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iSPHERE – A New Approach to Collaborative Research and Cloud Computing

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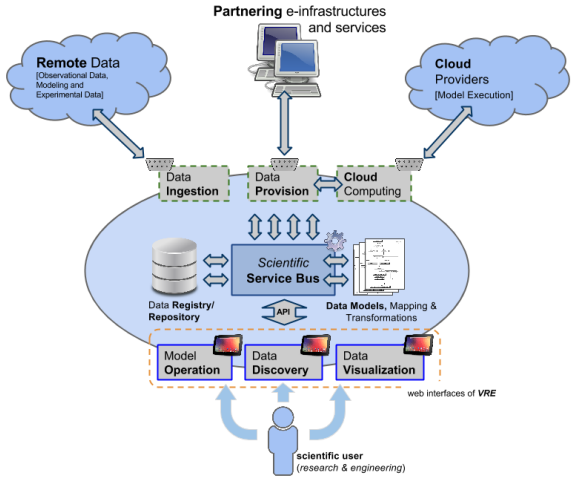
Abstract

The project ***iSPHERE*** (*integrated Scientific Platform for HEterogeneous Research and Engineering*) that has been proposed for **Horizon 2020** (*EINFRA-9-2015*, [1]) aims at creating a next generation *Virtual Research Environment* (VRE) that embraces existing and emerging technologies and standards in order to provide a versatile platform for scientific investigations and collaboration. The presentation will introduce the large project consortium, provide a comprehensive overview of *iSPHERE's* basic concepts and approaches and outline general user requirements that the VRE will strive to satisfy.



An overview of the **envisioned architecture** will be given, focusing on the adapted *Service Bus* concept, i.e. the "Scientific Service Bus" as it is called in *iSPHERE*. The bus will act as a central hub for all communication and user access, and will be implemented in the course of the project. The agile approach [2] that has been chosen for detailed elaboration and documentation of user requirements, as well as for the actual implementation of the system, will be outlined and its motivation and basic structure will be discussed. The presentation will show which user communities will benefit and which concrete problems, scientific investigations are facing today, will be tackled by the system.

Another focus of the presentation is *iSPHERE's* seamless **integration of cloud computing resources** and how these will benefit scientific modeling teams by providing a reliable and web based environment for cloud based model execution, storage of results, and comparison with measurements, including fully web based tools for data mining, analysis and visualization. Also the envisioned creation of a dedicated data model for experimental plasma physics will be discussed. It will be shown why the *Scientific Service Bus* provides an ideal basis to integrate a number of data models and communication protocols and to provide mechanisms for data exchange across multiple and even **multidisciplinary** platforms.

References

[1] H2020/EC REA, e-Infrastructures for virtual research environments (VRE), EINFRA-9-2015, (http://ec.europa.eu/research/participants/portal/desktop/en/opportunities/h2020/topics/2144-einfra-9-2015.html)

[2] Beck, K. et al. (2001). "Manifesto for Agile Software Development" (http://agilemanifesto.org/). Agile Alliance. Retrieved 14 June 2010