

## A Visualisation Tool for Accounting Data \*

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This article describes the project "Computing Cluster Usage Visualization Tool" which has been developed in the context of the KoSI (Kooperativer Studiengang Informatik) project in cooperation between the "Hochschule Darmstadt" and the GSI.

### Introduction and background

The "Hochschule Darmstadt" offers in the faculty of Information Technology a dual study course during which a pre defined project is being developed in cooperation between the university and the participating company within three praxis semesters distributed over the whole course of studies. The "Computing Cluster Usage Visualization Tool" came into existence during the 3rd praxis semester - the 7th semester in total - and had the aim to provide a visualisation system for the capacity utilisation of the Prometheus compute cluster at GSI.

Users and groups have the possibility to get information about their computed jobs and their efficiency in a fast way via an easy to understand graphical display. By giving the time interval the degree of capacity usage within certain periods of time can be visualised. Most of the times recently computed jobs are available for such capacity usage visualisation. Also a time interval larger than a single month can be defined. The visualisation system is accessible in the intranet of the GSI under the following address <http://web-docs.gsi.de/~jsinisa/accountingApp/mainAjax.html>. An example view is given in fig. 1.

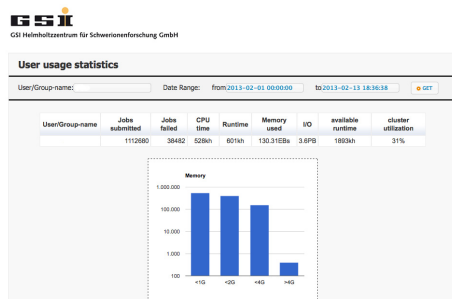


Figure 1: An example view of the Computing Cluster Usage Visualization Tool.

### Visualisation of resources

The "Computing Cluster Usage Visualization Tool" offers a visualisation for whole groups as well as for single

users. The following information about computed jobs in a given time interval can be displayed:

- number of computed jobs
- number of failed jobs
- consumed CPU time
- memory consumption
- storage consumption of I/O operations
- cluster capacity utilisation with respect to run time/wall clock in percentage

Additional graphs give more detailed information about the jobs. The charts are ordered according to time periods and memory consumption. Depending on how many jobs in a given time gap have been computed or on how many jobs consume a certain amount of memory corresponding bars will be plotted. This results in bar charts ordered in a way as described above.

### Benefit and results

The job management system of Sun Microsystems, Sun GridEngine, which is powering the compute cluster Prometheus, is documenting each computed job in a accounting file. A copy of this accounting file will be placed into the intranet of GSI and will be updated in periodical time spans. Via this method a permanent insight into the current capacity utilisation is available. At the end of each month a report is being created summarising the capacity utilisation of the cluster. This report is presented on a regular basis in the monthly Technical Computing Meeting where representatives of GSI IT and the experiments are present and are thus regularly informed. This may simplify estimates related to the currently available hardware and also estimates related to future resource distribution plans. Statistics of individual experiments can be discussed and also how to proceed in future.

### Outview

The project "Computing Cluster Usage Visualization Tool" has been developed during a praxis semester of a KOSI study course. The visualisation system can be further extended though with regards to functionality and simplified visualisation. Another possibility is to further develop and to integrate the current system into a larger monitoring project at GSI IT.

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