





Use Case Study: CERN challenges in adopting and procuring cloud services

DataCloud Europe 2015

4 June 2015

Bob Jones, CERN

Large Hadron Collider

CMS

LHCb

ATLAS

ALICE

LHC computing resources in 2014

- 3.4 billion CPU hours
- 100 PetaBytes storage

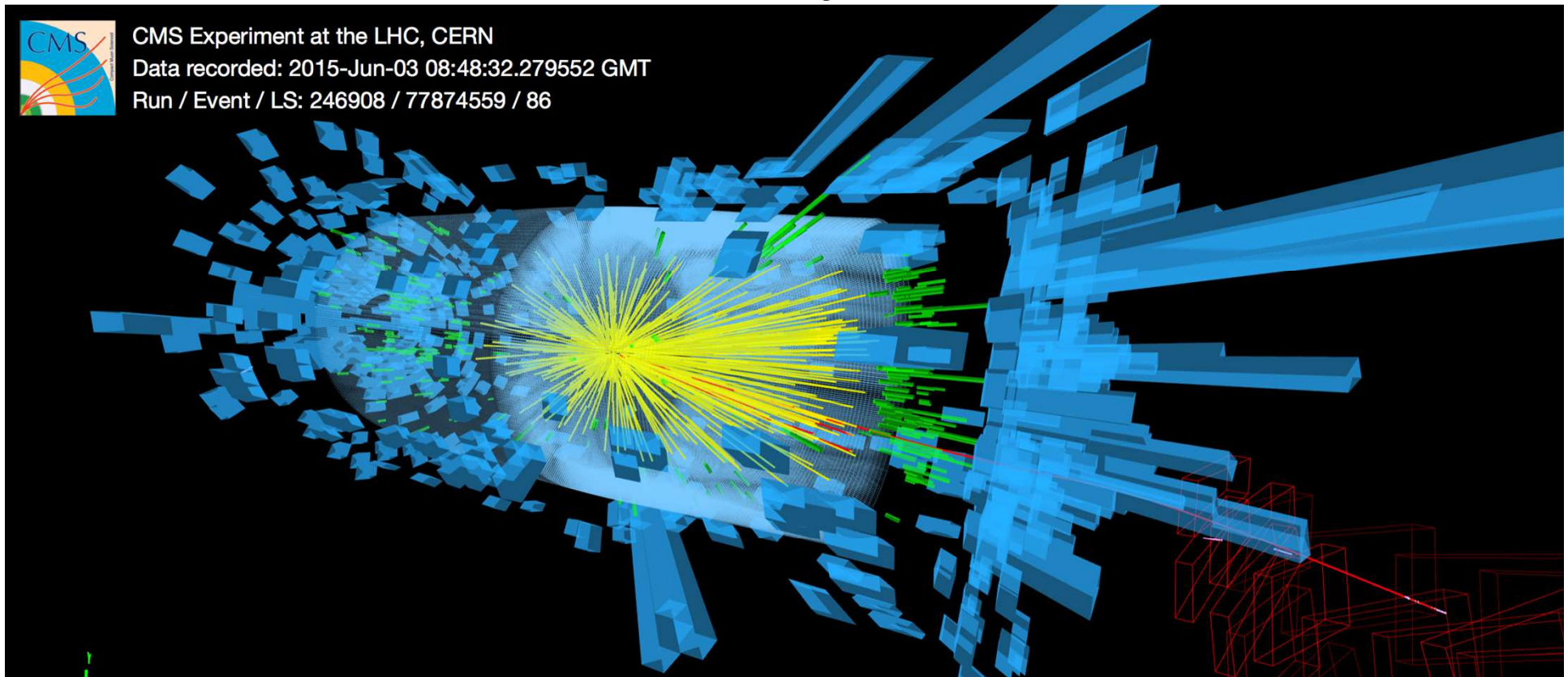
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Bob Jones, CERN

Start of Run2 physics at LHC



Geneva, 3 June 2015 - CERN's Large Hadron Collider (LHC) started delivering physics data for the first time in 27 months. After an almost two year shutdown and several months re-commissioning, **the LHC is now providing collisions to all of its experiments at the unprecedented energy of 13 TeV, almost double the collision energy of its first run.** This marks the start of season 2 at the LHC, opening the way to new discoveries. The LHC will now run round the clock for the next three years.

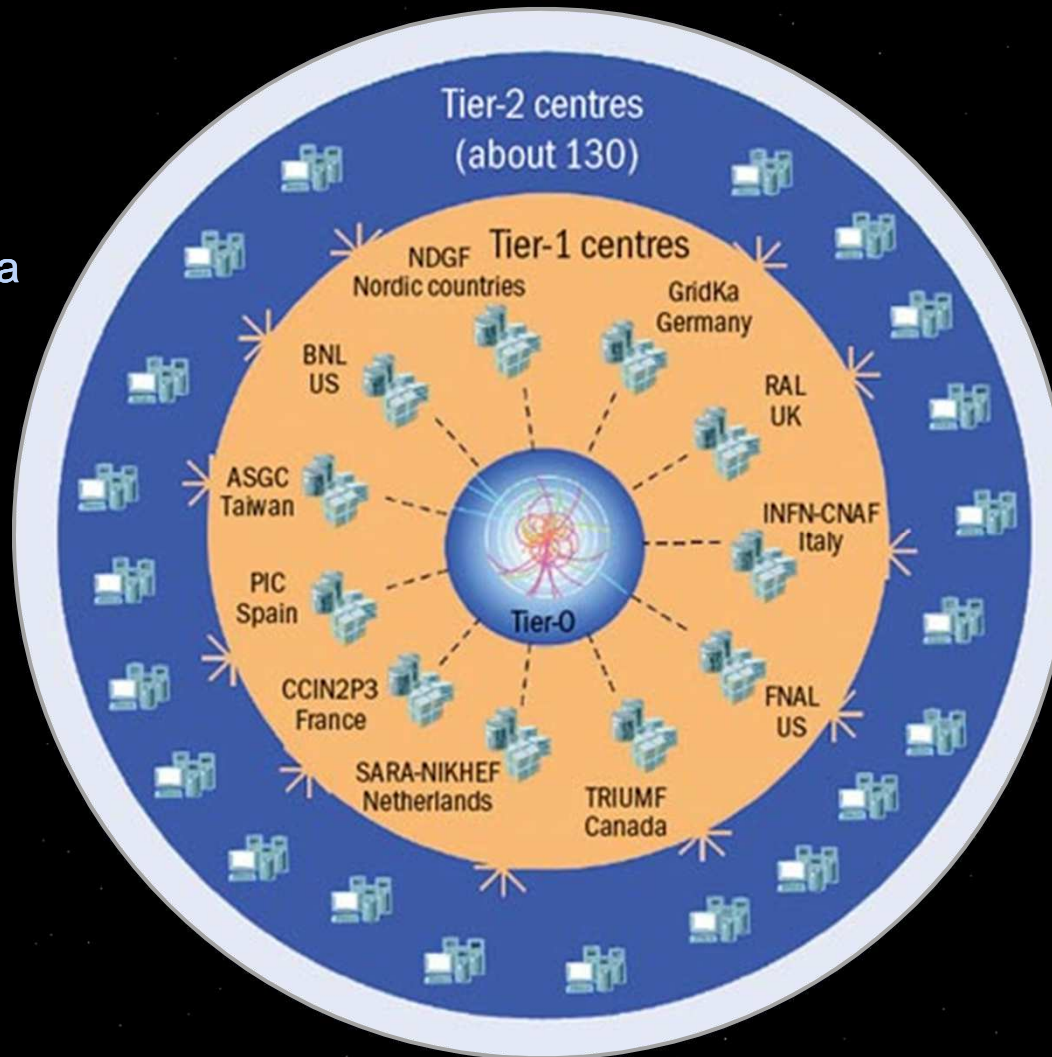
<http://run2-13tev.web.cern.ch/lhc-page-1>

The Worldwide LHC Computing Grid

Tier-0 (CERN): data recording, reconstruction and distribution

Tier-1: permanent storage, re-processing, analysis

Tier-2: Simulation, end-user analysis



nearly 170 sites,
40 countries

~350'000 cores

200 PB of storage

> 2 million jobs/day

10 Gb links

WLCG:

An International collaboration to distribute and analyse LHC data

Integrates computer centres worldwide that provide computing and storage resource into a single infrastructure accessible by all LHC physicists

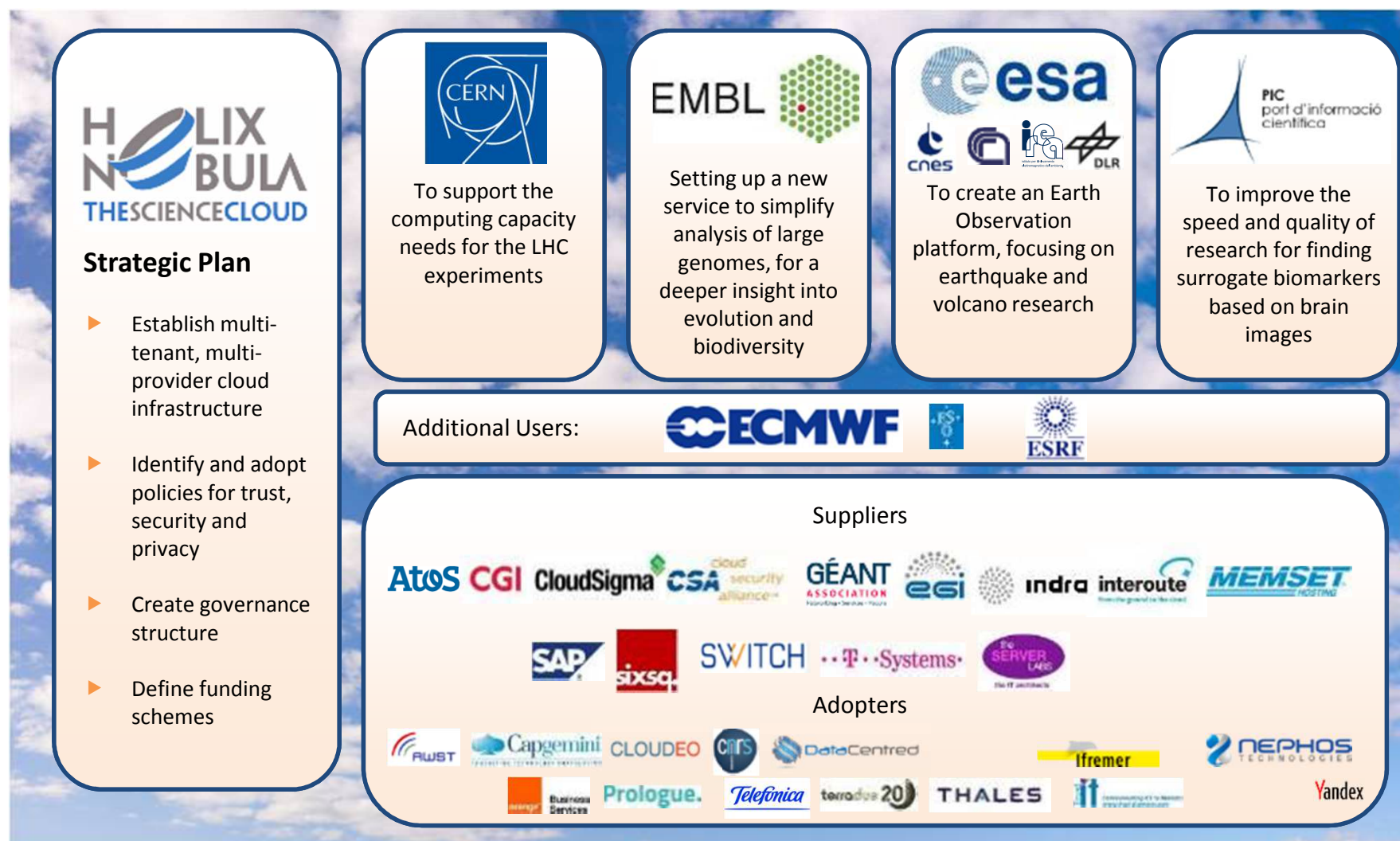
Evolution of the CERN Data Centre



- ❑ Existing CERN Geneva Data Centre reached power capacity
- ❑ New annexe procured in Budapest
Up to 2.7 MW
Connected at 2 x 100 Gbps

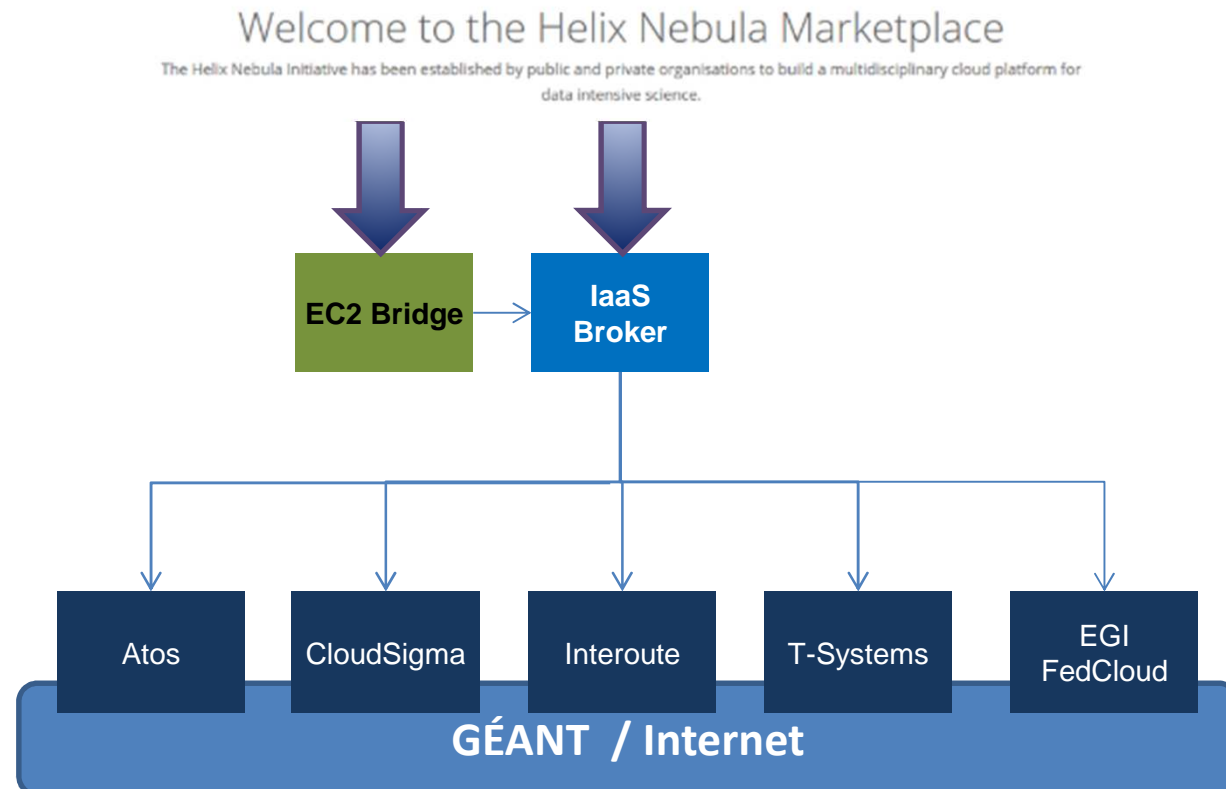
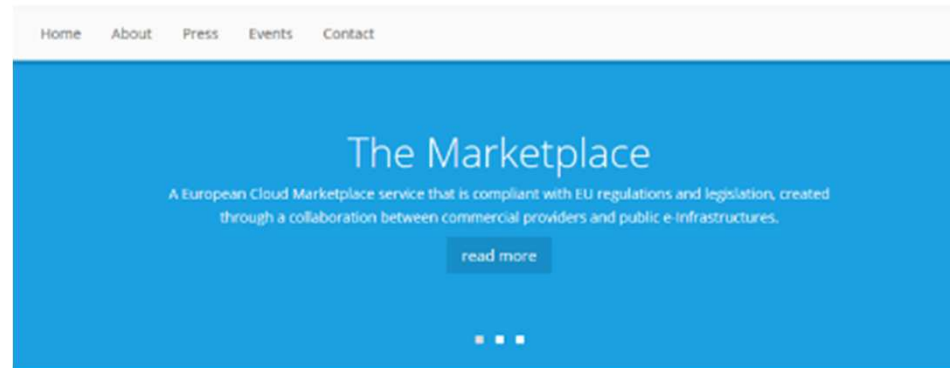


The Helix Nebula Initiative





Branded-product # 1: HNX

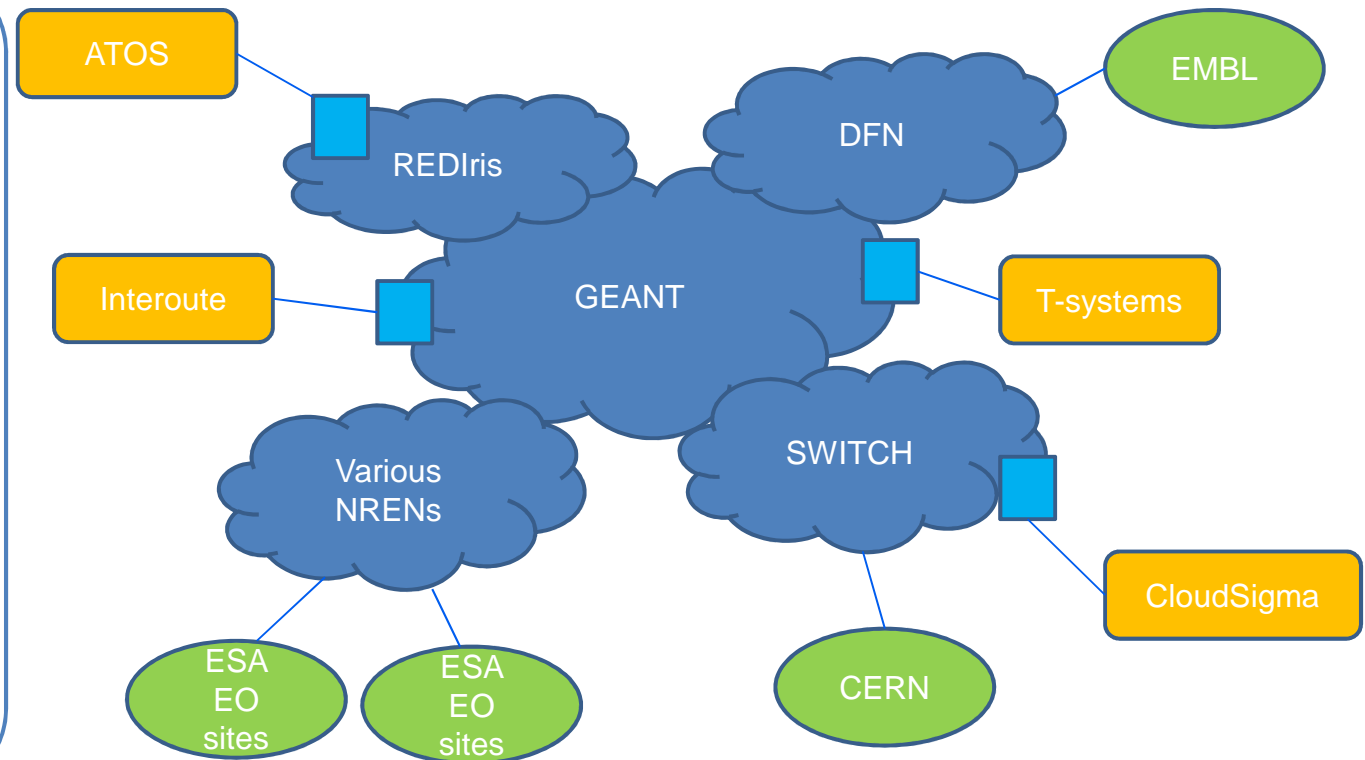


Building the hybrid cloud

Connecting commercial cloud providers to GÉANT/NRENs

GEANT Association offering free IP connectivity in GÉANT for research traffic during the pilot phase

NRENs have different commercial agreements (usually they apply a fee)



Example HNX procurement

CERN issued a price enquiry for a small fraction of the resources necessary to run the ATLAS experiment simulation software

- Several valid responses were received and Atos (data centre in Tenerife, Spain) was awarded the contract accessed via the SlipStream broker and provisioning engine (from SixSq SME) and delivered over the GÉANT network
- 1.2 million CPU hours over 6 weeks producing 11.5 million GEANT4 $t\bar{t}$ events with a high level of efficiency for CPU intensive workload



Procurement Innovation for Cloud Services in Europe

TOP FIVE OBJECTIVES



Who is PICSE for?



Public Research
Organisations



Libraries

Stay Tuned!



www.picse.eu
info@picse.eu

- H2020 Coordination and Support Action
- Partners:



CSA cloud
security
alliance®



Trust-IT Services Ltd
Communicating ICT to markets

Proposed Joint Pre-Commercial Procurement

The group of buyers have committed their resources to procure innovative cloud services in a co-fund scheme with the EC

- >1.6M€ of funds
- Manpower
- Applications & Data
- In-house IT resources

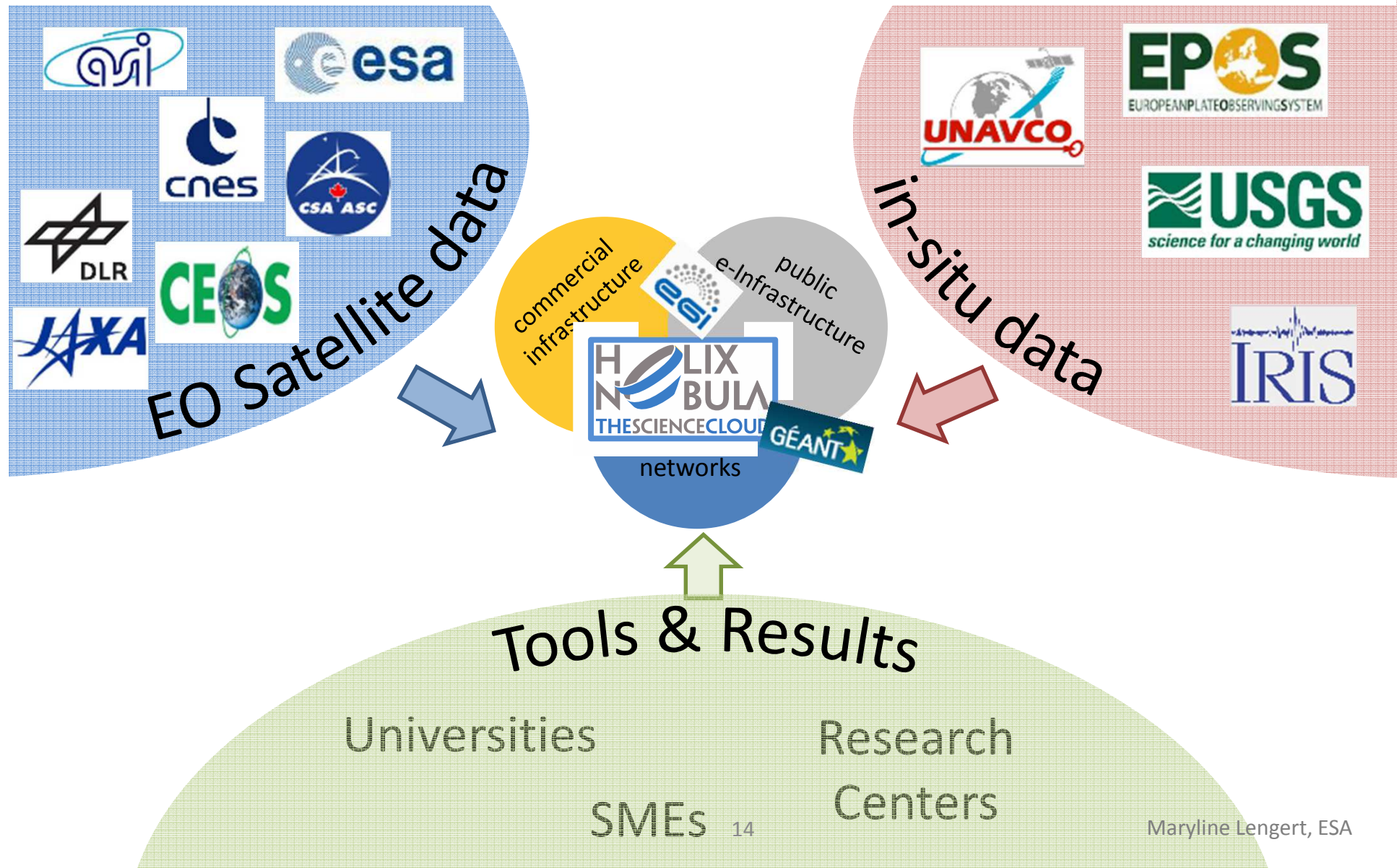
Integrated into a hybrid cloud model:

- Commercial cloud services
- Publicly funded e-Infrastructures
- In-house IT resources

Procured services will be made available to end-users via buyers own installations and publicly funded e-Infrastructures



Supersites Exploitation Platform: Infrastructure concept for science use





Wish List

- Having a **contract template for cloud services**
- Having **transparent catalogue of services**
- Mature European marketplaces** with a standard legal & contractual framework
- Vendor neutral **cloud brokers**



http://ec.europa.eu/priorities/digital-single-market/index_en.htm

✓ A simpler model to procure cloud services



✓ A template for the self-assessment and evaluation of procurement procedures



✓ PICSE Procurement Wizard (A web-based guide on Procuring Cloud Services)



✓ A realistic roadmap for cloud procurement over the next 5 years



6th Helix Nebula General Assembly
Towards a European Open Science Cloud
CERN, Geneva

26 June 2015 open day

<http://indico.cern.ch/e/OpenDay>

PICSE procurement use-cases, barriers & process
Working cloud marketplaces

