



LHCb - DC04



Overview

- Status
- Dirac Version 2
- Some Statistics
- Conclusions



Status



- Most of data produced
- Still running to verify new version
- Soon start to strip data
 - will take place at Tier1 centres
- Prepare for analysis code



Dirac



Dirac version 2

- 4 parts: *Services, Agents, Resources, User Interface*
- Pull system
- Optimised for high throughput
- Implementation: python script
- Single configuration file for each site



Dirac



Requirements

- python 2.2
- batch system (if it is a cluster)
- outbound connectivity
- local disk space
- shared disk space (if possible)
- no root access!



Dirac



- Configuration
 - local configuration file with defaults from the Information Services
- Data Management
 - different file catalogs
 - existing LHCb file database
 - AliEn file catalog
- Redundancy
 - duplication, fail over, caching, watchdogs (job monitoring, file transfer)



Dirac



- Watchdog and Wrappers
 - job runs in a wrapper script:
 - download of data
 - start job watchdog
 - job execution and monitoring
 - handles failed jobs
- LCG Implementation
 - send a Dirac job in 'run once mode'
 - install Dirac
 - fetch one job



Tier2



- Installation:
 - Single configuration file
 - Single installation script
 - Whole installation takes less than 5 minutes
 - Updates during operation possible
- Used resources:
 - CPU power
 - Shared storage space for common software
 - Local temporary storage space
 - Mass storage **ONLY** at Tier1 centres



Some Statistics



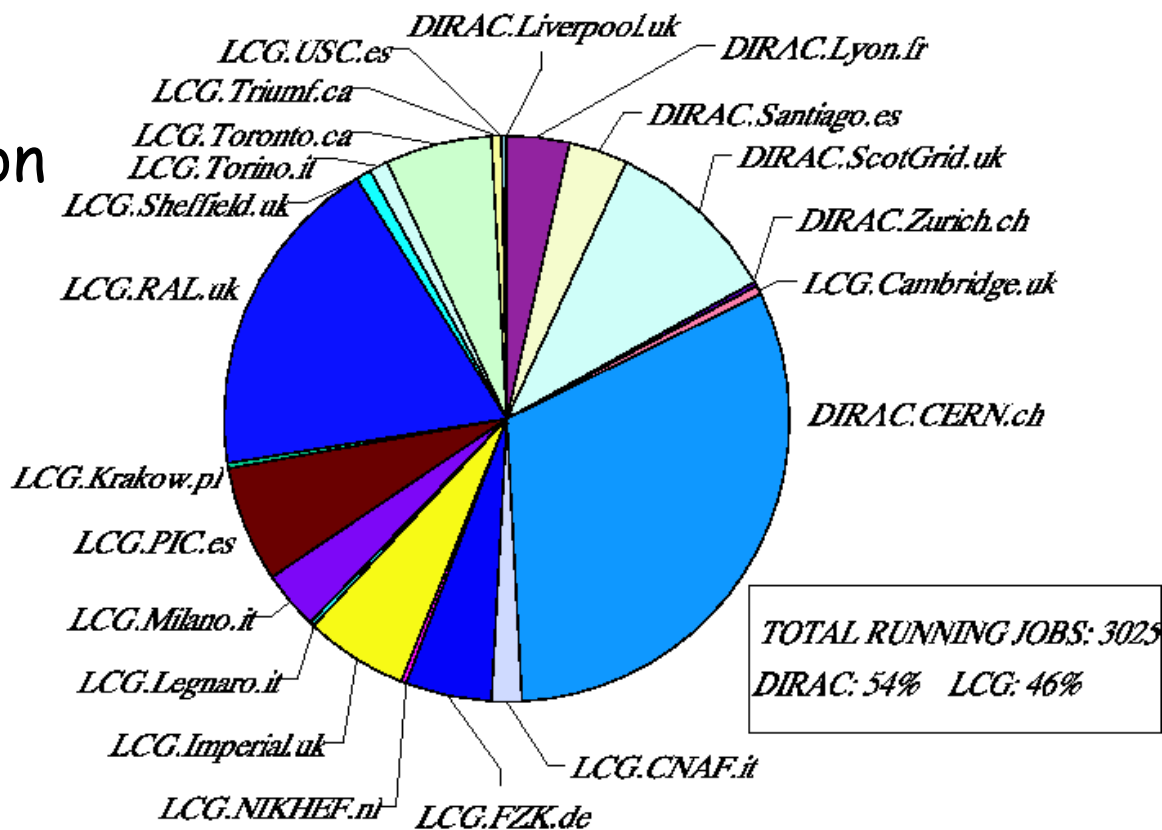
LHCb total

Jobs:	191'242	
CPU time:	3'840'227	hours
Events:	193'203'426	
Data (DST):	63'308	GByte

Some Statistics



Snapshot of
site distribution





Some Statistics



	Manno	Zurich	
Jobs:	112	826	
CPU time:	1'934	20'643	hours
Events:	66'450	786'700	
Data (DST):	27	243	GByte



Conclusions



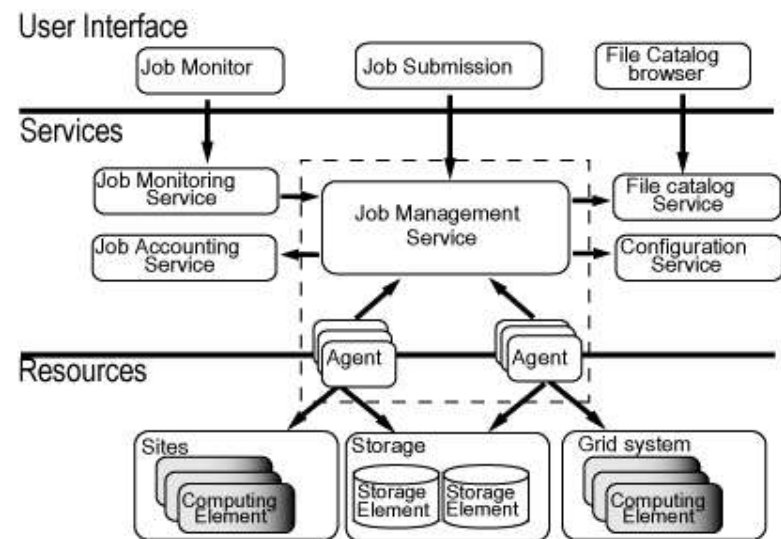
- Dirac 2 very flexible and robust
easy to use and deploy
- Biggest challenges: Monitoring
Data transfers
- LCG implementation achieved
- User interface available - GANGA
- Next challenge: Data analysis by users

- **General**

- Few distributed core services, centrally managed
- Agents managed by the sites
- Pull system

- **Services**

- Job receiver
- Job database
- Optimizer
- Matchmaker





Dirac



- Agent
 - Job Request
 - Pending Jobs
 - Bookkeeping
 - Transfer
- Resources
 - Storage: gridftp, bbftp, sftp, ftp, http, rfio, local
 - Computing: LSF, PBS, NQS, BQS, SGE, CONDOR, GLOBUS, LCG, stand-alone