

**RO-11-NIPNE, evolution, user support, site and
software development**

IFIN-HH, DFCTI, LHCb Romanian Team

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- Short overview:
 - The old RO-11-NIPNE site
 - New requirements from the LHCb team
 - User support (solution offered).
 - Data reprocessing
 - 2012 facts
 - Future plans

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- The old RO-11-NIPNE grid site
- RO-11-NIPNE site is dedicated to LHCb experiment therefore we are only using a small number of VO's (LHCb VO, OPS and ifops).
- Historical facts:
 - The site has 120 cores (not all of those are usable at this time , the servers are very old)
 - The storage element has only 500GB disk space as the LHCb computing does not require storage space. (T2 sites do not need storage)
 - Pretty old networking connections 1 Gbps (unmanaged switch)
- Last hardware upgrade of the site was made in 2008 , so urgent upgrade is necessary as some of the servers do not meet the minimum condition of 2 GB Ram memory for each core.

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- The requirements of the LHCb team
- The team leader of the group managed to achieve a young and dynamic team, able to engage both data analysis and software development.
- New group, new ideas, new requests:
 - data analysis works better on local sites than through LHCbDIRAC
 - LHCbDirac is offering monitor tools (local site do not offer that)
 - job submission from the clasical glite-UI is not useful as you can not monitor the jobs
 - the local user interface (glite-UI) can't offer the proper environment for some specific user jobs.
- Solution for that offered by the LHCbDIRAC client installed on the user interface.

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- User support for the romanian LHCb team
- LHCbDIRAC offers a way to :
 - submit jobs through CERN WMS servers
 - the jobs are monitored (the user can see the exact output and errors)
 - the user is able to submit jobs on the entire grid network or he can specify a grid site to run the jobs.(it is not recommended to be used as the user doesn't know the exact amount of memory or the type of CPU's installed on the sites).
 - a job submitted through the WMS (without specifying the site's name will take longer as it will wait for the WMS to find a site that matches the requests.
- This is the first step in user's support as the team needs more resources for data analysis.

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- **Data Reprocessing**

- This year the LHCb computing model has changed as the Tier 1 sites can't offer enough computing power for the data reprocessing.
- The data stored on T1's needs to be reprocessed until the end of the year (the process started in september) using both Tier1 and Tier2 sites.
- LHCb does not use Tier3.
- All the Tier2 sites that are running reprocessing jobs need to accomplish some strict requirements (in Romania we have RO-11-NIPNE and RO-07-NIPNE)

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- Requirements:
 - All the sites that run reprocessing jobs have to use CVMFS (Cern Virtual Machine Filesystem)
 - The load of each grid site depends on the network connections (RO-11-NIPNE is running only 50 reprocessing jobs)
 - The sites running reprocessing jobs are tested for and monitored by CERN
- CVMFS
 - is a virtual filesystem deployed from CERN
 - is replacing the old shared area that each grid site had with a more powerful tool (more reliable as it does not depend on local resources).
 - CVMFS for LHCb is making software upgrades easier (physics software releases are upgraded on a central repository only)

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- CVMFS for LHCb
 - replaces the need of sam jobs (the jobs that upgrades the physics software)
 - it makes things easy for the grid site admins (no need for shared spaces and NFS)
 - it does require a squid server that caches the recently accessed data
 - the software are required by the job is mounted automatically on the worker nodes when it's needed by the job.
- The physics team all over the world are able to use CVMFS even on the laptops for accessing the complete set of experiment's physics software.

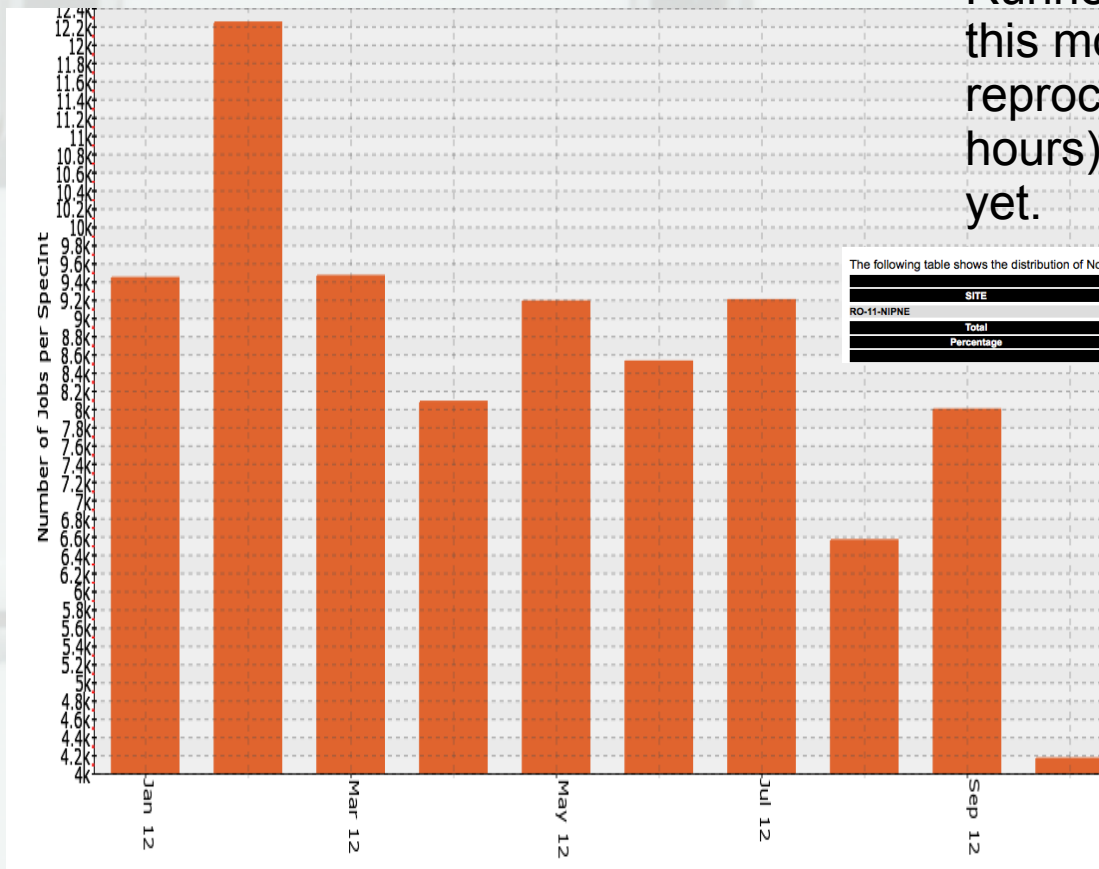
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- **2012 facts**

- during this year RO-11-NIPNE grid site ran about 1% of the LHCb Monte Carlo jobs.
- the site is still running with limited resources, which are quite old
- we had some ram memory problems and also some networking problems this year (now solved).
- the site has at this time a 6.7 TB user interface to offer storage for user jobs output (CERN has a limited capacity for each user that is not enough).

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- Runned jobs during this year, for this month as we are running reprocessing (a job takes 24-48 hours) the graphs are not updated yet.



The following table shows the distribution of Normalised CPU time (kSI2K) grouped by SITE and VO.

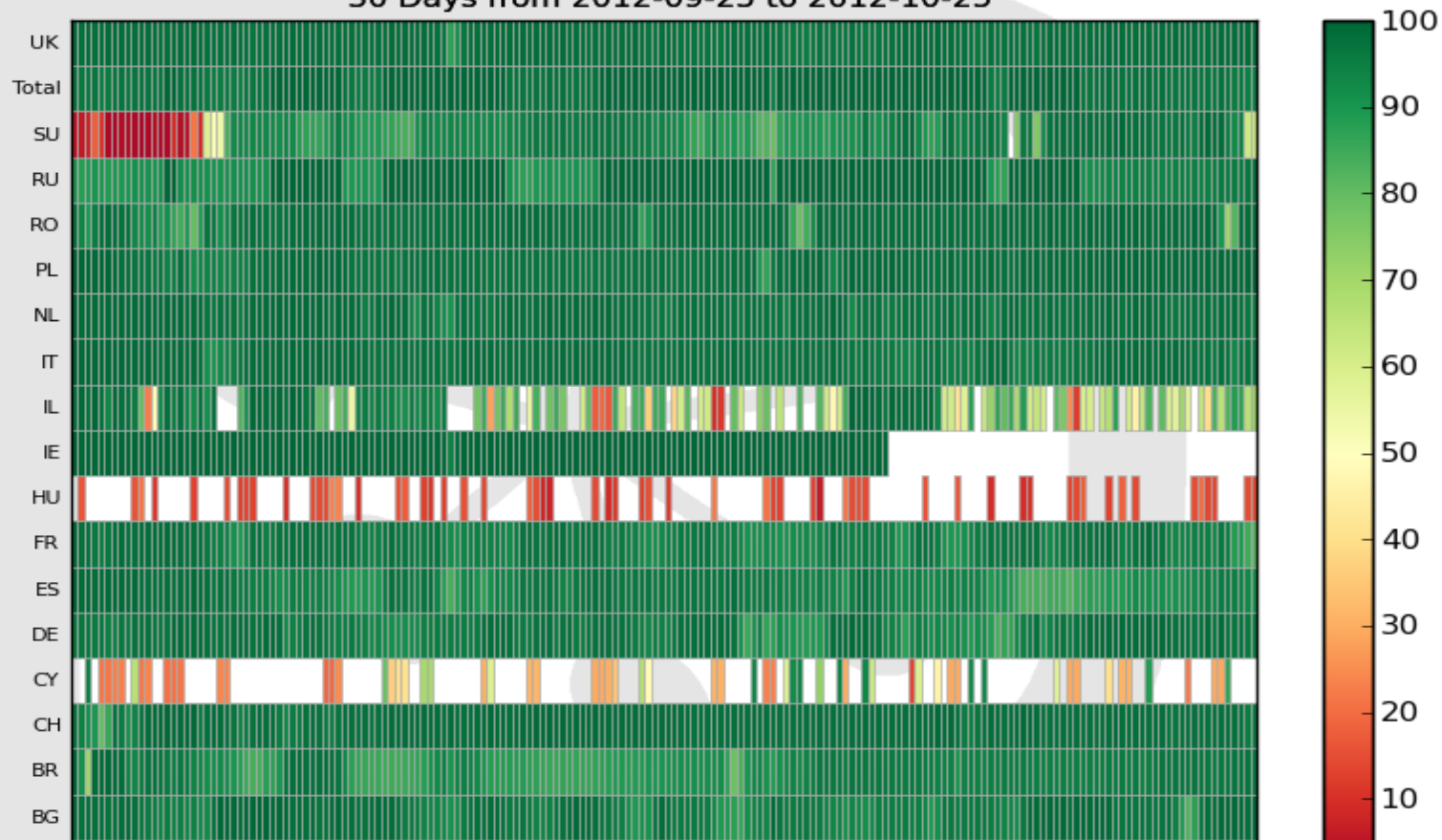
SITE	Normalised CPU time (units 1K_S12K_Hours) by SITE and VO		Total	%
	lhcb	ops		
RO-11-NIPNE	199,839	101	199,940	100.00%
Total	199,839	101	199,940	
Percentage	99.95%	0.05%		

[Click here for a CSV dump of this table](#)

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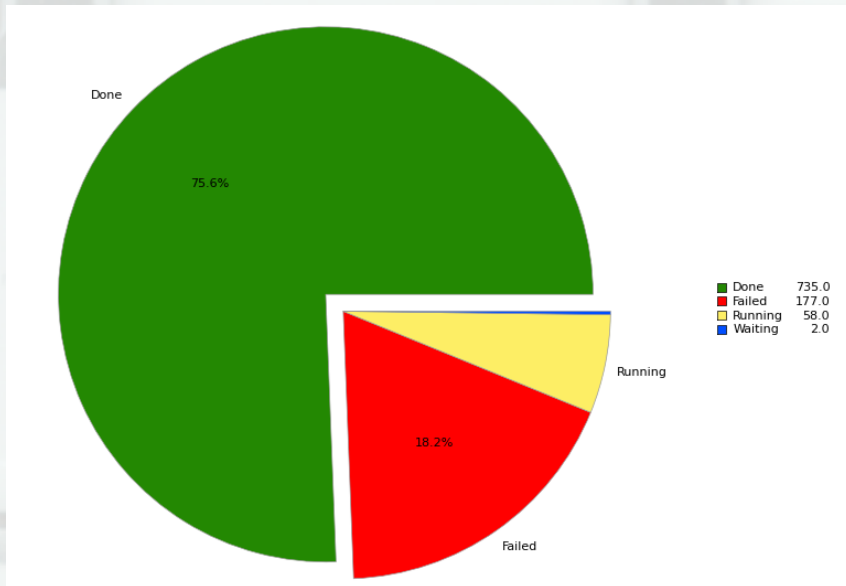
Job CPU efficiency by Country

30 Days from 2012-09-25 to 2012-10-25



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- The plots are made strictly on production jobs, ops and pilot jobs are omitted.



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- Future plans for the site:
 - as it was mentioned earlier we are going to upgrade the middleware to EMI as the collaboration requested
 - we've achieved already 9 new servers (8 cores /16 GB ram memory) to replace some of the old machines
 - also we are replacing the switches to improve the network speeds
 - this year will have some more servers in december (12 cores/ 24 GB ram memory each).
 - and a new user interface 36 TB raid 6 storage for it.
 - the group has a member involved in software development at CERN.

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Thank you!

On behalf of IFIN-HH, DFCTI and LHCb Romania Team.
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