Contribution ID: **11** Type: **Short Talk**

The evolution of the CMS monitoring infrastructure

Thursday 20 May 2021 15:00 (13 minutes)

The CMS experiment at the CERN LHC (Large Hadron Collider) relies on a distributed computing infrastructure to process the multi-petabyte datasets where the collision and simulated data are stored. A scalable and reliable monitoring system is required to ensure efficient operation of the distributed computing services, and to provide a comprehensive set of measurements of the system performances. In this paper we present the full stack of CMS monitoring applications, partly based on the MONIT infrastructure, a suite of monitoring services provided by the CERN IT department. These are complemented by a set of applications developed over the last few years by CMS, leveraging open-source technologies that are industry-standards in the IT world, such as Kubernetes and Prometheus. We discuss how this choice helped the adoption of common monitoring solutions within the experiment, and increased the level of automation in the operation and deployment of our services.

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Session Classification: Monitoring

Track Classification: Distributed Computing, Data Management and Facilities