

Experience in using commercial clouds in CMS

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Historically high energy physics computing has been performed on large purpose-built computing systems. In the beginning there were single site computing facilities, which evolved into the Worldwide LHC Computing Grid (WLCG) used today. The vast majority of the WLCG resources are used for LHC computing and the resources are scheduled to be continuously used throughout the year. In the last several years there has been an explosion in capacity and capability of commercial and academic computing clouds. Cloud resources are highly virtualized and intended to be able to be flexibly deployed for a variety of computing tasks. There is a growing interest amongst the cloud providers to demonstrate the capability to perform large scale scientific computing. In this presentation we will discuss results from the CMS experiment using the Fermilab HEP Cloud Facility, which utilized both local Fermilab resources and Amazon Web Services (AWS). The goal was to work with AWS through a matching grant to demonstrate a sustained scale approximately equal to half of the worldwide processing resources available to CMS. We will discuss the planning and technical challenges involved in organizing the most IO intensive CMS workflows on a large-scale set of virtualized resource provisioned by the Fermilab HEPCloud. We will describe the data handing and data management challenges. Also, we will discuss the economic issues and cost and operational efficiency comparison to our dedicated resources. At the end we will consider the changes in the working model of HEP computing in a domain with the availability of large scale resources scheduled at peak times.

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