



Contribution ID: 484

Type: **Parallel**

## Dynamic Extension of a Virtualized Cluster by using Cloud Resources

*Tuesday, May 22, 2012 2:45 PM (25 minutes)*

The specific requirements concerning the software environment within the HEP community constrain the choice of resource providers for the outsourcing of computing infrastructure. The use of virtualization in HPC clusters and in the context of cloud resources is therefore a subject of recent developments in scientific computing.

The dynamic virtualization of worker nodes in common batch systems provided by ViBatch serves each user with a dynamically virtualized subset of worker nodes on a local cluster. Now it can be transparently extended by the use of common open source cloud interfaces like OpenNebula or Eucalyptus, launching a subset of the virtual worker nodes within the cloud.

It is demonstrated how a dynamically virtualized computing cluster is combined with cloud resources by attaching remotely started virtual worker nodes to the local batch system.

### Summary

The IEKP institute at the Karlsruhe Institute of Technology (KIT) is sharing a cluster with nine different departments. The cluster, maintained by the central computing department of KIT is installed with a SuSE Enterprise Linux. To be able to use CERN specific setups and software (e.g. AFS, CMSSW) the IEKP relies on a Scientific Linux OS environment. Therefore, we developed the dynamic virtualization of worker nodes within common batch systems (ViBatch) as presented already at CHEP09. In order to cope peak load times of the cluster we now extended this local “by-job” virtualization system by using worker nodes which are automatically spawned within cloud resources through the “Responsive On-demand Cloud Enabled Deployment” (ROCED). ROCED hereby manages the monitoring of the local job queues and spawns automatically new cloud worker nodes if a certain queue length threshold is reached. The locally used virtual machines are setup with SLC5 and use the CernVMFS to provide the CMS software transparently to our users.

The presentation will give a summary on both tools, ViBatch and ROCED, their new features and the experiences of using the combination of both in our local analysis production system.

**Primary authors:** OBERST, Oliver (KIT - Karlsruhe Institute of Technology (DE)); Mr HAUTH, Thomas (KIT - Karlsruhe Institute of Technology (DE))

**Co-authors:** KERNERT, David (KIT - Karlsruhe Institute of Technology (DE)); QUAST, Gunter (KIT - Karlsruhe Institute of Technology (DE)); RIEDEL, Stephan (KIT - Karlsruhe Institute of Technology (DE))

**Presenter:** OBERST, Oliver (KIT - Karlsruhe Institute of Technology (DE))

**Session Classification:** Distributed Processing and Analysis on Grids and Clouds

**Track Classification:** Distributed Processing and Analysis on Grids and Clouds (track 3)