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Fermilab Grid and Cloud Computing Updates

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Beginning in 2007, Fermilab has made extensive use of virtualization to deliver services in support of science. Many production services are deployed using virtualization and have realized significant cost savings while delivering improvements in performance and availability.

In 2010, Fermilab initiated the FermiCloud project to deliver a dynamic and scalable Infrastructure-as-a-Service (IaaS) capability using open source cloud computing frameworks to support the needs of the Fermilab scientific communities. A collaboration of personnel from Fermilab and the Korea Institute of Science and Technology Information (KISTI) has focused significant work over the past 18 months to deliver improvements to the applicability and robustness of FermiCloud, together with specific accomplishments with respect to direct and indirect support of science.

The General Physics Computing Facility (GPCF), also initiated in 2010, uses open source virtualization tools to provide computing server resources for scientific experiments at Fermilab. This allows us to provision new needs quickly and to make efficient use of available hardware resources. GPCF provides virtual servers that are expected to have medium to long lives and that are centrally managed by a team of system administrators.

The Virtual Server Hosting Service provides hosting for virtual machines running Windows, Linux, or Solaris x86. The service is intended for customers wishing to provision new virtual machines, import virtual machines from other environments, and convert physical systems into virtual machines. While currently used mainly for Enterprise Business application hosting, we are exploring it as a hosting environment for enterprise level scientific services and those experiment processes that are not data intensive. Our plans in the future include developing a cost model against which to measure our future choices for procurements and activities.

The opportunities, challenges and successes of virtualization and cloud computing at Fermilab will be presented.

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