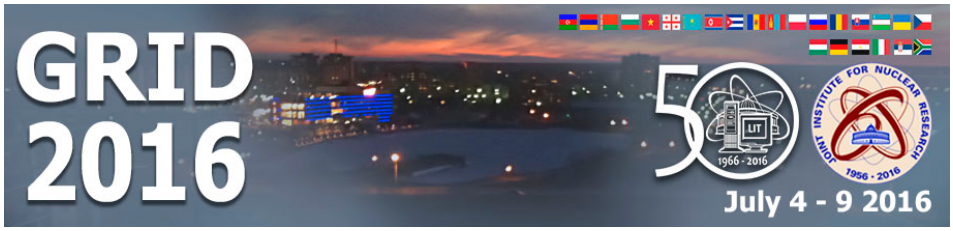

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User interface for a computational cluster: resource description approach.

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Computational centers provide users with HPC resources.
This usually includes not only hardware (e.g. powerful computational clusters) and system software (e.g. Linux and some PBS implementation), but also application software too.

In case of university computational center system administrators install some scientific applications, provide users with access to it and manage that access. They are usually responsible for updating such software and solving problems.

But such access usually implies only the ability to submit user jobs to resources: users are responsible for creating correct job description (in terms of necessary resources) and job start script (conventional and widely used systems like PBS usually require some script which contains commands that actually start the job).

Such task is easy for an average system administrator, but difficult for an average user.
Users usually consider job scripting to be very complex.
Moreover, some of them can not request the necessary resources correctly too.
But as matter of fact, users should learn scripting language (e.g. bash), some tasks of system administration (e.g. Linux administration) and learn information about all the hardware in the cluster.
Such tasks could be facilitated by creating some template scripts by administrators.
And even in this case users should learn scripting in order to modify such script for their needs and learn work with command line interface (in order to submit their jobs to the cluster management system).
But users are usually not accustomed with such work.
And all they need is to run their computations and retrieve the results.

This article is dedicated to this problem: the mentioned above tasks will be discussed in details on example of a cluster with widely used management system (PBS). Then the possible solution to this problem will be proposed: graphical user interface used based on resource and task description system. This case implies a language for resource (hardware and applications) description. Such descriptions are created by system administrators. They represent available hardware and software as an abstraction.
They are used by graphical user interface in order to represent the available resources in a common way.
Such approach eliminates the need to learn command line interface and scripting for users and allow them to access resources in a

convenient way.
Moreover, this leads to more efficient resource utilization
since users will rarely do mistakes when requesting resources.

Keywords:
Computational clusters, User interface, Cluster management systems,
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