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ALDIRAC, a commercial extension to DIRAC

We provide a report on ALDIRAC, the first DIRAC extension for a commercial application. DIRAC is a complete distributed computing solution, initially implemented for the LHCb experiment but now used by a wider community. The ALDIRAC extension is designed for the Alpes Lasers SA company in Neuchatel, Switzerland, to perform the simulation of the properties of Quantum Cascade Lasers on a Cloud system, namely Amazon EC2.

In this report, we will demonstrate that DIRAC is well suited to be used as a commercial solution. We will put an emphasis on the software developments required to use it in such a context. In particular, the resources used will be detailed. Moreover, as the Intellectual Property is an essential aspect of the business, a special treatment of the simulation software installation was implemented. Additional developments were necessary: due to the limited in-house computing resources, in particular network bandwidth, a system was designed to automatically deploy a complete DIRAC server on Amazon EC2 based on external signals. The machines provided by Amazon EC2 give the ability to quickly scale up and down the capabilities of the service. We will show the challenges faced and the solutions provided to allow agility with controlled costs. Finally the chosen data model will be presented: it is based on a postgresql database, where the every simulation result is stored individually. A set of meta data is used to select interesting simulation results.

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