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Transparent Integration of Opportunistic Resources into the WLCG Compute Infrastructure

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The inclusion of opportunistic resources, for example from High Performance Computing (HPC) centers or cloud providers, is an important contribution to bridging the gap between existing resources and future needs by the LHC collaborations, especially for the HL-LHC era. However, the integration of these resources poses new challenges and often needs to happen in a highly dynamic manner. To enable an effective and lightweight integration of these resources, the tools COBalD and TARDIS are developed at KIT.

In this contribution we report on the infrastructure we use to dynamically offer opportunistic resources to collaborations in the World Wide LHC Computing Grid (WLCG). The core components are COBalD/TARDIS, HTCondor, CVMFS and modern virtualization technology. The challenging task of managing the opportunistic resources is performed by COBalD/TARDIS. We showcase the challenges, employed solutions and experiences gained with the provisioning of opportunistic resources from several resource provides like university clusters, HPC centers and cloud setups in a multi VO environment. This work can serve as a blueprint for approaching the provisioning of resources from other resource providers.

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