

# CERN Computing in Commercial Clouds

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With the imminent upgrades to the LHC and the consequent increase of the amount and complexity of data collected by the experiments, CERN's computing infrastructures will be facing a large and challenging demand of computing resources. Within this scope, the adoption of cloud computing at CERN has been evaluated and has opened the doors for procuring external cloud services from providers, which can supply the computing services needed to extend the current CERN infrastructure.

Over the past two years the CERN procurement initiatives and partnership agreements have led to several cloud computing activities between the CERN IT department and firms like ATOS, Microsoft Azure, T-Systems, Deutsche Börse Cloud Exchange and IBM SoftLayer.

As of summer 2016 more than 10 Million core-hours of computing resources will have been delivered by commercial cloud providers to the 4 LHC experiments to run their production workloads, from simulation to full chain processing.

In this paper we describe the experience gained in procuring and exploiting commercial cloud resources for the computing needs of the LHC experiments. The mechanisms used for provisioning, monitoring, accounting, alarming and benchmarking will be discussed, as well as the feedback received from the LHC collaborations in terms of managing experiment' workflows within a multi-cloud environment.

## Primary Keyword (Mandatory)

Computing facilities

## Secondary Keyword (Optional)

Cloud technologies

## Tertiary Keyword (Optional)

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