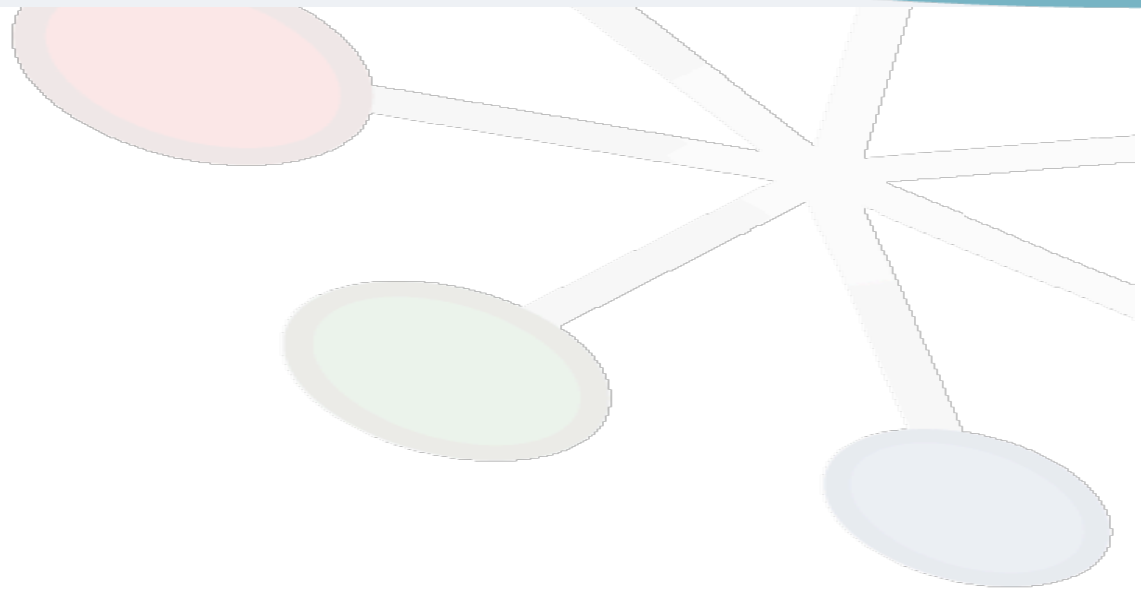


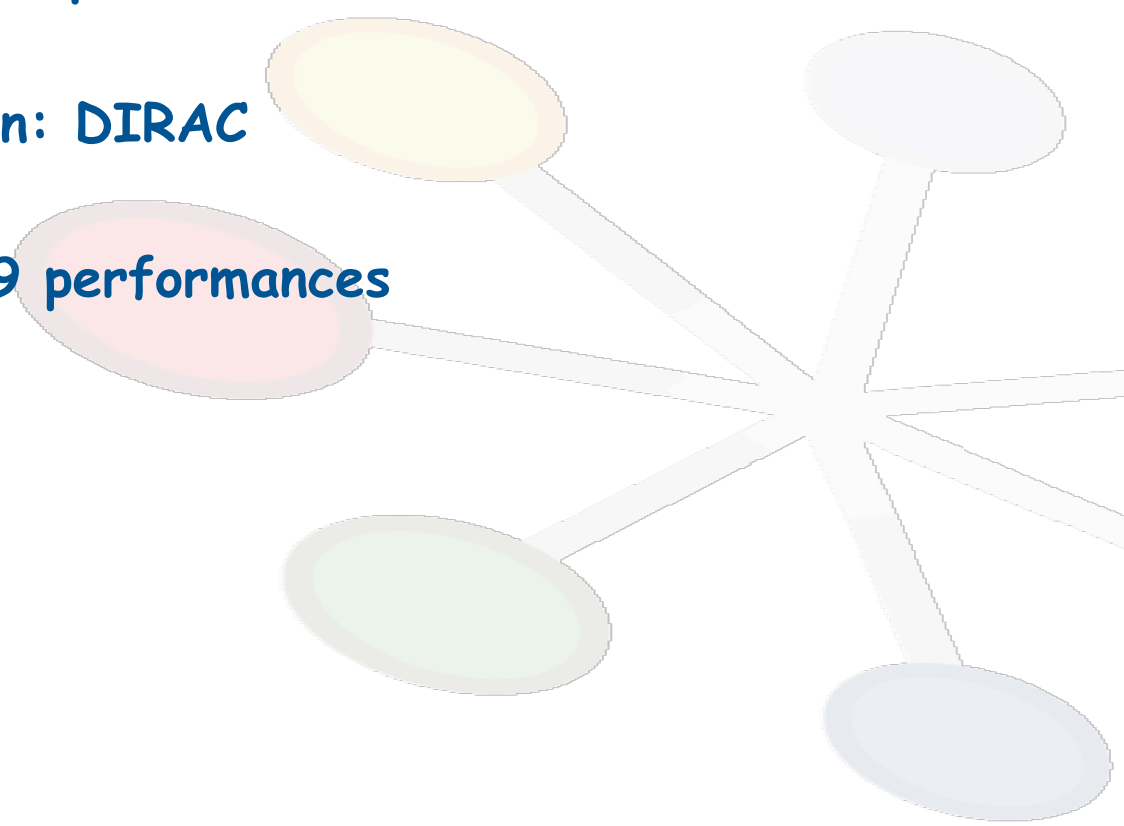


LHCb readiness for first data



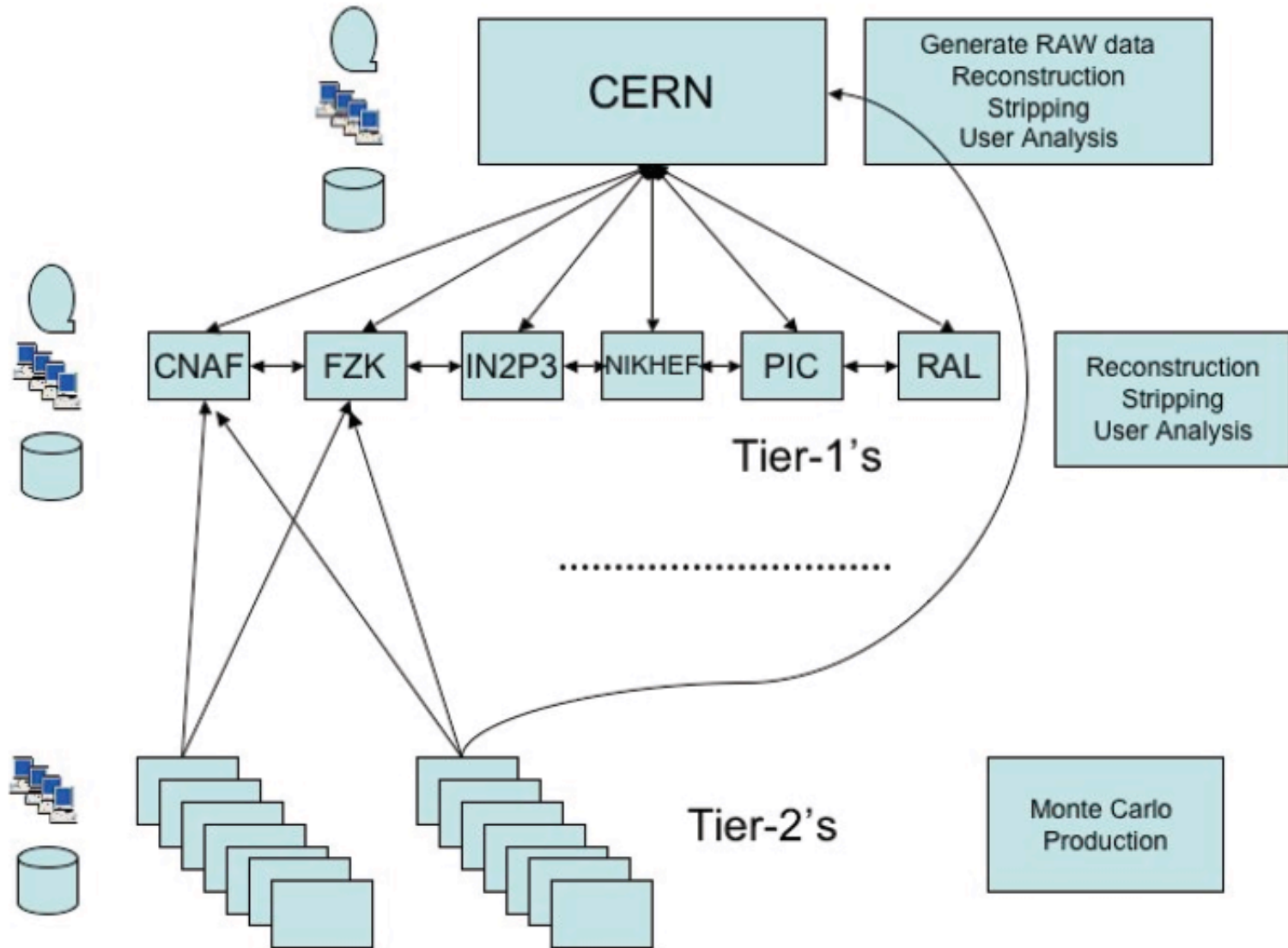


- LHCb Computing Model and resources
- LHCb Software Components and releases
- LHCb Grid solution: DIRAC
- Monte-Carlo 2009 performances
- Sites' readiness
- Summary





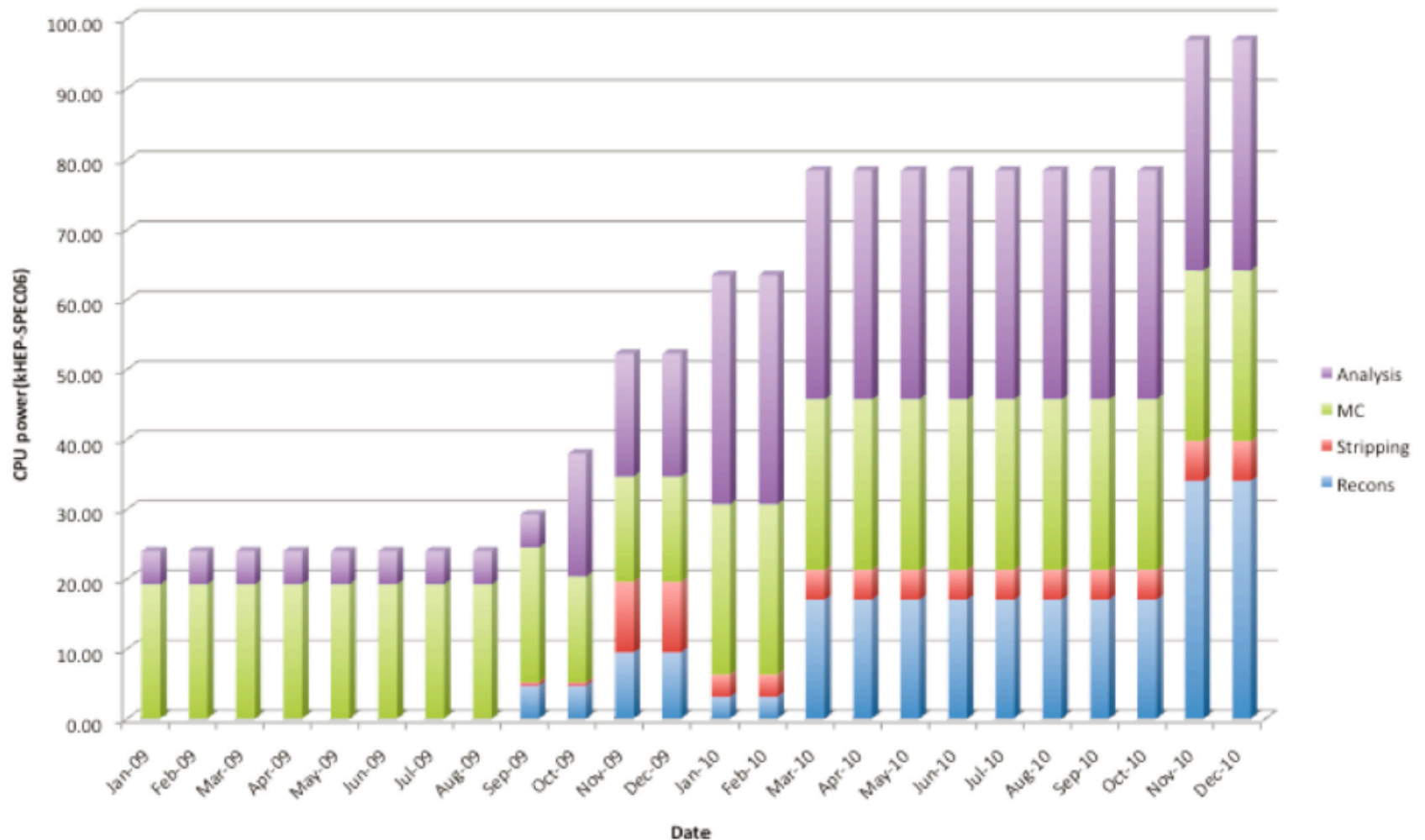
LHCb Computing Model





Resource requirements

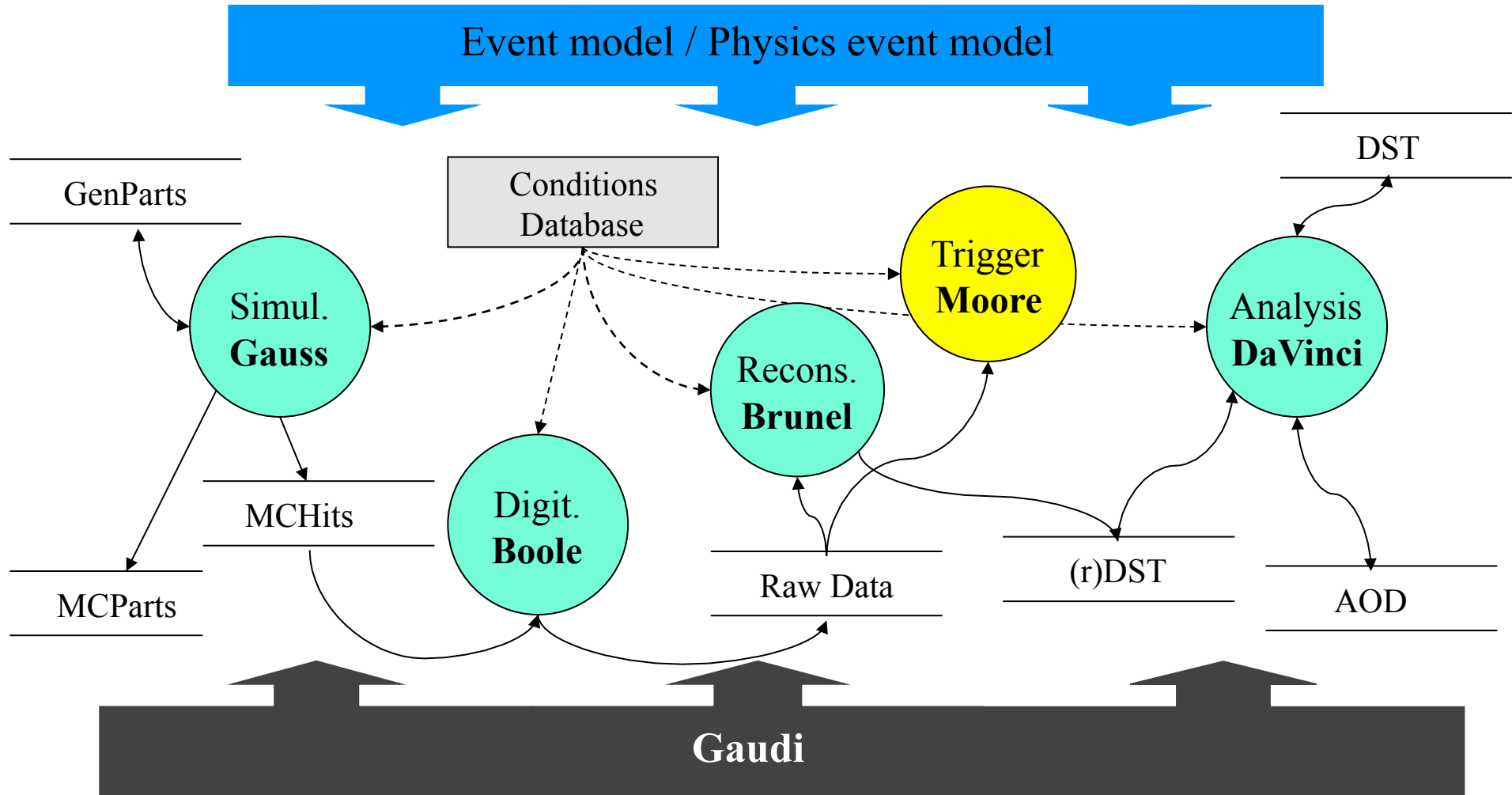
- Presented and agreed by CRSG
 - Of course very much depending on the LHC schedule...





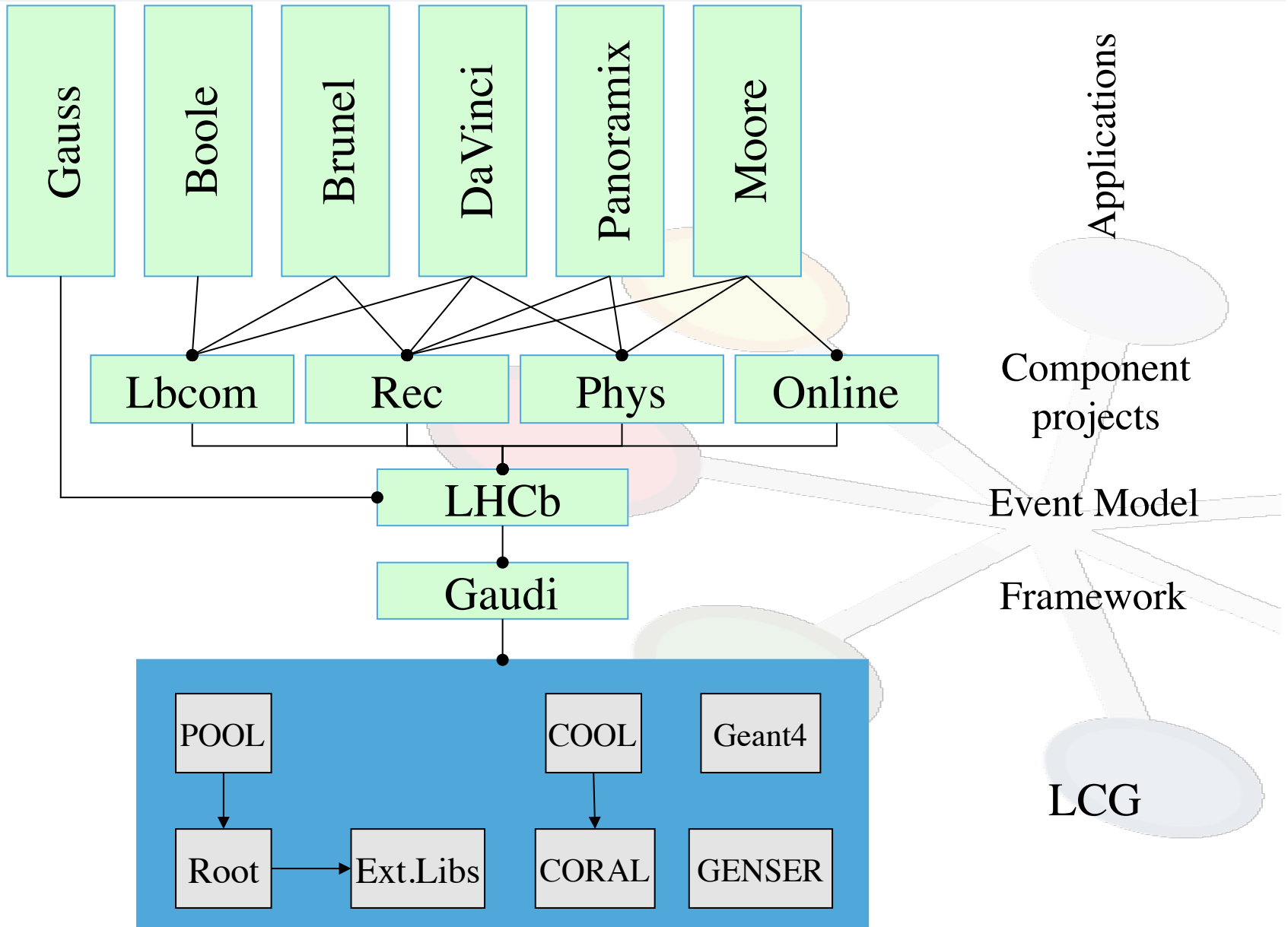
Resource pledges

CERN Tier0 / CAF (note 1)	2009	2010	Split 2010	ALICE	ATLAS	CMS	LHCb	SUM 2010
CPU (HEP-SPEC06)	131880	233400	Offered	46800	67000	96600	23000	233400
			Required	46800	67000	96600	23000	233400
			% of Req.	100%	100%	100%	100%	100%
Disk (Tbytes)	10065	14790	Offered	5500	3900	4100	1290	14790
			Required	5500	3900	4100	1290	14790
			% of Req.	100%	100%	100%	100%	100%
Tape (Tbytes)	25083	31600	Offered	6300	8900	14600	1800	31600
			Required	6300	8900	14600	1800	31600
			% of Req.	100%	100%	100%	100%	100%
Nominal WAN (Mbits/sec)	140000	160000						
Summary Ext. Tier1s	2009	2010	Split 2010	ALICE	ATLAS	CMS	LHCb	SUM 2010
CPU (HEP-SPEC06)	245800	414135	Offered	46458	217504	105505	44668	414135
			Required	57600	192000	100500	44000	394100
			Balance	-19%	13%	5%	2%	5%
Disk (Tbytes)	34890	44544	Offered	6368	22252	12510	3414	44544
			Required	10800	21900	13400	3290	49390
			Balance	-41%	2%	-7%	4%	-10%
Tape (Tbytes)	40189	51560	Offered	8720	15549	24138	3153	51560
			Required	16300	14200	23300	2400	56200
			Balance	-47%	10%	4%	31%	-8%
Summary Tier2s with Split In 2010	2009	2010	Split 2010	ALICE	ATLAS	CMS	LHCb	SUM 2010
CPU (HEP-SPEC06)	308524	511829	Offered	45669	207005	187678	41476	511828
			Required	89600	240000	195000	38000	562600
			Balance	-49%	-14%	-4%	9%	-9%
Disk (Tbytes)	22647	39353	Offered	3431	20055	12753	315	39354
			Required	12600	24800	9200	20	46620
			Balance	-73%	-19%	39%	1474%	-16%





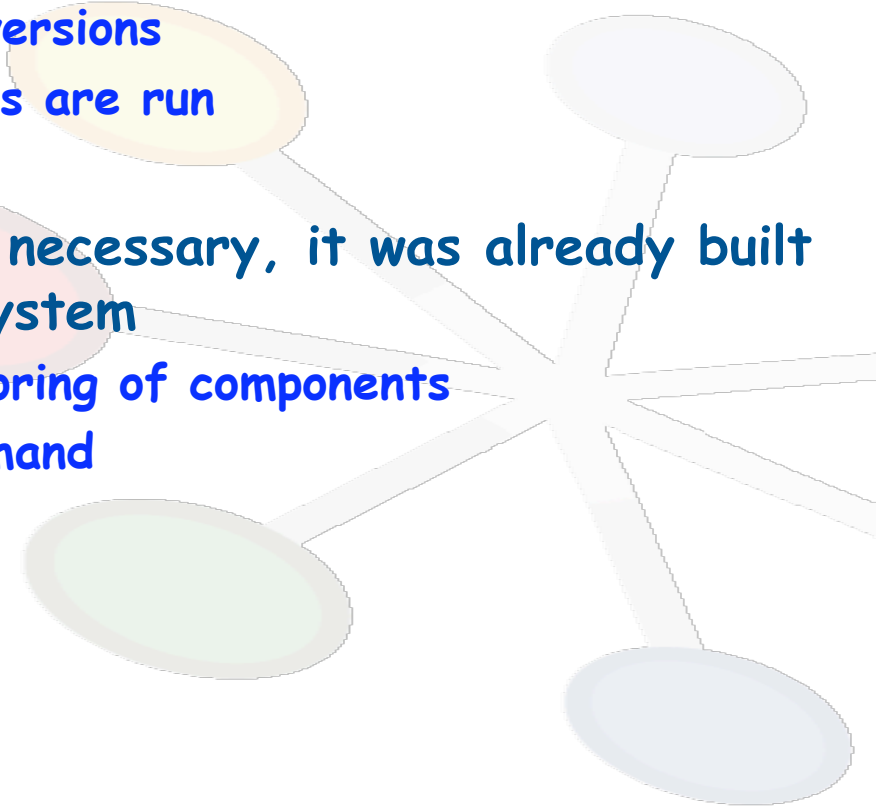
LHCb Software project dependencies





Software releases strategy

- Bottom up dependency of software projects
- Every night all projects and applications are built
 - Several sets of software versions
 - If build is successful, tests are run
- Whenever a new release is necessary, it was already built and tested in the nightly system
 - Careful planning and monitoring of components
 - Releases performed on demand
 - ☆ From subsystems
 - ☆ From the Core Software
 - ☆ From Production team





Nightly build and test

News



Summaries of nightly builds for LHCb

Last update: Thu Nov 12 22:46:08 2009

[+] Display Criteria

[+] Colour coding

Thursday (Today):

Thursday Slot : lhcb 1 Release validation for applications depending on already released projects

Project	Version	slc4_amd64_gcc34 (Thu Nov 12 03:08 2009)		slc4_amd64_gcc34_dbg (Thu Nov 12 05:39 2009)		slc4_ia32_gcc34_dbg (Thu Nov 12 05:11 2009)		slc4_ia32_gcc34 (Thu Nov 12 02:47 2009)	
Brunel	BRUNEL_v34r8	build	tests	build	tests	build	tests (2)	build	tests (2)

Checkout logs: [lxbuuld111](#), [lxbuuld120](#)

Thursday Slot : lhcb 2 Release validation of LHCb_v28r1 stack on top of GAUDI_v21r5 and LCG_57

Project	Version	slc4_amd64_gcc34 (Thu Nov 12 05:08 2009)		x86_64-slc5-gcc43-opt (Thu Nov 12 03:41 2009)		slc4_ia32_gcc34 (Thu Nov 12 05:17 2009)		slc4_amd64_gcc34_dbg (Thu Nov 12 08:42 2009)		slc4_ia32_gcc34_dbg (Thu Nov 12 08:57 2009)		x86_64-slc5-gcc43-dbg (Thu Nov 12 06:31 2009)	
LHCb	LHCb_v28r1	build	tests	build	tests	build	tests	build	tests	build	tests	build	tests
Lbcom	LBCOM_v7r7	build	tests	build	tests	build	tests	build	tests	build	tests	build	tests
Boole	BOOLE_v19r7	build	tests	build	tests	build	tests	build	tests	build	tests	build	tests
Rec	REC_v7r7	build	tests	build	tests	build	tests	build	tests	build	tests	build	tests
Brunel	BRUNEL_v35r7	build	tests	build	tests	build	tests	build	tests (1)	build	tests (1)	build	tests (1)

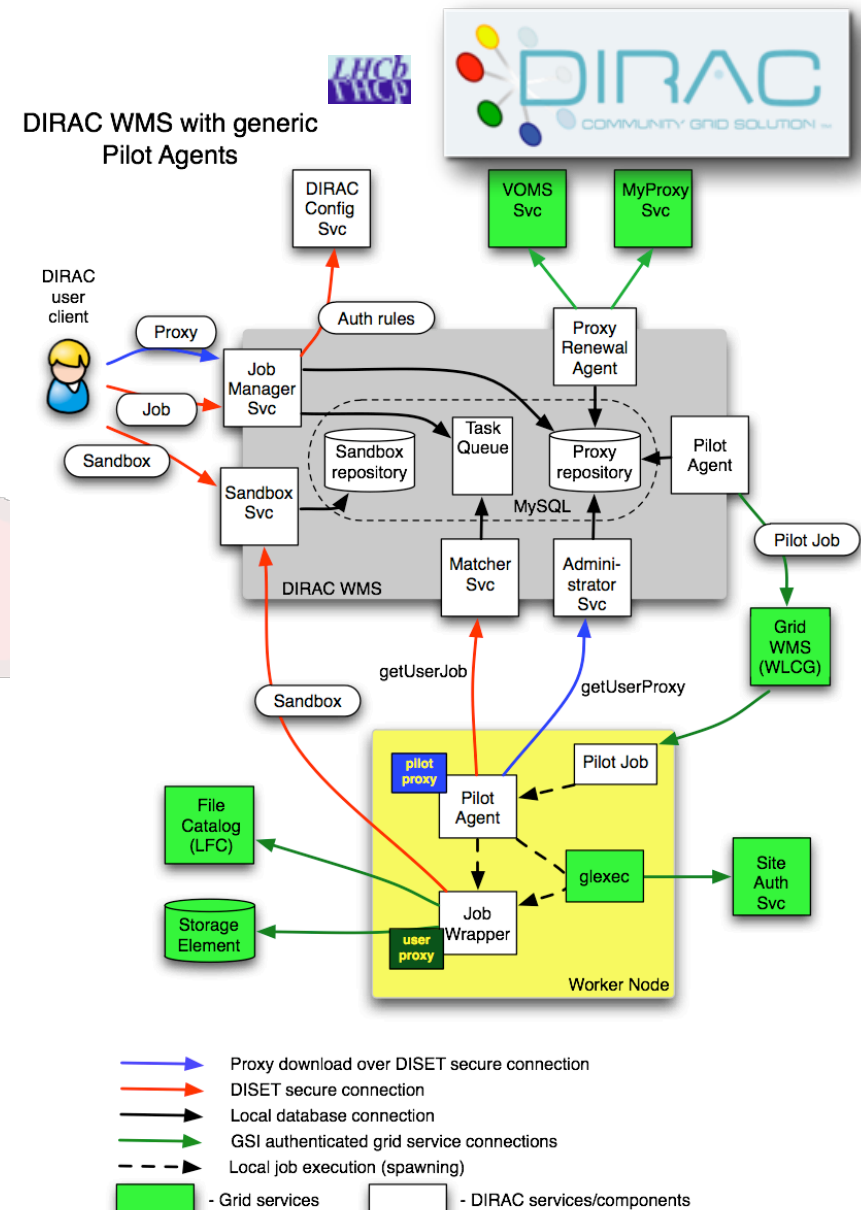
Checkout logs: [lxbuuld111](#), [lxbuuld120](#), [lxbuuld135](#)





DIRAC, the LHCb Grid solution

- Late job binding
 - A job is fetched only when all is OK
 - ☆ Software and data present
 - ☆ Site capabilities matching
- Apply priorities centrally
 - No site intervention
 - Users and production jobs mixed
- Federating Grids
 - Same pilots can be submitted to multiple Grids
- Similar systems:
 - ☆ AliEn (ALICE)
 - ☆ PANDA (ATLAS)
 - ☆ CMSGlideins (CMS)



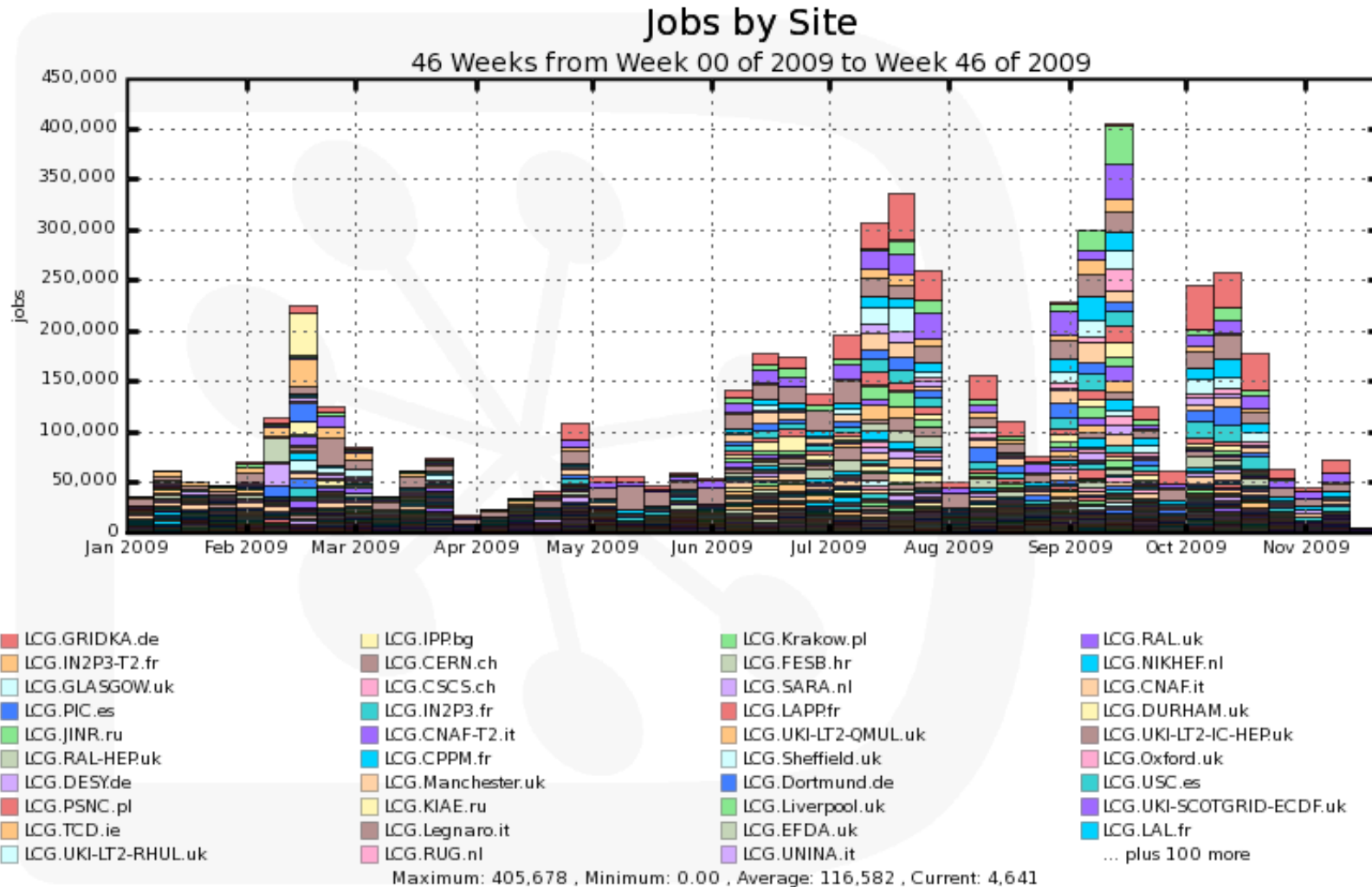


- Prepare for 2009/10 data taking
 - Lower energy (selected 5 TeV)
 - Different instantaneous luminosities
 - ☆ Various pileup values
- Certification of simulation (January-May)
 - New tuning
 - New version of Geant4
- Large minimum bias production (Started in June)
 - Trigger and stripping tuning
 - 10^9 events
- Key channels and background channels
 - Already simulated 500 million events
- Regularly run FEST (Full Experiment System Test)
 - Simulated data injected into the trigger filter farm
 - Full dataflow exercised (distribution, reconstruction, stripping)



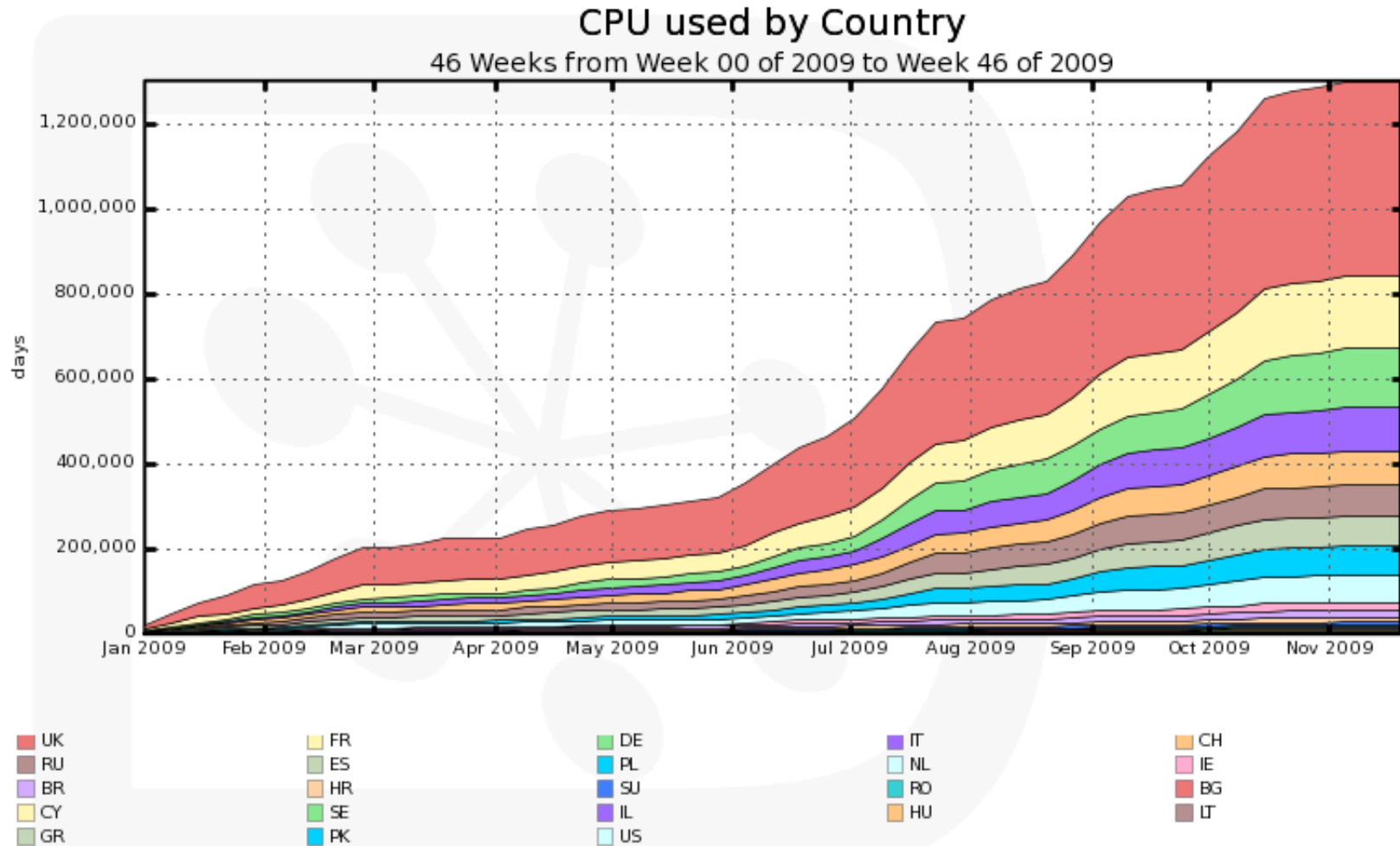
Jobs per week and per site

- 140 sites used in 2009





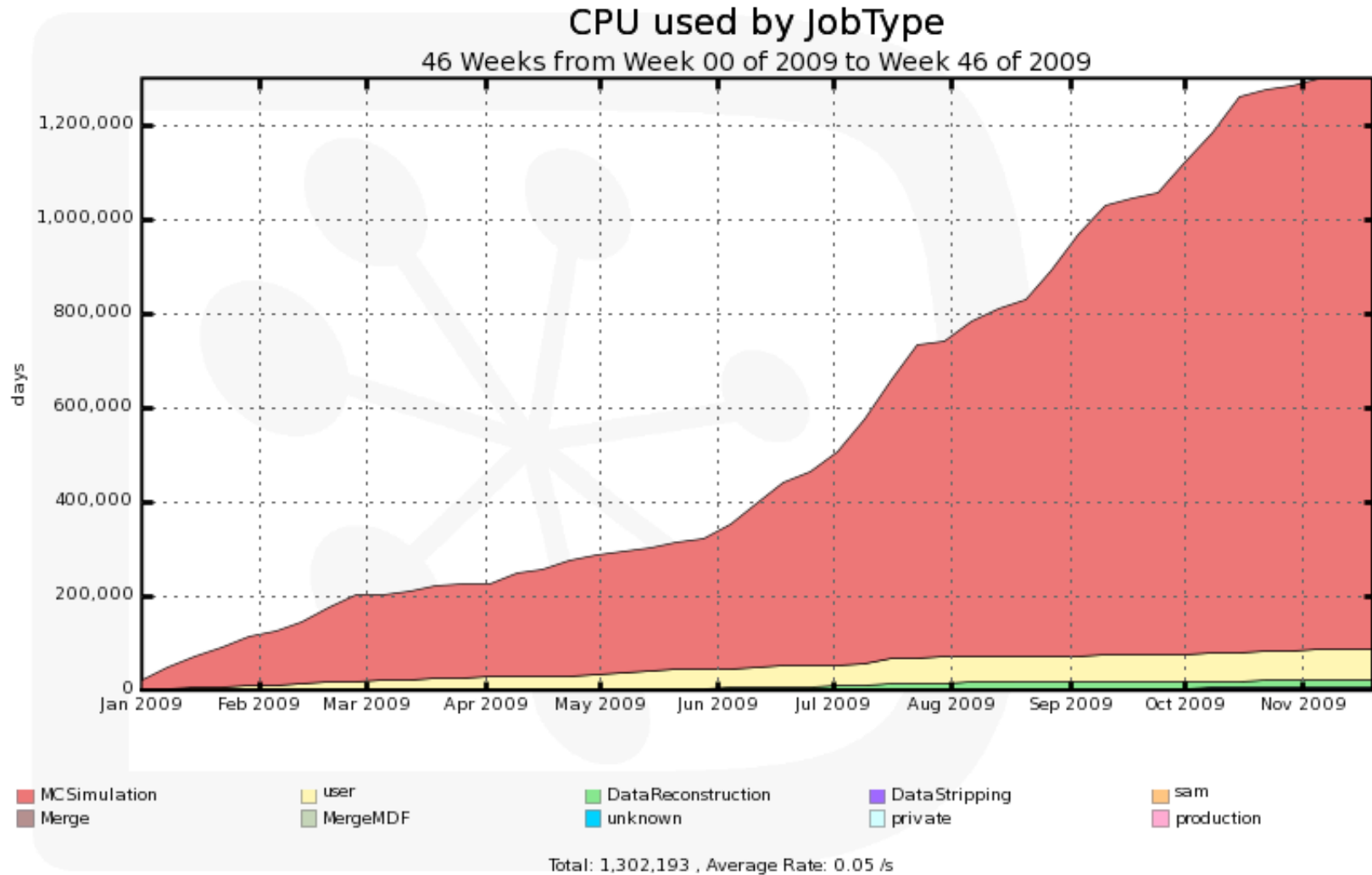
CPU (in days)



Total: 1,302,083 , Average Rate: 0.05 /s



CPU (in days)





- Very large number of **recurrent** problems!
- Main issue: **Data Access at Tier1s**
 - Stability of Storage Elements
 - Configuration issues, storage-ware versions
 - Software repository availability, scalability and reliability
- Regular reports at daily and weekly Grid Operations meeting
 - Sites are usually very responsive...
 - ... but many problems take (far too) long to be fixed
- Lack of **stability**
 - What works today will not necessarily work tomorrow
- Not all problems can be spotted with functional tests
 - E.g. if some WNs are wrongly configured
- Non-Tier0-1 are easier to deal with for LHCb (only used for simulation)
 - ... but it is a full time job to follow site reliability



- LHCb applications are ready for first data
 - Alignment and calibration procedure have been tested on simulated data and on TED runs
- Large MC samples have been generated for preparing 2009/10 analysis
 - The full computing model was tested
- Resource estimates for 2009/10 have been made
 - Pledges just match requirements
 - Still details to be worked out with sites
 - ☆ Detailed disk sharing
 - It is important that pledged resources are installed in due time
 - ☆ Detailed staging will be discussed with sites
- Main risks for LHCb
 - Sites stability (in particular data access)
 - Scarce in manpower: less than 20 FTE overall in the Computing project
 - ☆ Core software, DIRAC, ganga and Computing operations