

Opportunistic resource usage at Argonne Facility for CMS

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With the increased load and pressure on required computing power brought by the higher luminosity in LHC during Run2, there is a need to utilize opportunistic resources not currently dedicated to the Compact Muon Solenoid (CMS) collaboration. Furthermore, these additional resources might be needed on demand. The Caltech group together with the Argonne Leadership Computing Facility (ALCF) are collaborating to demonstrate the feasibility of using resources from one of the fastest supercomputers in the world, Mira (10 petaflops IBM Blue Gene/Q system). CMS uses the HTCondor/glideinWMS job submission infrastructure for all its batch processing. On the other hand, Mira only supports MPI applications using Cobalt submission, which is not yet available through HTCondor. Majority of computing facilities utilized by CMS experiment are powered by x86_64 processors while Mira is Blue Gene/Q based (PowerPC Architecture). The CMS Monte-Carlo and Data production makes use of a bulk of pledge resource and other opportunistic resource. For efficient use, Mira's resource has to be transparently integrated into the CMS production infrastructure. We address the challenges posed by submitting MPI applications through CMS infrastructure to Argonne PowerPC (Mira) supercomputer. We will describe the design and implementation of the computing and networking systems for running CMS Production jobs with first operational prototype for running on PowerPC. We also demonstrate the state of the art high networking from the LHC Grid to ALCF requirement of CMS data intensive computation.

Secondary Keyword (Optional)

Data processing workflows and frameworks/pipelines

Primary Keyword (Mandatory)

High performance computing

Tertiary Keyword (Optional)

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