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Dynamic partitioning as a way to exploit new computing paradigms: the cloud usecase.

The WLCG community and many groups in the HEP community have based their computing strategy on the Grid paradigm, which proved successful and still ensures its goals. However, Grid technology has not spread much over other communities; in the commercial world, the cloud paradigm is the emerging way to provide computing services.

WLCG experiments aim to achieve integration of their existing current computing model with cloud deployments and take advantage of the so-called opportunistic resources (including HPC facilities) which are usually not Grid compliant. One missing feature in the most common cloud frameworks, is the concept of job scheduler, which plays a key role in a traditional computing centre, by enabling a fairshare based access at the resources to the the experiments in a scenario where demand greatly outstrips availability.

At CNAF we have opened started, as a preproduction service, the possibility to access the Tier-1 computing resources as an OpenStack based cloud service. The system, exploiting the dynamic partitioning mechanism already being used to enable Multicore computing, allowed us to avoid a static splitting of the computing resources in the Tier-1 farm, while permitting a share friendly approach.

The hosts in a dynamically partitioned farm may be moved to or from the partition, according to suitable policies for request and release of computing resources. Nodes being requested in the partition switch their role and become available to play a different one. In the cloud use case hosts may switch from acting as Worker Node in the Batch system farm to cloud compute node member, made available to tenants.

In this paper we describe the dynamic partitioning concept, its implementation and integration with our current batch system, LSF. We then present results for the dynamic cloud usecase.

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