Feasability Study

DIRAC 4 NA62

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What we have now

NA62 MC Production Rounds

This list is dynamically created from the information stored in the GridJobs database. The full MC production schedule can be found here. Production rounds must be entered by hand in the DB and uniquely identified by a tag.

Jobs | Files | Production | Misc | Scripter | Refresh | Show all | Expand

Tag	Description	Runs	Files	Total size
Kch2emnumumu-1	Production round, 500k events decay type 140, $K^+ \rightarrow e^- \upsilon \mu^+ \mu^+$ (Kch2emnumumu) **Progress:** 114% **Destination directory**: /castor/cern.ch/grid/na62/mc/prod/r261/Kch2emnumumu **Date interval:** 16 May, 2013 21:14 - November 11, 2013 16:40 **Run numbers:** 23680 - 23825 **Cumulated runtime:** 439 hours **Job success rate*:** 64%	145	93	0.06 TB
Kch2mumnuee-1	Production round, 500k events decay type 141, $K^+ \rightarrow \mu^- \upsilon e^+ e^+$ (Kch2mumnuee)	138	115	0.09 TB
Kch2munumumu-2	Production round, 500k events decay type 103, $K^+ \rightarrow \mu^+ \upsilon \mu^+ \mu^-$ (Kch2munumumu) **Progress:** 109% **Destination directory**: /castor/cern.ch/grid/na62/mc/prod/r261/Kch2munumumu **Date interval:** 16 May, 2013 10:35 - May 17, 2013 07:11 **Run numbers:** 23421 - 23580 **Cumulated runtime:** 112 hours **Job success rate*:** 78%	119	93	0.03 TB
Kch2enumumu-2	Production round, 500k events decay type 102, $K^+ \rightarrow e^+ \upsilon \mu^+ \mu^-$ (Kch2enumumu)	119	83	0.06 TB
Kch2munuee-2	Production round, 500k events decay type 101, $K^+ \rightarrow \mu^+ \upsilon e^+ e^-$ (Kch2munuee)	167	89	0.09 TB
Kch2enuee-2	Production round, 500k events decay type 100, $K^+ \rightarrow e^+ \upsilon e^+ e^-$ (Kch2enuee)	220	152	0.12 TB
Kch2pim_mup_mup-1	Production round, 500k events decay type 134, $K^+ \rightarrow \pi^- \mu^+ \mu^+$ (Kch2pim_mup_mup)	127	105	0.07 TB
Kch2pim_ep_ep-1	Production round, 500k events decay type 133, $K^+ \rightarrow \pi^- e^+ e^+$ (Kch2pim_ep_ep)	291	267	0.36 TB
Kch2pim_mup_ep-1	Production round, 500k events decay type 132, $K^+ \rightarrow \pi^- \mu^+ e^+$ (Kch2pim_mup_ep)	405	404	0.48 TB
Kch2pip_mum_ep-1	Production round, 500k events decay type 131, $K^+ \rightarrow \pi^+ \mu^- e^+$ (Kch2pip_mum_ep)	208	158	0.16 TB
Kch2pip_mup_em-1	Production round, 500k events decay type 130, $K^+ \rightarrow \pi^+ \mu^+ e^-$ (Kch2pip_mup_em)	102	78	0.26 TB
~~Kch2munumumu-1~~	Production round, 500k events decay type 103, $K^+ \rightarrow \mu^+ \upsilon \mu^+ \mu^-$ (Kch2munumumu) Junk, due to a fatal bug in the 4-lepton decay generator	50	50	~~0.01 TB~~
Total: 2041 runs, 12246 hours of cumulated runtime***, 1637 data files, 1.71 TB of output data**				

* this success rate is defined as jobs done/submitted and counts killed jobs, failures due to configuration errors etc.
** excluding junk runs; *** this is approx. 122k HEPSPEC-hours assuming our average CPU has 10HEPSPEC06

NA62 gLite-based Grid Production System

Up and running since mid-2012, encompassing 5 UK sites and one Belgian. Used for the first production/ simulations round (Sep 2012 - May 2013): 28 decay channels, 22,675 runs, 19,469 files produced, 200,000 cumulated CPU hours, 29 TB of data on CASTOR.

Data produced was used for

Improving the detector geometry/acceptance, the digitisation and reconstruction software, refining the background studies and the trigger; fixing problems in our MC software.

Long term prospects

Some components will be outdated in the not so far future: support for WMS is shrinking within the Grid community, LFC is being phased out; new and more capable frameworks are available.

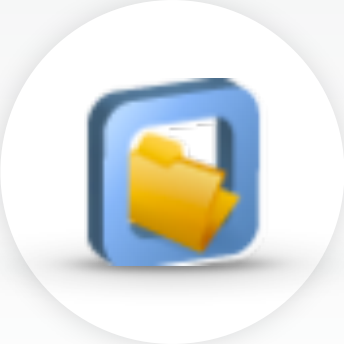
Components examined

Rucio

Is an ATLAS Distributed Data Management (DDM) system capable of managing large volumes of experiment, generated and derived data, and used to manage accounts, files, datasets and distributed storage systems.

PanDA

PanDA provides an integrated service architecture with late binding of jobs, maximal automation through layered services, tight binding with ATLAS DDM system, advanced error discovery and recovery procedures, etc.



CVMFS

A caching, http-based read-only filesystem optimised for delivering experiment software to (virtual) machines. Originally developed as part of the CernVM project, is potentially even more promising for physical worker nodes.

Ganga

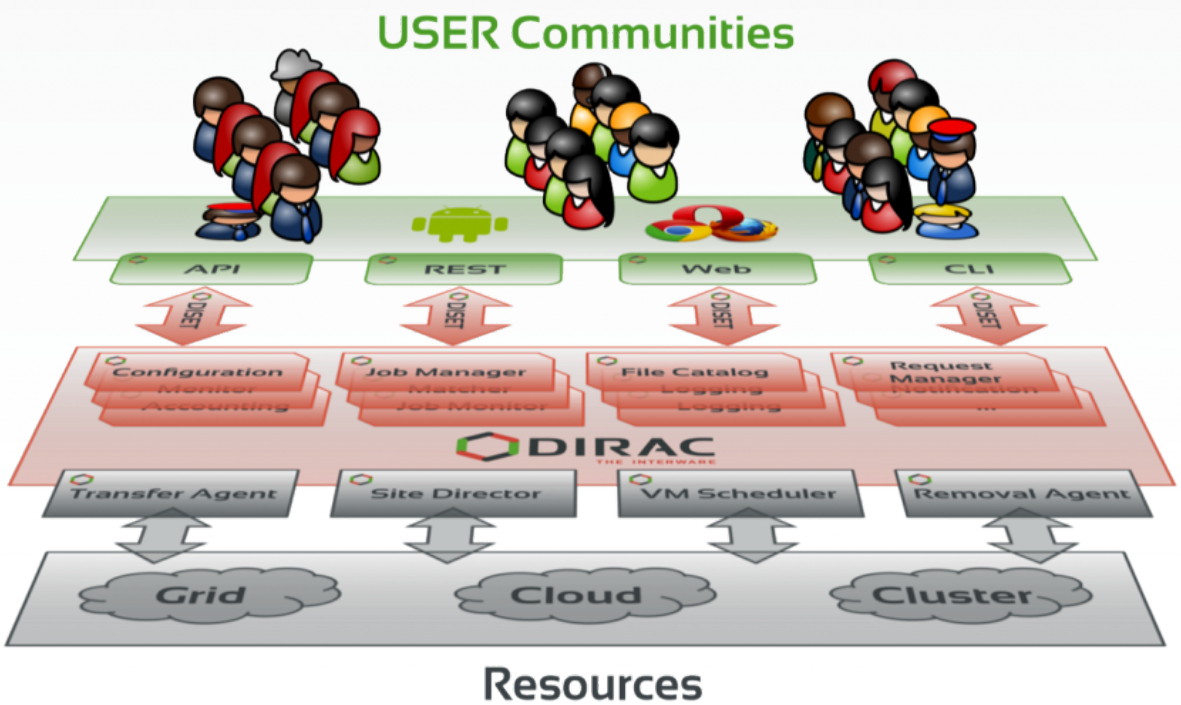
Ganga is an easy-to-use frontend for job definition and management, implemented in Python. It has been developed for ATLAS and LHCb, and includes built-in support for configuring and running applications based on the experiments' frameworks.

read NA62-14-04

DIRAC

The DIRAC (**D**istributed **I**nfrastructure with **R**emote **A**gent **C**ontrol) is a software framework for distributed computing providing a complete solution to a user community requiring access to distributed resources.

DIRAC builds a layer between the users and resources offering a common interface to a number of heterogeneous providers, integrating them in a seamless manner, while providing interoperability and an optimised, transparent and reliable access to computing resources.



And the winner is …

DIRAC is a *complete* workload and data management system, which is in production use by LHCb and ILC. Furthermore, it is nowadays an independent project and features and long-term support outside of the LHCb community. There is already a NA62 VO enabled DIRAC installation at Imperial College in London, which was used for testing over the summer of 2014.

Rucio offers services that allow the ATLAS collaboration to manage large volumes of experimental, generated and derived data, within the ATLAS distributed computing system. However, it is relatively immature and designed for a much bigger data management problem than NA62's.

PanDA architecture is well suited for the computing needs of the ATLAS experiment who requires petabyte scale production and distributed analysis processing. Although PanDA has some users outside ATLAS, this usage is less mature than that of DIRAC.

Ganga is implemented as a plugin in the current gLite-based NA62 system, however, by itself Ganga cannot completely replace the existing functionality.

CVMFS is already in use by the UK grid sites participating in NA62. We highly recommend CVFMS for software distribution.

Regardless of the components used, NA62 will employ a custom-built layer providing collaboration-specific functionality that depends on the structure and usage of the data, desired features etc. This is a very lightweight layer, that can be designed to be robust and easily reconfigurable, and will be well documented.

DIRAC 4 NA62

We've cloned the existing gLite-based system, and changed all the bindings to use DIRAC for job submissions and management, file transfers, etc.

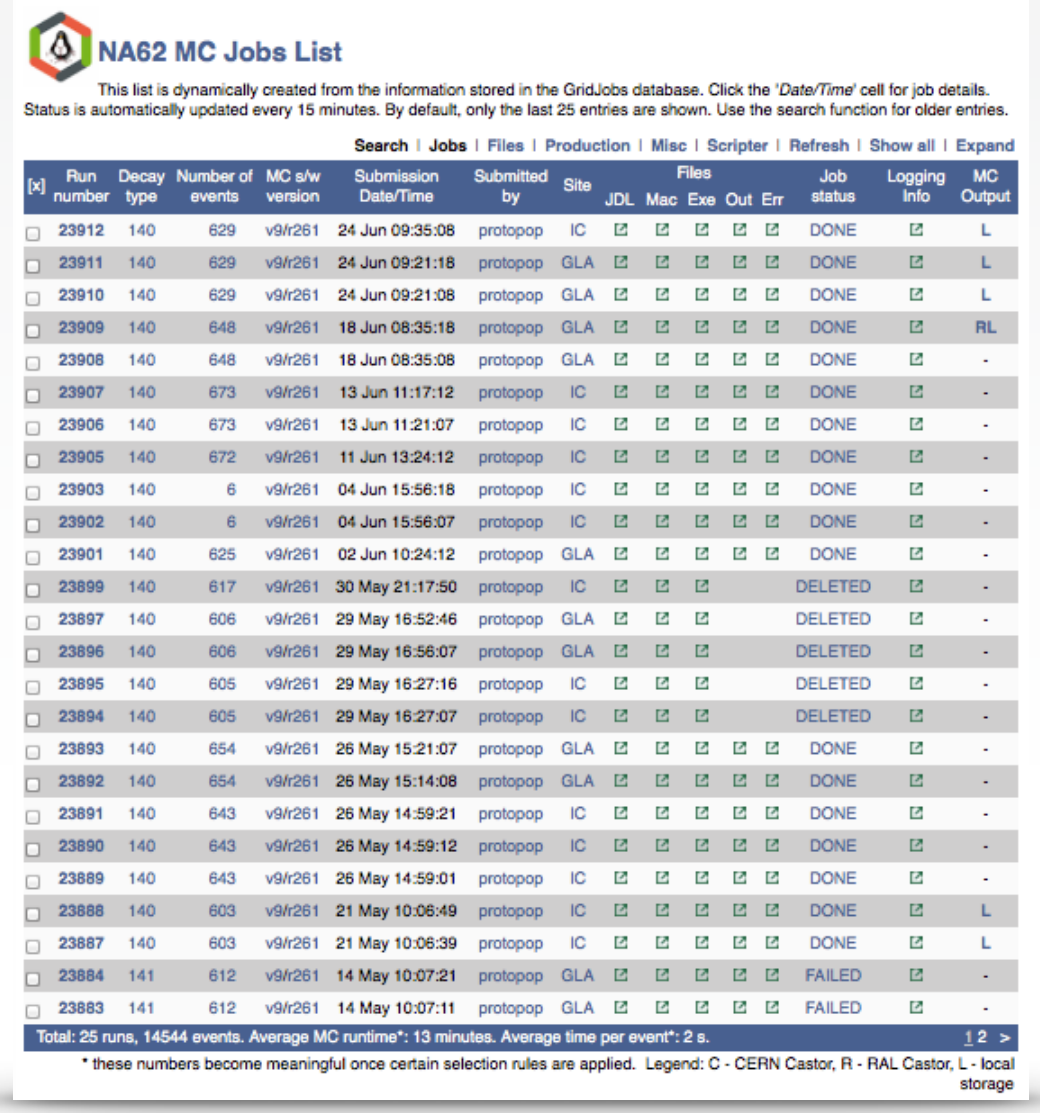
The new web interface is located at

http://dna62.gla.ac.uk

and is identical in functionality with the old NA62 grid production interface.

We've kept the gLite based interface fully functional, and the two share the same (custom) MySQL database.

The plan is to employ this system during the next production season.



NA62 MC Jobs List

This list is dynamically created from the information stored in the GridJobs database. Click the '*Date/Time*' cell for job details. Status is automatically updated every 15 minutes. By default, only the last 25 entries are shown. Use the search function for older entries.

Search | Jobs | Files | Production | Misc | Scripter | Refresh | Show all | Expand

[x]	Run number	Decay type	Number of events	MC s/w version	Submission Date/Time	Submitted by	Site	Files: JDL	Mac	Exe	Out	Err	Job status	Logging Info	MC Output
☐	23912	140	629	v9/r261	24 Jun 09:35:08	protopop	IC						DONE		L
☐	23911	140	629	v9/r261	24 Jun 09:21:18	protopop	GLA						DONE		L
☐	23910	140	629	v9/r261	24 Jun 09:21:08	protopop	GLA						DONE		L
☐	23909	140	648	v9/r261	18 Jun 08:35:18	protopop	GLA						DONE		RL
☐	23908	140	648	v9/r261	18 Jun 08:35:08	protopop	GLA						DONE		-
☐	23907	140	673	v9/r261	13 Jun 11:17:12	protopop	IC						DONE		-
☐	23906	140	673	v9/r261	13 Jun 11:21:07	protopop	IC						DONE		-
☐	23905	140	672	v9/r261	11 Jun 13:24:12	protopop	IC						DONE		-
☐	23903	140	6	v9/r261	04 Jun 15:56:18	protopop	IC						DONE		-
☐	23902	140	6	v9/r261	04 Jun 15:56:07	protopop	IC						DONE		-
☐	23901	140	625	v9/r261	02 Jun 10:24:12	protopop	GLA						DONE		-
☐	23899	140	617	v9/r261	30 May 21:17:50	protopop	IC						DELETED		-
☐	23897	140	606	v9/r261	29 May 16:52:46	protopop	GLA						DELETED		-
☐	23896	140	606	v9/r261	29 May 16:56:07	protopop	GLA						DELETED		-
☐	23895	140	605	v9/r261	29 May 16:27:16	protopop	IC						DELETED		-
☐	23894	140	605	v9/r261	29 May 16:27:07	protopop	IC						DELETED		-
☐	23893	140	654	v9/r261	26 May 15:21:07	protopop	GLA						DONE		-
☐	23892	140	654	v9/r261	26 May 15:14:08	protopop	GLA						DONE		-
☐	23891	140	643	v9/r261	26 May 14:59:21	protopop	IC						DONE		-
☐	23890	140	643	v9/r261	26 May 14:59:12	protopop	IC						DONE		-
☐	23889	140	643	v9/r261	26 May 14:59:01	protopop	IC						DONE		-
☐	23888	140	603	v9/r261	21 May 10:06:49	protopop	IC						DONE		L
☐	23887	140	603	v9/r261	21 May 10:06:39	protopop	IC						DONE		L
☐	23884	141	612	v9/r261	14 May 10:07:21	protopop	GLA						FAILED		-
☐	23883	141	612	v9/r261	14 May 10:07:11	protopop	GLA						FAILED		-

Total: 25 runs, 14544 events. Average MC runtime*: 13 minutes. Average time per event*: 2 s. 1 2 >

* these numbers become meaningful once certain selection rules are applied. Legend: C - CERN Castor, R - RAL Castor, L - local storage

Current status

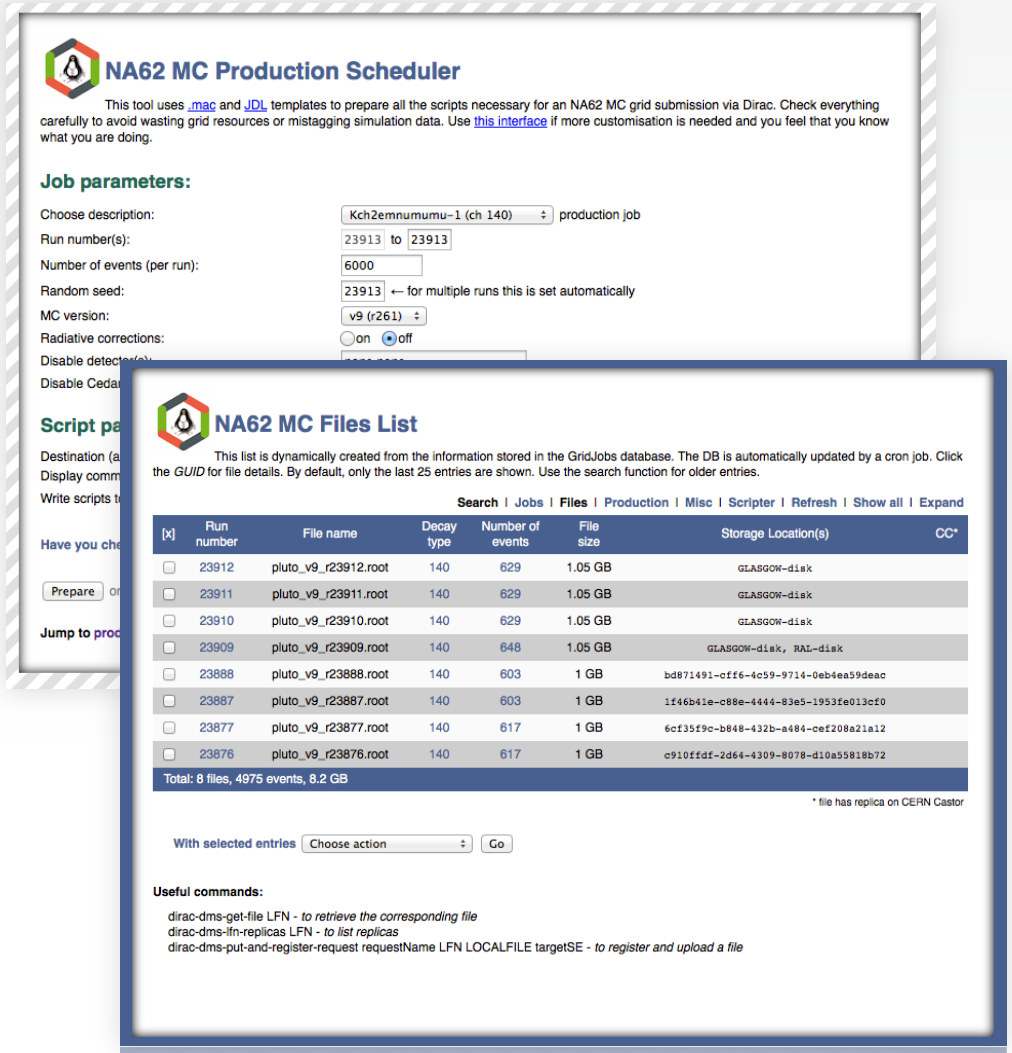
Full functionality:

- jobs table
- files table
- production table
- search form
- test submission form
- production submission form
- automation scripts

To do:

- streamline file registrations and transfers
- full benchmarking
- evaluate DIRAC's builtin DM
- iPhone webapp

Close contact is maintained with DIRAC developers in case we encounter problems or we desire new features.



NA62 Grid Production Logbook

A fully-featured and robust electronic logbook was implemented for use during NA62 Grid production shifts.

Explore it and register to use it at

na62.gla.ac.uk/elog

This MySQL-backended electronic logbook is available as an easily customisable toolkit and could be used as a runlog as well.

Recent logbook entries

#	Contents	Posted	Properties
11	2014-04-16 14:33: Test entry after access settings tweaked ...	April 16	**Experiment:** N/A **Entry type:** Settings changed **Posted by:** protopop@cern.ch on Apr/16/2014 @ 14:34 GMT **Operators:** Dan Protopopescu **Systems:** Logbook **Attributes:** Info **Last modified:** Apr/16/2014 @ 14:34 GMT
10	2014-04-14 13:33: Test of an 'Action required' entry. When this is added/modified, and email is sent to the corresponding system expert. Edited: 2014-04-14 13:38 - protopop@cern.ch: Marked as resolved	April 14	**Experiment:** NA62 **Entry type:** Problems **Posted by:** protopop@cern.ch on Apr/14/2014 @ 13:34 GMT **Operators:** Dan Protopopescu **Systems:** Grid UI **Attributes:** Resolved **Last modified:** Apr/14/2014 @ 13:39 GMT **by** protopop@cern.ch
9	NA62 Status talk given at GridPP32, in Pitlochry (UK) on March 25, 2014 [secure link] NA62-Mar-2014.pdf	April 14	**Experiment:** NA62 **Entry type:** Other **Posted by:** protopop@cern.ch on Apr/14/2014 @ 12:35 GMT **Operators:** Dan Protopopescu **Systems:** Grid UI, Simulations **Attributes:** Info **Attachments:** [NA62-Mar-2014.pdf] **Last modified:** Apr/14/2014 @ 13:26 GMT
8	Confidential (login required) CONFIDENTIAL	April 14	**Experiment:** NA62 **Entry type:** Other **Posted by:** protopop@cern.ch on Apr/14/2014 @ 12:28 GMT **Operators:** Dan Protopopescu **Systems:** General **Attributes:** Confidential **Last modified:** Apr/14/2014 @ 12:28 GMT
7	The official NA62 logbook is located here: [secure link]	April 11	**Experiment:** NA62 **Entry type:** Other **Posted by:** protopop@cern.ch on Apr/11/2014 @ 14:50 GMT **Operators:** Dan Protopopescu **Systems:** Documentation **Attributes:** Info **Last modified:** Apr/14/2014 @ 14:15 GMT **by** protopop@cern.ch

THE END

QUESTIONS ? IDEAS ?

Check out http://dna62.gla.ac.uk