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## Combining virtualization tools for a dynamic, distribution agnostic grid environment for ALICE grid jobs in Scandinavia

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The Nordic Tier-1 for LHC is distributed over several, sometimes smaller, computing centers. In order to minimize administration effort, we are interested in running different grid jobs over one common grid middleware. ARC is selected as the internal middleware in the Nordic Tier-1. At the moment ARC has no mechanism of automatic software packaging and deployment. The AliEn grid middleware, used by ALICE provides this functionality. We are investigating the possibilities to use modern virtualization technologies to make these capabilities available for ALICE grid jobs on ARC.

The CernVM project is developing a virtual machine that can provide a common analysis environment for all LHC experiments. One of our interests is to investigate the use of CernVM as a base setup for a dynamical grid environment capable of running grid jobs. For this, performance comparisons between different virtualization technologies have been conducted.

CernVM needs an existing virtualization infrastructure, which is not always existing or wanted at some computing sites. To increase the possible application of dynamical grid environments to those sites, we describe several possibilities that are less invasive and have less specific Linux distribution requirements, at the cost of lower performance.

Different tools like user-mode Linux (UML), micro Linux distributions, a new software packaging project by Stanford university (CDE) and CernVM are under investigation for their invasiveness, distribution requirements and performance. Comparisons between the different methods with solutions that are closer to the hardware will be presented.

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