

Integrating distributed data infrastructures with IndigoDataCloud

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In the past decade, European research institutions, scientific collaborations and resource providers have been involved in the development of software frameworks and in the setup of unprecedented distributed e-infrastructures such as the European Grid Infrastructure (EGI)⁸⁹⁴; their collaboration made it possible to produce, store and analyze Petabytes of research data through hundreds of thousands of compute processors, in a way that has been instrumental for scientific research and discovery worldwide. New technological advancements, such as virtualization and cloud computing, and the need of resource providers to keep improving their services to maximize effectiveness, efficiency and business opportunities poses new important challenges.

In this context, INDIGODataCloud (INtegrating Distributed data Infrastructures for Global Exploitation), a proposal approved in January 2015 within the EINFRA1 call of the Horizon2020 framework program of the European Community, aims at developing a data/computing platform targeting scientific communities, deployable on multiple hardware and provisioned over hybrid (private or public) e-infrastructures.

In Cloud computing, both the public and private sectors are already offering Cloud resources as IaaS (Infrastructure as a Service). However, there are numerous areas of interest to scientific communities where Cloud computing uptake is currently lacking, especially at the PaaS and SaaS (Software as a Service) levels. INDIGO therefore aims at developing tools and platforms based on Open Source solutions addressing scientific challenges in the Cloud computing, storage and network areas.

This talk will show the technology gaps identified by INDIGO and describe how INDIGO is going to develop and deliver software components allowing execution of applications on Cloud and Grid based infrastructures, as well as on HPC clusters.

The project will extend existing PaaS (Platform as a Service) solutions, allowing public and private e-infrastructures, including those provided by EGI, EUDAT, PRACE and Helix Nebula, to integrate their existing services and make them available through AAI services compliant with GEANT's inter federation policies, thus guaranteeing transparency and trust in the provisioning of such services. INDIGO will also provide a flexible and modular presentation layer connected to the PaaS and SaaS frameworks developed within the project, allowing innovative user experiences and dynamic workflows, also from mobile appliances.

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