



HNSciCloud Status Update

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WLCG Grid Deployment Board 11-Jan-2017



Computing Challenges for Science

- ☛ LHC upgrades: x16 in 8 years' time
- ☛ Other HEP projects: Belle II, neutrinos; FCC, ILC
- ☛ Other physics: LSST, SKA, CTA
- ☛ Bioinformatics: x2 per year
- ☛ Photon/neutron science

All have **sharply increasing** data processing and storage **needs** beyond on-premise resources

Fluctuating demands hardly compatible with fixed on-premise resources

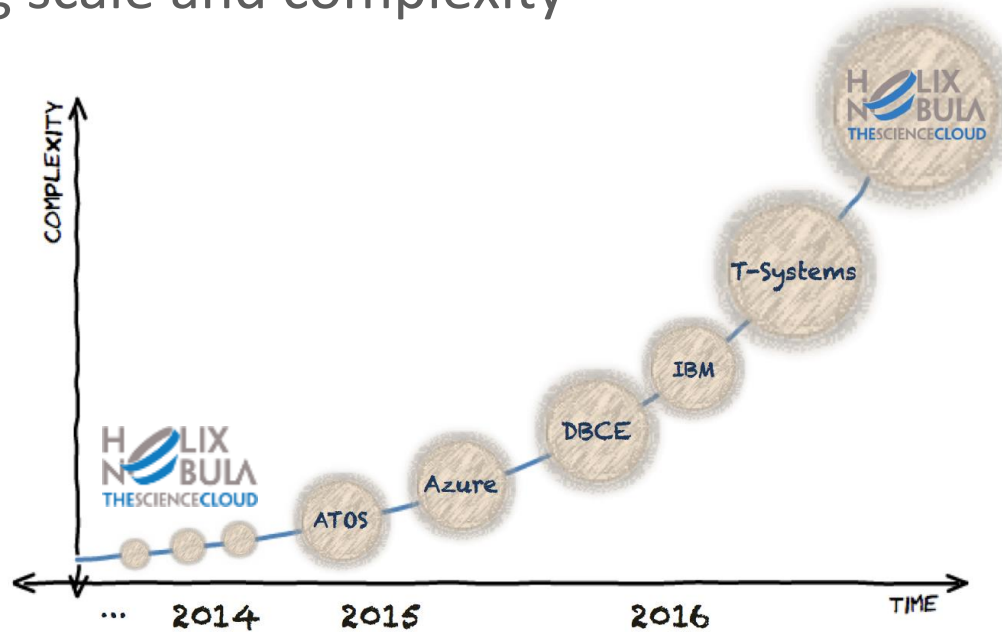
Potential solution: **public clouds**

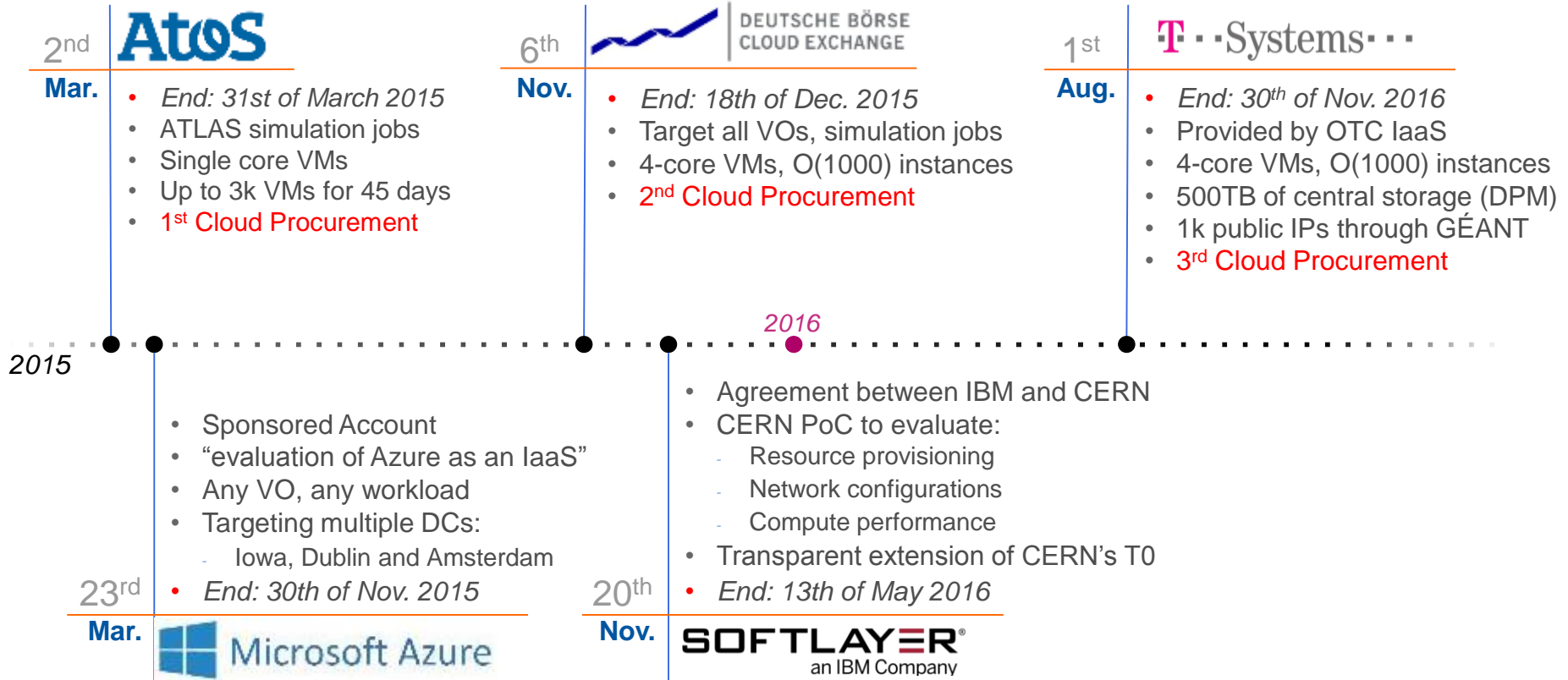
Issues with Public Clouds

- ☞ Disruptive to our usual way of resource provisioning
- ☞ Not integrated with on-premise resources and/or publicly funded e-infrastructures
- ☞ Procurements: Current organisational and financial models and technical skills and experience don't fit
- ☞ Legal impediments exist

CERN Approach

Since ~2014, series of short CERN procurement projects of increasing scale and complexity





HELIX NEBULA The Science Cloud

- / Procurers: CERN, CNRS, DESY, EMBL-EBI, ESRF, IFAE, INFN, KIT, SURFSara, STFC
 - / Procurers have committed funds (>1.6M€), manpower, use-cases with applications & data, in-house IT resources
 - / Experts: Trust-IT & EGI.eu

- / Objective: procure innovative IaaS level cloud services
 - Fully and seamlessly integrating commercial cloud (IaaS) resources with in-house resources and European e-Infrastructures
 - To form a hybrid cloud platform for science

- / Services will be made available to end-users from many research communities: High-energy physics, astronomy, life sciences, neutron/photon sciences, long tail of science

- / Co-funded via H2020 (Jan'16-Jun'18) as a Pre-Commercial Procurement (PCP) project: Grant Agreement **687614**, total procurement volume: >5M€

- / R&D is a very important part – represents > 50% of contract volume



HNSciCloud – Challenges

- ☞ Compute
 - ☞ Mostly HTC, integrating some HPC requirements
 - ☞ Full support for containers at scale
- ☞ Storage
 - ☞ Caching at provider's site, if possible automatically (avoid managed storage)
- ☞ Network
 - ☞ Connection via GÉANT
 - ☞ Support of identity federation (eduGAIN) for IT managers
- ☞ Procurement
 - ☞ Match of cloud providers' business model with public procurement rules

HNSciCloud – Project Phases

We are here

Preparation

- Analysis of requirements, current market offers and relevant standards
- Build stakeholder group
- Develop tender material

Implementation and sharing

4 Designs

3 Prototypes

2 Pilots

Tender

Call-off

Call-off

Jan'16

200+ downloads
70+ requests
for clarifications

Each step is competitive - only contractors that successfully complete the previous step can bid in the next

Dec'18

HNSciCloud – Achievements So Far

- ☞ Official start of project: Jan 2016, duration: 30 months
- ☞ Tender announced in Jan 2016
- ☞ 17-Mar-2016: Open market consultation
- ☞ 21-Jul-2016: Tender issued (> 200 downloads, > 70 requests for clarification)
- ☞ 07-Sep-2016: Tender information day – design phase
- ☞ 19-Sep-2016: Deadline for tender replies
 - ☞ Sufficient number of valid tenders received
 - ☞ Evaluation by administrative and technical experts
- ☞ 07-Oct-2016: Award decision, contracts
- ☞ 02-Nov-2016: Kick-off meeting with Design Phase contractors
- ☞ 12 and 13-Dec-2016: Mid-phase review with Design Phase contractors

HNSciCloud – Design Phase Contractors

- ☞ T-Systems, Huawei, Cyfronet, Divia
- ☞ IBM
- ☞ RHEA Group, T-Systems, exoscale, SixSq
- ☞ Indra, HPE, Advania, SixSq

- ☞ Other major players not interested or dropped out just before tender submission

HNSciCloud – Envisaged Solutions

- ☞ HTC: Standard offerings
- ☞ HPC: Mostly via specialised partners

- ☞ Storage: ONEdata; GPFS/SpectrumScale and NFS

- ☞ AAI: Indigo AIM; direct support of SAML 2.0

- ☞ Remember: It's early days, solutions need to be verified and submitted to 'reality check'

HNSciCloud – Design Phase

- ☞ 30-Jan-2017: Deadline for end-of-phase reports and other deliverables
- ☞ 23-Feb-2017: Decision on which contractors passed design phase successfully

HNSciCloud – Prototype Phase

- ☞ 24-Feb-2017: Request for tenders out
- ☞ 10-Mar-2017: Deadline for tender submissions
- ☞ 28-Mar-2017: Decision on contracts
- ☞ 04-Oct-2017: Deadline for end-of-phase reports and other deliverables
- ☞ 26-Oct-2017: Decision on which contractors passed prototype phase successfully

HNSciCloud – Pilot Phase

- ☞ 27-Oct-2017: Request for tenders out
- ☞ 17-Nov-2017: Deadline for tender submissions
- ☞ 06-Dec-2017: Decision on contracts
- ☞ 13-Nov-2018: Deadline for end-of-phase reports and other deliverables
- ☞ 04-Jan-2019: Decision on which contractors passed pilot phase successfully

HNSciCloud – Contacts



- Further details:
 - See <http://www.hnscicloud.eu/>
 - Subscribe to hnscicloud-announce@cern.ch