





Helix Nebula - The Science Cloud Pre-Commercial Procurement

17 March 2016
Bob Jones, CERN

All information contained herein are for discussion purposes only and shall not be considered a commitment on the part of CERN or the Buyers group.

Logistics

☞ IT Ampitheatre

- ☞ No food and drink inside the Ampitheatre
- ☞ Please keep doors & windows closed as the A/C system will not work if they are open
- ☞ To make telephone calls during the meeting, stay in the closed corridor / coffee area to avoid disturbing people in their offices
- ☞ Bathrooms are on the same floor at the other end of the building

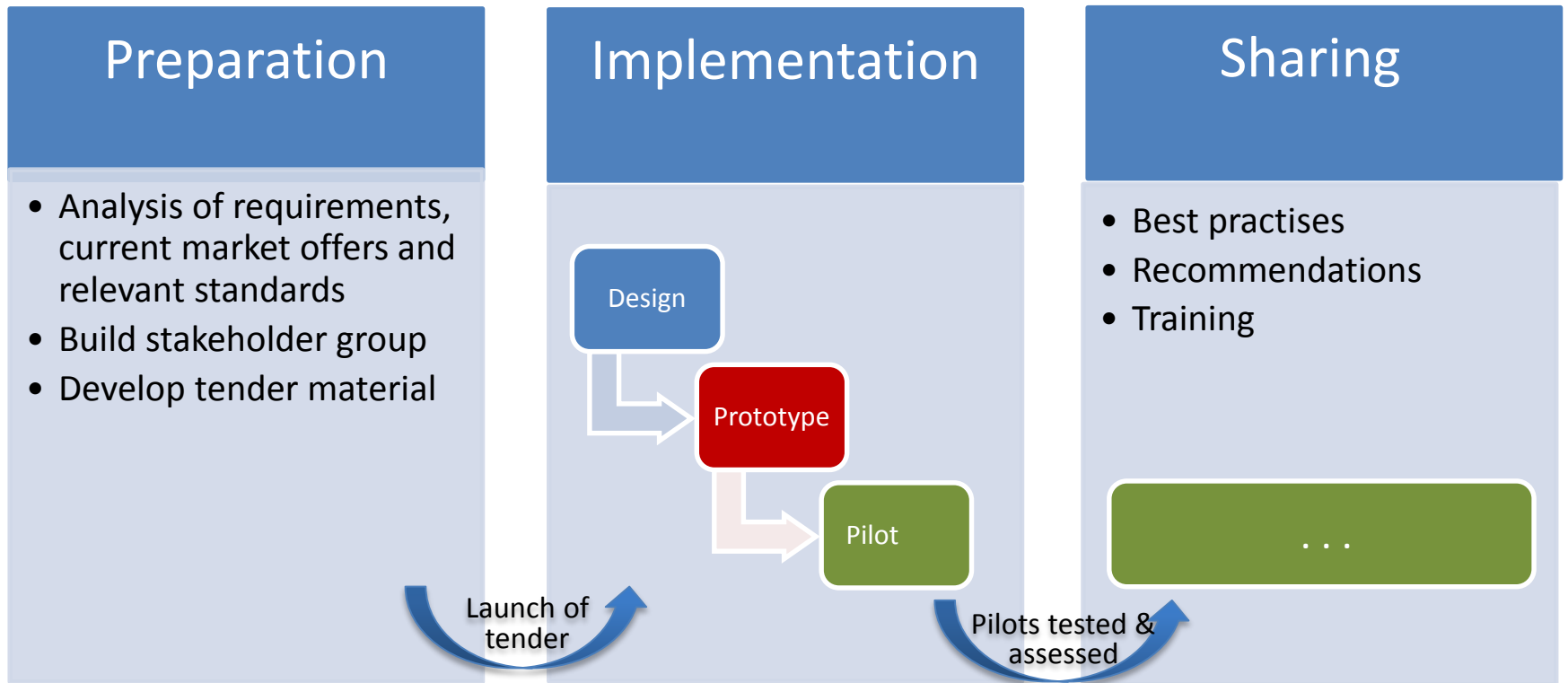
☞ Lunch

- ☞ Self-service cafeteria in building 504 (1st floor)

☞ Taxi

- ☞ Please fully complete the taxi form and place in designated box 4 hours prior to departure
- ☞ The drop-off box is in the coffee area
- ☞ You can reach the taxi company at +41 22 320 22 02

HNSciCloud PCP project phases



Jan'16

Jun'18



Objectives of this meeting

- Share information about the pre-commercial procurement
- Gather feedback to prepare the tender material

Agenda for today

- Information session (10:00 - 12:30 CET)

This session will be webcast.

This session will include a series of presentations that will provide an overview of the HNSciCloud project and consortium, the pre-commercial procurement process and the objectives of the procurement activity. It will include information about the use-cases to be supported, their technical requirements as well as the legal and contractual framework in which the procurement will be executed.

- Information session (13:30 - 17:00 CET)

This session will NOT be webcast.

This will be an interactive session between the HNSciCloud group of procurers & external partners on the one hand, and potential suppliers present at the open market consultation on the other, to explore the requirements of the procurement, how it matches current market offerings and where developments will be necessary.

In order to actively participate in this session, it is **strongly recommended that the company representatives present have a technical/architectural role.**

Information Session

Thursday, 17 March 2016

09:30 - 10:00 Coffee and registration

10:00 - 12:30 **Information session**

This session will include a series of presentations that will provide an overview of the HNSciCloud project and consortium, the pre-commercial procurement process and the objectives of the procurement activity. It will include information about the use-cases to be supported, their technical requirements as well as the legal and contractual framework in which the procurement will be executed.

This information session from 10:00 to 12:00 will be webcast.

10:00 **Introduction to HNSciCloud 20'**


Discussion 10'

Speaker: Bob Jones (CERN)

10:30 **PICSE (Procurement for Cloud Services Innovation in Europe) results 20'**

The PICSE Wizard, Barriers & Best Practices, and Roadmap

Speaker: Sara Garavelli (Trust-IT)

 [PICSE Website](#)

Discussion 10'

11:00 **System architecture & technical requirements 20'**

Discussion 15'

Speaker: Helge Meinhard (CERN)

11:35 **PCP methodology and legal contractual aspects 40'**

Discussion 15'

Speakers: Karen Ernst (CERN), Christophe Veys (CERN)

12:30 - 13:30 Lunch (Restaurant 2)

The Helix Nebula Science Cloud public-private partnership



Strategic Plan

- ▶ Establish multi-tenant, multi-provider cloud infrastructure
- ▶ Identify and adopt policies for trust, security and privacy
- ▶ Create governance structure
- ▶ Define funding schemes



To support the computing capacity needs for the ATLAS experiment

EMBL



Setting up a new service to simplify analysis of large genomes, for a deeper insight into evolution and biodiversity



To create an Earth Observation platform, focusing on earthquake and volcano research



PIC
port d'informació científica

To improve the speed and quality of research for finding surrogate biomarkers based on brain images

Additional Users:



Suppliers



Adopters



March 2016

Large Hadron Collider

CMS

LHCb

LHC computing resources in 2014

- 3.4 billion CPU hours
- 100 PetaBytes storage

ATLAS

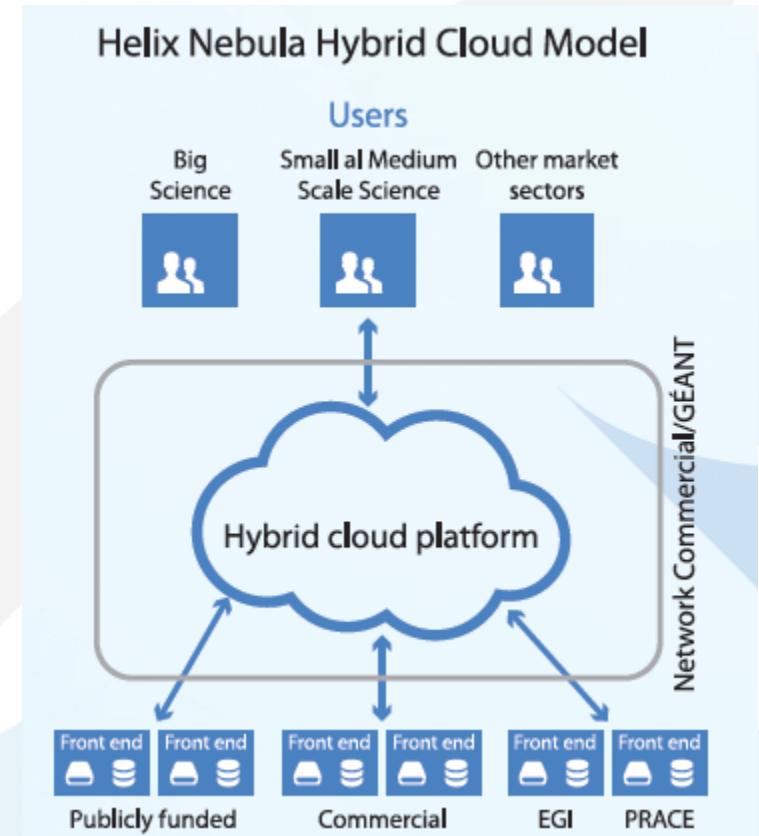
ALICE





The Helix Nebula Initiative

The Helix Nebula initiative has brought together research organisations, data providers, publicly funded e-infrastructures and European commercial cloud service providers to develop a hybrid cloud model with procurement and governance approaches suitable for the dynamic cloud market



The preferred model for public research organisations is a hybrid cloud that combines in-house resources with public e-infrastructures and commercial cloud services

HNSciCloud Joint Pre-Commercial Procurement

Procurers: CERN, CNRS, DESY, EMBL-EBI, ESRF,
IFAE, INFN, KIT, SURFSara, STFC

Experts: Trust-IT & EGI.eu

The group of procurers have committed

- >1.6M€ of procurement funds
- Manpower for testing/evaluation
- Use-cases with applications & data
- In-house IT resources

To procure innovative IaaS level cloud services
integrated into a hybrid cloud model

- Commercial cloud services
- European e-Infrastructures

Services will be made available to end-users
from many research communities

Co-funded via H2020 (Jan'16-Jun'18)

- Grant Agreement 687614

Total procurement commitment >5M€



What will be procured

A joint science cloud platform for the European research community

Combining services at the IaaS level into an environment supporting the full lifecycle of science workflows

The R&D services to be developed will need to be integrated with
Resources in data centres operated by the buyers group
European-scale publicly funded e-Infrastructures

As a hybrid platform on which a competitive marketplace of European cloud players can develop their own services for a wider range of users beyond research and science

User groups to be supported

High Energy Physics

- High Energy Physics
 - LHC experiments
 - Belle II
 - COMPASS



Astronomy

- Astronomy
 - CTA – Cherenkov Telescope Array
 - MAGIC
 - Pierre Auger Observatory



Life Sciences

- Life Sciences
 - ELIXIR
 - Euro-BioImaging
 - Pan-Cancer
 - BBMRI
 - WeNMR



Photon/Neutron science

- Photon/Neutron science
 - PETRA III, European XFEL, 3DIX, OCEAN, OSIRIS



Long tail of science

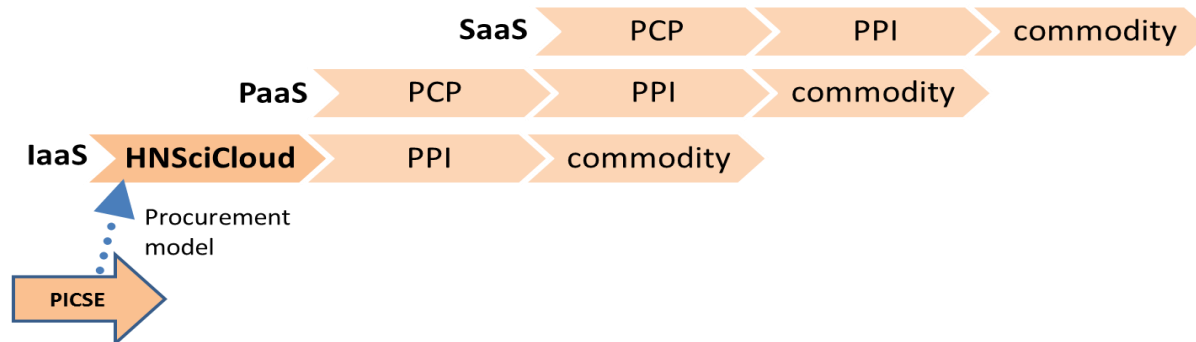
Etc.



Going Beyond HNSciCloud

HNSciCloud is the first in a possible series of EC co-funded projects

- Progression from R&D to production services
- Extend functionality with higher-level services
- Broaden the user base



Research Infrastructures



ESFRI RIs are facilities, resources or services of a unique nature identified by European research communities to conduct top-level research activities in all fields

Updated roadmap identifies
29 Landmarks (2 new) and 21 Projects (6 new)

All new entries have been evaluated also for e-needs

All the Roadmap Projects are monitored also for e-infrastructure aspects

The Landscape Analysis has been carried out for all thematic areas and for the transversal e-INFRASTRUCTURES - ***Helix Nebula is included***

ESFRI PROJECTS				
	NAME	FULL NAME	ROADMAP ENTRY (YEAR)	OPERATION (YEAR)
ENERGY	ECCSEL	European Carbon Dioxide Capture and Storage Laboratory Infrastructure	2008	2016
	EU-SOLARIS	European SOLAR Research Infrastructure for Concentrated Solar Power	2010	2020*
	MYRRHA	Multi-purpose hybrid Reactor for High-tech Applications	2010	2024*
	WindScanner	European WindScanner Facility	2010	2018*
ENVIRONMENT	ACTRIS	Aerosols, Clouds and Trace gases Research Infrastructure	2016	2025*
	DANUBIUS-RI	International Centre for Advanced Studies on River-Sea Systems	2016	2022*
	EISCAT_3D	Next generation European incoherent scatter radar system	2008	2021*
	EPOS	European Plate Observing System	2008	2020*
	SIOS	Svalbard Integrated Arctic Earth Observing System	2008	2020*
HEALTH & FOOD	AnaEE	Infrastructure for Analysis and Experimentation on Ecosystems	2010	2018*
	EMBRC	European Marine Biological Resource Centre	2008	2016
	EMPHASIS	European Infrastructure for multi-scale Plant Phenomics and Simulation for food security in a changing climate	2016	2020*
	ERINHA	European research infrastructure on highly pathogenic agents	2008	2018*
	EU-OPENSREEN	European Infrastructure of Open Screening Platforms for Chemical Biology	2008	2018*
	Euro-Bioluminescence	European Research Infrastructure for Imaging Technologies in Biological and Biomedical Sciences	2008	2017*
	ISBE	Infrastructure for Systems Biology Europe	2010	2018*
	MIRRI	Microbial Resource Research Infrastructure	2010	2019*
	CTA	Cherenkov Telescope Array	2008	2023*
PHYSICAL SCIENCES & ENGINEERING	EST	European Solar Telescope	2016	2026*
	KM3NeT 2.0	KM3 Neutrino Telescope 2.0: Astroparticle & Oscillations Research with Cosmics in the Abyss	2016	2020*
	E-RIHS	European Research Infrastructure for Heritage Science	2016	2022*

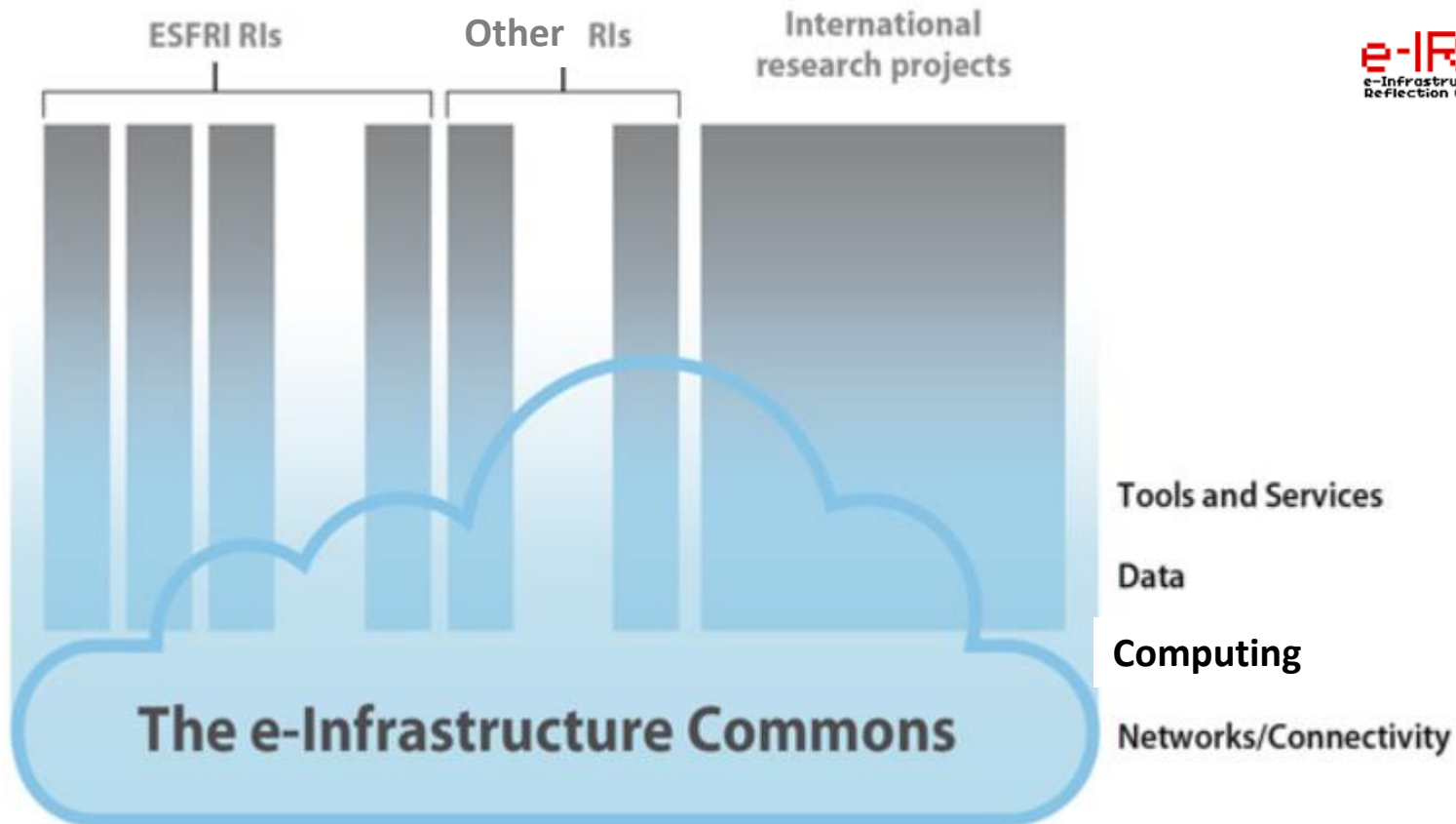


ESFRI LANDMARKS				
	NAME	FULL NAME	ROADMAP ENTRY (YEAR)	OPERATION (YEAR)
	JHR	Jules Horowitz Reactor	2006	2020*
	EMSO	European Multidisciplinary Seafloor and water-column Observatory	2006	2016
	EURO-ARGO ERIC	European contribution to the international Argo Programme	2006	2014
	IAGOS	In-service Aircraft for a Global Observing System	2006	2014
	ICOS ERIC	Integrated Carbon Observation System	2006	2016
	LifeWatch	e-Infrastructure for Biodiversity and Ecosystem Research	2006	2016
	BBMRI ERIC	Biobanking and BioMolecular resources Research Infrastructure	2006	2014
	EATRIS ERIC	European Advanced Translational Research Infrastructure in Medicine	2006	2013
	ECRIN ERIC	European Clinical Research Infrastructure Network	2006	2014
	ELIXIR	A distributed infrastructure for life-science information	2006	2014
	INFRAFRONTIER	European Research Infrastructure for the generation, phenotyping, archiving and distribution of mouse disease models	2006	2013
	INSTRUCT	Integrated Structural Biology Infrastructure	2006	2012
	E-ELT	European Extremely Large Telescope	2006	2024*
	ELI	Extreme Light Infrastructure	2006	2018*
	EMFL	European Magnetic Field Laboratory	2008	2014
	ESRF UPGRADES	Phase I Phase II: Extremely Brilliant Source	2006 2016	2015 2022*
	European Spallation Source ERIC	European Spallation Source	2006	2025*
	European XFEL	European X-Ray Free-Electron Laser Facility	2006	2017*
	FAIR	Facility for Antiproton and Ion Research	2006	2022*
	HL-LHC	High-Luminosity Large Hadron Collider	2016	2026*
	ILL 20/20	Institut Max von Laue-Paul Langevin	2006	2020*
	SKA	Square Kilometre Array	2006	2020*
	SPIRAL2	Système de Production d'Ions Radioactifs en Ligne de 2e génération	2006	2016
	CESSDA	Consortium of European Social Science Data Archives	2006	2013
	CLARIN ERIC	Common Language Resources and Technology Infrastructure	2006	2012
	DARIAH ERIC	Digital Research Infrastructure for the Arts and Humanities	2006	2019*
	ESS ERIC	European Social Survey	2006	2013
	SHARE ERIC	Survey of Health, Ageing and Retirement in Europe	2006	2011

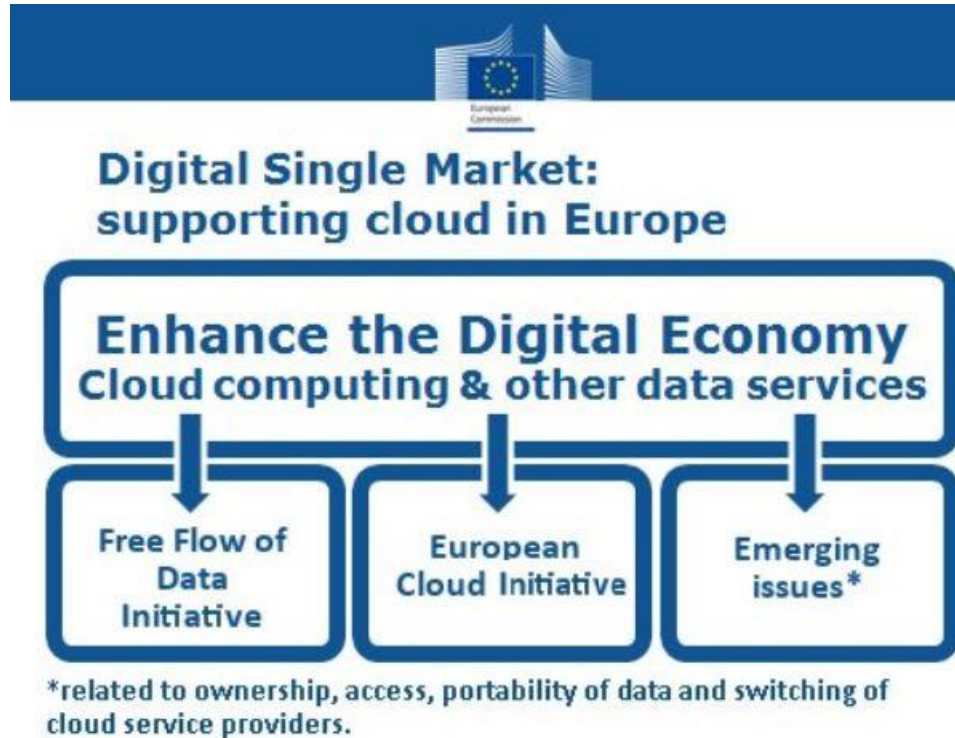


Bob Jones, CERN

An IT model for Research Infrastructures



European Cloud Initiative



European Cloud Initiative will focus on:

- **European Open Science Cloud:** a trusted, open environment for storing, sharing and re-using scientific data and results
- **European Data Infrastructure:** a world-class digital infrastructure to securely access, move, share and process data in Europe



EIROforum position paper on the European Open Science Cloud

This position paper is a rallying call for adoption of a strategic approach

<http://dx.doi.org/10.5281/zenodo.34264>

November 2015, 26 pages

Endorsed by the Director Generals of all EIROforum members and accompanied by a statement of intent to enact this strategy



EIROforum IT Working Group
24 November 2015

A European Open Science Cloud

Abstract

This document outlines the position of EIROforum on a European Open Science Cloud. It explores the essential characteristics of a European Open Science Cloud if it is to address the big data needs of the latest generation of Research Infrastructures. The high-level architecture and key services as well as the role of standards is described. A governance and financial model together with the roles of the stakeholders, including commercial service providers and downstream business sectors, that will ensure a European Open Science Cloud can innovate, grow and be sustained beyond the current project cycles is described.

About the EIROforum

EIROforum partners are intergovernmental research organisations – CERN, ESA, EMBL, ESO, EuroFusion, European XFEL, ILL and ESRF – covering disciplines ranging from particle physics, space science and biology to fusion research, astronomy, and neutron and photon sciences. The partner organisations have a truly European governance, funding and remit, and in many cases share a global engagement. They are world leaders in basic research, as well as in managing and operating large research infrastructures and facilities. The EIROforum collaboration is helping European science reach its full potential through exploiting its unparalleled resources, facilities and expertise. By combining international facilities and human resources, EIROforum exceeds the research potential of the individual organisations, achieving world-class scientific and technological excellence in interdisciplinary fields. EIROforum works closely with industry to foster innovation and to stimulate the transfer of technology.

Prepared by CERN IT department on behalf of the EIROforum IT Working Group.

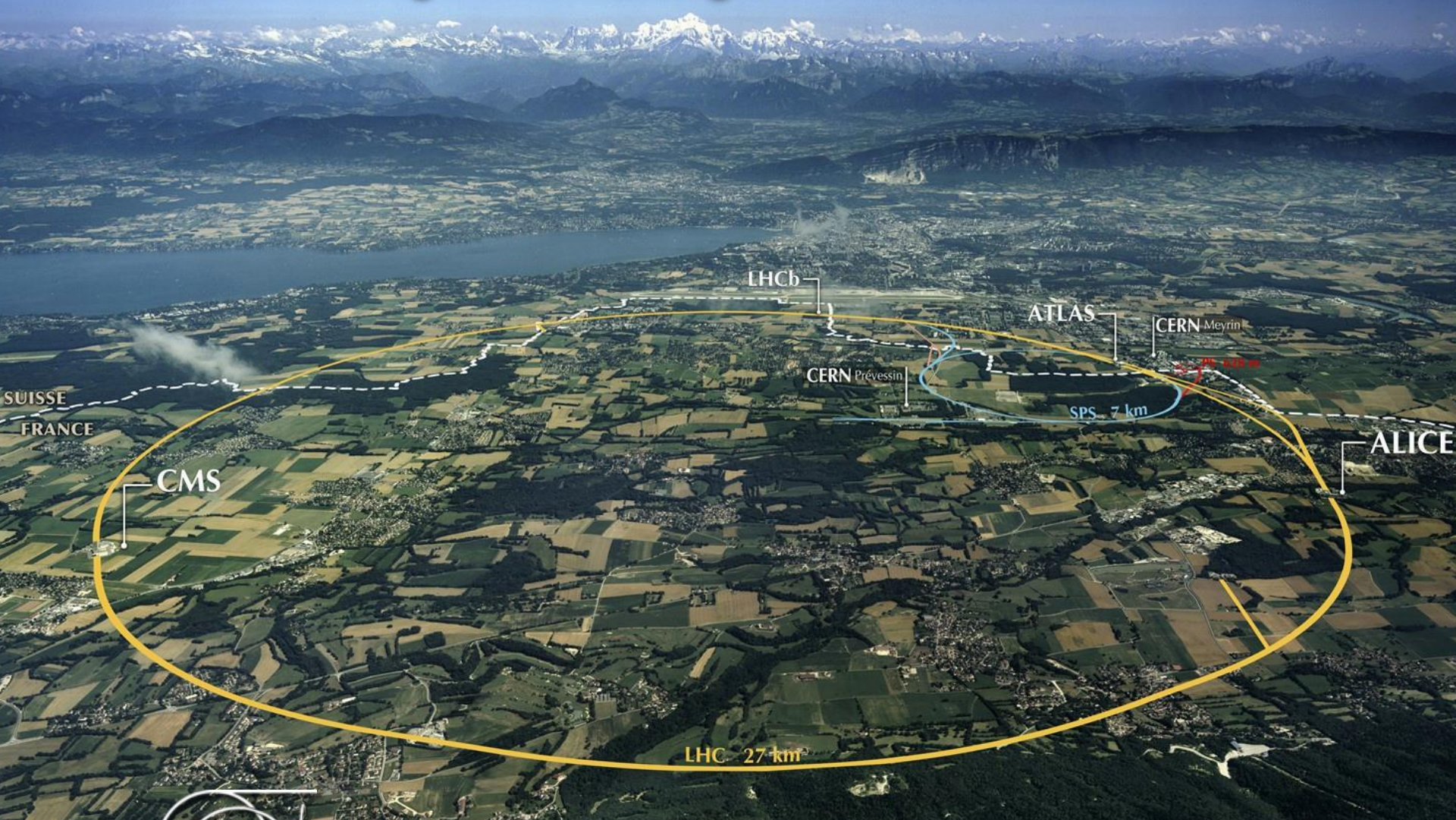
This document produced by Members of the EIROforum (<http://www.eiroforum.org/>) and is licensed under the Creative Commons CC-BY 4.0 licence.



Summary

- ☞ **Helix Nebula Science Cloud** is a Pre-Commercial Procurement project with a budget of more than 5M€ that is co-funded by the European Commission
- ☞ The objective is to produce a hybrid cloud platform for the European research community
- ☞ Changes to the procurement process in the public research sector are necessary to benefit from a dynamic Digital Single Market and should be supported by the platform
- ☞ Commercial cloud services are expected to play an increasing role in the computing models of scientific Research Infrastructures as part of a hybrid cloud platform
- ☞ Such a hybrid cloud platform has a potential market that includes many ESFRI landmarks and projects
- ☞ **Helix Nebula Science Cloud** is the first in a foreseen series of EC co-funded projects which will contribute to the European Cloud Initiative

Thank you for your attention



Accelerating Science and Innovation