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## Accessing commercial cloud resources within the European Helix Nebula cloud marketplace

Helix Nebula –the Science Cloud Initiative is a public-private-partnership between Europe’s leading scientific research organisations (notably CERN, EMBL and ESA) and European IT cloud providers, that aims to establish a cloud-computing platform for data intensive science within Europe.

Over the past two years, Helix Nebula has built a federated cloud framework –the Helix Nebula Marketplace (HNX) - to provision cloud services from a range of commercial cloud providers and public e-infrastructures, such as the EGI and GEANT. HNX delivers efficient and scalable access to cloud resources through an innovative broker technology deployed within the Helix Nebula project. In addition it complies with EU regulations and legislation to provide trusted cloud services.

CERN contributed to this initiative by providing a flagship use case: the integration of Helix Nebula cloud resources within the workload management system of the ATLAS experiment. Aiming to gain experience in managing and monitoring large-scale deployments as well as in benchmarking the cloud resources, a sizable Monte Carlo production was realized using the Helix Nebula platform. Thousands of concurrent virtual machines were run for several months in order to be comparable with the capacity supplied by a typical WLCG Tier-2 site.

This contribution describes the Helix Nebula initiative and summarizes the CERN experience and the lessons learned in deploying experiment applications with large cloud setups involving several commercial providers. Details about the procurement process, the cost analysis and the cloud benchmark are provided.

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