HNSciCloud

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Agenda

The Project

AAI

Challenges

The Helix Nebula Science Cloud public-private partnership

The Helix Nebula Initiative

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

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

Helix Nebula Hybrid Cloud Model
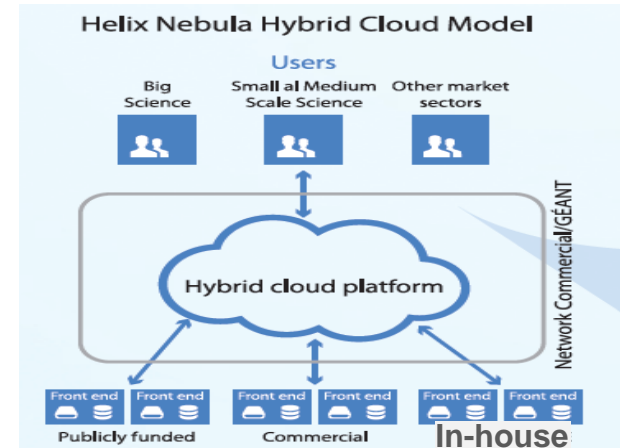
HNSciCloud Pre-Commercial Procurement

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

The group of procurers have committed
- 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 with
- Data centres operated by the procurers
- European e-Infrastructures

Resulting services will be made available to end-users from many research communities. Co-funded via H2020 Grant Agreement 687614

Total procurement budget >5M€
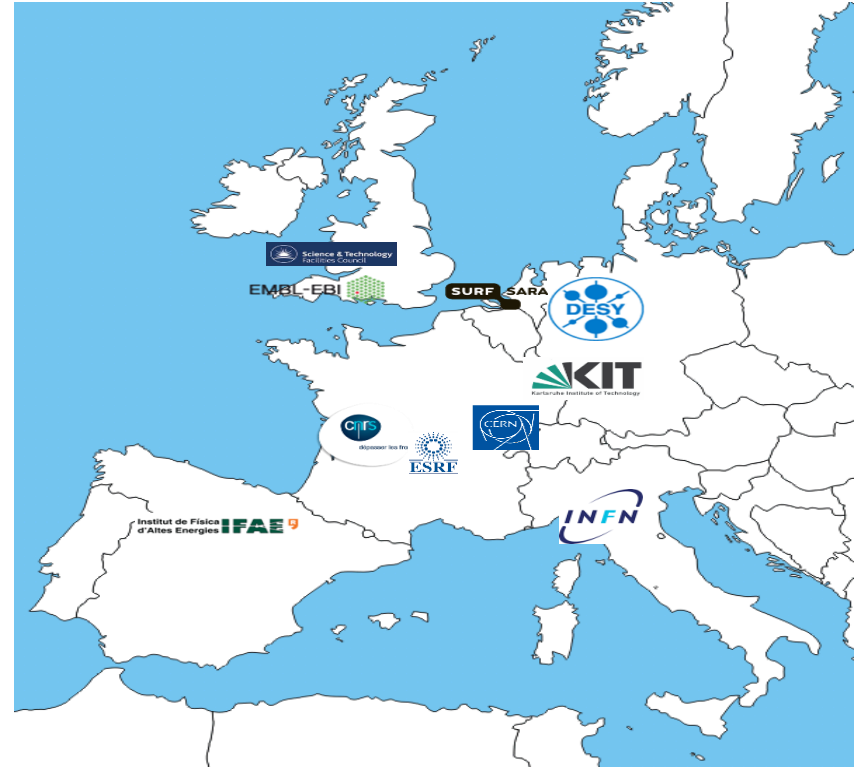
Pre-Commercial Procurement Process and Timeline

What will be procured

A hybrid cloud platform for the European research community

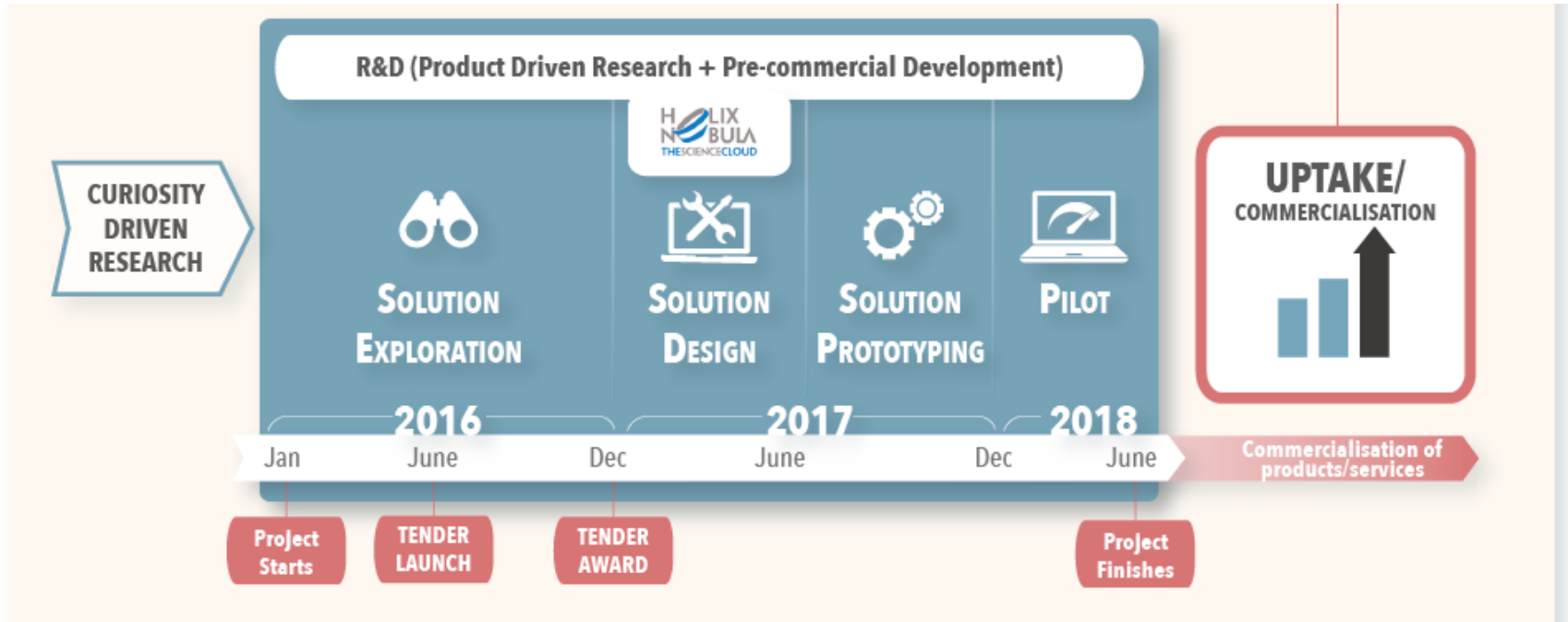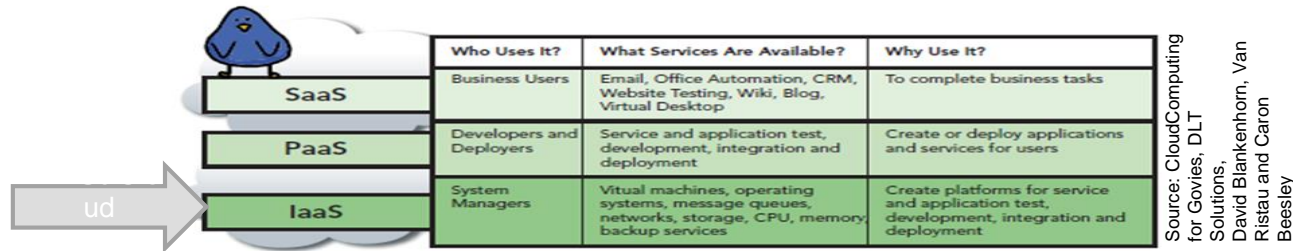| High Energy Physics	Astronomy	Life Sciences	Photon/Neutron Sciences	Long Tail of Science

Combining services at the IaaS level to support science workflows

	Who Uses It?	What Services Are Available?	Why Use It?
SaaS	Business Users	Email, Office Automation, CRM, Website Testing, Wiki, Blog, Virtual Desktop	To complete business tasks
PaaS	Developers and Deployers	Service and application test, development, integration and deployment	Create or deploy applications and services for users
IaaS	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

The R&D services to be developed are to be integrated with resources in data centres operated by the buyers group

GÉANT

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

AAI

- Each procurer must provide SAML AuthN
  - Enable federated login to cloud management portals
  - Generate tokens for API access based on federated credentials
  - Both ELIXIR & EduGAIN

SP troubles

- How do I join eduGAIN?
- How do I test things before joining eduGAIN?
- How do I know which attributes I'll receive?
- Which attribute is the ID?
- How do I map the different attributes?

Decisions

Procurers should join eduGAIN directly (rather than create a HNSciCloud federation, for example)

Expected attribute bundle is equivalent to R&S (agreed among the buyers group)

Procurers should demonstrate compliance with GEANT Code of Conduct where possible

Authorization should be managed locally to the cloud provider

A few findings…

The Good	The Bad	The Ugly
eduGAIN support is useful!	Understanding FIM is complicated ☹	Standards are not respected
R&S is a useful concept (even if cloud procurers may not be R&S SPs)	Testing without user involvement is impossible	IdPs are still unable to be flexible, attribute release and policies
	Testing with user involvement is painful	Some SPs expect user blocking by the IdP
	SPs expect AuthZ with AuthN	

Testing

- SPs struggle to test
- Consortium struggles to understand how flexible the solution is – will this serve the wider community?

Proposal

- Maybe create a test for eduGAIN under AARC?
  - SP & IdP compatibility test
  - Try and limit interaction with user, as much as possible
  - Perfsonar style test, each entity deploys a testing element (?)

Next Steps

- 1 Procurer will be eliminated based on performance

- The 2 remaining are expected to have fully enabled SAML, thorough testing needed

- Policies must be solidified (Sirtfi, Data Protection)

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