



VIRTUAL INFRASTRUCTURE ARCHITECTURE FOR THE *StarFormMapper* H2020 SCIENCE PROJECT

J.M. Herrera-Fernandez*, Luis Valero-Martin, Jose Manuel Blanco, Ignacio de la Calle, Aitor Ibarra and Jesús Salgado

Quasar Science Resources, S. L., Gabriel García Márquez 4, Las Rozas de Madrid, 28232 Madrid, (Spain)
*josemariaherrera@quasarsr.com

We introduce StarFormMapper (SFM), a project funded by the European Union under the Horizon 2020 programme. This contribution is focused on the description of the virtual and software infrastructure to be implemented for the project by the company Quasar Science Resources. This infrastructure is needed in order to fully exploit the scientific contents of the archive of two of ESA's space missions, GAIA and Herschel.

QUASAR Science Resources is a private company that provides consulting Software and System Engineering services for Research and Development projects. We provide high quality tailored-made services targeted at Research Centres, Universities and Private Companies looking to expand their activity domain. We operate in the Madrid (Spain) area but our customers include national and European partners both in the public and private sectors.

Introduction The SFM project combines data from two of ESA's major space missions, Gaia and Herschel, together with ground based facilities, to constrain the mechanisms that underlie massive star and star cluster formation. Quasar Science Resources deals with the creation of the necessary software tools in order to handle the scientific algorithms for the analysis of the combined Gaia, Herschel and other data of young star clusters, including, the visualization of the results.

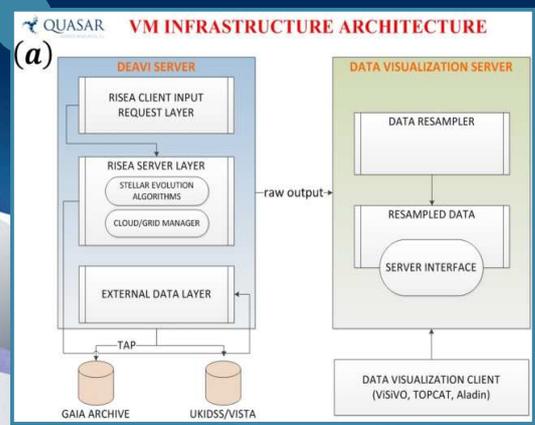


Figure 1: Home page of SFM project, <http://www.sfm.leeds.ac.uk/>

Virtual Infrastructure Architecture

1. DEAVI Server

- RISEA Client interface: to access the existing, either in production or development, scientific algorithms for mass inversion, as designed by the scientific team within the project. The Client should allow interacting with the algorithm in order to add/modify/implement, physical conditions, input parameters and output data.
- RISEA Server: running on the virtualized infrastructure, it will be able to handle and inject different scientific algorithms, including a wrapper on top of the input data.
- Data Access Interface: it will include not only access to the Gaia, or other, Archive data but, also, all the auxiliary data needed by the scientific algorithm.



2. Data Visualization Server

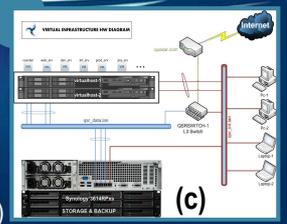
A Data Resampler will resample the data on the server side to allow client visualization, and a Data Visualization Client will allow the exploration of the results in 3D.



Figure 2 (a) Proposed Virtual Server architecture design for the SFM project showing the different subsystems proposed, (b) summary of the different technologies to be employed and (c) SFM hardware infrastructure diagram.

Infrastructure Deployment

- The vSphere 6.0 cluster will be installed in two Lenovo x3550M5 servers
- The virtual center server will be virtualized inside the Virtual Infrastructure (Microsoft Windows 2012 R2 server)
- The Storage Infrastructure will consist of a Synology DS3614RPxs NAS compatible (RAID6 volumes)
- The NAS server will be used for backup purposes, and off-site data replication will be performed to our partner's IT infrastructure
- The network setup will consist of two isolated vlan segments with dedicated switches, firewall and security measures



QUASARSR.COM
CONTACT@QUASARSR.COM

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