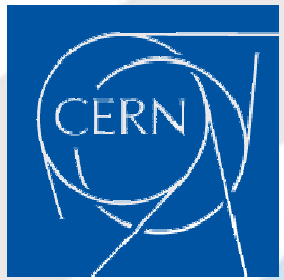

CERN



The Helix Nebula Science Cloud Pre Commercial Procurement Project

13 July 2016

Bob Jones, CERN

This work is co-funded by H2020 Grant Agreement 687614

The Helix Nebula Science Cloud public-private partnership

HELIX NEBULA THESCIENCECLOUD

Strategic Plan

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

CERN

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

esa

cnes

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: cnrs, CRS4, DESY, ECMWF, ESO, ESRF, INFN, Science & Technology Facilities Council, SCC, SURF SARA

Suppliers

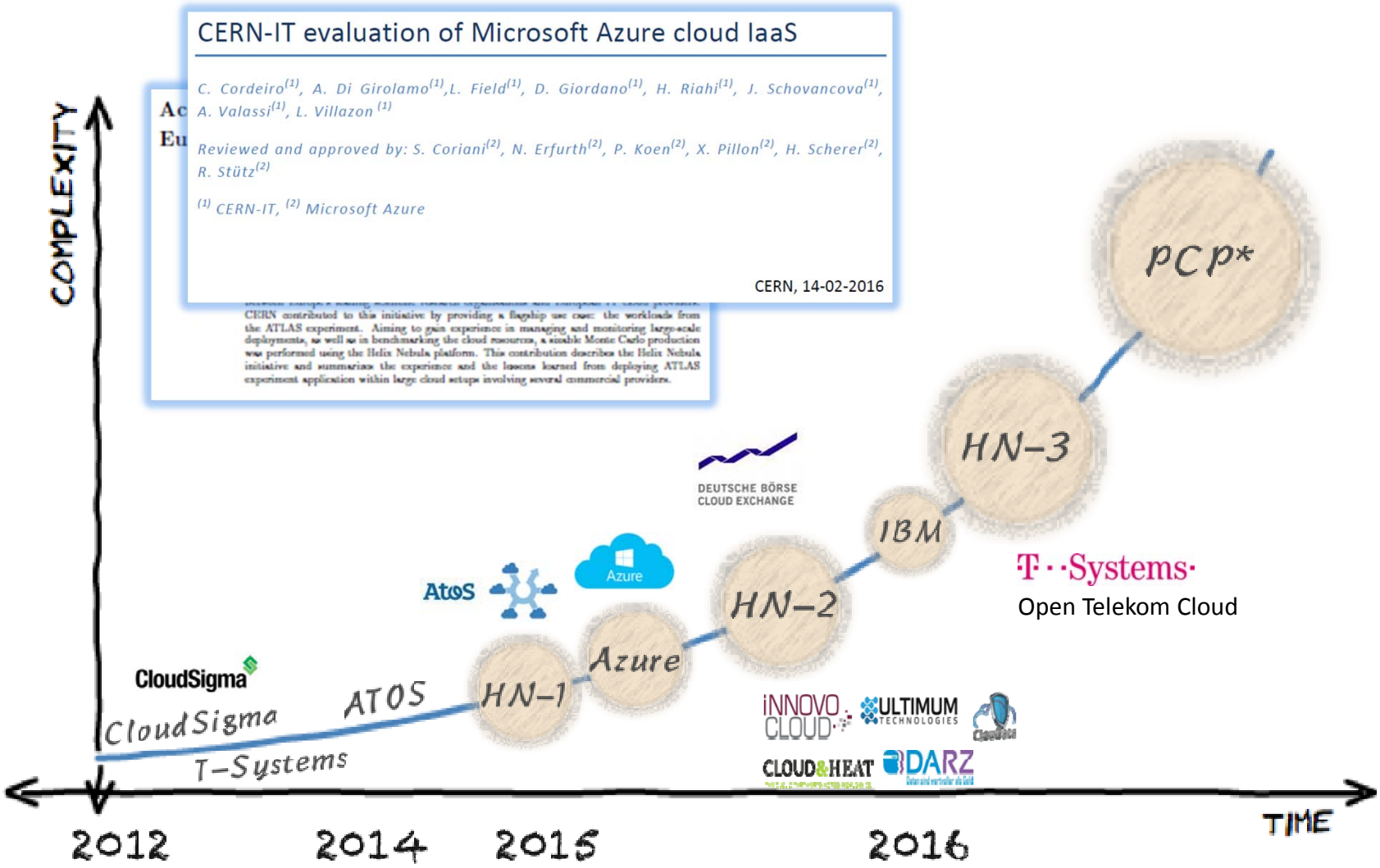
Atos, CGI, CLOUDEO, CloudSigma, Cloudwatt, DataCentred, Deutsche Börse Cloud Exchange, egi, exoscale, GÉANT, iNNOVO CLOUD, ITER, Prologue., sixsq, SWITCH, T-Systems, the SERVER LABS, the IT architects, ultimum technologies

Adopters

AWST, CSA cloud security alliance, deac IT outsourcing, Ifremer, MEMSET HOSTING, orange Business Services, RHEA, Strategic Blue, terradue 20, THALES, it Communicating ICT to Markets, vito, VU Vrije Universiteit Amsterdam, Yandex

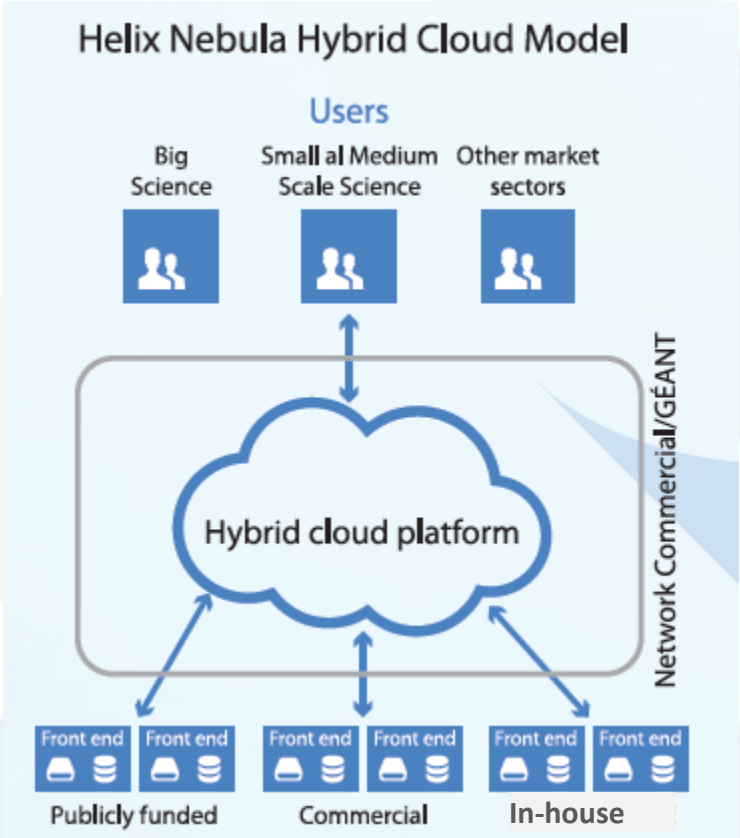
March 2016

Augmenting CERN's scientific computing programme with commercial cloud services



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

Procurement Process

A more **flexible and agile procurement process** must be created and implemented to **speed up the uptake of cloud services for the research sector**

See PICSE roadmap and call to action

http://www.picse.eu/

HNSciCloud Joint Pre-Commercial Procurement

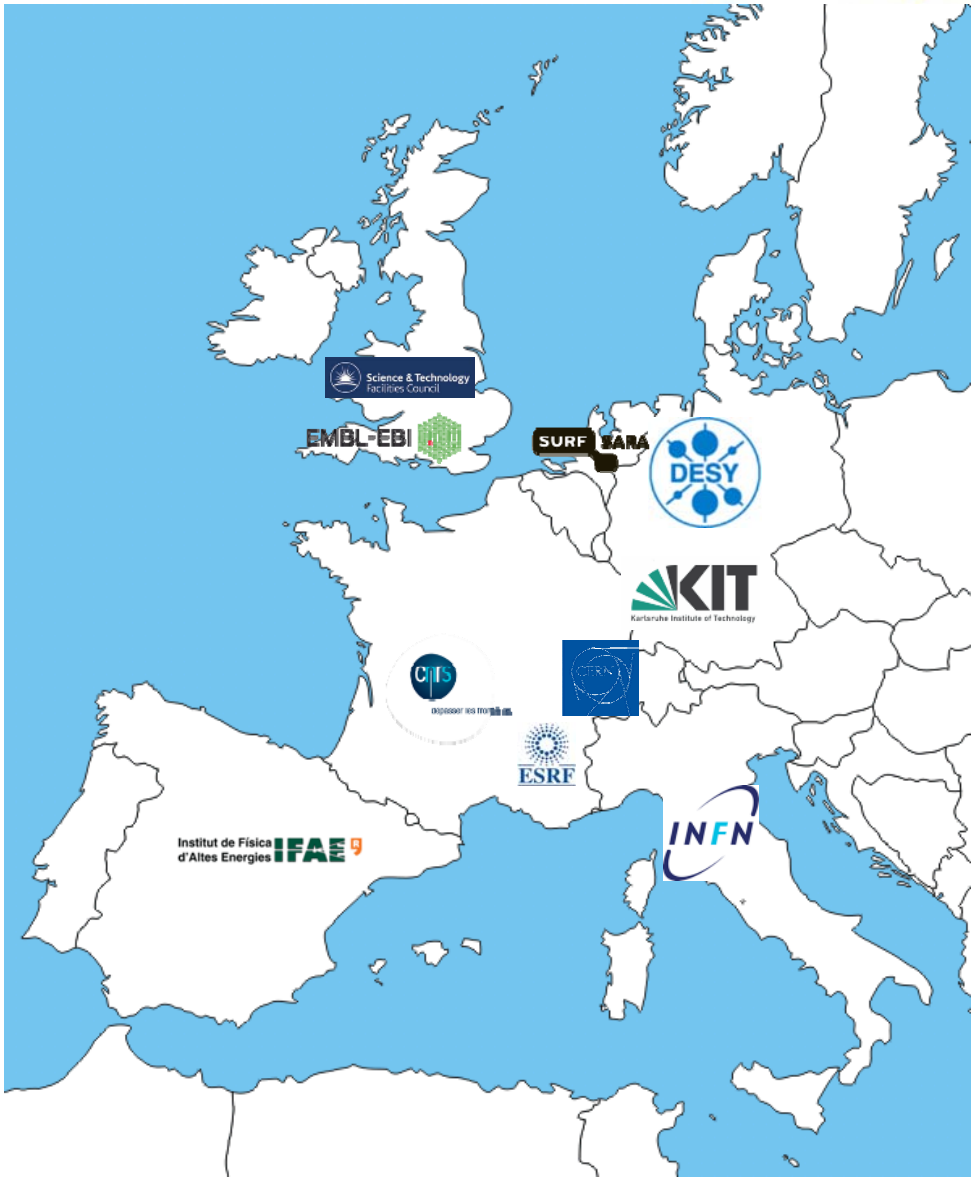
Procurers: CERN, CNRS, DESY, EMBL-EBI, ESRF,
IFAE, INFN, KIT, SURFSara, STFC
Experts: Trust-IT & EGI.eu

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

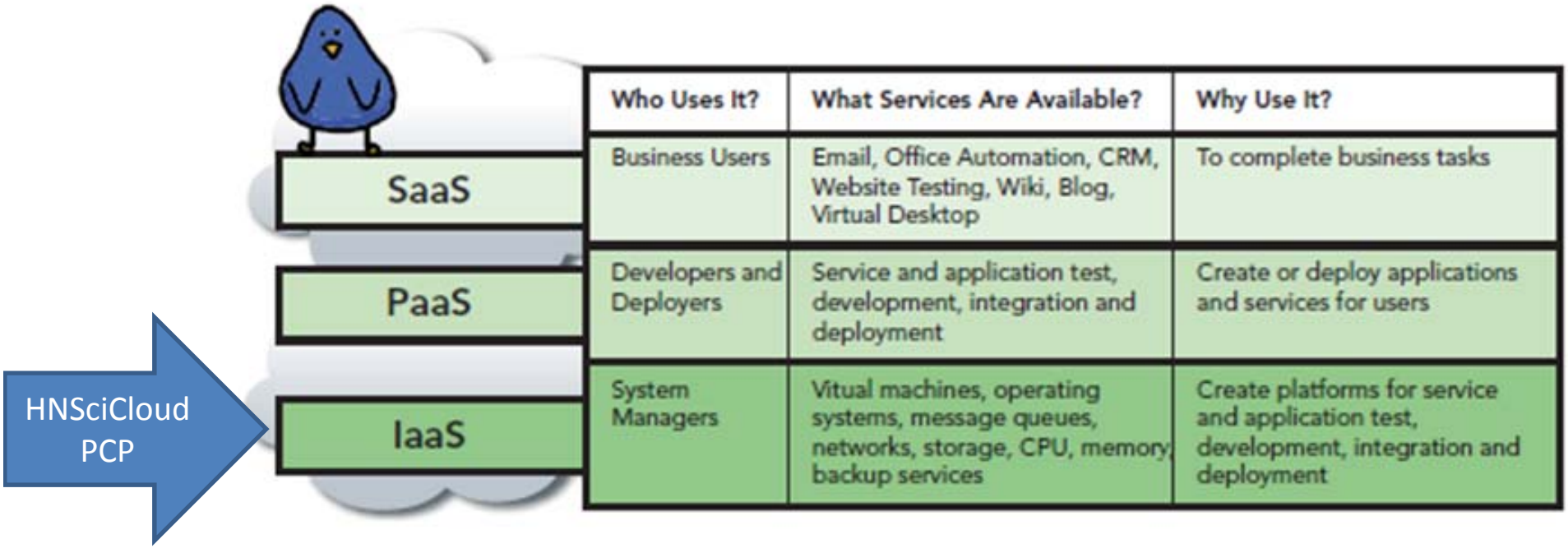
Services will be made available to end-users from many research communities

Co-funded via H2020 Grant Agreement 687614



Total procurement budget >5.3M€

Focus is on IaaS level services



Who Uses It?	What Services Are Available?	Why Use It?
Business Users	Email, Office Automation, CRM, Website Testing, Wiki, Blog, Virtual Desktop	To complete business tasks
Developers and Deployers	Service and application test, development, integration and deployment	Create or deploy applications and services for users
System Managers	Vitual machines, operating systems, message queues, networks, storage, CPU, memory, backup services	Create platforms for service and application test, development, integration and deployment

Source: CloudComputing for Govies, DLT Solutions, David Blankenhorn, Van Ristau and Caron Beesley

User groups to be supported

- High Energy Physics
  - WLCG & LHC experiments
  - Belle II, COMPASS, ILC
- Astronomy
  - CTA – Cherenkov Telescope Array
  - MAGIC
  - Pierre Auger Observatory
- Life Sciences
  - ELIXIR
  - Euro-BioImaging
  - Pan-Cancer
  - BBMRI
  - WeNMR
- Photon/Neutron science
  - PETRA III, European XFEL, 3DIX, OCEAN, OSIRIS
- Long tail of science
- Etc.

http://www.hnscicloud.eu/hnscicloud-user-groups

Open Market Consultation

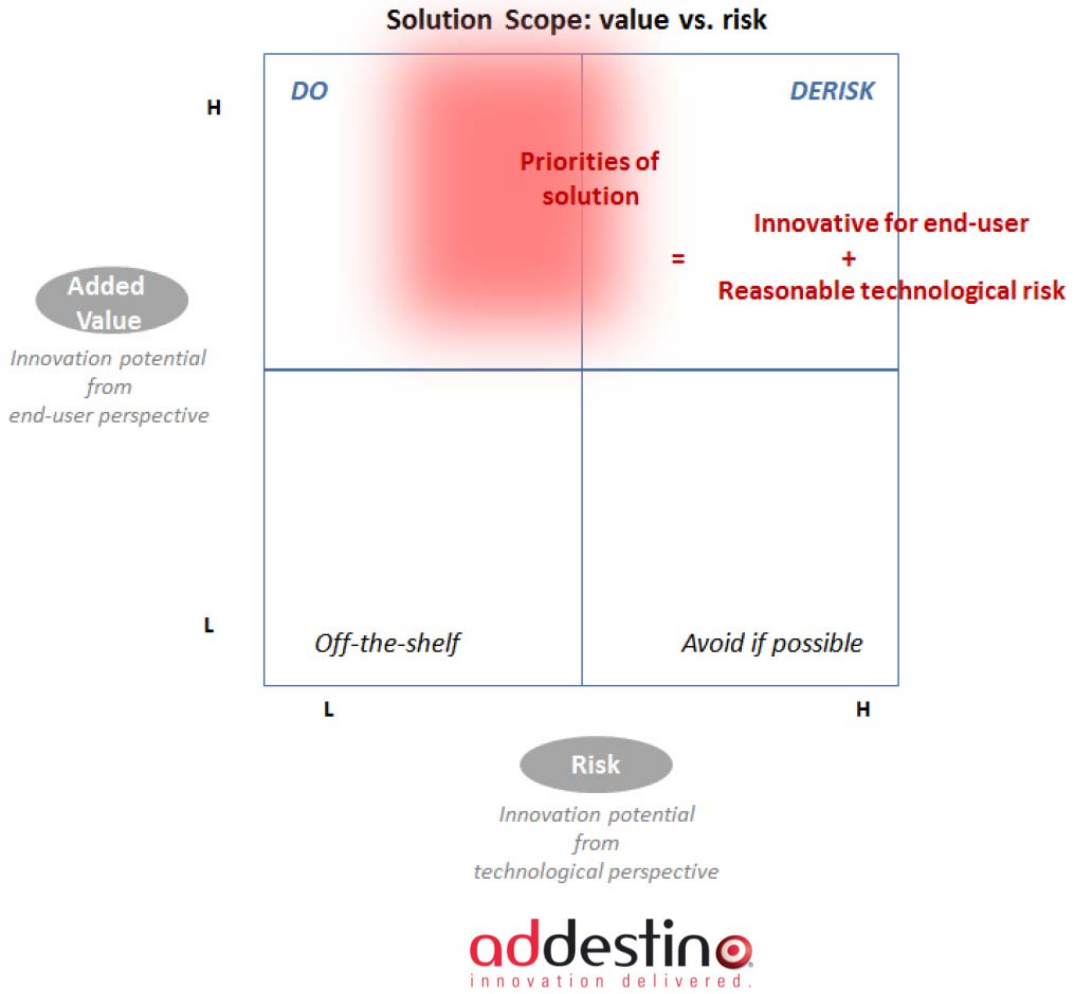
Pre-Commercial Procurement is about procuring innovative services which are not yet on the market

Need to understand what is important to the procurers and what is available from suppliers

30+ companies participated to the event on 17 March 2016 @ CERN

25+ use-cases were assessed for innovation and technological risk

See report
http://dx.doi.org/10.5281/zenodo.51592

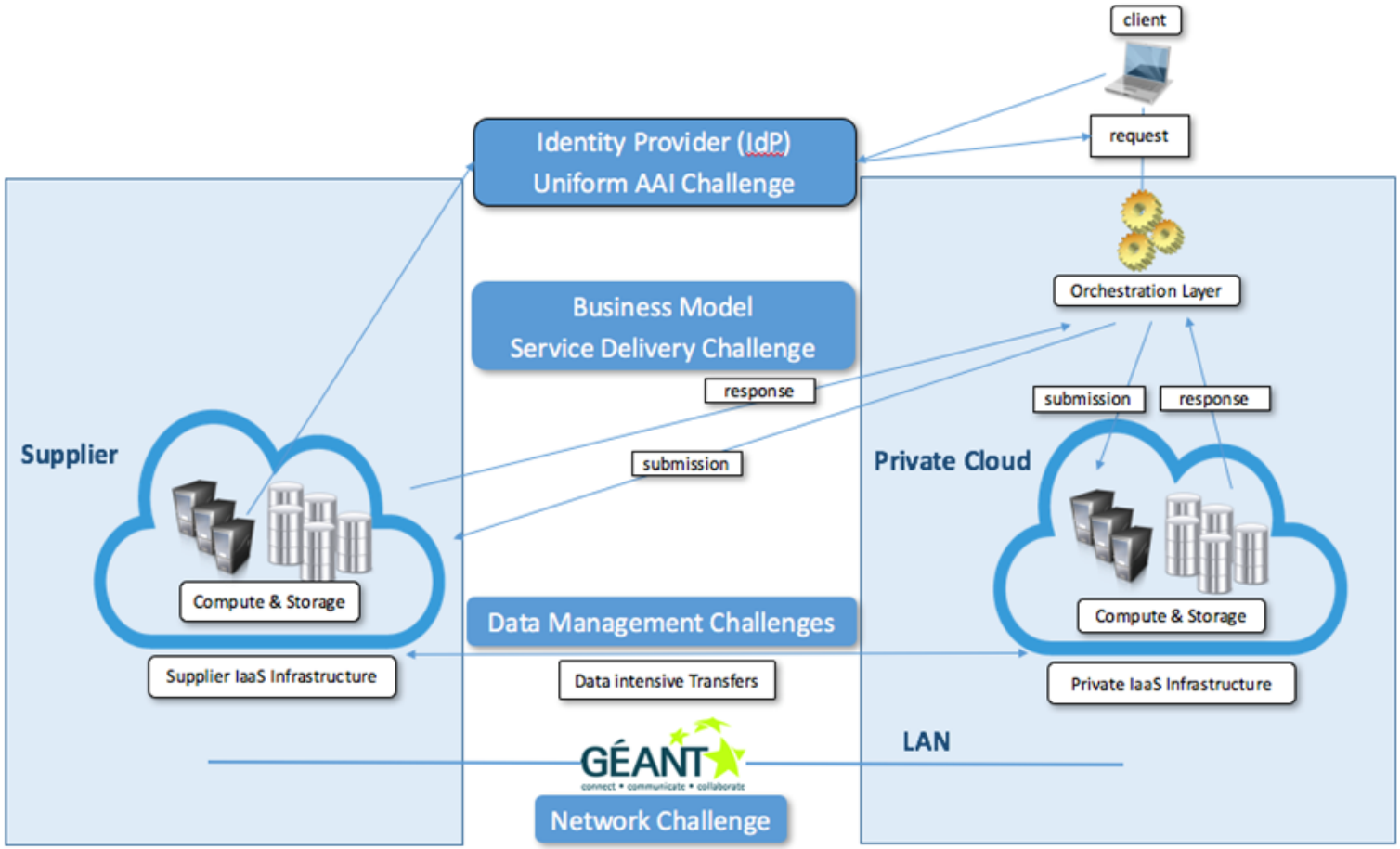


Challenges

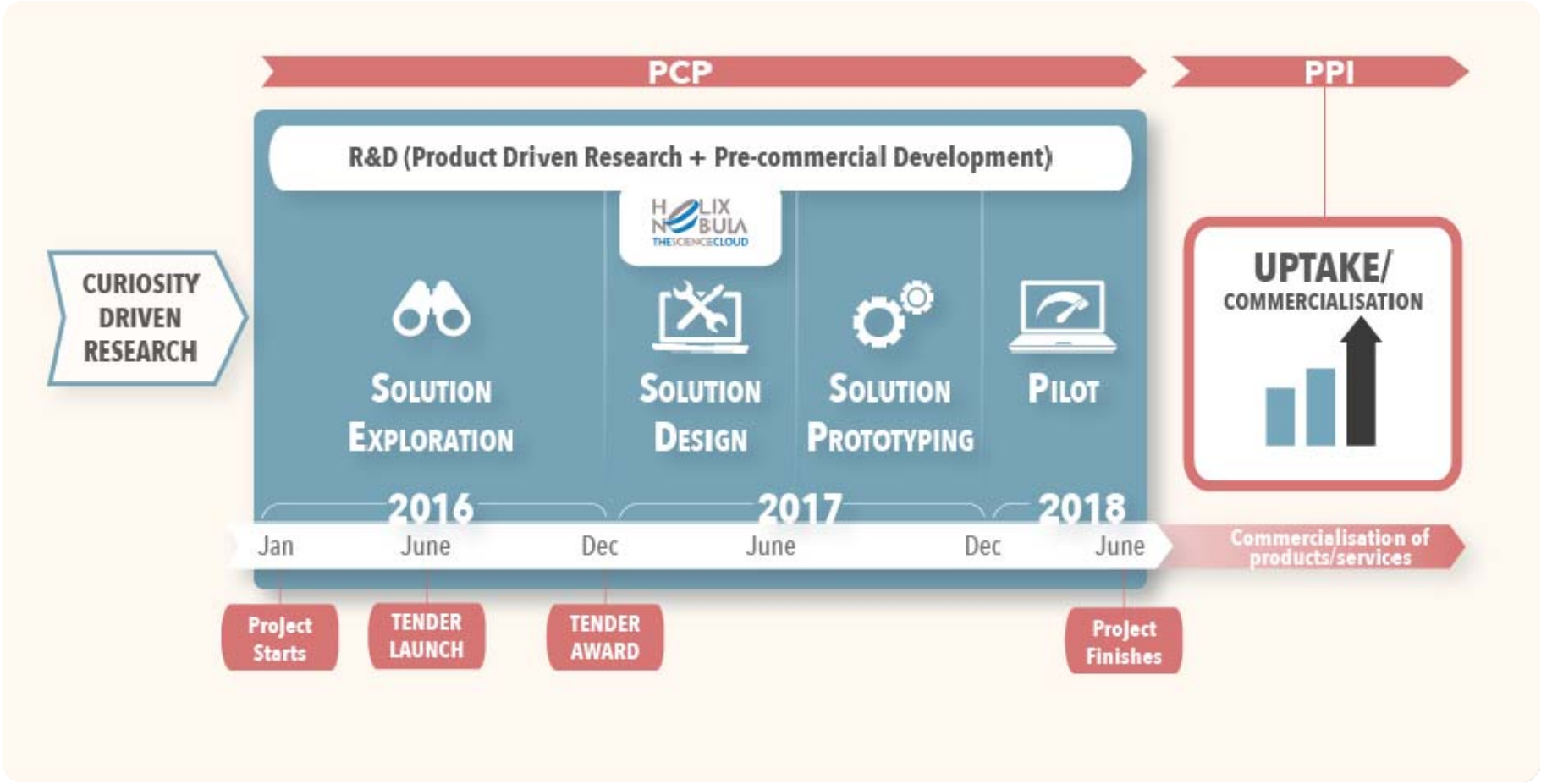
Innovative IaaS level cloud services integrated with procurers in-house resources and public e-infrastructure to support a range of scientific workloads

- ***Compute and Storage***
  - support a range of virtual machine and container configurations working with datasets in the petabyte range
- ***Network Connectivity and Federated Identity Management***
  - provide high-end network capacity for the whole platform with common identity and access management
- ***Service Payment Models***
  - explore a range of purchasing options to determine the most appropriate ones for the scientific application workloads that will be deployed

High Level Architecture of the Hybrid Cloud Platform including the R&D challenges



Pre-Commercial Procurement Process and Timeline



Competitive Tender

- Contracts in each phase (design, prototype, pilot) awarded to multiple contractors (4, 3, 2) using *Most Economically Advantageous Tender* (MEAT) criterion
- Contractors will not be required to integrate their services with those of competing contractors
- Tender published by 20 July 2016
- Information Session @ CERN 7 September 2016
- Deadline for bid submission 19 September 2016

Evaluation of Procured Services

All procurers will participate in the evaluation of the procured services

- Design – WP3 led by CNRS (2016Q4 - 2017Q1)
- Prototype – WP4 led by DESY (2017H2)
- Pilot – WP5 led by INFN (2018)

EGI.eu will chair a user board to gather feedback

Test-plans for the prototype and pilot phases will be produced at the start of the relevant WP

Summary

- Commercial cloud services are expected to play an increasing role in the computing models of research communities
- **PICSE** has identified changes to the procurement process in the public research sector that are necessary to benefit from a commercial cloud services market
- A hybrid cloud platform has the potential to serve many research communities and their downstream industries
- ***Helix Nebula Science Cloud*** is the first in a foreseen series of EC co-funded projects which will contribute to the European Cloud Initiative
- The HNSciCloud tender will be published in July 2016


Thank you for your attention
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