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Grids, Virtualization and Clouds at Fermilab

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Fermilab supports a scientific program that includes experiments and scientists located across the globe. To better serve this community, in 2004, the (then) Computing Division undertook the strategy of placing all of the High Throughput Computing (HTC) resources in a Campus Grid known as FermiGrid, supported by common shared services. In 2007, the FermiGrid Services group deployed a service infrastructure that utilized Xen virtualization, LVS network routing and MySQL circular replication to deliver highly available services that offered significant performance, reliability and serviceability improvements. This deployment was further enhanced through the deployment of a distributed redundant network core architecture and the physical distribution of the systems that host the virtual machines across multiple buildings on the Fermilab Campus.

In 2010, building on the experience pioneered by FermiGrid in delivering production services in a virtual infrastructure, the Computing Sector commissioned the FermiCloud, GPCF and Virtual Services projects to serve as platforms for support of scientific computing (FermiCloud & GPCF) and core computing (Virtual Services).

This work will present the evolution of the Fermilab Campus Grid, Virtualization and Cloud Computing infrastructure together with plans for the future.

Summary

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