

Digital Single Market

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HELIX NEBULA

Scientific research is entering a new era: unprecedented amounts of data, together with near-infinite computing power, are accessible to researchers all over the world through e-infrastructures. This new era is characterised by a new paradigm: e-science. Computation-intensive science involving analysis of massive data sets, e-science is making possible discoveries that otherwise would remain elusive to humankind. The cornerstones to this new chapter in the history of science are distributed computing and data infrastructures.

Very aware of the benefits of cloud computing for e-science, the Helix Nebula project was launched by key European players to challenge the approach to e-infrastructure deployment that has dominated over the last 25 years.

Cloud-based services for science could become a billion-euro business in the near future.

Within the Helix Nebula project, the European Organisation for Nuclear Research (CERN), the European Molecular Biology Laboratory (EMBL) and the European Space Agency (ESA) – together with industrial stakeholders – have deployed three pilot applications in the cloud:

- CERN is currently running a large-scale distributed computing system to process the data acquired within the particle physics ATLAS experiment (<http://www.atlas.ch/> ^[1]).
- EMBL is developing a portal for the cloud-supported analysis of large and complex genomes that will facilitate genomic assembly and annotation, allowing deeper insight into evolution and biodiversity across a range of organisms.
- ESA is developing the SuperSites Exploitation Platform, which enables the analysis and interpretation of the large datasets needed to understand the processes behind geohazards such as earthquakes and volcano eruptions.

These three pilots have opened the door to new target domains for the science cloud. Three new applications are in the pipeline for deployment in three different scientific fields: weather forecasting, oceanic research and neuroimaging. Helix Nebula currently involves more than 35 organisations and foresees expansion to include more public and private sector partners.

(Article from **net-cloud future** magazine (2013) - for complete magazine click [here](#) [2])

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