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Building a Federated Tier2 Center to support Physics Analysis and MC Production for multiple LHC Experiments

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The IT Group at DESY is involved in a variety of projects ranging from Analysis of High Energy Physics Data at the HERA Collider and Synchrotron Radiation facilities to cutting edge computer science experiments focused on grid computing. In support of these activities members of the IT group have developed and deployed a local computational facility which comprises many service nodes, computational clusters and large scale disk and tape storage services. The resources contribute collectively or individually to a variety of production and development activities such as the main analysis center for the presently running HERA experiments, a German Tier2 center for the ATLAS and CMS experiments at the Large Hadron Collider (LHC) and research on grid computing for the EGEE and D-Grid projects.

Installing and operating a great variety of services required to run a sizable Tier2 center as a federated facility is a major challenge. The anticipated computing and storage capacity for the start of LHC data taking is O(2000)kSI2K and O(700)TB disk. Given local constraints and particular expertise at the sites the DESY IT Group and the Physics Group at RWTH Aachen, both having their facilities in two distinct locations that are about 500km apart, are in the process of building such a center for CMS. The anticipated conceptual design is based on a network-centric architecture allowing the installation and operation of selected services where they fit most optimally the boundary conditions as they do exist at either institution. While the group at RWTH is having their focus on LHC physics, interfacing to data processing at a fairly high level, a considerable amount of expertise on processing of petabyte scale physics data in a highly distributed environment exists at DESY.

In this paper we describe the architecture, the distribution of the services, the anticipated operational model and finally the advantages and disadvantages of using such a scheme to manage a large scale federated facility.

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