



Contribution ID: 92

Type: **Oral presentation to parallel session**

Challenging data and workload management in CMS Computing with network-aware systems

Tuesday 15 October 2013 17:25 (20 minutes)

After a successful first run at the LHC, and during the Long Shutdown (LS1) of the accelerator, the workload and data management sectors of the CMS Computing Model are entering into an operational review phase in order to concretely assess area of possible improvements and paths to exploit new promising technology trends. In particular, since the preparation activities for the LHC start, the Networks have constantly been of paramount importance for the execution of CMS workflows, exceeding the original expectations - as from the MONARC model - in terms of performance, stability and reliability. The low-latency transfers of PetaBytes of CMS data among dozens of WLCG Tiers worldwide using the PhEDEx dataset replication system is an example of the importance of reliable Networks. Another example is the exploitation of WAN data access over data federations in CMS. A new emerging area of work is the exploitation of “Intelligent Network Services”, including also bandwidth on demand concepts. In this paper, we will review the work done in CMS on this, and the next steps.

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Session Classification: Facilities, Infrastructures, Networking and Collaborative Tools

Track Classification: Facilities, Production Infrastructures, Networking and Collaborative Tools