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## Strategic Plan for a Scientific Cloud Computing infrastructure for Europe

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### Description of the Work

In the US, for example, the Federal Cloud Computing Strategy [1] estimates that by moving a quarter of its annual \$80bn ICT expenditure to cloud-based services, it will achieve greater efficiency, agility and innovation in delivery of services –and possibly save 10% of that budget. These efficiencies are primarily brought about by achieving economies of scale, multiple tenancy of irregularly-used resources and more sophisticated approaches to resource management. More fundamentally, making a business case for moving some or all ICT facilities to a cloud-service model at the end of their current life necessitates a reappraisal of the way those facilities are utilised, potentially transforming one of the significant operational cost centres.

The feasibility of such a transformation is, therefore, of great interest to the suppliers of cloud-based services and to the national and European funding agencies as well. The HELIX NEBULA initiative is a preliminary step towards a European cloud-based scientific e-infrastructure: HELIX NEBULA –the Science Cloud. The Science Cloud Strategic Plan [2] was presented and adopted by representatives of all three stakeholder groups at a workshop hosted by ESA/ESRIN in June 2011. The supporters of the HELIX NEBULA initiative include: ATOS, BT Global Services, CAP Gemini, CERN, CloudSigma, CNES, CNR, DLR, EC, EGI.eu, EMBL, ENEA, ESA, Logica, OpenNebula, Orange Business Services, SAP, SIENA, StratusLab, Server Labs, Six2, T-Systems International, Terradue srl, Thales and TrustIT.

### Conclusions

GEANT, EGI and PRACE are existing e-infrastructures heavily used by the research community and co-funded by the European Commission. Interoperability with these infrastructures is important to allow the research community to migrate their data and applications between all the infrastructures and combine them so that the most appropriate resource can be used in an efficient manner.

[1] <http://www.cio.gov/documents/Federal-Cloud-Computing-Strategy.pdf>

[2] <http://cdsweb.cern.ch/record/1374172/files/CERN-OPEN-2011-036.pdf>

### Impact

The HELIX NEBULA initiative will lead and co-ordinate these communities of interest through a two year pilot-phase during which procurement processes and governance issues for a framework of public/private partnership will be appraised. Three flagship use cases from HEP, molecular biology and earth-observation will be used to validate the approach, enable a cost-benefit analysis to be undertaken and the next stage of the Science Cloud Strategic Plan developed and approved. The Science Cloud infrastructure will be initialized with large-scale unique data sets and bring thousands of scientists on the platform.

The outputs will be:

1. A template for capture of functional and non-functional requirements based on industry best practices
2. Recommendations for the integration and interoperation of commercial cloud resources with e-infrastructures across technical, policy and operation areas
3. Templates and guidelines for business models for the supply-side and business-cases for the demand side.
4. Guidelines for governance of a Public/Private Partnership framework for procurement of commercial cloud services
5. A roadmap for implementation of the recommendations and an updated Science Cloud Strategic Plan

## **Overview (For the conference guide)**

Besides the core processes of R&D agencies and organisations of capturing, processing, analysing and archiving data, a new paradigm of having permanent on-line access to IT resources, information and collaboration tools has become a central aspect of scientific endeavour. Research infrastructures such as the members of EIROForum are beginning to challenge the sustainability of an approach to ICT deployment that has predominated for a quarter of a century but is rapidly being overtaken by events.

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