Prompting an EOSC in Practice in the Iberian area

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& EOSC High Level Expert Group
The objective of the EOSC is to give the Union a global lead in research data management and ensure that European scientists reap the full benefits of data-driven science, by offering ‘1.7 million European researchers and 70 million professionals in science and technology a virtual environment with free at the point of use, open and seamless services for storage, management, analysis and re-use of research data, across borders and scientific disciplines’.

(https://ec.europa.eu/research/openscience)
Content of the presentation

• Reflexions from the EOSC HLEG
• How is IBERGRID positioned towards EOSC
• Innovation: Opportunities and Challenges
The EOSC High Level Expert Group

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<th>Members</th>
<th>Mission:</th>
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<tr>
<td>Isabel Campos Plasencia (CSIC, ES)</td>
<td><strong>Advise the EC on the measures needed to implement the European Open Science Cloud.</strong></td>
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<td>George Komatsoulis (Microsoft, USA, Observer)</td>
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<td>Ross Wilkinson (Australian Library Ser., AU, Observer)</td>
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Framework of the EOSC HLEG

The HLEG work takes place through direct funding from the EC

- Collaborates with ongoing Horizon 2020 projects contributing to the establishment of the EOSC: EOSC-Pilot, EOSC-Hub

With the **Commission expert group on Turning FAIR data into reality** and the **Open Science Policy Platform.**

- **Summary report of the Stakeholder workshops** (June 2017 and October 2018);
- **Interim report** – May 2018;
- **Final Roadmap Report**: advice on implementation of the EOSC preparatory phase Dec. 2018
The rational

THE EOSC
MINIMUM VIALBE ECOSYSTEM
Designing EOSC as a Minimum Viable Ecosystem

*EOSC aims to put Europe at a global lead regarding scientific data infrastructures*

The provision of *infrastructures, technology* development, and *human* resources to support it will take place in a *very heterogeneous landscape*.

Addressing this challenge requires the **definition of a smallest common denominator**: the EOSC Minimum Viable Ecosystem (MVE).
Minimum Viable Ecosystem

A Minimal Viable Ecosystem (MVE) will emerge if Technical and Human / Sociological conditions are met.

- Technical Conditions
  - Interoperable Services
  - Open Data

- Human Conditions
  - Software Developers
  - Researchers
  - Infrastructure Managers
EOSC is an effort to enable Hybrid Clouds

Individual Clouds

FEDERATED CLOUD

Marketplace

Layer of Federation Services to enable the Hybrid Cloud
EOSC Infrastructure Managers
Incentives

- Infrastructure **publicly funded by national agencies** and providers
  - Banking on the economy of scale to support international collaborations
  - Provide a “stable” infrastructure safe from money flow issues that affect Research funding lines.
  - Provide the environment to do IT independent research at State of the Art (piloting innovative services).

- Infrastructure **provisioned by Commercial clouds** (direct market offer, pre-procurements, ...)
  - Direct market offer: could be a solution for “peaks of demand”.
  - Pre-procurement procedures for “flat budget” organizations.
The Interoperability Challenge for EOSC

Applications & tools;
Baseline services (storage, compute, connectivity);
Training...

Marketplace
AAI
Accounting
Monitoring....

Services
Federated Services
Federated Resources
Processes and Policies

Lightweight certification of Providers
SLA negotiation...

Security regulations,
Compliance to standards,
Terms of use,
FAIR guidelines ...
IBERGRID towards the EOSC

IBERGRID BACKGROUND
IBERGRID history and origins

Many successful e-science projects with strong PT + ES partnership and also extending to Latin America
Timeline

• 8-Nov-2003 Scientific and Technology Cooperation Agreement between Portugal and Spain (Figueira da Foz)


• 25-Nov-2006 Memorandum of Understanding (Badajoz): Ministério da Ciência, Tecnologia e Ensino Superior + Ministerio de Educación y Ciencia

• 22-Jan-2009 Memorandum of Understanding (Zamora): Ministério da Ciência, Tecnologia e Ensino Superior + Ministerio de Educación y Ciencia ➔ IBERGRID federated infrastructure
IBERIAN common plan

Initial plan released in May 2007

- **1st phase**
  - Operations Centre
  - Establish 4 VOs
  - Training
  - Sustainability study

- **2nd phase**
  - Expansion to more Resource Centres
  - Expand VO coverage

- **3rd phase**
  - Expand to supercomputing centres

- **In green the areas that become active and are operational**
Distributed computing infrastructure

Tech coordination

Tech coordination
IBERGRID in EGI and EOSC-hub

• Previously in EGI
  • Middleware rollout (LIP/IFCA)
  • Middleware criteria definition & validation (IFCA/CESGA/LIP)
  • EGI accounting (CESGA)
  • EGI support (LIP/IFCA)

• Now 2018 in EOSC-hub
  • Configuration and Change Management, Release and Deployment Management
  • EGI accounting portal
  • Processing and Orchestration
  • Common service requirements
  • Stakeholder Engagement Programme

• Global tasks:
  • Coordination of European wide activities
IBERGRID role to Federate in the EOSC-hub Catalogue
https://ibergrid.eu/federating-clouds/

- Accounting Portal: http://accounting.egi.eu
- Cloud Accounting software – CASO
  https://github.com/IFCA/caso
- Processes and Policies: SQA Coordination
  Software Quality Assurance Processes and Policies
- Author.& Authent. OpenStack-VOMS
  https://github.com/IFCA/voms-auth-system-openstack
EOSC Marketplace

- **Open catalogue** of services
- **Integrated** discovery, order & access management
- Integrated with **Authentication** (AARC blueprint conformant)

https://marketplace.eosc-hub.eu
IBERGRID developments in the EOSC-HUB Marketplace

- **CONTAINER SERVICES**
  - UDocker (LIP)

- **COMPUTING SERVICES**
  - OpenStack Preemptible Instances - OPIE (CSIC)

- **PaaS SERVICES**
  - Infrastructure Manager - IM (UPVLC)

- **THEMATIC SERVICES**
  - LIFEWATCH (Lifewatch ERIC)
  - OPENCOASTS (LNEC)
IBERGRID towards the EOSC

INNOVATION IN THE EOSC ECOSYSTEM
Innovation Potential:

“Engaging Human Talent”

- EOSC Infrastructure: in general a hybrid landscape, based on
  - Public and Private Clouds
  - Commercial or Publicly Funded Infrastructures
- Scientific Communities usually pilot the deployment of innovative services: advanced requirements.
- Software developers are a fundamental part in this ecosystem: recognition
- EOSC should implement policies to harness the potential of European developers in academia and industry.

Breakthrough ideas leading to innovation need to be awarded with the proper Recognition
IBERGRID towards the EOSC

IBERGRID INNOVATION POTENTIAL IN SOFTWARE DEVELOPMENT
Example: *Preemptible* (or *Spot*) cloud instances or, how to make extra money with idle CPU cycles?
Example: *Preemptible* (or *Spot*) cloud instances

Independent, State of the Art Research, delivering Innovation

OpenStack Preemptible Instances – OPIE
https://github.com/indigo-dc/opie

Alvaro, Premio a la mejor Tesis en “Ciencias Experimentales”
Incentives for Software Developers: “Engaging Human Talent”

• “EOSC-Ready” as a Branding for software products, will harness the potential of the European developers, both in academia and industry.

What does it mean “EOSC-Ready”? Trustable

• Open Source → contributed upstream (potentially sustainable)
• Based on Open Standards
• Adheres to code style quality standards → Software Quality
• It respects the EC directives on cloud security (NIS), personal data protection (GDPR) and Free Flow of non-personal Data (FFD).
Software activity history as Iberian Federation

- **2002-2005**: 11 countries / 21 partners (5 Iberian)
- **2005-2007**: CSIC coordinated 7 countries / 12 partners (5 Iberian)
- **2006-2010**: EGI.eu is funded in Feb. 2009. Software Quality task EGI-wide
- **2009-2013**: Many…
- **2010-2013**: Many…
- **2014-2017**: EGI.eu

@ Jesús Marco & Jorge Gomes
INDIGO-DC Software Collaboration Agreement

Ibergrid teams are involved in the development of software to support innovative services for researchers in the European Open Science Cloud framework.

CSIC, LIP and UPVLC are signatories of the INDIGO-Datacloud Software Collaboration Agreement, a key Technology provider for the EOSC ecosystem.

The INDIGO-DC Software Stack Catalogue is a catalogue of open source software components that are follow the Architecture defined by the INDIGO-DataCloud project, funded by the European Union under the Horizon 2020 Framework Program with Grant Agreement 653549.

This Collaboration Agreement targets to sustain and further develop the INDIGO–DataCloud architecture, the original INDIGO-DataCloud Software Catalogue and as well as the „INDIGO brand” beyond the lifetime of the INDIGO-DataCloud Project, through a not-for-profit, liability-free mutual…. 
Software Quality Management

A set of Common Software Quality Assurance Baseline Criteria for Research Projects

Abstract
The purpose of this document is to define a set of quality standards, procedures and best practices to conform a Software Quality Assurance plan to serve as a reference within the European research ecosystem related projects for the adequate development and timely delivery of software products.

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See: http://digital.csic.es/handle/10261/160086
• Evolve up to production level intensive computing services exploiting specialized hardware: **Hardware Accelerators: GPUs** and **low-latency** interconnects

• **Integrate** intensive computing **Services under a Hybrid Cloud** approach ensuring interoperability expanding over multiple IaaS using high level networking technologies

• Offer a **DevOps approach for application development**
... OUR ROOTS GO DEEP

http://slideplayer.com/slide/4798848
In retrospective: CrossGrid 2002-2004:
AcrossGrids Conference, February 2003, Santiago de Compostela

http://slideplayer.com/slide/4798848

First discussions on Network connectivity via LIP contact

Testbed middleware
- One of the aims of CrossGrid is to extend the grid coverage in Europe hence it needs to

Central X# validation services
The CrossGrid validation central services

EOSC-hub
Software Verification Team

Pablo, Alvaro, Mario, Joao, Miguel