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Evaluation of Virtual Machines for HEP Grids

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The heterogeneity of resources in computational grids, such as the Canadian GridX1, makes application deployment a difficult task. Virtual machine environments promise to simplify this task by homogenizing the execution environment across the grid. One such environment, Xen, has been demonstrated to be a highly performing virtual machine monitor. In this work, we evaluate the applicability of Xen to scientific computational grids. We verify the functionality and performance of Xen, focusing on the execution of software relevant to the LHC community. A variety of production deployment strategies are developed and tested. In particular, we compare the execution of job-specific and generic VM images on grids of conventional Linux clusters as well as virtual clusters.

Primary author: Dr SOBIE, Randall (Univeristy of Victoria)

Co-authors: NORTON, Angela (Univeristy of Victoria); Dr AGARWAL, Ashok (Univeristy of Victoria); Mr VANDERSTER, Dan (Univeristy of Victoria); Mr DESMARAIS, Ronald (Univeristy of Victoria)

Presenter: Dr AGARWAL, Ashok (Univeristy of Victoria)

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