

# MC production on SAMGrid/LCG

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# SAMGrid

- SAM - Data Handling system used at D-Zero for last seven years
- JIM–Job and Information Management
- JIM packages submit and monitor
- SAM DataGrid + JIM -> SAMGrid computational grid
- <http://projects.fnal.gov/samgrid>

# Pre-Grid MC Production

- Via global request system
  - Farmers chose and run a request
  - Request defines mc\_runjob macro
  - Results stored into SAM, request marked finished
- One farmer per farm, inefficient

<http://samgrid.fnal.gov:8080/>

Please click at the map to monitor the execution sites.

Get information about the **submission** sites

Get information about the **advertised** sites.



Participating Experiments:

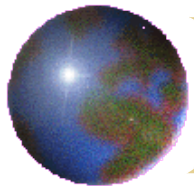


DO



CDF





## *Participating sites*

- ✚ Manchester: 1 cluster, 30 “fast” proc, run ~30 jobs
- ✚ IN2P3: 1 cluster, 475 “medium”/“fast” proc, can run 135 jobs, run ~ 30 jobs ave
- ✚ Wisconsin: 2 clusters, 320+ “medium” proc, can run ~200 jobs, run ~ 100 “short” jobs ave
  - ✚ P cluster: 69 “medium” proc, no preemption
  - ✚ GLOW cluster: 250+ “medium” proc, potential preemption
- ✚ SAR sites are joining in...

# Additional sites

- Proto sites, production since Feb 2004
  - Lyon, Manchester, Wisconsin
- Sites added during Mar/Apr/May 2004
  - Imperial College, Lancaster, Oklahoma, UTA
- Sites pending
  - FNAL, GridKA, Michigan, RAL, Wuppertal
- Nikhef (LCG operation described later)

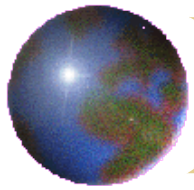
# SAMGrid operation

```
job_type = montecarlo
station_name = ccin2p3-analysis
runjob_requestid = 11866
runjob_numevts = 10000
d0_release_version = p14.05.01
jobfiles_dataset = san_jobset2
minbias_dataset = ccin2p3_minbias_data
sam_experiment = d0
sam_universe = prd
group = test
instances = 1
```

Dataset san\_jobset2:

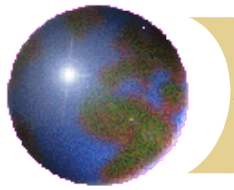
```
MagField_v00-01-00.tar.gz
cardFile_v00-05-07.tar.gz
d0_p14.05.01.tar.gz
mc_runjob_v06-02-02-jim-dbg.tar.gz
```

- Operator defines requestID, num events, station
- Translated to condor JDL
- Lands on gatekeeper (jobmanager-runjob), retrieves software from SAM, submits to batch system
- WN untars software release, aux files, and executes
- Stores results into SAM, output to submission node



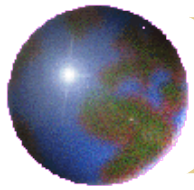
## *Statistics: Efficiency*

- ✚ The infrastructure is in production since middle of March
- ✚ Current average production efficiency ~90%
- ✚ Production inefficiency due to the grid infrastructure 1-5%
- ✚ Main concern: concurrent access to the data via db server (Network Communication Failures)



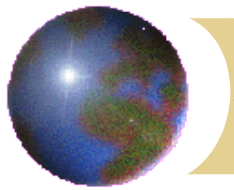
# Statistics: Event production I

- From 01-01-04 to 03-19-04
  - Events produced (per execution site)
    - Wisconsin = 199,558
    - Lyon > 125,455
    - Manchester > 110,000
    - 
    - Total > 435,013
- Many events come from test jobs



## *Statistics: Event production II*

- ✚ From 03-19-04 to 04-13-04 (25 days)
  - ✚ Total Ev. Produced/ Ev. Requested = 196,353 / 220,000 (89% eff.)
  - ✚ Avg. Events/week Produced = 65,451



## *Statistics: Event production III*

- ✚ From 04-14-04 to 04-27-04 (4 days:  
No activity between 04-14 and 04-23)

<b>SITE</b>	<b>ev prod / ev requested</b>
Wisconsin	97,300 / 100,000 (2 days)
Manchester	75,250 / 82,250 (4 days)
Total	172,550 / 182,250 (94% eff. ; 1% SAM-Grid ineff.)

# Efficiency statistics

<http://www-d0.fnal.gov/computing/grid/deployment-issues.html>

250 events/job




Week	Execution Site	Number of local jobs	Success Rate (Ev Stored/Ev Submitted )
02/02 to 02/08	Lyon	220	56%
	Manchester	200	86%
	Wisconsin	200	58%
02/09 to 02/14	Lyon	118	56%
	Manchester	200	77%
	Wisconsin	100	62%
02/15 to 02/22	Lyon	100	95%
	Manchester	200	84%
	Wisconsin	100	91%
02/23 to 03/09	Lyon	107	93%
	Manchester	-	-
	Wisconsin	59	81%

	Lyon	80	99%
Latest:	Manchester	181	93%
	Wisconsin	139	91%

# DZero MC production on LCG

- Explored at Nikhef
- Restricted to Nikhef's LCG resources
- Nikhef MC production now exclusively via this route

# LCG DZero VO

GridICE is monitoring

Site view VO view Geo view Grid view Help about

Virtual Organization: **dzero** [[VO jobs graph](#)] [[VO storage graph](#)]

VO select

Site: <b>fzk.de</b>	power		CPU #		load5min	ERT
Computing Element ID	run jobs	wait jobs	free slots	total slots	max run	ERT
@gridkap01.fzk.de:2119/jobmanager-pbspro-lcg	6	0	97	280	216	0-0:0:0

Site: <b>gridpp.rl.ac.uk</b>	power		CPU #		load5min	ERT
Computing Element ID	run jobs	wait jobs	free slots	total slots	max run	ERT
@lcgce02.gridpp.rl.ac.uk:2119/jobmanager-lcgpbs-short	4	0	2	144	99999	0-0:0:0
@lcgce02.gridpp.rl.ac.uk:2119/jobmanager-lcgpbs-long	0	0	2	144	99999	0-0:0:0
@lcgce02.gridpp.rl.ac.uk:2119/jobmanager-lcgpbs-infinite	136	0	2	144	99999	0-0:0:0

Site: <b>hep.man.ac.uk</b>	power		CPU #		load5min	ERT
Computing Element ID	run jobs	wait jobs	free slots	total slots	max run	ERT
@gf17.hep.man.ac.uk:2119/jobmanager-lcgpbs-long	0	0	3	3	99999	0-0:0:0
@gf17.hep.man.ac.uk:2119/jobmanager-lcgpbs-short	0	0	3	3	99999	0-0:0:0
@gf17.hep.man.ac.uk:2119/jobmanager-lcgpbs-infinite	0	0	3	3	99999	0-0:0:0

Site: <b>nikhef.nl</b>	power		CPU #		load5min	ERT
Computing Element ID	run jobs	wait jobs	free slots	total slots	max run	ERT
@tbn18.nikhef.nl:2119/jobmanager-pbs-qlong	147	29	95	242	99999	1-16:8:23
@tbn18.nikhef.nl:2119/jobmanager-pbs-qshort	0	0	95	242	99999	0-0:0:0

Storage Element ID - Storage Space ID	avail space	used space
tbn17.nikhef.nl - dzero:dzero	0.00 Mb	0.00 Mb

Site: <b>physik.uni-wuppertal.de</b>	power		CPU #		load5min	ERT
Computing Element ID	run jobs	wait jobs	free slots	total slots	max run	ERT

# How to run MC on LCG

- Store MC s/w and minbias files on SE
- For each request
  - Run mc\_runjob on User Interface
  - On SAM station
    - Collect output from SE
    - Merge thumbnails
    - Store output in SAM

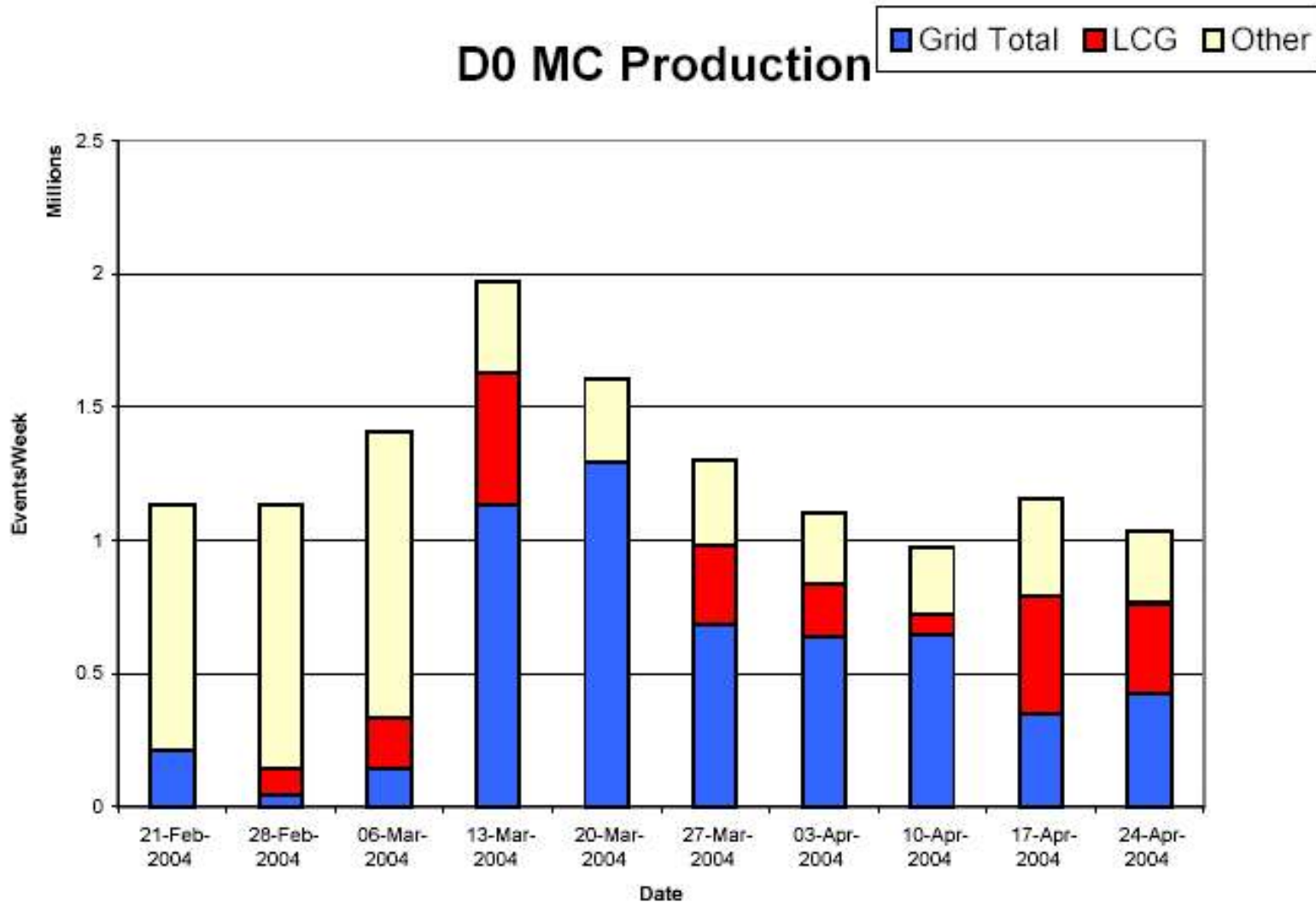
# mc\_runjob on UI

- mc\_runjob macro
  - Creates input directory structure
  - RunJob.py
    - Makes tarfile
    - Makes job description file
    - Submits job

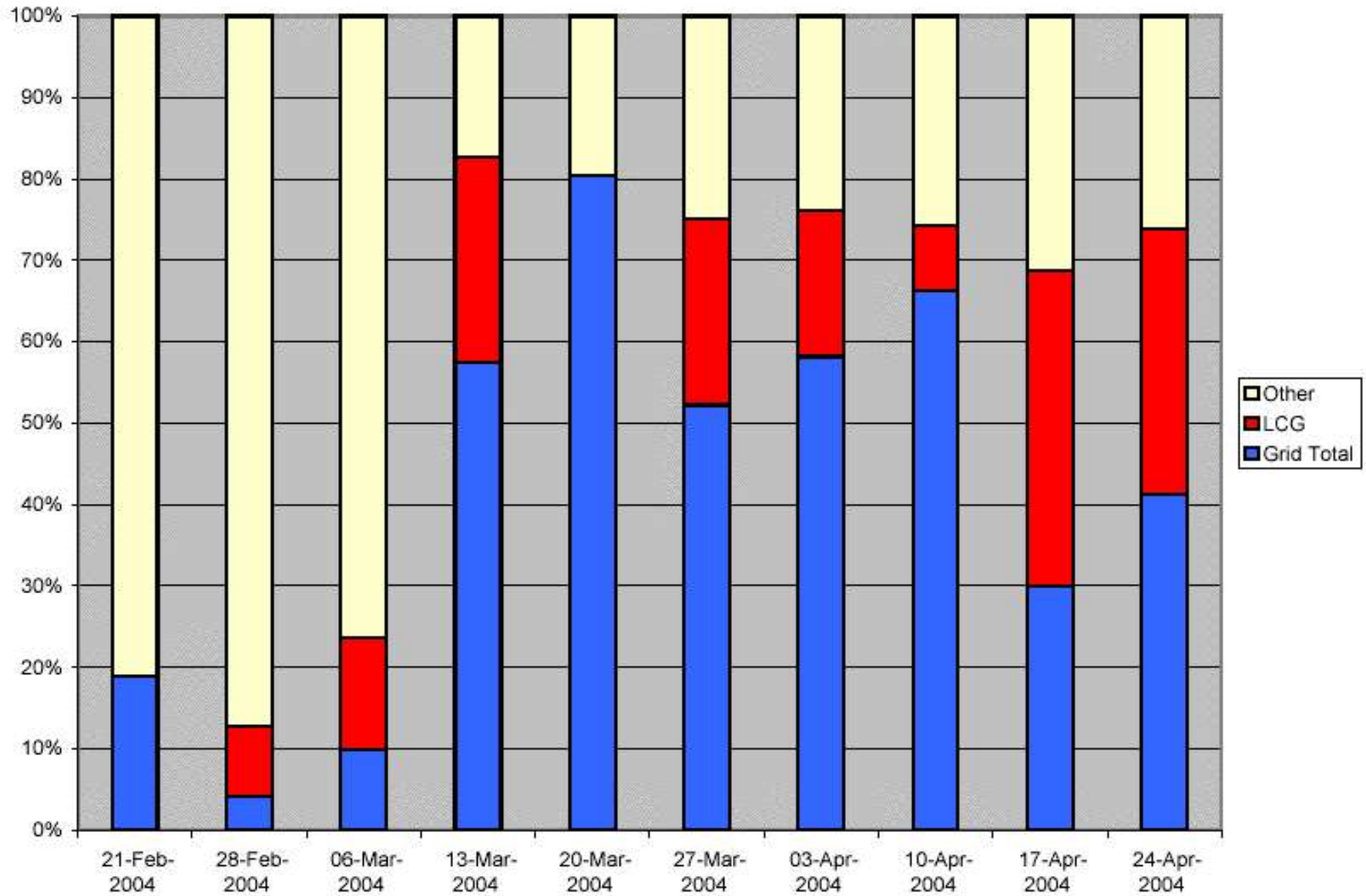
# UI vs. WN

- On UI
  - mc\_runjob macro
- On WN
  - sh exec.sh tarfile
- Different environments on UI and WN!
  - Correct links

# Weekly MC event production



# Weekly MC production – by technique



# Future plans

- All DZero MC production via grid by mid-summer
- Migrating infrastructure to VDT
  - (currently using globus 2.0)
- MC production for CDF
- DZero reprocessing on Grid

# Acknowledgments

- Status info from D0London Grid Workshop, (29 April – 1 May)
- Gabriele Garzoglio(FNAL) – Status slides
- Willem van Leeuwen(Nikhef) – LCG at Nikhef