CernVM CoPilot: a Framework for Orchestrating Virtual Machines Running Applications of LHC Experiments on the Cloud

Content:

Over the years of exploiting Grid, all four LHC experiments have converged to a model where they come into control of Grid resources using a special kind of jobs, known as pilot jobs. After this they use experiment specific job submission and scheduling systems (e.g. AliEn in case of ALICE, or PANDA in case of ATLAS) to perform late binding of these resources to real jobs.

CernVM CoPilot is a framework for the execution of LHC experiments' pilot jobs on a variety of computing resources so far untapped by LHC experiments. Such resources include enterprise cloud computing infrastructures (e.g. Amazon EC2), scientific computing clouds (e.g. Nimbus), as well as volunteer computing clouds (e.g. powered by BOINC). CoPilot serves as a gateway between cloud resources and different pilot job implementations of the LHC experiments. Currently CoPilot can be used to execute ALICE and ATLAS jobs. Support for CMS and LHCb will be implemented in order to complete the system.

When providing additional computing resources to the LHC experiments, it is crucial not to expect the physicists who run job production to make changes to their existing scripts or procedures. The CoPilot is designed in a way that the integration of the external resources is completely transparent to them.

Together with the LHC experiments' application frameworks the CernVM images can be configured to support the CoPilot agents. All in all, it makes CernVM a ready-to-run platform for exploiting cloud computing resources.

In this contribution we present the architecture and the current status of CernVM CoPilot framework.

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