.0	Slac_SM		w11752	98241
9	n2n2aa	Whizard	500.000	1000.0	153.1940000	1.0	-1.0	Slac_SM		w11755	153195
10	n2n2aa	Whizard	500.000	1000.0	97.9220000	-1.0	1.0	Slac_SM		w11756	97923
11	n3n3aa	Whizard	500.000	1000.0	152.7940000	1.0	-1.0	Slac_SM		w11759	152795
12	n3n3aa	Whizard	500.000	1000.0	97.8742000	-1.0	1.0	Slac_SM		w11760	97875
13	n1n1aaa	Whizard	500.000	1000.0	170.7480000	1.0	-1.0	Slac_SM		w11763	170750
14	n1n1aaa	Whizard	500.000	1164.2	8.5905600	-1.0	1.0	Slac_SM		w11764	10001
15	n2n2aaa	Whizard	500.000	1000.0	13.4083000	1.0	-1.0	Slac_SM		w11767	13409
16	n2n2aaa	Whizard	500.000	1160.0	8.6212400	-1.0	1.0	Slac_SM		w11768	10001
17	n3n3aaa	Whizard	500.000	1000.1	13.4676000	1.0	-1.0	Slac_SM		w11771	13469
18	n3n3aaa	Whizard	500.000	1164.5	8.5878800	-1.0	1.0	Slac_SM		w11772	10001
19	uu	Whizard	500.000	245.6	3832.4600000	-1.0	1.0	Slac_SM		w11776	941159
20	uu	Whizard	500.000	135.1	6519.7900000	1.0	-1.0	Slac_SM		w11775	880720
21	cc	Whizard	500.000	231.0	3815.6000000	-1.0	1.0	Slac_SM		w11780	881471
22	cc	Whizard	500.000	127.1	6522.5200000	1.0	-1.0	Slac_SM		w11779	829150
23	e1e1	Whizard	500.000	1.0	17275000.0000000	1.0	1.0	Slac_SM		w11785	17385272
24	e1e1	Whizard	500.000	1.1	17469600.0000000	-1.0	1.0	Slac_SM		w11784	19217585
25	e1e1	Whizard	500.000	1.1	17525700.0000000	1.0	-1.0	Slac_SM		w11783	19217585

Filter

By generator

- All
- Whizard
- whizard+taula
- whizard-1.51
- whizard-1.51+tau

By pol ep

- All
- 1.0
- 0.0
- 0.6
- 1.0

By pol em

- All
- 1.0
- 0.8
- 0.0
- 1.0

By producer

- All
- Desy_point5
- Desy_point5_v2
- Desy_SM
- Desy_spslap
- Desy_Xspslap_X
- Slac_SM
- Slac_SM_250_fore
- Slac_SM_250_ptsu
- Slac_SM_cosTheta
- Slac_SM_Egamma
- Slac_SM_forTaika

By energy

- All
- 250.0
- 500.0

1. User request (search data catalog - metadata)



Go 186 results (3980 total)

Gen id	Process	Generator	Energy	Luminosity	Cross section	Pol ep	Pol em	Producer	Cut	Root name	Total events
23	e1e1	Whizard	500.000	1.0	17275000.00000000	1.0	1.0	Slac_SM		w11785	17385272
175	n1e1e1n1	Whizard	500.000	1000.0	158.9480000	1.0	1.0	Slac_SM		w11833	158949
188	n2e2e1n1	Whizard	500.000	1000.0	127.5770000	1.0	1.0	Slac_SM		w11853	127578
197	ude1n1	Whizard	500.000	1000.0	379.4840000	1.0	1.0	Slac_SM		w11893	379486
206	cse1n1	Whizard	500.000	1000.0	379.1080000	1.0	1.0	Slac_SM		w11913	379110
251	n2n2e1e1	Whizard	500.000	1000.0	31.9336000	1.0	1.0	Slac_SM		w11989	31935
261	n3n3e1e1	Whizard	500.000	1000.0	31.9917000	1.0	1.0	Slac_SM		w12009	31993
273	uue1e1	Whizard	500.000	1000.0	705.4350000	1.0	1.0	Slac_SM		w12029	705438
283	cce1e1	Whizard	500.000	1000.0	706.7160000	1.0	1.0	Slac_SM		w12049	706719
293	tte1e1	Whizard	500.000	506431.0	0.0197480	1.0	1.0	Slac_SM		w15637	10001
305	e1e1e1e1	Whizard	500.000	1000.0	1434.2800000	1.0	1.0	Slac_SM		w12069	1434285
309	e1e1e2e2	Whizard	500.000	1000.0	1557.9100000	1.0	1.0	Slac_SM		w12073	1557915
313	e1e1dd	Whizard	500.000	1000.0	124.3520000	1.0	1.0	Slac_SM		w12081	124353
317	e1e1ss	Whizard	500.000	1000.0	124.6560000	1.0	1.0	Slac_SM		w12085	124657
321	e1e1bb	Whizard	500.000	1000.0	134.7400000	1.0	1.0	Slac_SM		w17539	134741
1137	e1e1n1e1e1n1	Whizard	500.000	51189.5	0.1953720	1.0	1.0	Slac_SM		w12305	10001
1141	e1e1n1e1e2n2	Whizard	500.000	50587.0	0.1976990	1.0	1.0	Slac_SM		w12309	10001
1145	e1e1n1e1du	Whizard	500.000	17204.1	0.5813150	1.0	1.0	Slac_SM		w12317	10001
1149	e1e1n1e1sc	Whizard	500.000	17307.6	0.5778370	1.0	1.0	Slac_SM		w12321	10001
1153	e1e1n2e2e1n1	Whizard	500.000	48028.6	0.2082300	1.0	1.0	Slac_SM		w12325	10001
1157	e1e1n2e2e2n2	Whizard	500.000	48947.2	0.2043220	1.0	1.0	Slac_SM		w12329	10001
1161	e1e1n2e2du	Whizard	500.000	16821.5	0.5945370	1.0	1.0	Slac_SM		w12337	10001
1165	e1e1n2e2sc	Whizard	500.000	16816.5	0.5947120	1.0	1.0	Slac_SM		w12341	10001
1169	e1e1ude1n1	Whizard	500.000	16134.9	0.6198380	1.0	1.0	Slac_SM		w12365	10001
1173	e1e1ude2n2	Whizard	500.000	16755.7	0.5968700	1.0	1.0	Slac_SM		w12369	10001

Filter

By generator

All

Whizard

whizard+tauola

whizard-1.51

whizard-1.51+tauola

By pol ep

All

-1.0

0.0

0.6

1.0

By pol em

All

-1.0

-0.8

0.0

1.0

By producer

All

Desy_point5

Desy_point5_v2

Desy_SM

Desy_spslap

Desy_Xspslap_X

Slac_SM

Slac_SM_250_for

Slac_SM_250_pts

Slac_SM_cosThet

Slac_SM_Egammm

Slac_SM_forTaika

By energy

All

250.0

500.0



1. User request (search data catalog - files)

Q Go 6 results (6023 total)

< March 2010 **March 22**

Id	Path	Filename	Filesize	Guid	Created
6023	generated/ilc-tests/rec/	w14002-aa_csdu-ssw-v01-07-LCPhys-ILD_00-rsw-v01-07-0003-DST.slcio	None	None	March 22, 2010, 4:36 p.m.
6022	generated/ilc-tests/rec/	w14002-aa_csdu-ssw-v01-07-LCPhys-ILD_00-rsw-v01-07-0003-REC.000.slcio	None	None	March 22, 2010, 4:36 p.m.
6020	generated/ilc-tests/rec/	w14002-aa_csdu-ssw-v01-07-LCPhys-ILD_00-rsw-v01-07-0002-DST.slcio	None	None	March 22, 2010, 4:36 p.m.
6019	generated/ilc-tests/rec/	w14002-aa_csdu-ssw-v01-07-LCPhys-ILD_00-rsw-v01-07-0002-REC.000.slcio	None	None	March 22, 2010, 4:36 p.m.
6017	generated/ilc-tests/rec/	w14002-aa_csdu-ssw-v01-07-LCPhys-ILD_00-rsw-v01-07-0001-DST.slcio	None	None	March 22, 2010, 4:36 p.m.
6016	generated/ilc-tests/rec/	w14002-aa_csdu-ssw-v01-07-LCPhys-ILD_00-rsw-v01-07-0001-REC.000.slcio	None	None	March 22, 2010, 4:36 p.m.

6 files

Filter

By usr
All
jan
steve
jenny
nils_ilc
nils_cal

By se
All
desy
lyon
lal

By created
Any date
Today
Past 7 days
This month
This year

By path
All
generated/ilc-tests/logs/rec/
generated/ilc-tests/logs/sim/
generated/ilc-tests/rec/
generated/ilc-tests/sim/
mc-2008/generated
/CMS_500/



1. User request (search data catalog - files)

Q ilc-tests/rec/ w14002-aa_csdu Go

2010						
Id	Path	Filename	Filesize	Guid	Created	
6023	generated/ilc-tests/rec/	w14002-aa_csdu-ssw-v01-07-LCPhys-ILD_00-rsw-v01-07-0003-DST.slcio	None	None	March 22, 2010, 4:36 p.m.	
6022	generated/ilc-tests/rec/	w14002-aa_csdu-ssw-v01-07-LCPhys-ILD_00-rsw-v01-07-0003-REC.000.slcio	None	None	March 22, 2010, 4:36 p.m.	
6021	generated/ilc-tests/logs/rec/	w14002-aa_csdu-ssw-v01-07-LCPhys-ILD_00-rsw-v01-07-0003-REC.tar.gz	None	None	March 22, 2010, 4:36 p.m.	
6020	generated/ilc-tests/rec/	w14002-aa_csdu-ssw-v01-07-LCPhys-ILD_00-rsw-v01-07-0002-DST.slcio	None	None	March 22, 2010, 4:36 p.m.	
6019	generated/ilc-tests/rec/	w14002-aa_csdu-ssw-v01-07-LCPhys-ILD_00-rsw-v01-07-0002-REC.000.slcio	None	None	March 22, 2010, 4:36 p.m.	
6018	generated/ilc-tests/logs/rec/	w14002-aa_csdu-ssw-v01-07-LCPhys-ILD_00-rsw-v01-07-0002-REC.tar.gz	None	None	March 22, 2010, 4:36 p.m.	
6017	generated/ilc-tests/rec/	w14002-aa_csdu-ssw-v01-07-LCPhys-ILD_00-rsw-v01-07-0001-DST.slcio	None	None	March 22, 2010, 4:36 p.m.	
6016	generated/ilc-tests/rec/	w14002-aa_csdu-ssw-v01-07-LCPhys-ILD_00-rsw-v01-07-0001-REC.000.slcio	None	None	March 22, 2010, 4:36 p.m.	
6015	generated/ilc-tests/logs/rec/	w14002-aa_csdu-ssw-v01-07-LCPhys-ILD_00-rsw-v01-07-0001-REC.tar.gz	None	None	March 22, 2010, 4:36 p.m.	
6014	generated/ilc-tests/sim/	w14002-aa_csdu-ssw-v01-07-LCPhys-ILD_00-0007.slcio	None	None	March 22, 2010, 4:36 p.m.	
6013	generated/ilc-tests/logs/sim/	w14002-aa_csdu-ssw-v01-07-LCPhys-ILD_00-0007.tar.gz	None	None	March 22, 2010, 4:36 p.m.	
6012	generated/ilc-tests/sim/	w14002-aa_csdu-ssw-v01-07-LCPhys-ILD_00-0006.slcio	None	None	March 22, 2010, 4:36 p.m.	
6011	generated/ilc-tests/logs/sim/	w14002-aa_csdu-ssw-v01-07-LCPhys-ILD_00-0006.tar.gz	None	None	March 22, 2010, 4:36 p.m.	
6010	generated/ilc-tests/sim/	w14002-aa_csdu-ssw-v01-07-LCPhys-ILD_00-0005.slcio	None	None	March 22, 2010, 4:36 p.m.	

Filter

- By usr**
 - All
 - jan
 - steve
 - jenny
 - nils_ilc
 - nils_cal
- By se**
 - All
 - desy
 - lyon
 - lal
- By created**
 - Any date
 - Today
 - Past 7 days
 - This month
 - This year
- By path**
 - All
 - generated/ilc-tests/logs/rec/
 - generated/ilc-tests/logs/sim/

1. User request (add new request)



Usr:	<input type="text" value="steve"/>  
Gen:	<input type="text" value="ch1ch1_ude1n1 ep+1.0em-1.0_ch1ch1_ude1n1_v2"/>  
Sim:	<input type="text" value="ilcsoft_v01-06 - ILD_00 - LCPhys"/>  
Rec:	<input type="text" value="ilcsoft_v01-06 - ILD_00 - mc2008 - gear_ILD_00.xml"/>  
Total events:	<input type="text" value="20000"/>
Last update:	Date: <input type="text" value="2010-03-22"/> Today  Time: <input type="text" value="16:36:48"/> Now 

2. Validate request



- Production admin checks new requests
- Settings may be modified (if needed)
 - Storage element
 - Computing elements (still on a per-job basis for now)
 - Job basket sizes
 - Priority
 - ...
- Finally:
 - Approves request → grid jobs are generated

3. Data processing



- Start production daemon
- Start job submission
- Check request tracker in database (or web interface)

```
mysql> select * from gevents;
```

gen_id	process	generator	energy	luminosity	cross_section	pol_ep	pol_em	producer	cut	root_name	total_events
1	uds	Pythia	91	0	0	0	0	Camb_SM	null	uds91	10000
3	uds	Pythia	200	0	0	0	0	Camb_SM	null	uds200	10000
5	uds	Pythia	500	0	0	0	0	Camb_SM	null	uds500	10000

```
3 rows in set (0.00 sec)
```

```
mysql> select * from req_tracker_sim;
```

gen_id	sim_id	username	ssw	ssw_ver	detector_model	physics_list	generated	processed	damaged
1	1	steve	ilcsoft	v01-08-01	ILD_00_noETD_TPCEP_0.30X0_100mm_z2350mm	LCPhys	5000	5000	0
1	3	steve	ilcsoft	v01-08-01	ILD_00_noETD_TPCEP_0.30X0_200mm_z2350mm	LCPhys	5000	5000	0
1	5	steve	ilcsoft	v01-08-01	ILD_00_noETD_TPCEP_0.30X0_200mm_z2450mm	LCPhys	5000	5000	0
3	1	steve	ilcsoft	v01-08-01	ILD_00_noETD_TPCEP_0.30X0_100mm_z2350mm	LCPhys	5000	5000	0
3	3	steve	ilcsoft	v01-08-01	ILD_00_noETD_TPCEP_0.30X0_200mm_z2350mm	LCPhys	5000	5000	0
3	5	steve	ilcsoft	v01-08-01	ILD_00_noETD_TPCEP_0.30X0_200mm_z2450mm	LCPhys	5000	5000	0
5	1	steve	ilcsoft	v01-08-01	ILD_00_noETD_TPCEP_0.30X0_100mm_z2350mm	LCPhys	5000	5000	0
5	3	steve	ilcsoft	v01-08-01	ILD_00_noETD_TPCEP_0.30X0_200mm_z2350mm	LCPhys	5000	5000	0
5	5	steve	ilcsoft	v01-08-01	ILD_00_noETD_TPCEP_0.30X0_200mm_z2450mm	LCPhys	5000	5000	0

```
9 rows in set (0.01 sec)
```

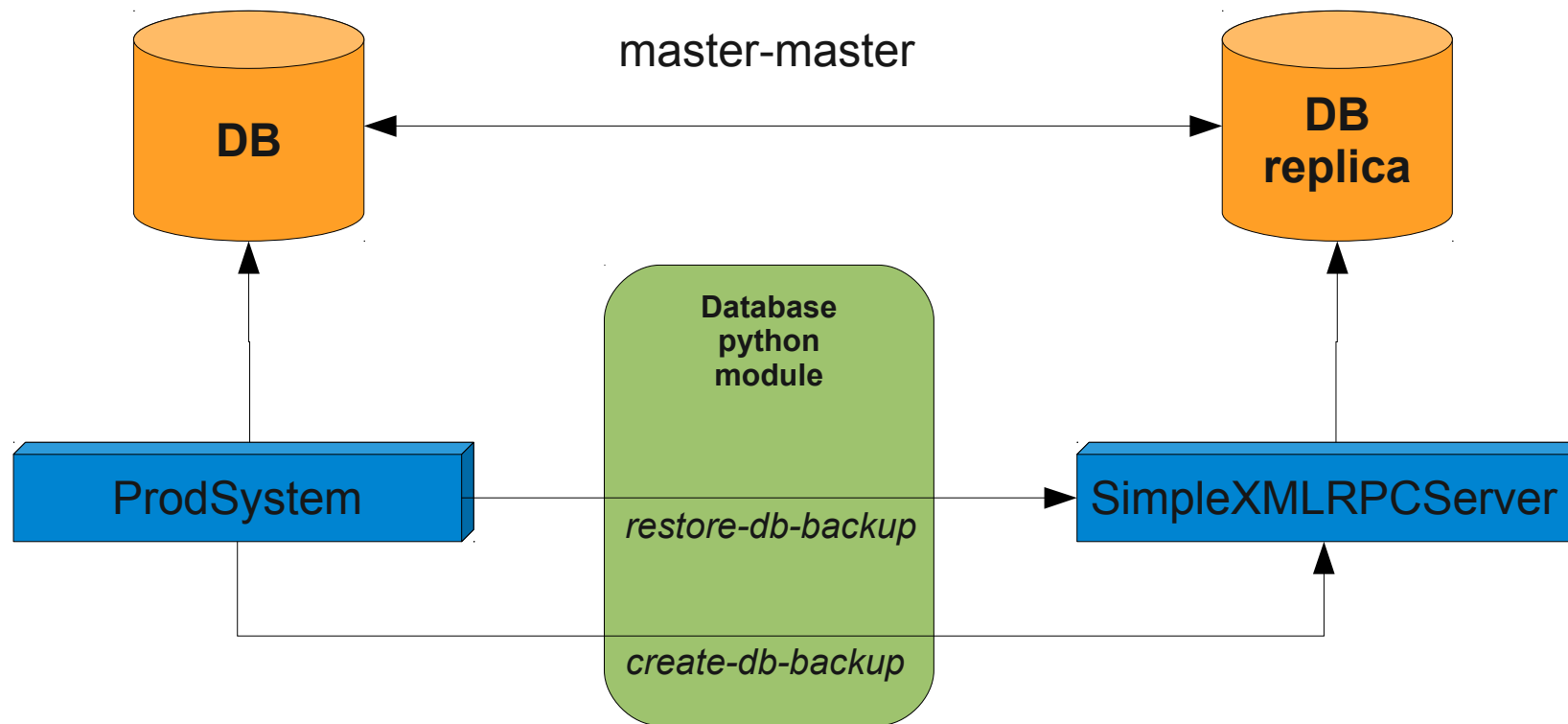
Current implementation



- Central DB used for bookkeeping also serves as Data-Catalog
- Production managed by multi-threaded Python-daemon
- Ganga used as job-submission interface
- DB backup provided by master-master replication scenario



New: DB Replication



master-master replication setup based on:
“LCTPC Conditions Database Handbook” (R. Diener)



- Production system ready
- Initial tests successful
- More testing needed (350 GeV ?)
- DB replication recently added for extra level of data redundancy
- Still missing: web interface
- Integration with DIRAC