Improved operation for the ALICE Tier2 Centre at GSI

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This article describes the improvements implemented in 2014 to increase the reliability and performance of the ALICE Tier2 Computing Centre at GSI.

ALICE tier2 centre at GSI and ALICE Grid in Germany

The ALICE tier2 centre and the National Analysis Facility at GSI provide a computing infrastructure for ALICE Grid and for the local usage of the German ALICE groups.

The storage resources pledged to the global ALICE community (550 TB) are provided via a Grid Storage Element which consists of an xrootd [1] daemon running on top of the Lustre file system.

In this contribution an enabling technology is described which gives the possibility to include local HPC resources into a distributed computing environment for ALICE and FAIR. A prototype has been implemented which will be operated in production mode for the ALICE tier2 centre at GSI. The work done in this context is also an important contribution to the Data Life Cycle Lab "Structure of Matter/FAIR" within the portfolio project "Large Scale Data Management and Analysis (LSDMA)" [2].

The new storage infrastructure as described in this article can also be used by Grid jobs in the firewall protected environment of the GSI HPC cluster.
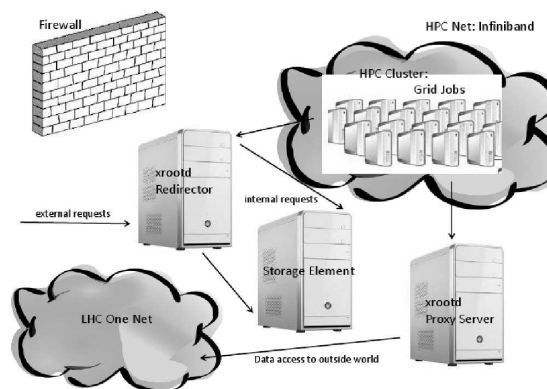

Figure 1: GSI storage setup

The main elements are the xrootd redirector as well as the xrootd forward proxy server. The redirector is using the split directive of xrootd and redirects external clients to the external interface of the GSI storage element and internal clients to the internal interface which is directly connected to the local Infiniband Cluster. The xrootd forward proxy server provides the possibility to Grid jobs running insid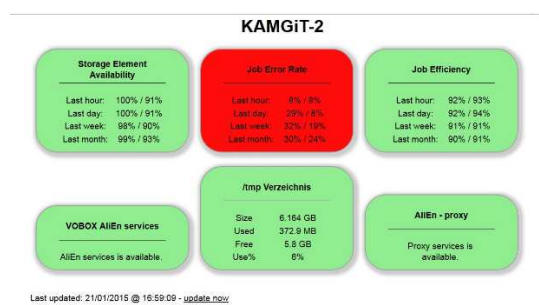e the protected HPC environment to read input data from ex-ternal data sources using the proxy interface. Writing to external storage elements is possible via the same technique. The setup is shown in fig. 1.

Throughout the year GSI participates in centrally managed ALICE Grid productions and data analysis activities, but also analysis jobs of individual users are running on the ALICE tier2 centre. The overall job share of successfully computed jobs in 2014 contributed by the German Grid sites, the GSI tier2 centre and Forschungszentrum Karlsruhe (ALICE tier1 centre) has been 10% of all ALICE Grid jobs worldwide. This corresponds well with the pledged CPU resources for 2014: 7000 HEP-SPEC06 for GSI tier2 (4% of the global T2 requirements) and 30000 HEP-SPEC06 for FZK (27% of the global T1 requirements)

High Level Service Monitoring for the GSI ALICE Tier2 centre

Within a Bachelor Thesis supervised in cooperation with Hochschule Darmstadt a High Level Service Monitoring Tool for the GSI ALICE Tier2 centre has been developed. After identifying the Key Performance Indicators which are relevant for characterizing the smooth operation of the ALICE Tier2 centre a High Level Service Monitoring tool has been implemented in JavaScript using Node.js, the Node.js framework Express.js and Jade for HTML templates. Depending on the functionality red, green, or yellow lights show the current status of the ALICE Tier2 Centre and help in providing a reliable service. A screenshot can be seen in fig. 2

Figure 2: **K**PI **A**LICE **M**onitoring **G**SI **T**ier**2**

References

[1] http://xrootd.org/

[2] http://www.helmholtz-lsdma.de/

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