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A Distriuted Tier-1 for WLCG

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The Tier-1 facility operated by the Nordic DataGrid Facility (NDGF) differs significantly from other Tier-1s in several aspects: It is not located one or a few locations but instead distributed throughout the Nordic, it is not under the governance of a single organization but instead a “virtual” Tier-1 build out of resources under the control of a number of different national organizations.

We present the technical implications of these aspects as well as the high-level design of this distributed Tier-1. The focus will be on computations, storage and monitoring.

In order to look like a single site some services requires one single entry point. Most notably is the srm entry point to storage. This is archived using dCache, but with a number of additional features developed by NDGF and DESY/FermiLab.

Computations are controlled by the NorduGrid ARC middleware, which has proven to be a reliable and easy to install a the sites and on top of that supports the distribution of the compute elements very well. Integration happens at the HEP experiment level, where one or more VO-boxes provide the interface between the experiments and the ARC middleware.

Finally, diagnosing problems at sites where NDGF staff does not have administrative access to the machines requires a well developed set of monitoring services. This includes SAM tests especially tailored to the NDGF setup and use of other standard monitoring software packages.

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