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Kubernetes testbed cluster for the Lightweight Sites project

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The Worldwide LHC Computing Grid (WLCG) is a global collaboration of more than 170 computing centres in 42 countries and the number is expected to grow in the coming years. However, provisioning resources (compute, network, storage) at new sites to support WLCG workloads is still no straightforward task and often requires significant assistance from WLCG experts. Recently, the WLCG community has initiated steps towards reducing such overheads through the use of prefab Docker containers or OpenStack VM images, along with the adoption of popular tools like Puppet for configuration. In 2017, the Lightweight Sites project was initiated to construct shared community repositories providing such building blocks. These repositories are governed by a single Lightweight Site Specification Document which describes a modular way to define site components such as Batch Systems, Compute Elements, Worker Nodes, Networks etc.

Implementation of the specification is based on a popular orchestration technology –Kubernetes. Here it is discussed the testbed cluster for deploying Lightweight grid sites. The research is mainly focused on the controlling lifecycle of containers for compute element, batch system and worker. Also some parameters for benchmarking and evaluation of the performance of different implementations were introduced.

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