

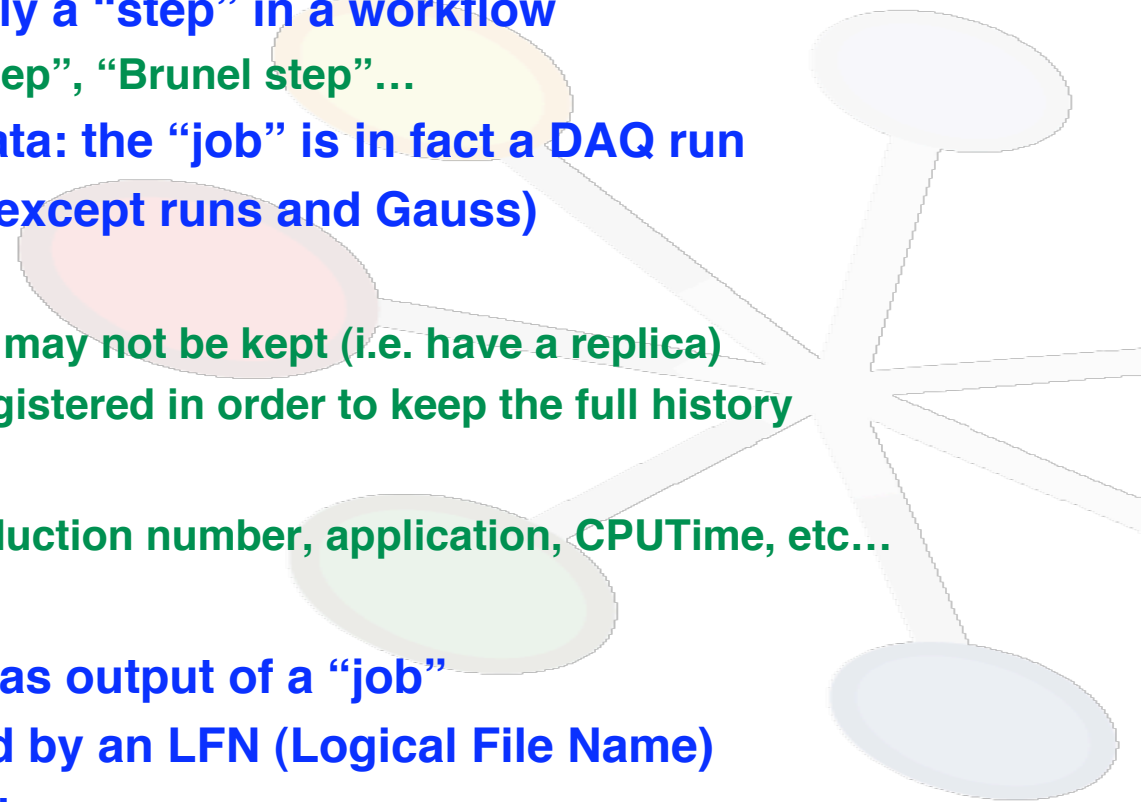


Bookkeeping Tutorial





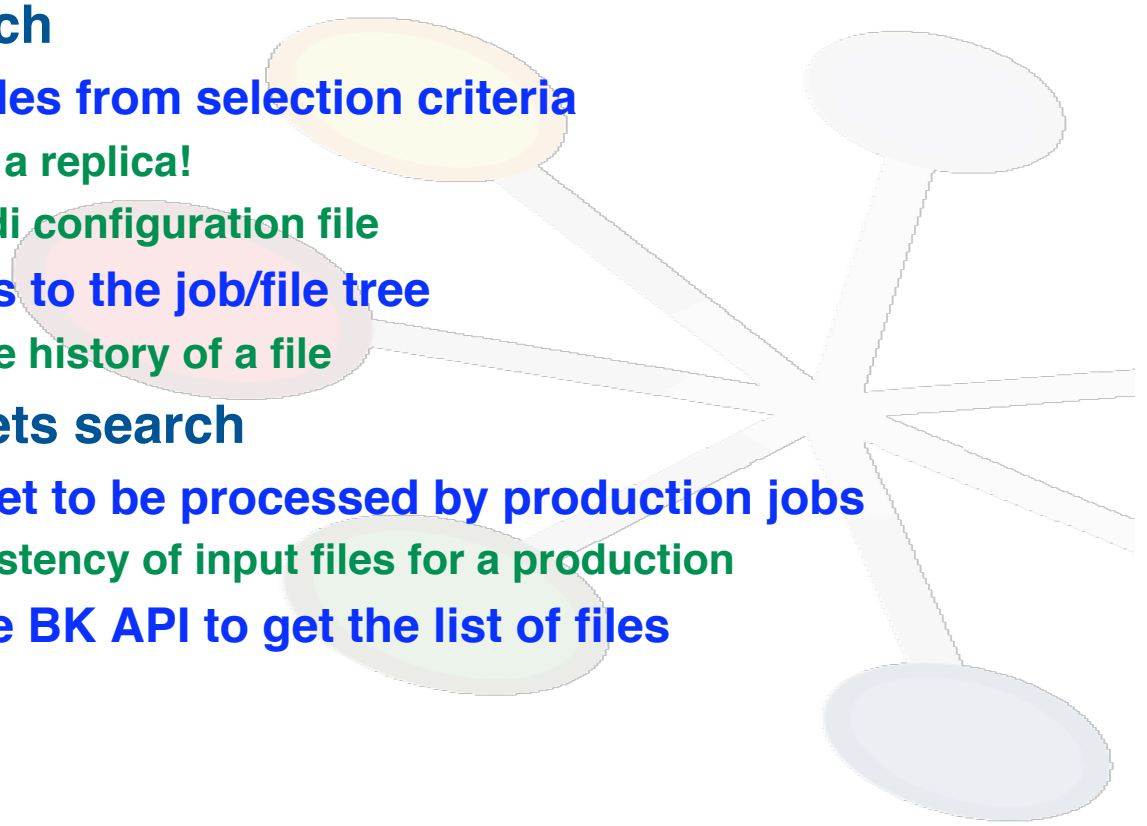
- Contains records of all “jobs” and all “files” that are created by production jobs
- Job:
 - In fact technically a “step” in a workflow
 - ☆ E.g. “Gauss step”, “Brunel step”...
 - For real RAW data: the “job” is in fact a DAQ run
 - Has input files (except runs and Gauss)
 - Has output files
 - ☆ Note that files may not be kept (i.e. have a replica)
 - ☆ All files are registered in order to keep the full history
 - Has metadata
 - ☆ Location, production number, application, CPUTime, etc...
- Files:
 - Always defined as output of a “job”
 - Files are defined by an LFN (Logical File Name)
 - Contain metadata
 - ☆ Number of events, size, event type, etc...





Bookkeeping purpose

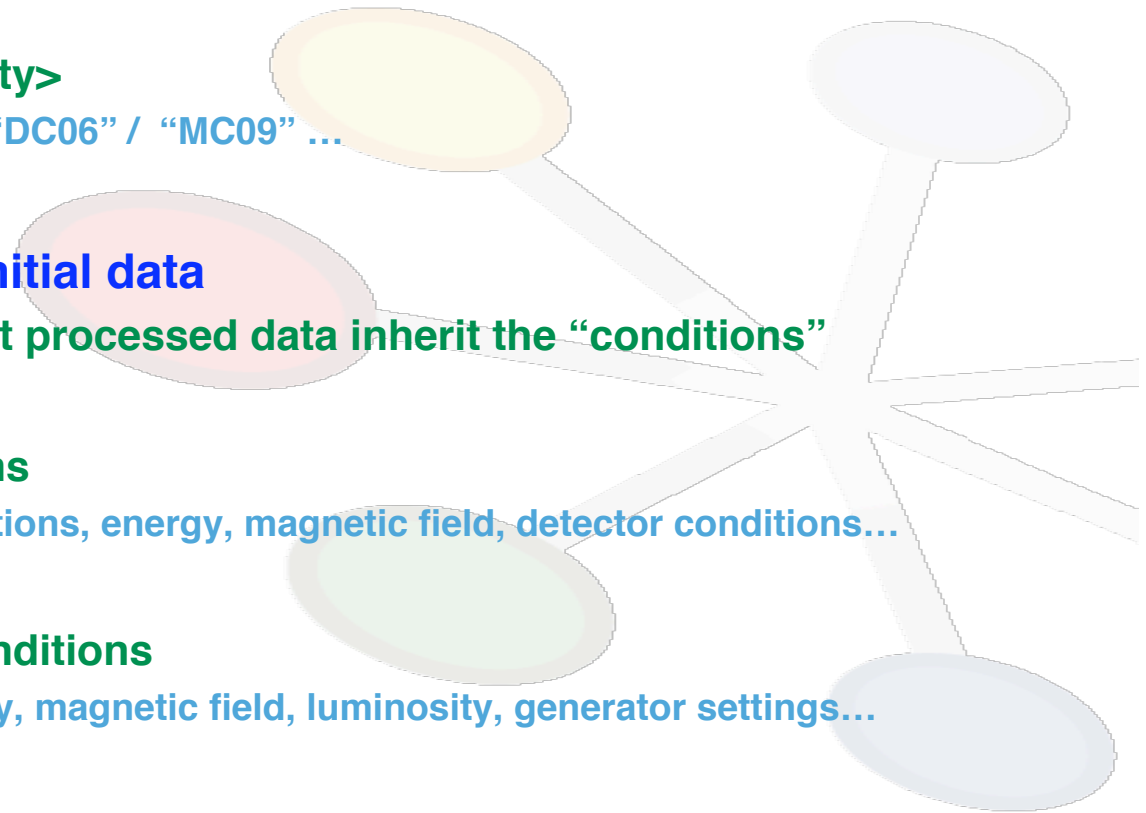
- **Provenance database**
 - **Contains the full history of productions**
 - ☆ **Traceability of datasets**
- **User dataset search**
 - **Select a list of files from selection criteria**
 - ☆ **Only files with a replica!**
 - ☆ **Generate Gaudi configuration file**
 - **Give also access to the job/file tree**
 - ☆ **E.g. investigate history of a file**
- **Production datasets search**
 - **Select the dataset to be processed by production jobs**
 - ☆ **Ensures consistency of input files for a production**
 - **Uses directly the BK API to get the list of files**





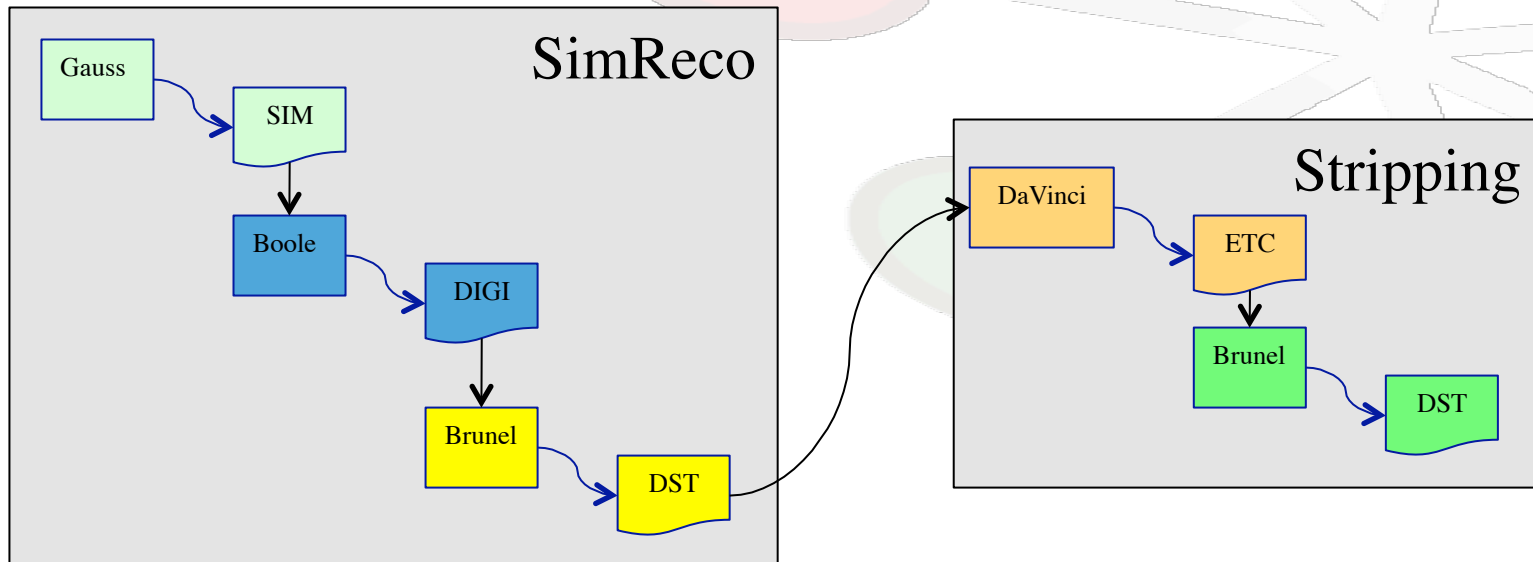
Bookkeeping partitioning

- **Configuration Name / version**
 - **Real data**
 - ☆ **<DAQ partition> / <activity>**
 - **Simulated data**
 - ☆ **“MC” / <activity>**
 - ✧ **<activity> : “DC06” / “MC09” ...**
- **Conditions**
 - **Parameters of initial data**
 - ☆ **All subsequent processed data inherit the “conditions”**
 - **Real data**
 - ☆ **DAQ conditions**
 - ✧ **Beam conditions, energy, magnetic field, detector conditions...**
 - **Simulated data**
 - ☆ **Simulation conditions**
 - ✧ **Beam energy, magnetic field, luminosity, generator settings...**





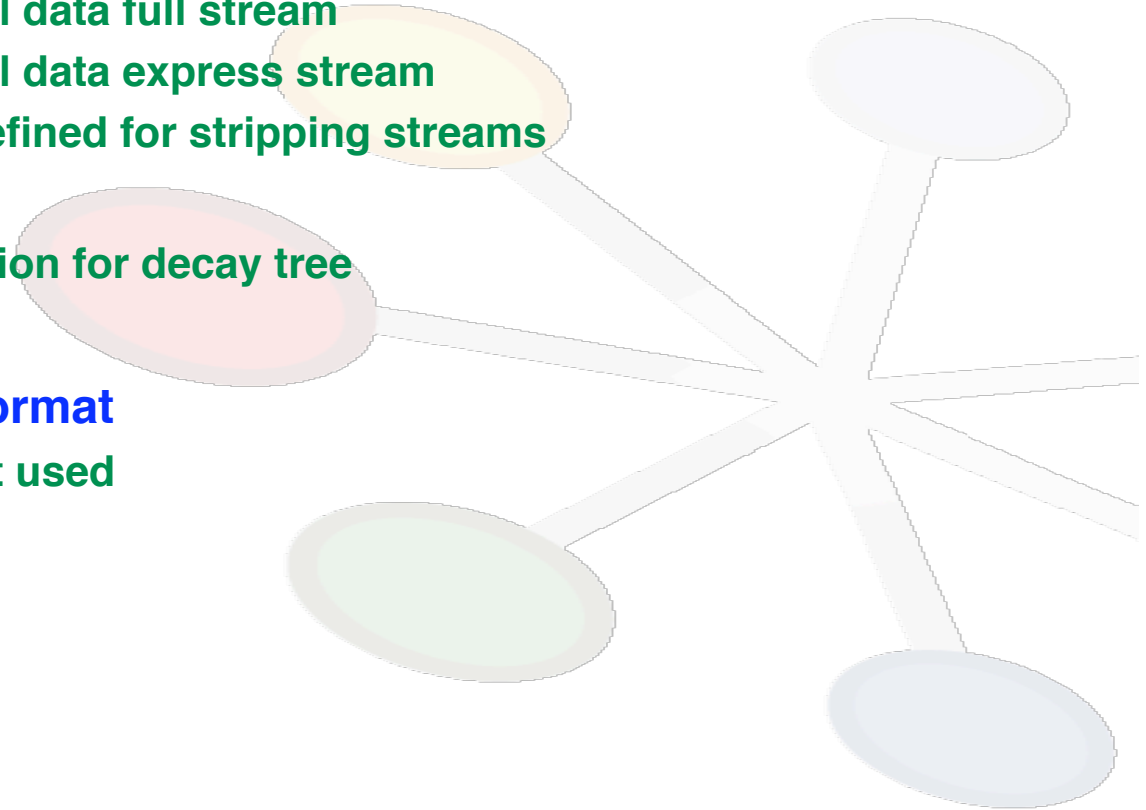
- **Associated to a level of processing**
 - **Within a given partition (config name / version + conditions)**
 - **Corresponds to the whole processing workflow**
 - ☆ **Single workflow for a given processing pass**
 - ☆ **Compatible versions of applications**
 - **Specifies the processing pass of input data when applicable**
 - ☆ **Sequence of processing**
 - **Re-processing creates branches**





Other query parameters

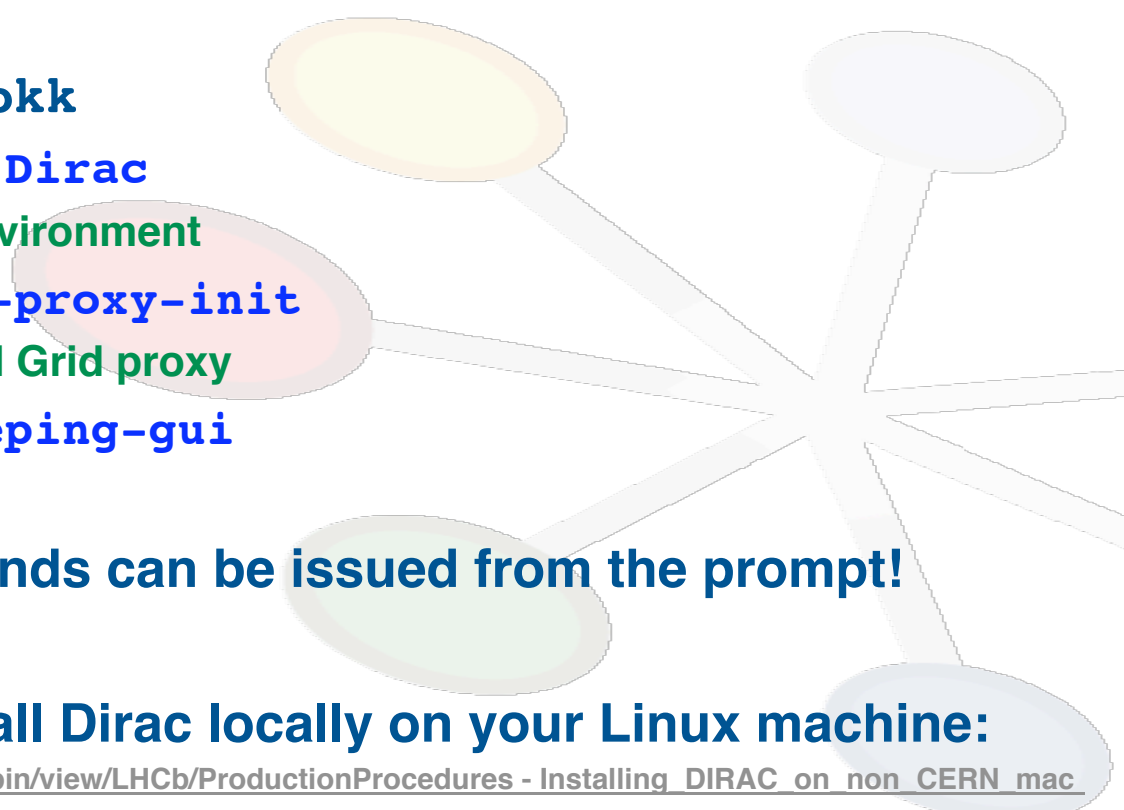
- **Event type**
 - **File property**
 - **Real data**
 - ☆ 90000000 : real data full stream
 - ☆ 90000001 : real data express stream
 - ☆ Types to be defined for stripping streams
 - **Simulated data**
 - ☆ LHCb convention for decay tree
- **File type**
 - **Data content / format**
 - ☆ Format not yet used





Running the bookkeeping GUI

- Needs a valid Grid certificate
 - <https://twiki.cern.ch/twiki/bin/view/LHCb/FAQ/Certificate>
- Needs an X server
- On lxplus: lhcb-bkk
 - SetupProject Dirac
 - ☆ Sets up the environment
 - If needed: lhcb-proxy-init
 - ☆ Creates a valid Grid proxy
 - dirac-bookkeeping-gui
- Individual commands can be issued from the prompt!
- You can also install Dirac locally on your Linux machine:
 - <https://twiki.cern.ch/twiki/bin/view/LHCb/ProductionProcedures - Installing DIRAC on non CERN mac>





The query tree

The image displays two screenshots of the 'Feicim - LHCb Bookkeeping browser' application, illustrating the 'query tree' structure.

Left Screenshot: The 'Standard' view is selected. The 'Tree' pane shows a hierarchical structure starting with 'LHCb', 'Lhcb', and 'MC'. Under 'MC', there are 'Configuration versions' (2007, 2008, 2008-HT, 2008-LT, 2008-QGSP, 2009) and 'DC 06'. Under 'DC 06', there is 'Simulation Conditions/DataTaking', which is expanded to show a list of simulation configurations, including 'DC 06 simulation 2 10^32' (selected), 'DC 06 simulation 5 10^32', 'DC 06 - velotest', and various 'DC 06-450GeV-CloseVelo-BOff' and 'DC 06-450GeV-OpenVelo-BOff' configurations for Beam1, Beam2, and Collisions. A 'test' folder is also visible at the bottom.

Right Screenshot: The 'Standard' view is selected. The 'Tree' pane shows the same hierarchy as the left screenshot, but with 'DC 06 simulation 2 10^32' selected. This selection has expanded to show a 'Processing Pass' section, which includes a list of processing passes, such as 'DC 06-Sim', 'DC 06-Sim + DC 06-Reco_v30', 'DC 06-Sim + DC 06-Reco_v30 + DC 06-Stripping_v31', 'DC 06-Sim + DC 06-Reco_v30 + DC 06-Stripping_v31 + DC 06-Stripping_v30', 'DC 06-Sim + DC 06-Reco_v32', 'DC 06-Sim + DC 06-Recon-L0-v1-lumi2', 'DC 06-Sim-Reco_v30', 'DC 06-Sim-Reco_v30 + DC 06-Stripping_v31', 'DC 06-Sim-Reco_v31', 'DC 06-Sim-Reco_v31 + DC 06-Stripping_v31', 'DC 06 simulation 5 10^32', 'DC 06 - velotest', and 'DC 06-450GeV-CloseVelo-BOff - Beam1'.



More info

- Right click on
 - Conditions
 - Processing pass

Feicim Info dialog

Name	Value
SimulationCondition	61833
Simulation Description	Beam5TeV-VeloClosed-MagDown-Nu1
MagneticField	-1
Luminosity	nu = 1, bunch spacing > 50 nsec (no spillover)
Generator	Pythia
DetectorCond	VeloClosed
BeamEnergy	5 TeV
BeamCond	beta* = 2 m, crossingAngle = 329 microrad

Close

Feicim - Processing Pass Viewer

MC09-Sim02Reco02-withTruth

Pass1000403

Steps /	PassDescription	Groupdescription	Application Name	Application Version	
1 Step0	Pass1000403	MC09-Sim02Reco02-withTruth	Gauss	v37r1	\$APPCONFIGOPTS/Gauss/MC09
2 Step1	Pass1000403	MC09-Sim02Reco02-withTruth	Boole	v18r1	\$APPCONFIGOPTS/Boole/MC09
3 Step2	Pass1000403	MC09-Sim02Reco02-withTruth	Brunel	v34r7	\$APPCONFIGOPTS/Brunel/MC09
4 Step3	Pass1000403	MC09-Sim02Reco02-withTruth	LHCB	v26r3	\$STDOPTS/PoolCopy.opts
5 Step4	Pass1000403	MC09-Sim02Reco02-withTruth	None		

Description

Total Processing pass MC09-Sim02Reco02-withTruth

Close



Event type and file type

Feicim - LHCb Bookkeeping browser

File

☒ Standard ☐ Advanced Queries

Tree	Description
12573011	Bu_DOK,Kmunu=DecProdCut
12873001	Bu_D0munu,Kpi=cocktail,D0muInAcc
File types	
DIGI	
DST	
Nb of Files/Events	5253/2611059
SIM	
12912001	Bu_smumu=DecProdCut
12912010	Bu_DOX,Kpi
12961000	Bu_Dst+X,incl
12962600	Bu_DstOX,Kpi
13102003	Bs_K+K-=CPV
File types	
DIGI	
DST	
Nb of Files/Events	2578/1281320
SIM	
13102013	Bs_pi+K-=CPV,DecProdCut
13102021	Bs_pi+pi-=DecProdCut
13102031	Bs_pp=DecProdCut
13102201	Bs_phigamma=DecProdCut
13104001	Bs_Kst0Kst0=DecProdCut
13104011	Bs_phiphi=DecProdCut
13112001	Bs_mumu=DecProdCut
13112011	Bs_emu=DecProdCut
13114001	Bs_phimumu=DecProdCut



Dataset selection

Logical File name

Feicim FileDialog

	FileName	EventStat	FileSize	Cr
1	/lhcb/MC/MC09/DST/00004827/0000/00004827_00000290_1.dst	39911	4684928728	
2	/lhcb/MC/MC09/DST/00004827/0000/00004827_00000289_1.dst	39900	4755255110	
3	/lhcb/MC/MC09/DST/00004827/0000/00004827_00000288_1.dst	39914	4774600587	
4	/lhcb/MC/MC09/DST/00004827/0000/00004827_00000287_1.dst	39911	4742196165	
5	/lhcb/MC/MC09/DST/00004827/0000/00004827_00000286_1.dst	39933	4761118641	
6	/lhcb/MC/MC09/DST/00004827/0000/00004827_00000285_1.dst	39922	4708299720	
7	/lhcb/MC/MC09/DST/00004827/0000/00004827_00000284_1.dst	39922	4788205003	
8	/lhcb/MC/MC09/DST/00004827/0000/00004827_00000283_1.dst	39918	4686272835	
9	/lhcb/MC/MC09/DST/00004827/0000/00004827_00000282_1.dst	39923	4798157649	
10	/lhcb/MC/MC09/DST/00004827/0000/00004827_00000281_1.dst	39927	4754771791	
11	/lhcb/MC/MC09/DST/00004827/0000/00004827_00000280_1.dst	39909	4736107668	
12	/lhcb/MC/MC09/DST/00004827/0000/00004827_00000279_1.dst	39915	4688764149	
13	/lhcb/MC/MC09/DST/00004827/0000/00004827_00000277_1.dst	39913	4728069619	
14	/lhcb/MC/MC09/DST/00004827/0000/00004827_00000276_1.dst	39915	4777781394	
15	/lhcb/MC/MC09/DST/00004827/0000/00004827_00000275_1.dst	39910	4797463086	
16	/lhcb/MC/MC09/DST/00004827/0000/00004827_00000274_1.dst	39922	4734725858	
17	/lhcb/MC/MC09/DST/00004827/0000/00004827_00000273_1.dst	39908	4755204271	
18	/lhcb/MC/MC09/DST/00004827/0000/00004827_00000272_1.dst	39916	4784914187	
19	/lhcb/MC/MC09/DST/00004827/0000/00004827_00000271_1.dst	39917	4791411266	
20	/lhcb/MC/MC09/DST/00004827/0000/00004827_00000270_1.dst	39928	4749839631	
21	/lhcb/MC/MC09/DST/00004827/0000/00004827_00000269_1.dst	39926	4753905490	
22	/lhcb/MC/MC09/DST/00004827/0000/00004827_00000268_1.dst	39920	4749794896	
23	/lhcb/MC/MC09/DST/00004827/0000/00004827_00000267_1.dst	39924	4751970250	

Next Page

Configuration Name: MC
Configuration Version: MC09
Simulation Conditions: 61833
Processing pass: i03Reco02-withTruth
Event Type: 30000000
File Type: DST
Production: ALL
Program Name and version: ALL - ALL

Statistics

Number Of Files: 255
Number Of Events: 10178796
Files size: 1207.99492184 GB

Selected

Number Of Files: 9
Number Of Events: 359282
Files size: 42.649767075 GB

Advanced Save... Save Files... Close



Limit number of files per page

The screenshot shows the Feicim LHCb Bookkeeping browser interface. A 'File dialog page size' dialog box is open, showing a 'Page size' of 20. The main window displays a tree view of data files and a table of file details.

Feicim FileDialog Table:

	FileName	Even
1	/lhcb/MC/MC09/DST/00004838/0000/00004838_00001328_1.dst	3989
2	/lhcb/MC/MC09/DST/00004838/0000/00004838_00001311_1.dst	3993
3	/lhcb/MC/MC09/DST/00004838/0000/00004838_00001121_1.dst	3991
4	/lhcb/MC/MC09/DST/00004838/0000/00004838_00001057_1.dst	3990
5	/lhcb/MC/MC09/DST/00004838/0000/00004838_00001056_1.dst	3991
6	/lhcb/MC/MC09/DST/00004838/0000/00004838_00001043_1.dst	3992
7	/lhcb/MC/MC09/DST/00004838/0000/00004838_00001008_1.dst	3991
8	/lhcb/MC/MC09/DST/00004838/0000/00004838_00000985_1.dst	3992
9	/lhcb/MC/MC09/DST/00004838/0000/00004838_00000809_1.dst	3991
10	/lhcb/MC/MC09/DST/00004838/0000/00004838_00000766_1.dst	3991
11	/lhcb/MC/MC09/DST/00004838/0000/00004838_00000692_1.dst	3990
12	/lhcb/MC/MC09/DST/00004838/0000/00004838_00000644_1.dst	3991
13	/lhcb/MC/MC09/DST/00004838/0000/00004838_00000643_1.dst	3992
14	/lhcb/MC/MC09/DST/00004838/0000/00004838_00000628_1.dst	3991
15	/lhcb/MC/MC09/DST/00004838/0000/00004838_00000500_1.dst	3992
16	/lhcb/MC/MC09/DST/00004838/0000/00004838_00000408_1.dst	3991
17	/lhcb/MC/MC09/DST/00004838/0000/00004838_00000188_1.dst	3991
18	/lhcb/MC/MC09/DST/00004838/0000/00004838_00000158_1.dst	3991
19	/lhcb/MC/MC09/DST/00004838/0000/00004838_00000054_1.dst	3992
20	/lhcb/MC/MC09/DST/00004838/0000/00004838_00000028_1.dst	3991

The 'Feicim FileDialog' window also shows configuration details on the right:

- Configuration Name: MC
- Configuration Version: MC09
- Simulation Conditions: 61833
- Processing pass: Reco02-withoutTruth
- Event Type: 30000000
- File Type: DST
- Production: ALL
- Program Name and version: ALL - ALL

Statistics section:

- Number Of Files: 20
- Number Of Events: 798307
- Files size: 22.57725815 GB

Selected section:

- Number Of Files: 0
- Number Of Events: 0
- Files size: 0 GB

Buttons: Advanced Save.., Save Files...

A black arrow points to the 'Next Page' button at the bottom of the file list.



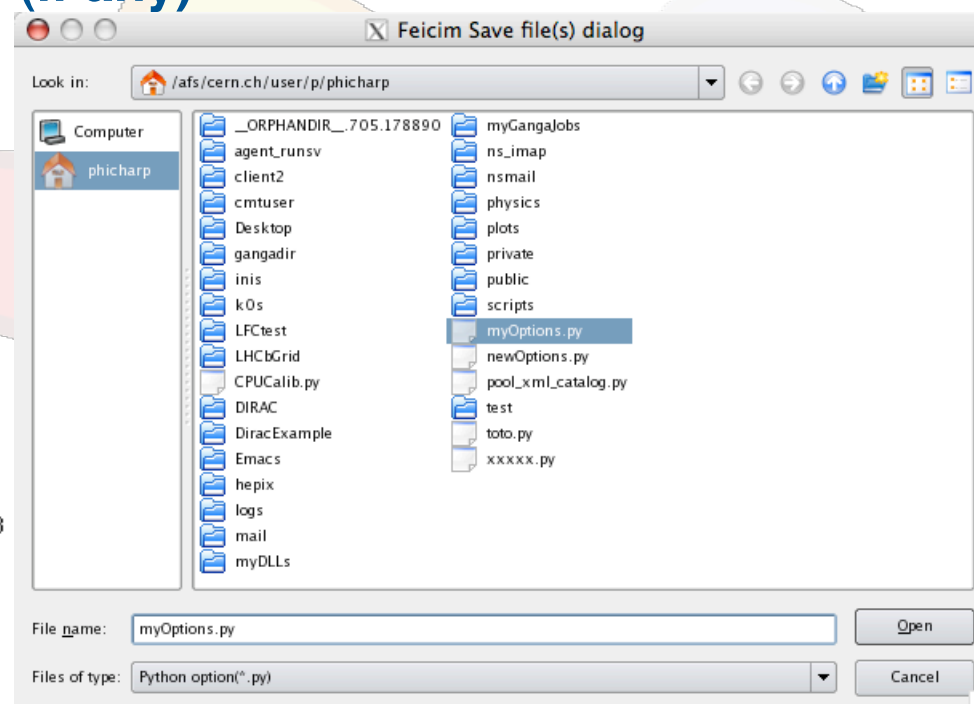
Saving configuration (a.k.a. options) file

- Python configuration (default)
 - Still possible to create .opts (discouraged!)
 - .txt file for just a list of LFNs
- All files or selected files (if any)

```
[lxplus209] ~ > more myOptions.py
#-- GAUDI jobOptions generated on Wed Dec 10 15:28:19 2008
#-- Contains event types :
#-- 10012000 - 4 files - 10429 events - 5.05 GBytes
```

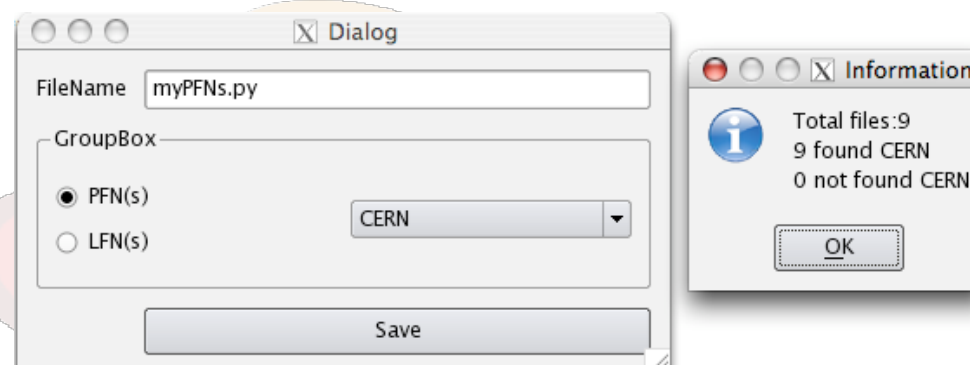
```
from Gaudi.Configuration import *
```

```
EventSelector().Input = [
"  DATAFILE='LFN:/lhcb/production/DC06/v1r0/00002069/DST/0000/00002069_00001592_2.dst' TYP='POOL_ROOTTREE' OPT='READ ''",
"  DATAFILE='LFN:/lhcb/production/DC06/v1r0/00002069/DST/0000/00002069_00001601_2.dst' TYP='POOL_ROOTTREE' OPT='READ ''",
"  DATAFILE='LFN:/lhcb/production/DC06/v1r0/00002069/DST/0000/00002069_00001608_2.dst' TYP='POOL_ROOTTREE' OPT='READ ''",
"  DATAFILE='LFN:/lhcb/production/DC06/v1r0/00002069/DST/0000/00002069_00001615_2.dst' TYP='POOL_ROOTTREE' OPT='READ ''"]
[lxplus209] ~ >
```





- Select files for a site (for local usage, not Grid job)
 - LFN+XML catalog
 - ☆ Next slide
 - PFN



```
[lxlplus230] ~ > more myPFNs.py
#-- GAUDI jobOptions generated on Mon Jun 15 13:49:54 2009
#-- Contains event types :
#-- 30000000 - 9 files - 359282 events - 42.65 GBytes
```

```
from Gaudi.Configuration import *
```

```
EventSelector().Input = [
  " DATAFILE='castor://castorlhcb.cern.ch:9002/?svcClass=lhcbdata&castorVersion=2&path=/castor/cern.ch/grid/lhcb/MC/MC09/DST/00004827/0000/00004827_00000277_1.dst' TYP='
POOL_ROOTTREE' OPT='READ'",
  " DATAFILE='castor://castorlhcb.cern.ch:9002/?svcClass=lhcbdata&castorVersion=2&path=/castor/cern.ch/grid/lhcb/MC/MC09/DST/00004827/0000/00004827_00000279_1.dst' TYP='
POOL_ROOTTREE' OPT='READ'",
  " DATAFILE='castor://castorlhcb.cern.ch:9002/?svcClass=lhcbdata&castorVersion=2&path=/castor/cern.ch/grid/lhcb/MC/MC09/DST/00004827/0000/00004827_00000280_1.dst' TYP='
POOL_ROOTTREE' OPT='READ'",
  " DATAFILE='castor://castorlhcb.cern.ch:9002/?svcClass=lhcbdata&castorVersion=2&path=/castor/cern.ch/grid/lhcb/MC/MC09/DST/00004827/0000/00004827_00000281_1.dst' TYP='
POOL_ROOTTREE' OPT='READ'",
  " DATAFILE='castor://castorlhcb.cern.ch:9002/?svcClass=lhcbdata&castorVersion=2&path=/castor/cern.ch/grid/lhcb/MC/MC09/DST/00004827/0000/00004827_00000282_1.dst' TYP='
POOL_ROOTTREE' OPT='READ'",
  " DATAFILE='castor://castorlhcb.cern.ch:9002/?svcClass=lhcbdata&castorVersion=2&path=/castor/cern.ch/grid/lhcb/MC/MC09/DST/00004827/0000/00004827_00000283_1.dst' TYP='
POOL_ROOTTREE' OPT='READ'",
  " DATAFILE='castor://castorlhcb.cern.ch:9002/?svcClass=lhcbdata&castorVersion=2&path=/castor/cern.ch/grid/lhcb/MC/MC09/DST/00004827/0000/00004827_00000284_1.dst' TYP='
POOL_ROOTTREE' OPT='READ'",
  " DATAFILE='castor://castorlhcb.cern.ch:9002/?svcClass=lhcbdata&castorVersion=2&path=/castor/cern.ch/grid/lhcb/MC/MC09/DST/00004827/0000/00004827_00000285_1.dst' TYP='
POOL_ROOTTREE' OPT='READ'",
  " DATAFILE='castor://castorlhcb.cern.ch:9002/?svcClass=lhcbdata&castorVersion=2&path=/castor/cern.ch/grid/lhcb/MC/MC09/DST/00004827/0000/00004827_00000286_1.dst' TYP='
POOL_ROOTTREE' OPT='READ'"]
```




Advanced saving (LFN)

○ LFNs + XML catalog

```
[lxplus230] ~ > more myLFNs.py
#-- GAUDI jobOptions generated on Mon Jun 15 14:01:39 2009
#-- Contains event types :
#-- 30000000 - 6 files - 239533 events - 28.52 GBytes
```

```
from Gaudi.Configuration import *
```

```
EventSelector().Input = [
" DATAFILE='LFN:/lhcb/MC/MC09/DST/00004827/0000/00004827_00000277_1.dst' TYP='POOL_ROOTTREE' OPT='READ'",
" DATAFILE='LFN:/lhcb/MC/MC09/DST/00004827/0000/00004827_00000279_1.dst' TYP='POOL_ROOTTREE' OPT='READ'",
" DATAFILE='LFN:/lhcb/MC/MC09/DST/00004827/0000/00004827_00000281_1.dst' TYP='POOL_ROOTTREE' OPT='READ'",
" DATAFILE='LFN:/lhcb/MC/MC09/DST/00004827/0000/00004827_00000282_1.dst' TYP='POOL_ROOTTREE' OPT='READ'",
" DATAFILE='LFN:/lhcb/MC/MC09/DST/00004827/0000/00004827_00000284_1.dst' TYP='POOL_ROOTTREE' OPT='READ'",
" DATAFILE='LFN:/lhcb/MC/MC09/DST/00004827/0000/00004827_00000286_1.dst' TYP='POOL_ROOTTREE' OPT='READ'"]
```

```
FileCatalog().Catalogs = [ 'xmlcatalog_file:myLFNs.xml' ]
```

```
[lxplus230] ~ > more myLFNs.xml
```

```
<?xml version="1.0" encoding="UTF-8" standalone="no" ?>
```

```
<!-- Edited By PoolXMLCatalog.py -->
```

```
<!DOCTYPE POOLFILECATALOG SYSTEM "InMemory">
```

```
<POOLFILECATALOG>
```

```
  <File ID="D4EAAC12-4F52-DE11-B3D5-0030487E54B5">
```

```
    <physical>
```

```
      <pfn filetype="ROOT_All" name="castor://clhcbstager.ads.rl.ac.uk:9002/?svcClass=lhcbMdst&castorVersion=2&path=/castor/ads.rl.ac.uk/prod/
      /lhcb/MC/MC09/D
      ST/00004827/0000/00004827_00000284_1.dst"/>
```

```
    </physical>
```

```
    <logical>
```

```
      <lfn name="/lhcb/MC/MC09/DST/00004827/0000/00004827_00000284_1.dst"/>
```

```
    </logical>
```

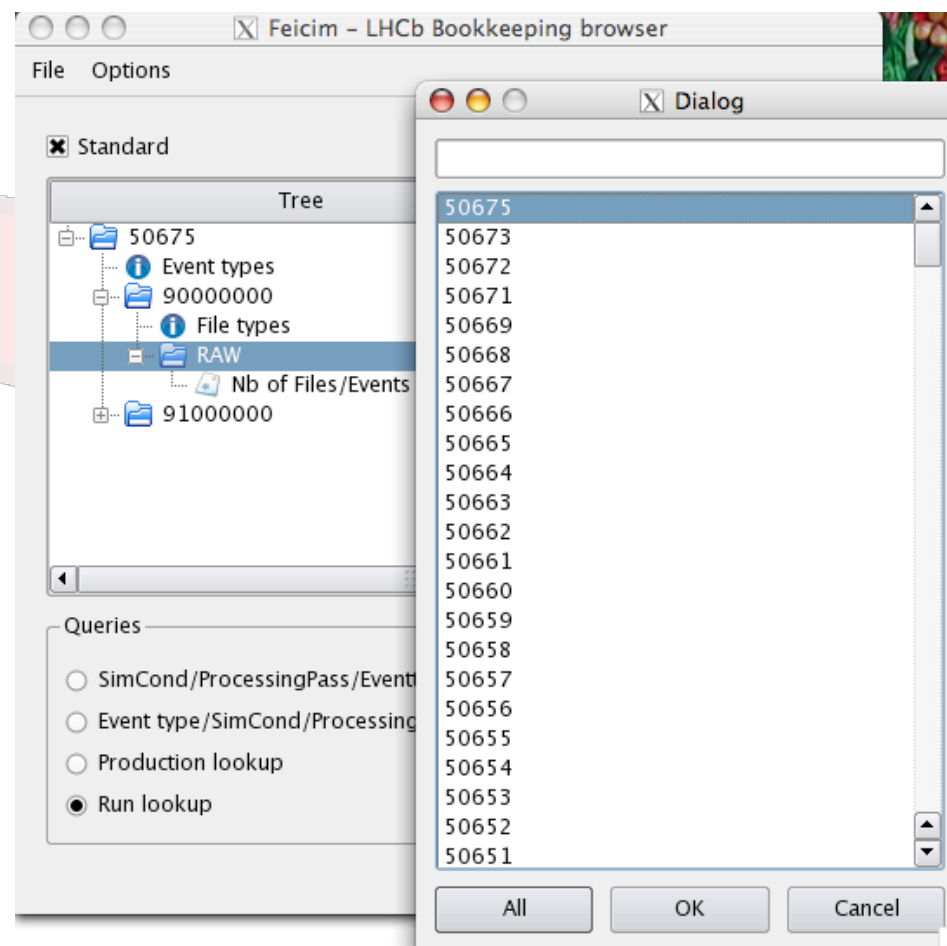
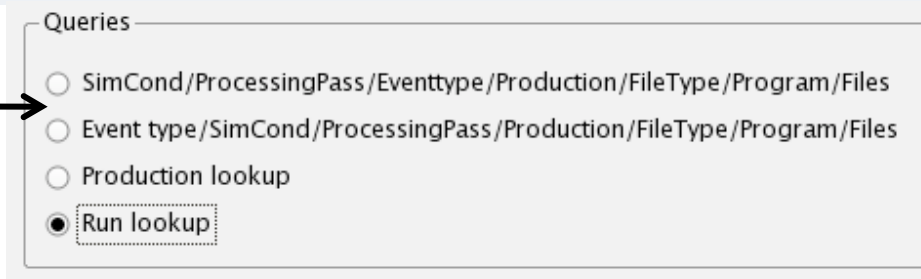
```
  </File>
```





Other queries

- **Select another “tree”**
 - Different order for the query
- **Production lookup**
 - If you are interested in a particular production number
- **Run lookup**
 - For real data (currently FEST)





Dealing with PFNs or XML catalogs

- **Using ganga + DIRAC**
 - **Bookkeeping integrated in ganga:**
 - ☆ `dataset = browseBK()`
 - **LFN handling is then automatic...**
- **genXMLCatalog**
 - **Same functionality as “Advanced save” of GUI**
 - **Ensures files are available on the specified site**
 - **Gets the PFN from the Storage Element**
 - ☆ **Not constructed “by hand”**

```
[lxplus209] ~ > genXMLCatalog --help
Usage: genXMLCatalog <options> <config-files>
Options:
  -s, --site <site>: site name (default=CERN)
  -d, --depth <depth>: depths for ancestors in BK (default=1)
  -f, -p, --catalog <catalog-name>: XML file catalog name (default=./pool_xml_catalog.xml)
  -n, --newoptions <config-file>: generate a new config file (no catalog is created)
  -o, --options <config-file>: python config file to be parsed (for backward compatibility)
  <config-files>: list of python config files
  -v: verbose output
```



DIRAC Monitoring web portal



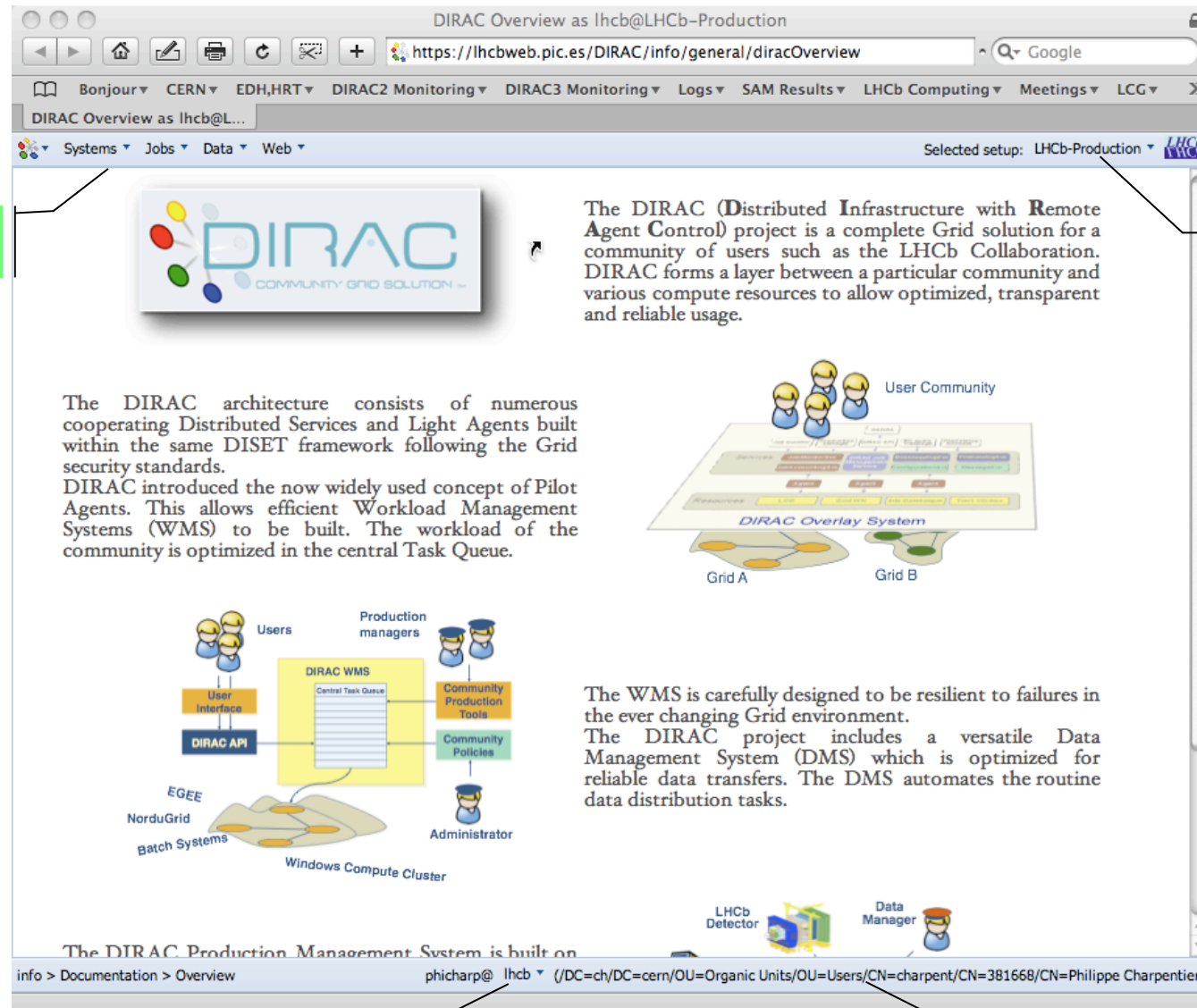


- **Entry point to the DIRAC web portal**
 - <http://dirac.cern.ch>
- **Web implementation of (almost) a full desktop application**
 - Monitoring of productions / jobs
 - Accounting (jobs, data management)
 - Allows to take actions on jobs
- **Authentication / authorisation is mandatory**
 - Anonymous access gives minimal information
 - Get a certificate and load it in our in your browser
<https://twiki.cern.ch/twiki/bin/view/LHCb/FAQ/Certificate>
 - **DIRAC authorisation through “DIRAC groups”**
 - ☆ Default: lhcb_user
 - ☆ Other groups: lhcb_prod, dirac_admin...
 - ☆ Future: specific groups per physics groups, PPG (for production authorisation)...
 - ☆ Capabilities depends on the group



The DIRAC portal home page

Menus



The screenshot shows the DIRAC portal home page in a web browser. The browser title is "DIRAC Overview as lhcb@LHCb-Production". The address bar shows the URL "https://lhcbweb.pic.es/DIRAC/info/general/diracOverview". The page has a navigation bar with links: Bonjour, CERN, EDH,HRT, DIRAC2 Monitoring, DIRAC3 Monitoring, Logs, SAM Results, LHCb Computing, Meetings, LCG. Below the navigation bar, there are tabs for Systems, Jobs, Data, and Web. The main content area features the DIRAC logo, a description of the project, and two diagrams. The first diagram, titled "The DIRAC architecture", shows a hierarchy from User Community to DIRAC Overlay System to Grid A and Grid B. The second diagram, titled "The DIRAC Production Management System", shows a flow from Users and Production managers through the DIRAC WMS (Central Task Queue) to various grid systems (EGEE, NorduGrid, Batch Systems, Windows Compute Cluster) and an Administrator. The footer contains links for info, documentation, and overview, along with a user identity string: "phicharp@lhcb (/DC=ch/DC=cern/OU=Organic Units/OU=Users/CN=charpent/CN=381668/CN=Philippe Charpentier)".

DIRAC Overview as lhcb@LHCb-Production

https://lhcbweb.pic.es/DIRAC/info/general/diracOverview

Bonjour CERN EDH,HRT DIRAC2 Monitoring DIRAC3 Monitoring Logs SAM Results LHCb Computing Meetings LCG

DIRAC Overview as lhcb@L...

Systems Jobs Data Web Selected setup: LHCb-Production

DIRAC
COMMUNITY GRID SOLUTION

The DIRAC (Distributed Infrastructure with Remote Agent Control) project is a complete Grid solution for a community of users such as the LHCb Collaboration. DIRAC forms a layer between a particular community and various compute resources to allow optimized, transparent and reliable usage.

The DIRAC architecture consists of numerous cooperating Distributed Services and Light Agents built within the same DISET framework following the Grid security standards. DIRAC introduced the now widely used concept of Pilot Agents. This allows efficient Workload Management Systems (WMS) to be built. The workload of the community is optimized in the central Task Queue.

User Community

DIRAC Overlay System

Grid A Grid B

Users Production managers

DIRAC WMS

Central Task Queue

Community Production Tools

Community Policies

Administrator

EGEE NorduGrid Batch Systems Windows Compute Cluster

The WMS is carefully designed to be resilient to failures in the ever changing Grid environment. The DIRAC project includes a versatile Data Management System (DMS) which is optimized for reliable data transfers. The DMS automates the routine data distribution tasks.

LHCb Detector Data Manager

The DIRAC Production Management System is built on

info > Documentation > Overview phicharp@lhcb (/DC=ch/DC=cern/OU=Organic Units/OU=Users/CN=charpent/CN=381668/CN=Philippe Charpentier)

DIRAC instance

DIRAC group

Identity



Job Monitoring

Monitoring info

Actions

Jobs monitoring as lhcb_prod@LHCb-Production

https://lhcbweb.pic.es/DIRAC/LHCb-Production/lhcb_prod/jobs/JobMonitor/display

Bonjour CERN EDH,HRT DIRAC2 Monitoring DIRAC3 Monitoring Logs SAM Results LHCb Computing Meetings LCG Voyages,banque Cinemas

Jobs monitoring as lhcb_pr...

Systems Jobs Data Web Selected setup: LHCb-Production

JobMonitoring

Select All Select None Reschedule Kill Delete

JobId	Status	MinorStatus	ApplicationStatus	Site	JobName	LastUpdate [UTC]	LastSignOfLife [...]	SubmissionTim...	Owner
<input type="checkbox"/> 1843543	Done	Execution Com...	diracJobMain.p...	LCG.CNAF.it	{Ganga_Root_(...	2009-03-06 21:21	2009-03-06 21:21	2009-03-06 21:20	wreece
<input type="checkbox"/> 1843542	Done	Execution Com...	diracJobMain.p...	LCG.CNAF-T2.it	{Ganga_Root_(...	2009-03-06 21:21	2009-03-06 21:21	2009-03-06 21:20	wreece
<input type="checkbox"/> 1843541	Stalled	Application	Initializing Gaudi...	LCG.CNAF.it	{Ganga_DaVinc...	2009-03-06 23:29	2009-03-06 21:20	2009-03-06 21:19	wreece
<input type="checkbox"/> 1843539	Done	Execution Com...	Executing RunS...	LCG.CNAF.it	OverSizedOutb...	2009-03-06 21:18	2009-03-06 21:18	2009-03-06 21:15	wreece
<input type="checkbox"/> 1843538	Done	Execution Com...	Executing RunS...	LCG.NIKHEF.nl	OutputData_{...	2009-03-06 21:14	2009-03-06 21:14	2009-03-06 21:12	wreece
<input type="checkbox"/> 1843537	Done	Execution Com...	Executing RunS...	LCG.NIKHEF.nl	{Ganga_Execut...	2009-03-06 21:11	2009-03-06 21:11	2009-03-06 21:10	wreece
<input type="checkbox"/> 1843536	Done	Execution Com...	Executing RunS...	LCG.CNAF-T2.it	{Ganga_Execut...	2009-03-06 21:08	2009-03-06 21:08	2009-03-06 21:07	wreece
<input type="checkbox"/> 1843535	Done	Execution Com...	Executing RunS...	LCG.CNAF.it	{Ganga_Execut...	2009-03-06 21:08	2009-03-06 21:08	2009-03-06 21:07	wreece
<input type="checkbox"/> 1843534	Done	Execution Com...	diracJobMain.p...	LCG.CNAF-T2.it	{Ganga_Root_(...	2009-03-06 21:06	2009-03-06 21:06	2009-03-06 21:04	wreece
<input type="checkbox"/> 1843533	Done	Execution Com...	diracJobMain.p...	LCG.CNAF-T2.it	{Ganga_Root_(...	2009-03-06 21:00	2009-03-06 21:00	2009-03-06 20:58	wreece
<input type="checkbox"/> 1843532	Done	Execution Com...	Executing RunS...	LCG.CNAF.it	{Ganga_Execut...	2009-03-06 20:59	2009-03-06 20:59	2009-03-06 20:58	wreece
<input type="checkbox"/> 1842339	Done	Execution Com...	Executing RunS...	LCG.GRIDKA.de	{Ganga_Execut...	2009-03-06 17:15	2009-03-06 17:15	2009-03-06 17:15	wreece
<input type="checkbox"/> 1842335	Failed	Application Finis...	Initializing Gaudi...	LCG.GRIDKA.de	{Ganga_DaVinc...	2009-03-06 17:19	2009-03-06 17:19	2009-03-06 17:01	wreece
<input type="checkbox"/> 1842334	Stalled	Application	Initializing Gaudi...	LCG.IN2P3.fr	{Ganga_DaVinc...	2009-03-06 19:29	2009-03-06 17:02	2009-03-06 17:01	wreece
<input type="checkbox"/> 1842325	Done	Execution Com...	diracJobMain.p...	LCG.CERN.ch	{Ganga_Root_(...	2009-03-06 16:48	2009-03-06 16:48	2009-03-06 16:45	wreece
<input type="checkbox"/> 1842324	Done	Execution Com...	diracJobMain.p...	LCG.BHAM-HE...	{Ganga_Root_(...	2009-03-06 16:49	2009-03-06 16:49	2009-03-06 16:44	wreece
<input type="checkbox"/> 1842320	Done	Execution Com...	Executing RunS...	LCG.CBPF.br	OverSizedOutb...	2009-03-06 16:42	2009-03-06 16:42	2009-03-06 16:35	wreece
<input type="checkbox"/> 1842319	Done	Execution Com...	Executing RunS...	LCG.Manchest...	OutputData_{...	2009-03-06 16:33	2009-03-06 16:33	2009-03-06 16:31	wreece
<input type="checkbox"/> 1842318	Done	Execution Com...	Executing RunS...	LCG.RAL-HEP.uk	{Ganga_Execut...	2009-03-06 16:30	2009-03-06 16:30	2009-03-06 16:29	wreece
<input type="checkbox"/> 1842317	Done	Execution Com...	Executing RunS...	LCG.ITPA.it	{Ganga_Execut...	2009-03-06 16:28	2009-03-06 16:28	2009-03-06 16:25	wreece

Submit Reset

Global Sort +

Current Statistics +

Global Statistics +

Page 4 of 9 Items displaying per page: 25

Displaying 76 - 100 of 207

jobs > Job monitor

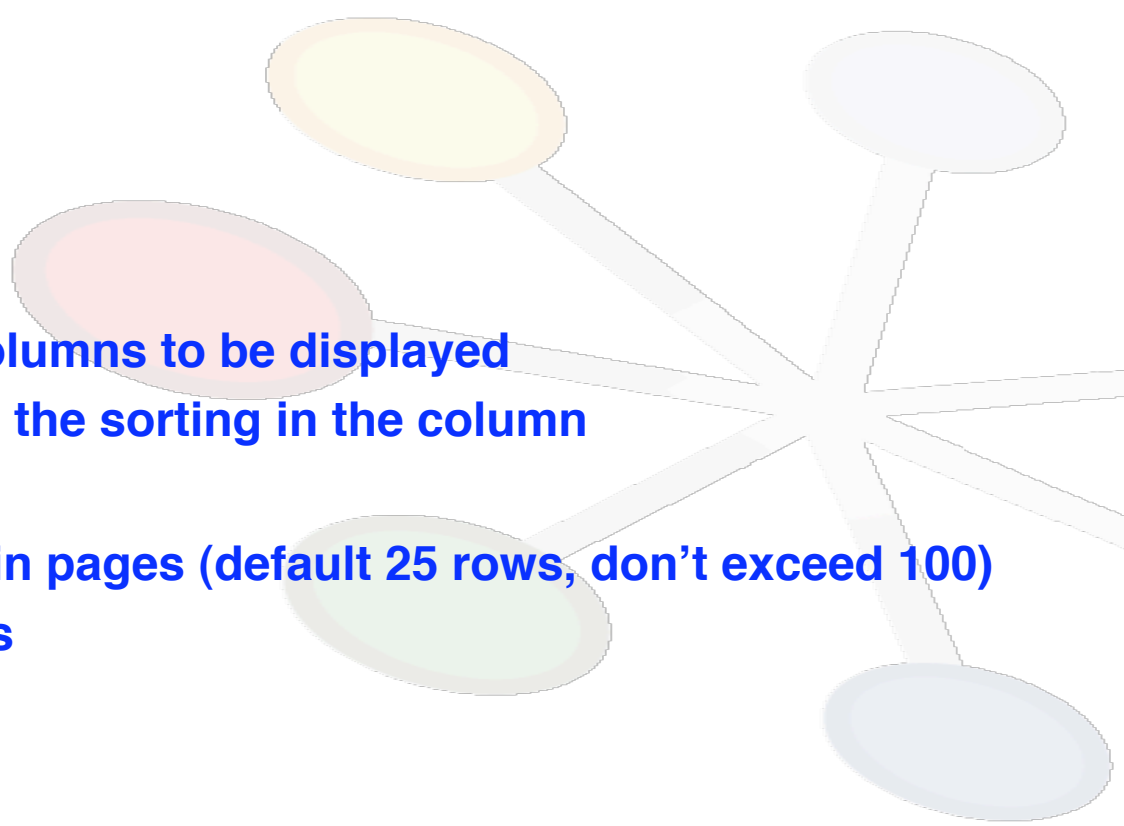
phicharp@ lhcb_prod (/DC=ch/DC=cern/OU=Organic Units/OU=Users/CN=charpent/CN=381668/CN=Philippe Charpentier)

Selection





- **Selection**
 - For group `lhcb_user`, only see your own jobs
 - Can select with
 - ☆ **Status**
 - ☆ **Site**
 - ☆ **Date**
 - ☆ ...
- **Columns**
 - Can tailor the columns to be displayed
 - Clicking toggles the sorting in the column
- **Rows**
 - Jobs displayed in pages (default 25 rows, don't exceed 100)
 - Can scroll pages





Logging info

<input type="checkbox"/>	1843539		Done	Execution Com...	Executing
<input type="checkbox"/>	1843538		Done	Execution Com...	Executing
<input type="checkbox"/>	1843537		Do	JDL	ecuting
<input type="checkbox"/>	1843536		Do	Attributes	ecuting
<input type="checkbox"/>	1843535		Do	Parameters	ecuting
<input type="checkbox"/>	1843534		Do	Logging info	acJobM
<input type="checkbox"/>	1843533		Do	Peek StandardOutput	acJobM
<input type="checkbox"/>	1843532		Do	Get LogFile	ecuting
<input type="checkbox"/>	1842339		Do	Get PendingReq	
<input type="checkbox"/>	1842335		Fail	Get StagerRepo	
<input type="checkbox"/>	1842334		Sta	Get SandBox file	
<input type="checkbox"/>	1842325		Do	Actions	
<input type="checkbox"/>	1842324		Do	Pilot	
<input type="checkbox"/>	1842320		Do	Show value	
<input type="checkbox"/>	1842319		Do		

Logging info for JobID: 1843538 Executing RunS... LCG.CNAF.it OverSizedOutb... 2009-03-06

Source	Status	MinorStatus	ApplicationStatus	DateTime
JobManager	Received	Job accepted	Unknown	Fri Mar 06 2009 21:12:21 ...
JobPath	Received	False	Unknown	Fri Mar 06 2009 21:12:23 ...
JobSanity	Checking	JobSanity	Unknown	Fri Mar 06 2009 21:12:23 ...
JobScheduling	Checking	JobScheduling	Unknown	Fri Mar 06 2009 21:12:23 ...
TaskQueue	Waiting	Pilot Agent Submission	Unknown	Fri Mar 06 2009 21:12:23 ...
Matcher	Matched	Assigned	Unknown	Fri Mar 06 2009 21:12:26 ...
JobAgent	Matched	Job Received by Agent	Unknown	Fri Mar 06 2009 21:12:27 ...
JobAgent	Matched	Installing Software	Unknown	Fri Mar 06 2009 21:12:30 ...
JobWrapper	Running	Downloading InputSan...	Unknown	Fri Mar 06 2009 21:12:32 ...
JobWrapper	Running	Application	Unknown	Fri Mar 06 2009 21:12:35 ...
Job_1843538	Running	Application	Executing RunScriptSt...	Fri Mar 06 2009 21:12:38 ...
JobWrapper	Completed	Application Finished Su...	Executing RunScriptSt...	Fri Mar 06 2009 21:12:44 ...
JobWrapper	Done	Execution Complete	Executing RunScriptSt...	Fri Mar 06 2009 21:14:17 ...



Output peeking

<input type="checkbox"/>	1843539		Done	Execution Com...	Executing
<input type="checkbox"/>	1843538		Done	Execution Com...	Executing
<input type="checkbox"/>	1843537		Do	JDL	ecuting
<input type="checkbox"/>	1843536		Do	Attributes	ecuting
<input type="checkbox"/>	1843535		Do	Parameters	ecuting
<input type="checkbox"/>	1843534		Do	Logging info	acJobM
<input type="checkbox"/>	1843533		Do	Peek StandardOutput	acJobM
<input type="checkbox"/>	1843532		Do	Get LogFile	ecuting
<input type="checkbox"/>	1842339		Do	Get PendingRequest	ecuting
<input type="checkbox"/>	1842335		Fai	Get StagerReport	ializing
<input type="checkbox"/>	1842334		Sta	Get SandBox file	ializing
<input type="checkbox"/>	1842325		D		
<input type="checkbox"/>	1842324		D		
<input type="checkbox"/>	1842320		D		
<input type="checkbox"/>	1842319		D		

Standard output for JobID: 1843538

```
=====
Last 20 lines of application output from JobWrapper on Fri Mar  6 21:12:44 2009 [UTC]:
CPU Total for job is 00:00:01 (h:m:s)
=====
2009-03-06 21:12:37 UTC dirac-jobexec.py  INFO: JobID: 1843538
2009-03-06 21:12:37 UTC dirac-jobexec.py  INFO: PYTHONPATH:
2009-03-06 21:12:37 UTC dirac-jobexec.py  INFO: ['/tmp/jobdir/1269523.stro.nikhef.nl/https_3a_2f_2fwms2
2009-03-06 21:12:37 UTC dirac-jobexec.py  INFO: DIRAC JobID 1843538 is running at site LCG.NIKHEF.nl
Executing StepInstance RunScriptStep1 of type ScriptStep1 ['ScriptStep1']
StepInstance creating module instance  ScriptStep1 of type Script
2009-03-06 21:12:39 UTC Script/Script      INFO: Script Module Instance Name: diracJobMainpy
2009-03-06 21:12:39 UTC Script/Script      INFO: Command is: /tmp/jobdir/1269523.stro.nikhef.nl/https_3a_2f_
2009-03-06 21:12:39 UTC Script/Script      INFO: diracJobMain.py execution completed with status 0
2009-03-06 21:12:39 UTC Script/Script      INFO: Output written to Script1_GangaExecutable.log, execution com
```




Attributes

<input type="checkbox"/>	1843539		Done	Execution Com...	Executing
<input type="checkbox"/>	1843538		Done	Execution Com...	Executing
<input type="checkbox"/>	1843537		Do	JDL	ecuting
<input type="checkbox"/>	1843536		Do	Attributes	ecuting
<input type="checkbox"/>	1843535		Do	Parameters	ecuting
<input type="checkbox"/>	1843534		Do	Logging info	acJobM
<input type="checkbox"/>	1843533		Do	Peek StandardOutput	acJobM
<input type="checkbox"/>	1843532		Do	Get LogFile	ecuting
<input type="checkbox"/>	1842339		Do	Get PendingRequest	ecuting
<input type="checkbox"/>	1842335		Fai	Get StagerReport	ializing
<input type="checkbox"/>	1842334		Sta	Get SandBox file	ializing
<input type="checkbox"/>	1842325		Do	Actions	acJobM
<input type="checkbox"/>	1842324		Do	Pilot	acJobM
<input type="checkbox"/>	1842320		Do		ecuting
<input type="checkbox"/>	1842319		Do	Show value	ecuting

Attributes for JobID: 1843538	
Name	Value
SystemPriority	0
ApplicationNumStatus	0
EndExecTime	2009-03-06 21:12:44
JobID	1843538
VerifiedFlag	True
RetrievedFlag	True
Status	Done
StartExecTime	None
RescheduleCounter	0
JobSplitType	Single
MinorStatus	Execution Complete
ApplicationStatus	Executing RunScriptStep1
SubmissionTime	2009-03-06 21:12:21
JobType	user
MasterJobID	0
KilledFlag	False
RescheduleTime	None
DIRACSetup	LHCb-Production
FailedFlag	False
CPUTime	0.0
OwnerDN	/DC=ch/DC=cern/OU=Organic Unit...
JobGroup	lhcb
JobName	OutputData_{Ganga_Executable_...
AccountedFlag	False
LastUpdateTime	2009-03-06 21:14:18



Parameters

<input type="checkbox"/>	1843539		Done	Execution Com...	Executing
<input type="checkbox"/>	1843538		Done	Execution Com...	Executing
<input type="checkbox"/>	1843537		Do	JDL	ecuting
<input type="checkbox"/>	1843536		Do	Attributes	ecuting
<input type="checkbox"/>	1843535		Do	Parameters	
<input type="checkbox"/>	1843534		Do	Logging info	
<input type="checkbox"/>	1843533		Do	Peek StandardOutput	
<input type="checkbox"/>	1843532		Do	Get LogFile	
<input type="checkbox"/>	1842339		Do	Get PendingRequest	
<input type="checkbox"/>	1842335		Fai	Get StagerReport	
<input type="checkbox"/>	1842334		Sta	Get SandBox file	
<input type="checkbox"/>	1842325		Do	Actions	
<input type="checkbox"/>	1842324		Do	Pilot	
<input type="checkbox"/>	1842320		Do		
<input type="checkbox"/>	1842319		Do	Show value	

Parameters for JobID: 1843538	
Name	Value
CacheSize(kB)	6144KB
AgentCompatiblePlatforms	slc4_ia32_gcc34
LocalBatchID	dc1843538
UploadedOutputData	/lhcb/user/w/wreece/1843/1843538/output.txt
LocalAccount	lhcbpi01
JobSanityCheck	Job: 1843538 JDL: OK,InputData: No input LFNs,
ModelName	Intel(R)Xeon(R)CPUE5420@2.50GHz
HostName	wn-val-004.farm.nikhef.nl
CPUScalingFactor	0.0
CPU(MHz)	2500.637
Pilot_Reference	https://wms216.cern.ch:9000/xEG5WQ6VTxE4y...
OK	1
TotalCPUTime(s)	1.73
PilotAgent	DIRAC version v4r9 build 0
OutputSandbox	MissingFiles: _output_sandbox.tgz, GangaExecut...
MatcherServiceTime	0.530229091644
Memory(kB)	4176148kB
AgentLocalSE	NIKHEF-RAW,NIKHEF-DST,NIKHEF_M-DST,NL...
JobPath	JobPath,JobSanity,JobScheduling,TaskQueue
LocalJobID	1269523.stro.nikhef.nl



Job statistics

JobMonitoring << ☒ Select All ☐ Select None

Selections +

Global Sort +

Current Statistics -

Status	Numbers
<input type="checkbox"/> Checking	-
<input checked="" type="checkbox"/> Comple...	-
<input checked="" type="checkbox"/> Done	440
<input checked="" type="checkbox"/> Failed	10
<input type="checkbox"/> Killed	5
<input checked="" type="checkbox"/> Matched	-
<input type="checkbox"/> Received	-
<input checked="" type="checkbox"/> Running	-
<input type="checkbox"/> Staging	-
<input type="checkbox"/> Stalled	42
<input checked="" type="checkbox"/> Waiting	-

JobId	Status	MinorS
<input type="checkbox"/> 2658778	<input checked="" type="checkbox"/> Done	Execut
<input type="checkbox"/> 2658775	<input checked="" type="checkbox"/> Failed	Job has
<input type="checkbox"/> 2658771	<input checked="" type="checkbox"/> Done	Execut
<input type="checkbox"/> 2658766	<input checked="" type="checkbox"/> Done	Execut
<input type="checkbox"/> 2658763	<input checked="" type="checkbox"/> Done	Execut
<input type="checkbox"/> 2658751	<input checked="" type="checkbox"/> Done	Execut
<input type="checkbox"/> 2658741	<input checked="" type="checkbox"/> Done	Execut
<input type="checkbox"/> 2658737	<input checked="" type="checkbox"/> Done	Execut
<input type="checkbox"/> 2658734	<input type="checkbox"/> Stalled	Applica
<input type="checkbox"/> 2658650	<input checked="" type="checkbox"/> Done	Execut
<input type="checkbox"/> 2658646	<input checked="" type="checkbox"/> Done	Execut
<input type="checkbox"/> 2658644	<input checked="" type="checkbox"/> Done	Execut
<input type="checkbox"/> 2658643	<input checked="" type="checkbox"/> Done	Execut
<input type="checkbox"/> 2658642	<input type="checkbox"/> Stalled	Applica

JobMonitoring << ☐ Select All ☐ Select None

Selections +

Global Sort +

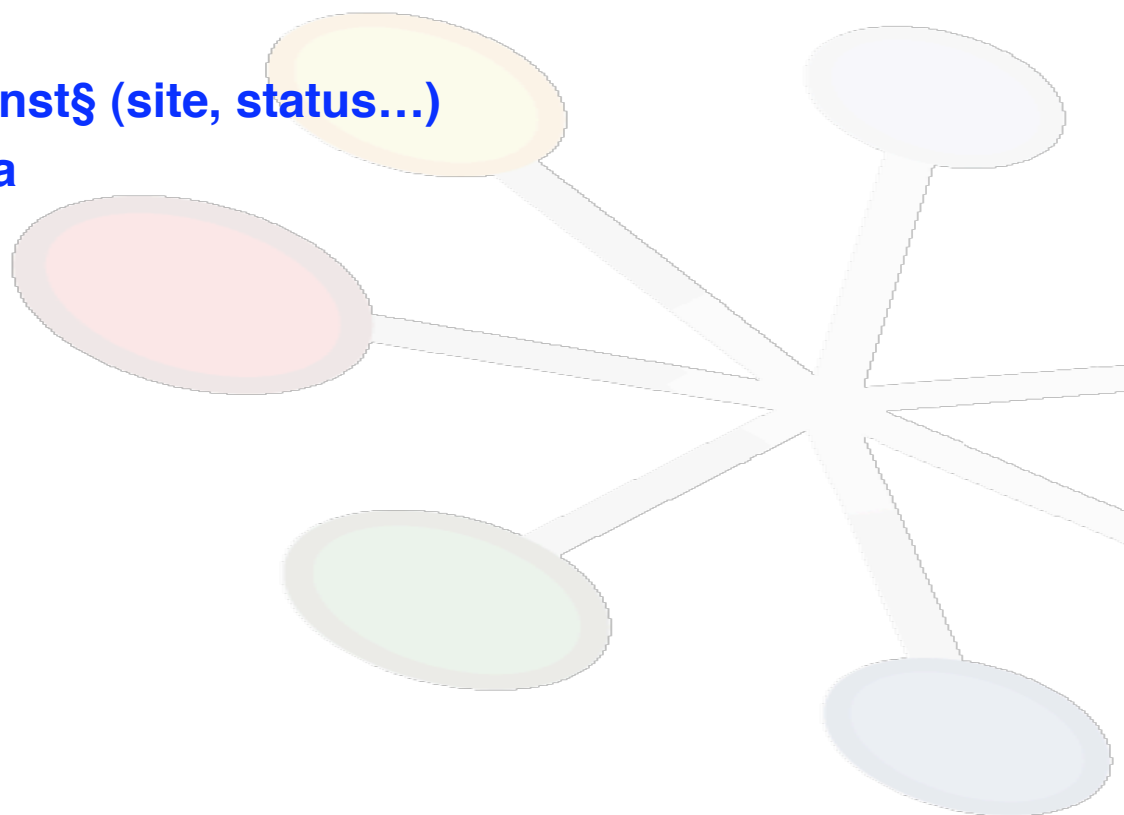
Current Statistics +

Global Statistics -

Status	Numbers
<input type="checkbox"/> Checking	5
<input checked="" type="checkbox"/> Comple...	59825
<input checked="" type="checkbox"/> Done	234105
<input checked="" type="checkbox"/> Failed	17102
<input type="checkbox"/> Killed	587
<input checked="" type="checkbox"/> Matched	312
<input type="checkbox"/> Received	4
<input checked="" type="checkbox"/> Running	6273
<input type="checkbox"/> Staging	289
<input type="checkbox"/> Stalled	5300
<input checked="" type="checkbox"/> Waiting	594

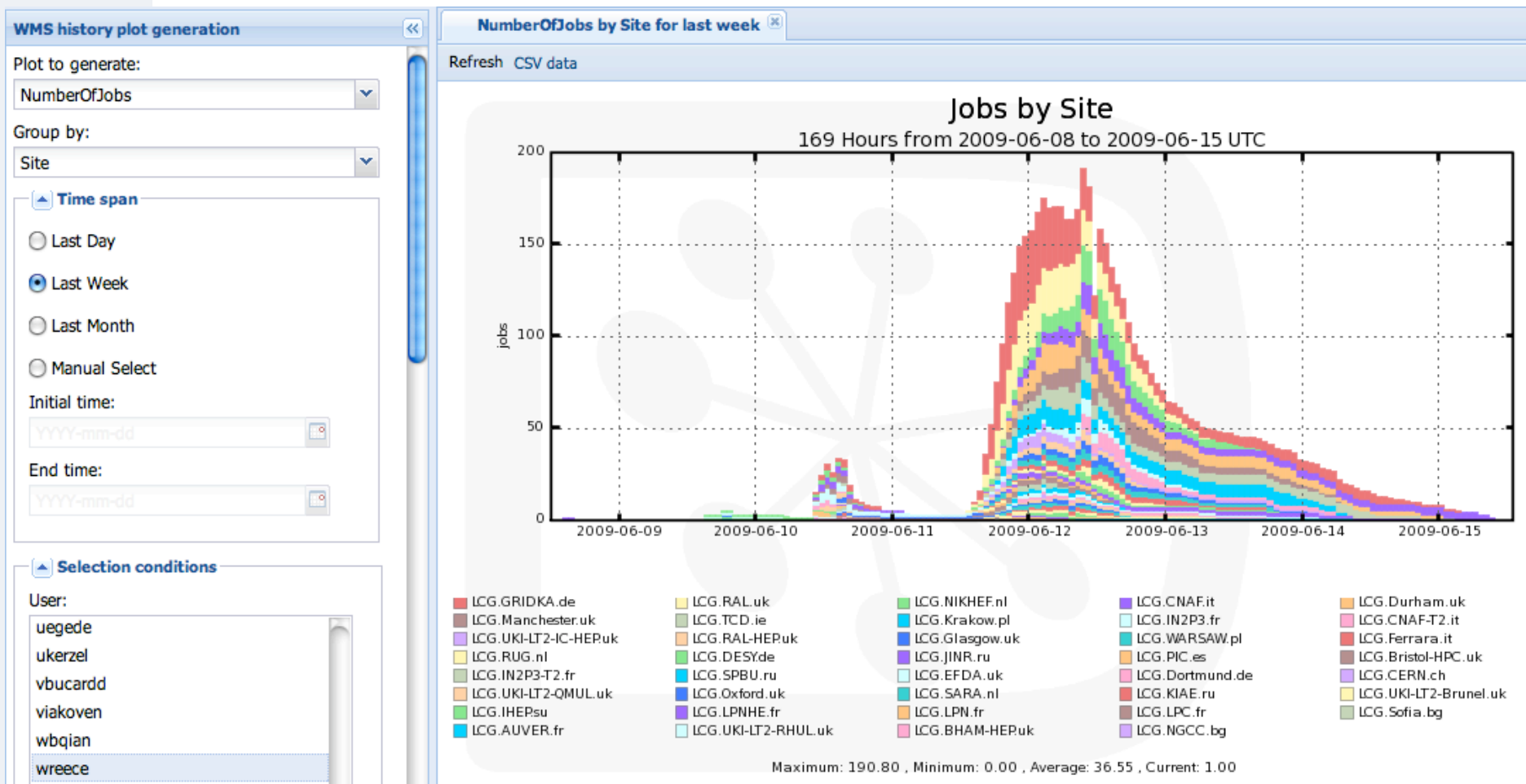


- Gives you access to your jobs
- Select parameters:
 - Plot
 - Time range
 - Item to plot against\$ (site, status...)
 - Selection criteria
 - ☆ Site
 - ☆ (Final) Status



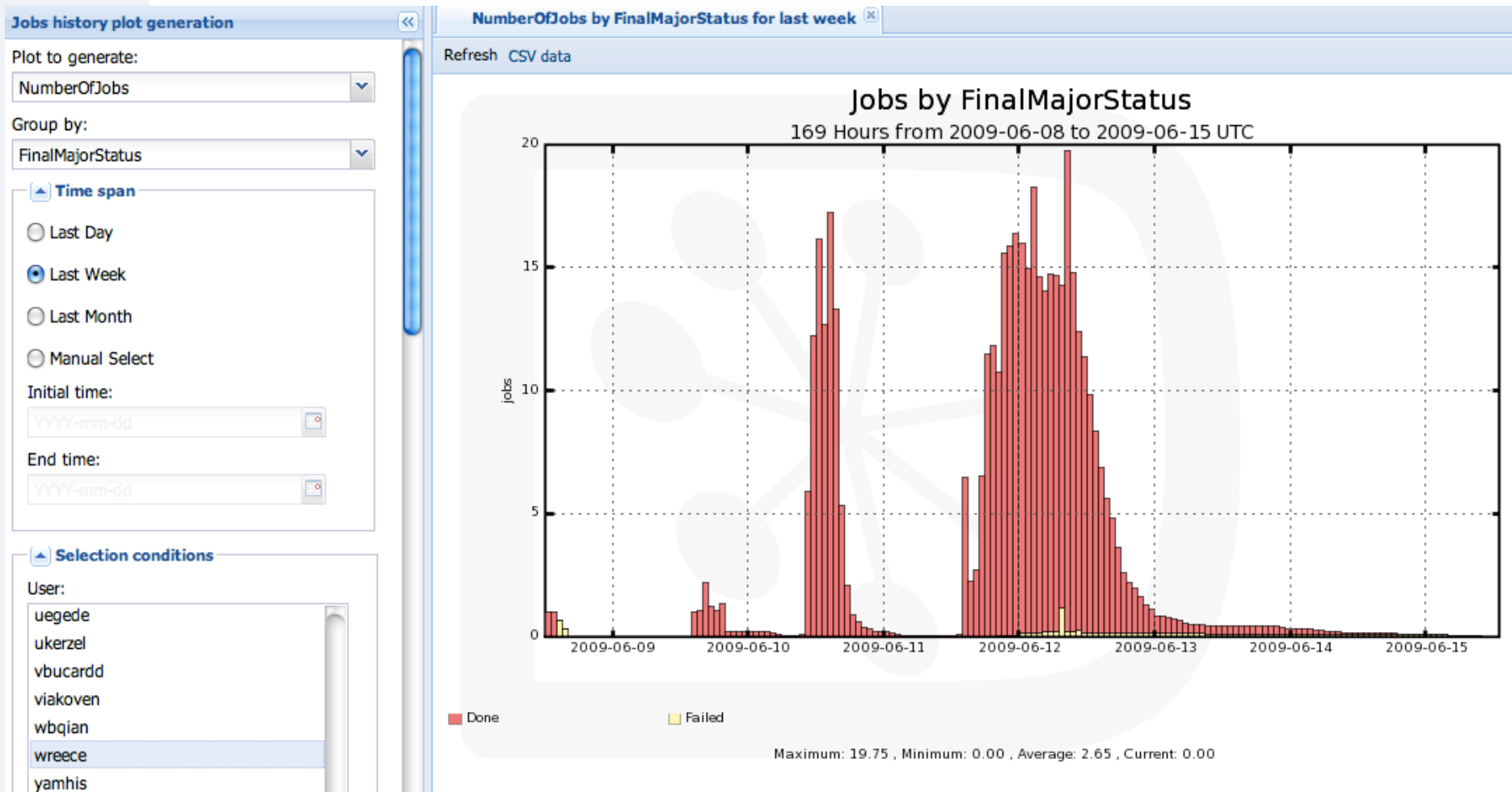


Accounting screenshots





Accounting (cont'd)





Job CPU efficiency

