



**Helix Nebula, the Science Cloud
Barcelona, 22-24th October**

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Atos

Research and Innovation

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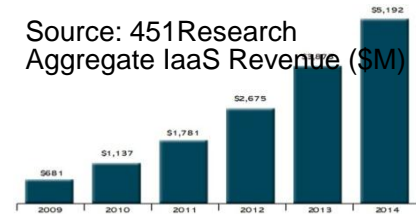


Your business technologists. **Powering progress**

Context and Trends

- Cloud is the key growth factor of IT spend
- Hybrids cloud scenarios in 2013+ (analysts trends)
- Public IT procurement pushing for open source
- EU Cloud Computing *Strategy* that would make Europe not just Cloud-friendly but Cloud-active
- “*European Cloud Partnership*” - Neelie Kroes (VP EC for DA)
 - Standards, data protection, storage solutions, interoperability (no vendor lock-in), legal certainty, Contracts (T&C) & SLAs
- Helix Nebula (ESA, CERN, EMBL, Atos, T-systems, etc) → Cloud for eScience (federate and outsource capacity needs)

Source: 451Research
Aggregate IaaS Revenue (\$M)



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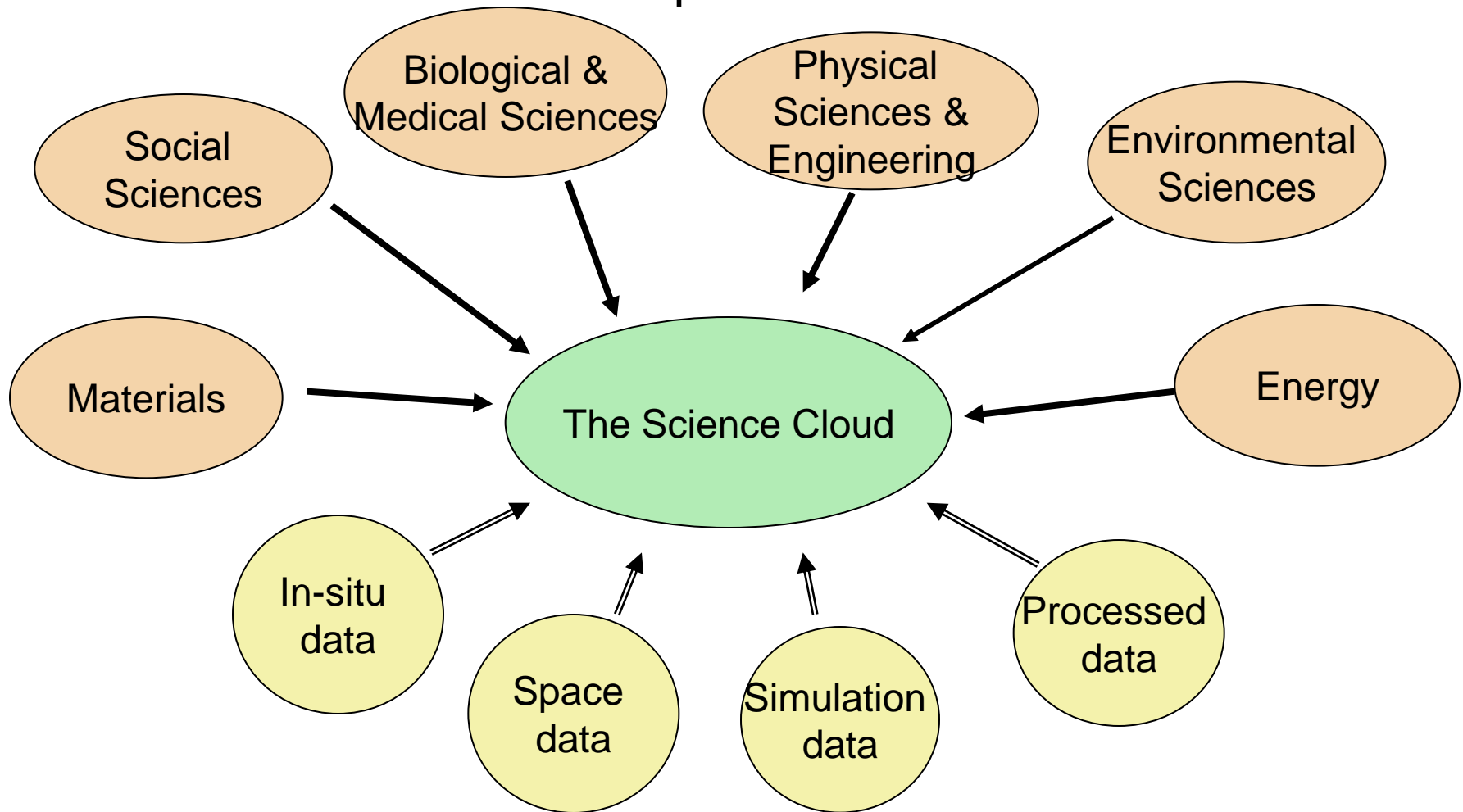
Strategic Goal

Helix Nebula, the Science Cloud

is a partnership that has been created
to support the **massive IT requirements**
of European scientists
and **create a Cloud computing market**
for the public sector in **Europe**.

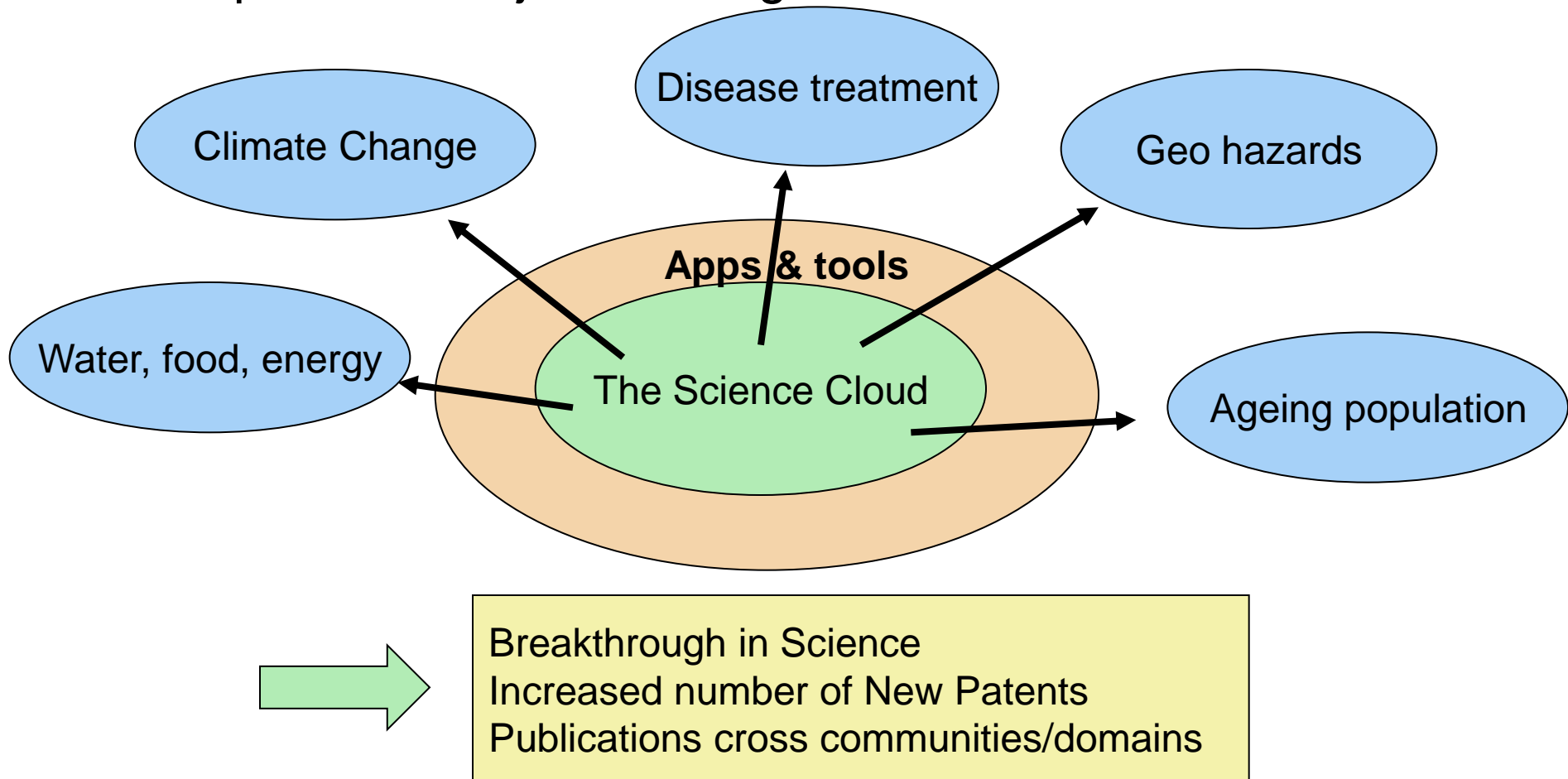
The Science Cloud : INPUT

The Science Cloud : a unique mine of scientific data



The Science Cloud: OUTPUT

The Science Cloud : a unique opportunity for Scientists to comprehend major challenges



4 Goals outlined in the Strategic Plan



Strategic Plan for a Scientific Cloud Computing infrastructure for Europe

1. Set up a **cloud computing infrastructure** for European Research Area
2. Identify and adopt **policies** for trust, security and privacy on a European-level
3. Create a light-weight **governance** structure involving all stakeholders
4. Define a short and medium term **funding** scheme

A Collaboration Initiative

**European Commission
& relevant projects**

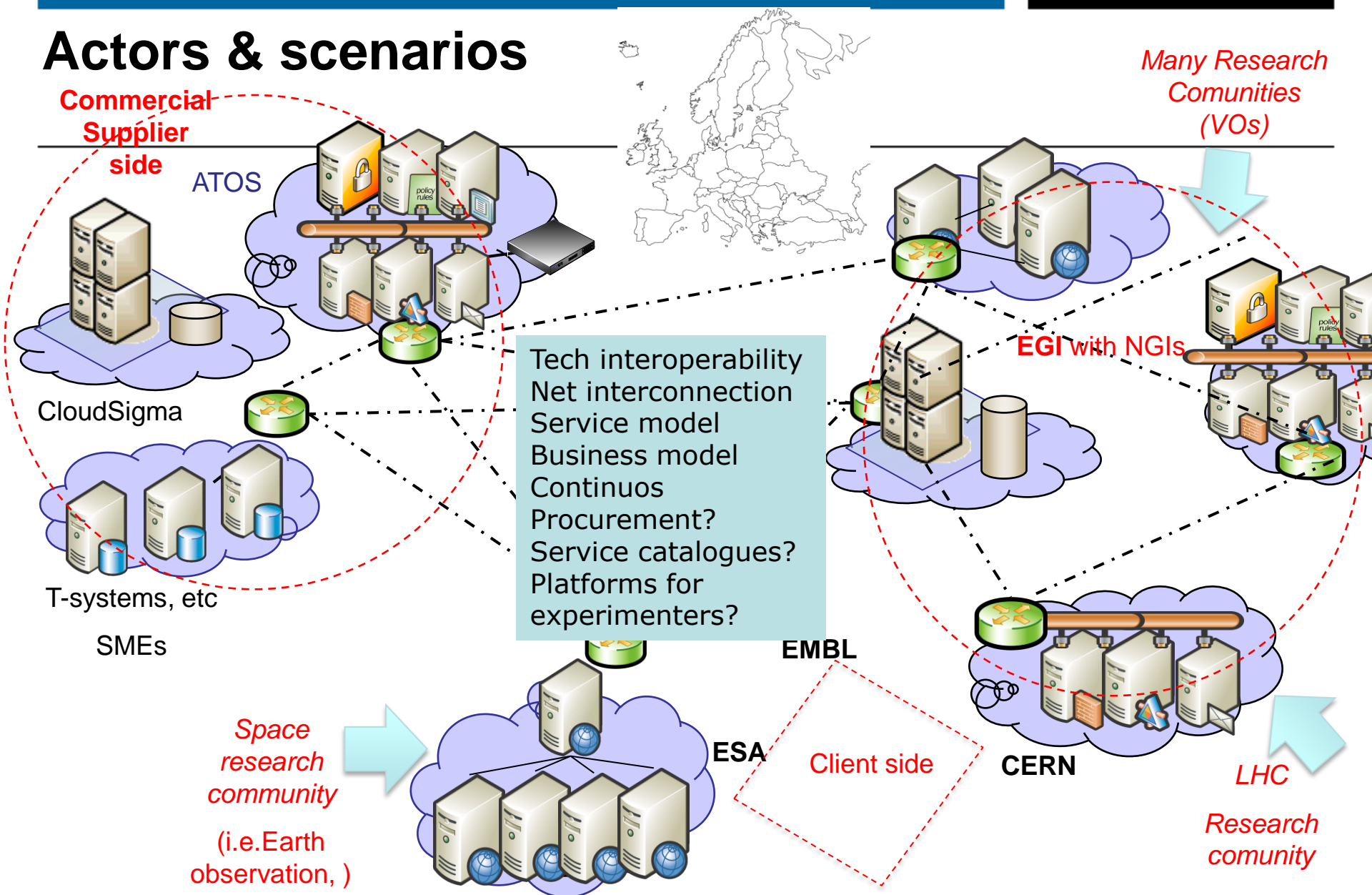
User organisations
Demand-side

**European
Cloud Computing
Strategy**

**Commercial Service
Providers**
Supply-side

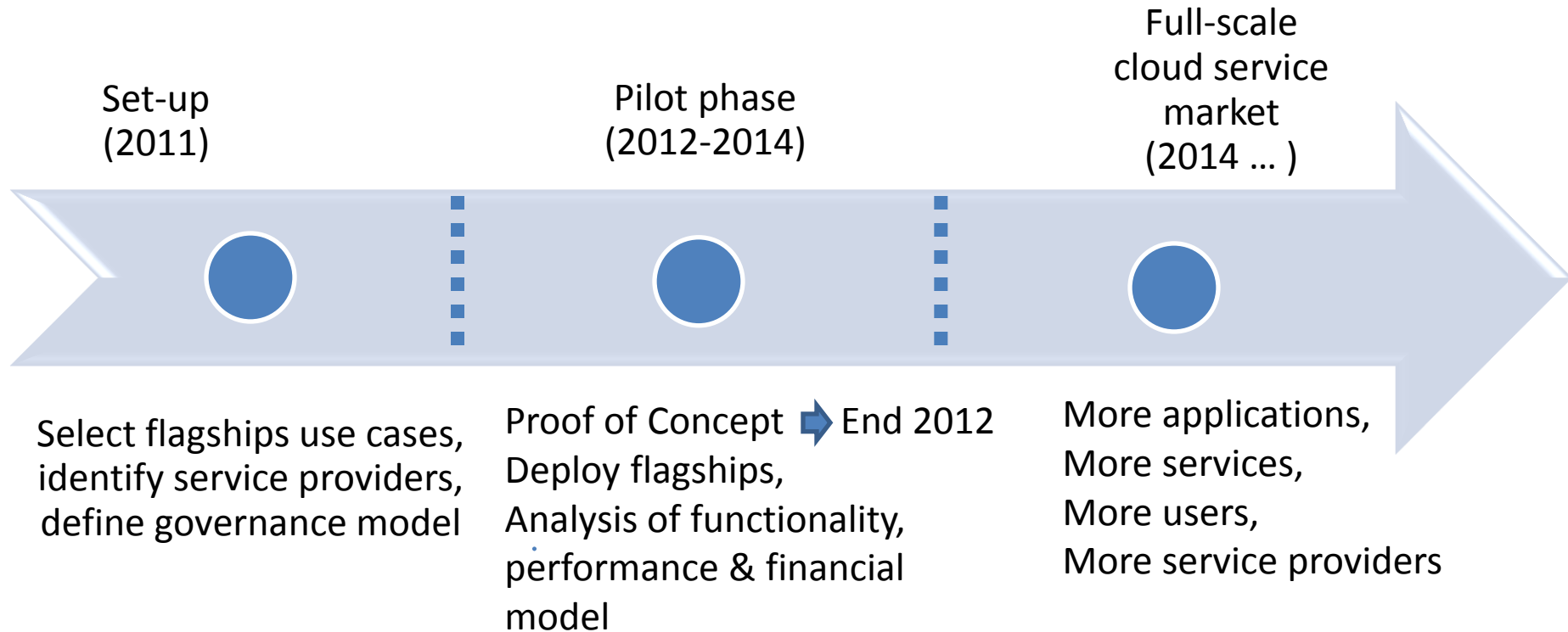
Bringing together all the stakeholders to establish a **public-private partnership**

Actors & scenarios

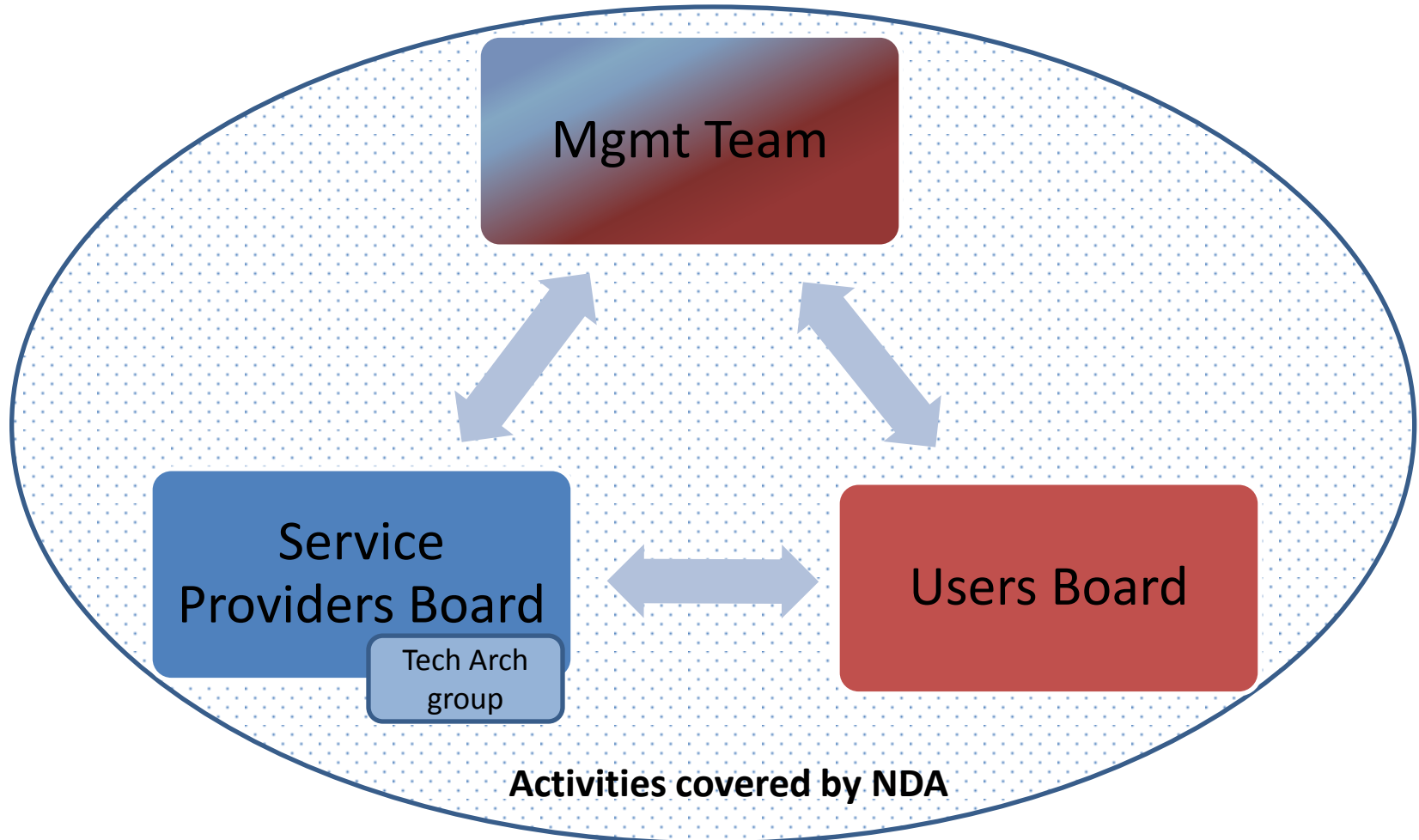


Note: sites and network links not representative

Timeline



Governance Model during Proof of Concept in the Pilot Phase



Become a new member

<http://www.helix-nebula.eu/>

as:

Users



Users: An organisation that applies to become a user member should be a science or space organisation and commit to provide at least one flagship use case for cloud computing that can be verified and validated through a Proof of Concept with multiple service providers. Users will name a representative to participate in regular meetings of the Helix Nebula Users Board.

Service
Providers



Service Providers: An organisation that applies to become a service provider member should commit to support a minimum set of cloud computing services and perform at least one Proof of Concept of a flagship use case with a user. Service Providers can apply to one or more of the following categories: Connectivity Provider, Infrastructure-as-a-Service Provider (IaaS), Platform-as-a-Service Provider (PaaS), Software-as-a-Service Provider (SaaS), Integrator, Consultant or Broker. Service Providers will name a representative to participate in regular meetings of the Helix Nebula Service Providers Board.

Adopters



Adopters: An organisation may apply to become an adopter, if they initially do not want to be directly involved in the flagship use cases but wish to make use of the Helix Nebula's products and services on a pay-per-use basis and be able to provide feedback. Adopters may be invited to Boards (either Service Providers or Users) meetings for information purposes. Adopters will name a representative to be informed or invited by the Helix Nebula Consortium on a regular basis.

Interested
Parties



Interested Parties: An organisation may apply to become an Interested Party, if they initially do not want to be directly involved in the flagship use cases but wish to be kept informed of the work of or use information provided by the Consortium.

For all types of members a formal acceptance procedure will apply (specified hereafter), to be implemented by the Helix Nebula Management Team following the receipt of the membership request. **Membership application implies acceptance of the vision of Helix Nebula** as outlined in the strategic plan [Strategic Plan for a Scientific Cloud Computing infrastructure for Europe, CERN-OPEN-2011-036, August 2011](#), and **willingness to collaborate with the other partners** in order to achieve the vision. All decisions must be adopted by consensus of both the user organisations and service provider companies. In case of lack of consensus, decision will be taken by a qualified majority of all members of the two Boards, which must include the positive vote of the public user organisations.

All users and service providers applying to become a member of the Helix Nebula Consortium (except as an Interested Party) agree to sign a multi-lateral NDA prior to becoming an active member.

For more details and updates about how to join, write to us at contact@helix-nebula.eu

Become a new member



Over the next two years the Helix Nebula Consortium is expected to involve an increasing number of members.

The potential members are likely to be stemming from the categories below:



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Become a new member

Contact us

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Become a new member

Events



Helix Nebula @ DCI Workshop, 18 September 2012, Prague
Bob Jones (CERN) and Michael Symonds (Atos) will participate to the DCI Workshop "Distributed Computing Infrastructures for e-Science: Future Perspectives".

[More](#)

Participants



All sign a non-disclosure agreement

Helix Nebula Pilot Phase

Flagship use cases



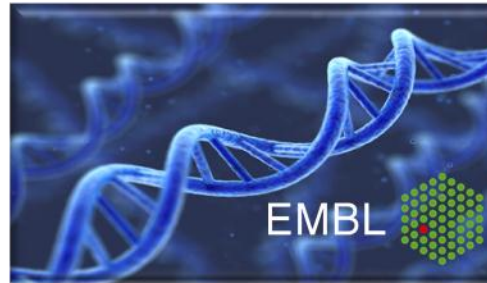
Initial Flagship Use Cases

ATLAS High Energy Physics Cloud Use



To support the computing capacity needs for the ATLAS experiment

Genomic Assembly in the Cloud



A new service to simplify large scale genome analysis; for a deeper insight into evolution and biodiversity

SuperSites Exploitation Platform



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

Call for proposals

- Template agreed by demand and supply side
- Eligibility review and analysis with cloud service suppliers

Flagship use cases

- **Proposed by demand-side user organisations addressing scientific challenges with societal impact**
 - High-profile applications that catch the public imagination and encourage others to use the services
 - Show need for significant scale of resources, federation/aggregation of data sets, long-term archiving and on-demand processing
 - Bring people and data together : Building communities and stimulating innovation



Use the Cloud for what it is good for !

Flagship deployments

First results - 1

- Proof of Concept stage within the Pilot Phase started January 2012 and finished by July 2012
- Each flagship has been deployed with a series of providers independently :

CERN, EMBL and ESA succeeded in deploying scientific applications each involving tens of thousands of jobs running at data centres operated by Atos, CloudSigma and T-Systems

Flagship deployments

First results - 2

- The PoC extensively evaluated **scalability**, **performance** and **on-demand provisioning of resources** for high performance computing and **fast data storage** in the cloud computing resources provided by **Atos**, **CloudSigma** and **T-Systems**
- In addition to the infrastructure providers, SME's such as **SixSq**, **Terradue** and **The Server Labs** were vital to get the flagship applications up and running.

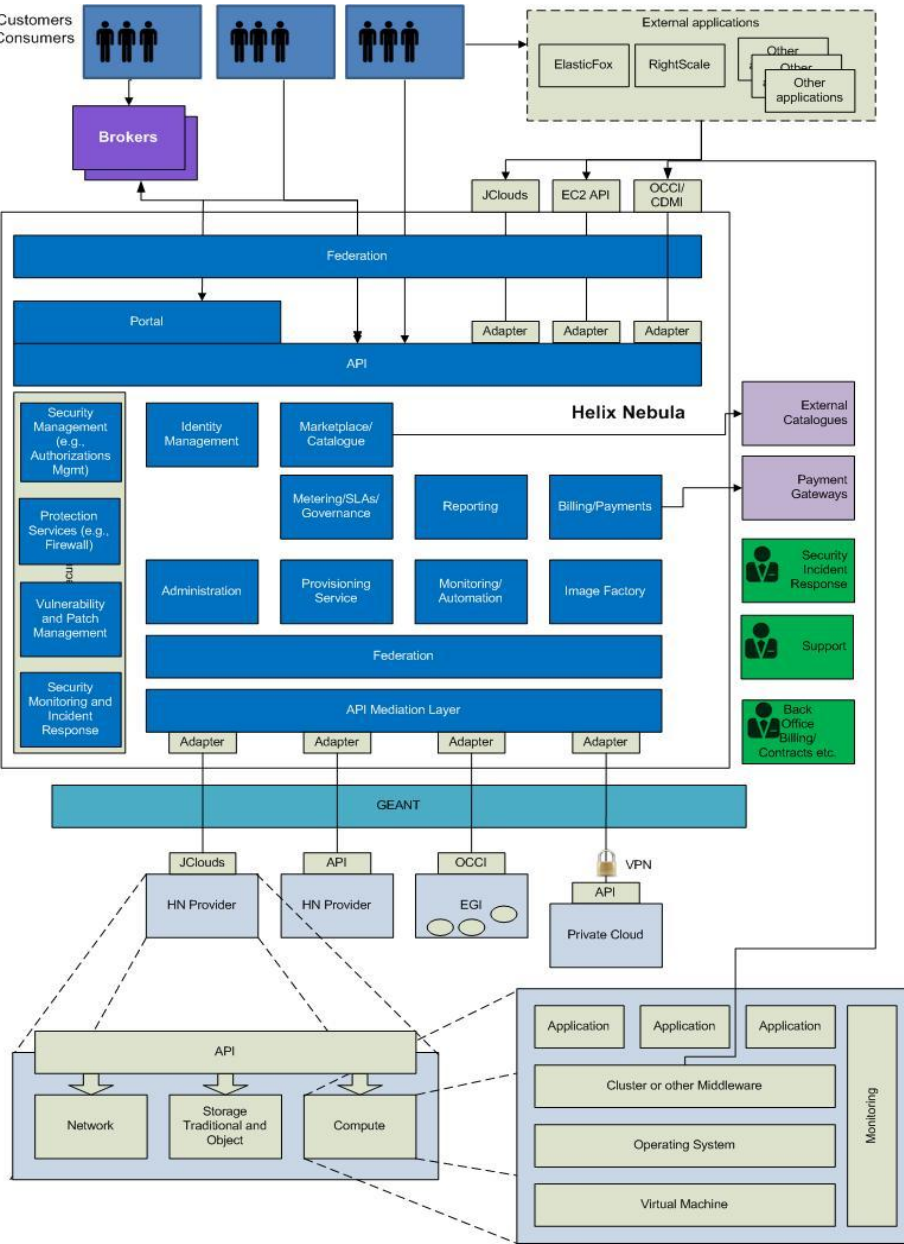
What's next for this phase?

- Process for new Suppliers / new Users to join started:
 - New comers can either submit flagships that propose some **innovation** in terms of functionality, performance, scope, business opportunities or impact of the European Cloud Computing infrastructure, or use the HN platform as is.
 - The flagship use cases must be **sponsored by user organisations** and **Service Providers**. Will be selected so as to be complementary and maximise coverage of the objectives outlined in the Strategic Plan



Templates will be provided

The Blue Box



- **Blue Box** is the software framework to support this hybrid-cloud delivery model in Helix Nebula
- Requirements elicitation done
- First version of HN architecture is publicly available
- Tech and tactics decisions are currently under discussion within supplier side

Next steps

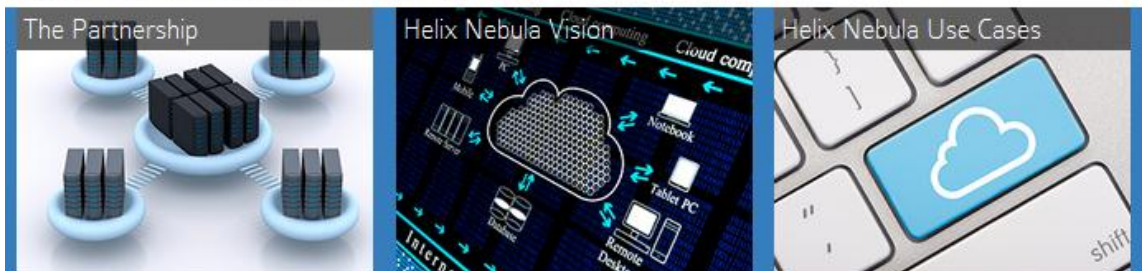
- Detailed design of blue box
- Technological choices.
- Interoperability
- Net interconnection of suppliers
- Service model in a hybrid federated cloud
- Settle procurement processes at demand side
- Business model
- Service delivery and support

And address other aspects such as;

- **How to interact with data service providers in EUDAT?**
- **Public cloud providers role?**
- **Is used tech in EUDAT available outside?**

Big science teams up with big business

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Highlights

Helix Nebula on ISGTW

isgtw international science grid this week

ISC Cloud'12 Keynote Session to Investigate Helix Nebula, Europe's Science Cloud - Article by Anna Schachoff, ISGTW, August 17th 2012

[More](#)

Helix Nebula on HPC Wire

HPC wire

Helix Nebula Cloud Targets European Scientific Research - Article by Robert Gelber, HPC Wire, July 10th 2012

[More](#)

Cloud Computing & The 'New' DG CONNECT



Helix Nebula HelixNebulaSC

HelixNebulaSC CERN, EMBL and ESA will present HelixNebula, the Science Cloud at ISC Cloud'12 in Mannheim, Germany on September... [fb.me/1hxpWqkSp](#)
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HelixNebulaSC Big data analysis in the cloud: Storage, network and server challenges... [fb.me/1qrYGLOO](#)
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HelixNebulaSC [ibm.com/developerworks](#).... [fb.me/1DetHp99X](#)
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HelixNebulaSC Helix Nebula Cloud Targets European Scientific Research Robert Gelber July 10, 2012 The scientific community is... [fb.me/1WuKkGBNz](#)
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Stay tuned on :

<http://www.helix-nebula.eu/>



Thank you

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Atos
Worldwide IT Partner



A European Cloud Computing Partnership big science teams up with big business

The infographic is set against a background of a blue sky with white clouds. It features a large box on the left for the 'Strategic Plan' and three smaller boxes to its right for 'CERN', 'EMBL', and 'ESA'. At the bottom is a wide box containing logos for various partner organizations.

HELIX NEBULA THE SCIENCE CLOUD

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

Partners: Atos, Capgemini, CloudSigma, CSA cloud security alliance, egi, interoute, logica, OpenNebula.org, orange Business Services, SAP, the SERVER LABS, sixsq, Telefonica, terradue 20, THALES, Trust IT, T-Systems.

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