A public-private partnership building a multidisciplinary cloud platform for data intensive science

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Partategaki— Why?

Partnership – Why?

- The **scale and complexity** of services needed to satisfy the foreseen needs of Europe's IT-intense scientific research & space organisations are beyond what can be provided by **any single company** and will require the collaboration of a variety of service providers and SMEs.

- By partnering with Science and Space Organizations, it shall cover most, if not all, of the needs of a public Cloud infrastructure.

Partnership – Who & How?

IT Providers
-commit resources
-share investments
-agree on standard
-interoperability

Scientific and Space Organizations
-commit resources
-data & user
-es

SME's
-commit res
-link betwee
Users and Providers
- Act as catalyser

-Policy & Strategy
-through targeted
calls under FP7

EC Projects
-Standard/Open source
-Contributing / using HN

Partnership has grown from 20 to 38 members

Sustainability Models

Need to identify and evaluate possible sustainability models for public-private partnership

- Understand the *financial implications* of 'utility computing' for vendors and customers

- Define mechanisms for quantifying and controlling business *risk*

- Assess the viability of standard cloud-service *procurement* templates across jurisdictions

Sustainability Model Options

- **Information as a Service**
  The trading of aggregated and analyzed data in the cloud.

- **Generic Cloud Computing for European Big Science**
  Provision of data capture and processing that elastically meet the need of big science's growing demand.

- **Versioned Cloud Computing for Science & Education**
  Addressing the entire world of science and education through explicit versioning of prices, revenue models, SLAs, and services.

- **Worldwide all-in-one enterprise cloud**
  Platform that offers a unique resource to governments, businesses and citizens.

- **Collaboration & Communication Platform for Science & Education**
  This BM combines social networking, collaboration, data interchange, and secure communication integrated in one web frontend.

- **Application Crowd**
  a marketplace where application users can outsource or "crowdsource" domain-specific development projects to thousands of developers from around the world.
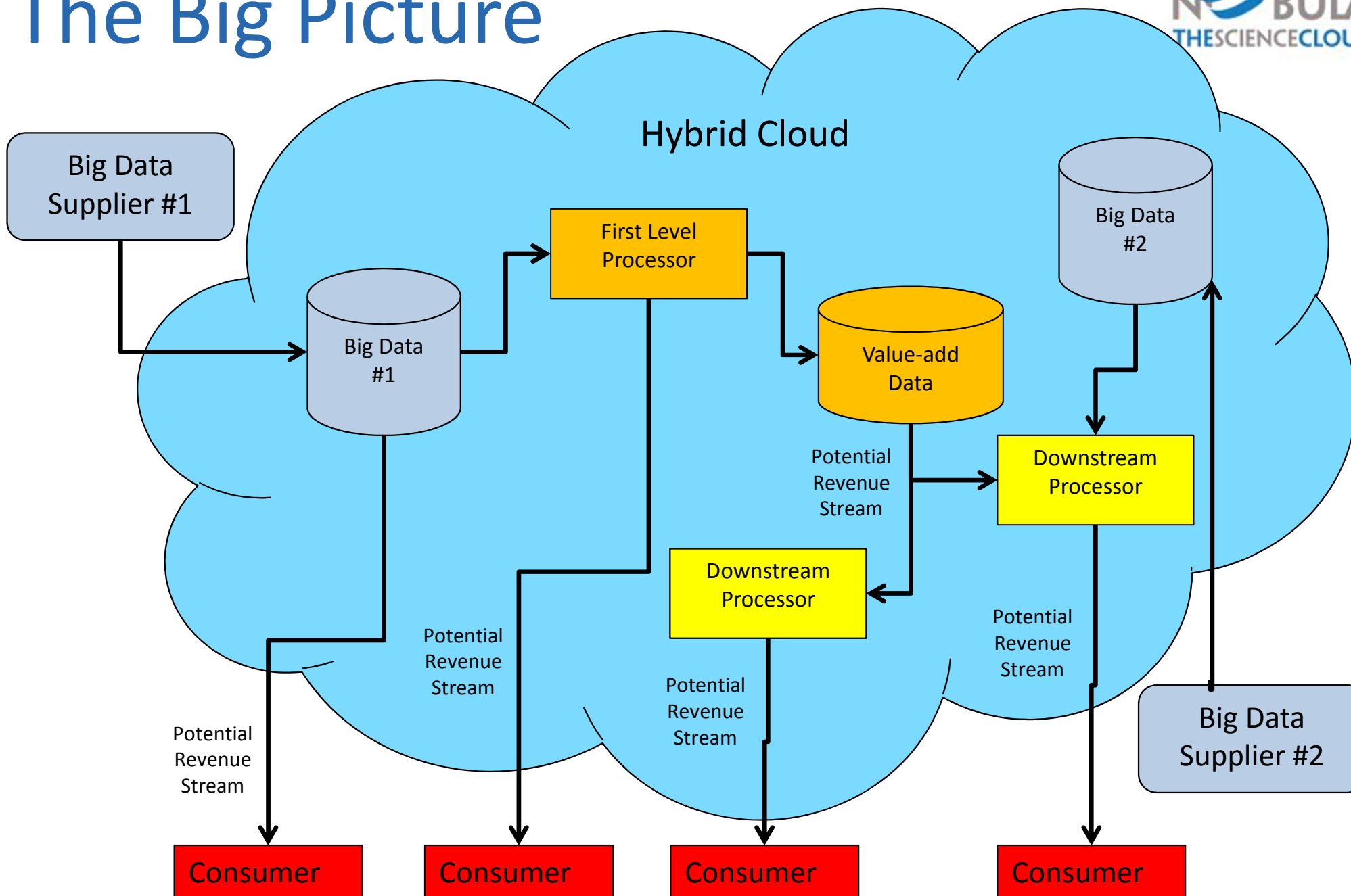
- **Brand Management**
  Establishment of a brand to utilize advertising and franchising as a revenue model.
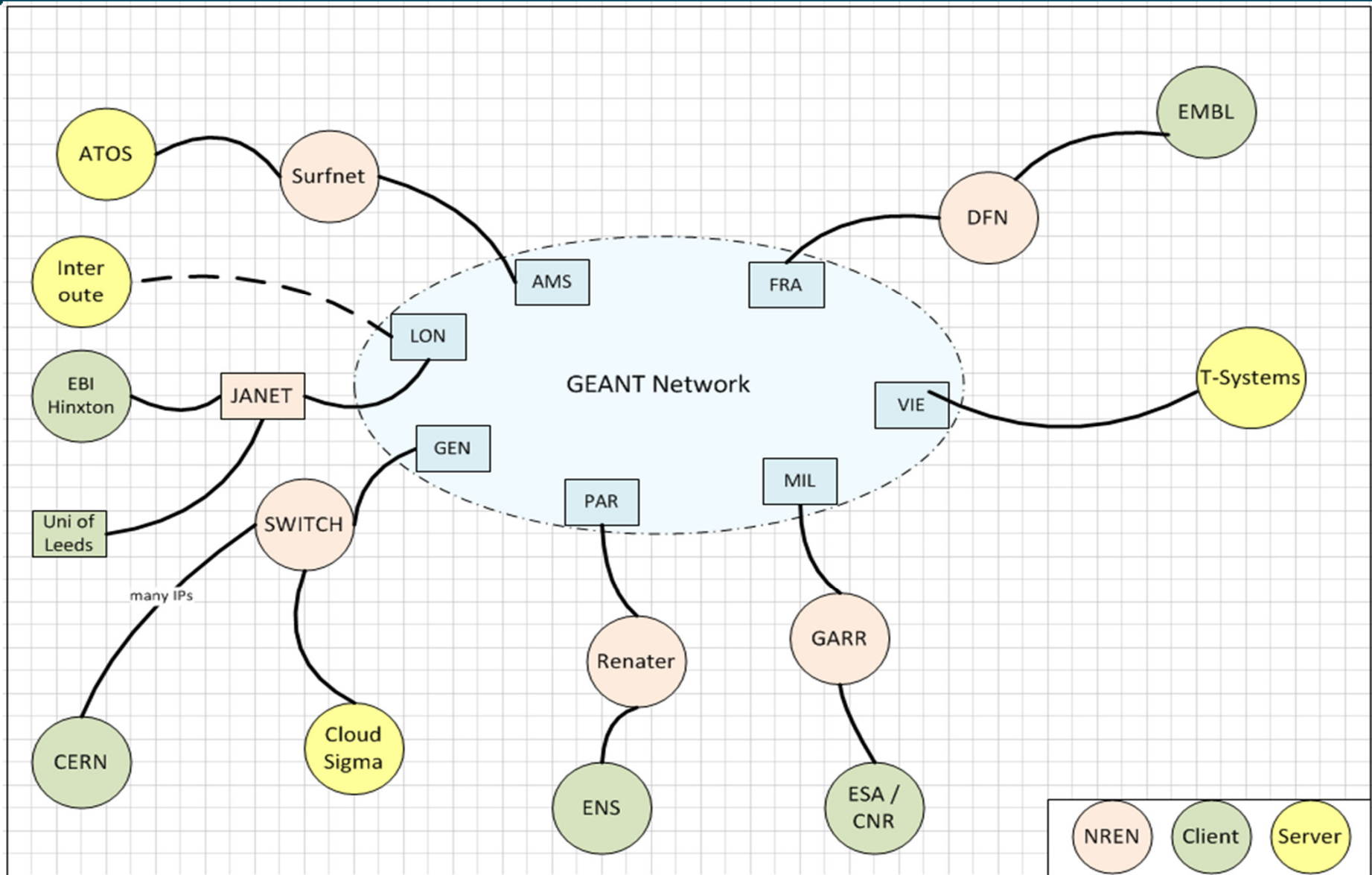
2. Build on 1 to get here

1. Basis for production service in 2014

See D7.2 'Synthesis and Analysis of Overall business Models' for details
http://cds.cern.ch/record/1615403

The Big Picture

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Topology

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connect • communicate • collaborate

Building the hybrid cloud
Testing the public-commercial cloud interoperability

- Deploy the ESA/CNES/DLR SuperSites Exploitation Platform on EGI Fed Cloud and then the CERN CMS/ATLAS flagship use cases across commercial suppliers and EGI Federated Cloud via a Blue Box broker

- Use the same evaluation criteria adopted for deployment on commercial cloud service suppliers

EGI Federated Cloud

Task Force
- Launched in Sep 2011
- 70 members from 40 institutions and 13 countries

Pre-production test-bed:
- 14 resource centres actively providing resources (900 cores, 16 TB storage)
- 30 active users from structural biology, linguistics, ecology, space science, software engineering

http://go.egi.eu/cloud

Accelerating Europe

Helix Nebula proposed accelerators represent a consistent set of concrete actions for H2020 that will have direct impact on the creation of a flourishing open cloud services market in Europe by facilitating supply and stimulating demand

- Recommendations grouped into a series of acceleration themes:
  - Creating the necessary political framework to increase access to publicly funded scientific research
  - Federating multiple commercial cloud service suppliers into an open platform
  - Using data-intensive science to bolster the data-driven economy
  - Building the hybrid cloud: putting together public and private cloud services
  - Adhering to open standards that encourage uptake of a federated cloud
  - Providing network access to cloud services
  - Introduce a financial incentive model to encourage a rapid uptake of cloud services

Building Blocks of the Collaborative Data Infrastructure

Metadata Catalogue
Aggregated EUDAT metadata domain.
Data inventory

AAI
Network of trust among authentication and authorization actors

Data Staging
Dynamic replication to HPC workspace for processing

Safe Replication
Data curation and access optimization

Simple Store
Researcher data store (simple upload, share and access)

Can these services be made available in the context of Helix Nebula?

A European cloud computing partnership:
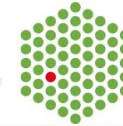## big science teams up with big business

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

Atos · CloudSigma · CSA cloud security alliance · DANTE www.dante.net · DLR · egi · interoute from the ground to the cloud

logica be brilliant together · SAP · sixsq · SWITCH · T·Systems · terradue 2.0 · the SERVER LABS the IT architects

Adopters: AWST · Capgemini CONSULTING.TECHNOLOGY.OUTSOURCING · cnrs · ECMWF · Ifremer · OpenNebula.org The Open Source Toolkit for Cloud Computing

orange Business Services · THALES · Telefonica · Trust it Communicating ICT to Markets www.trust-itservices.com

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