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Glint: VM image distribution in a multi-cloud environment

The HEP community is increasingly using clouds that are distributed around the world for running its applications. The stringent software criteria of HEP experiments require that we use the identical (secure) virtual machine (VM) image at all sites with a minimal set of site-specific customizations. Nearly all cloud systems (such as OpenStack) require that the VM image to be instantiated must be stored in the local repository (e.g. Glance in OpenStack). This requirement forces the user to manually distribute images to target clouds. As the number of clouds utilized grows, this procedure becomes increasingly time-consuming and error-prone. To remedy this situation, we designed and constructed an image replication system, called Glint, to manage VM images in multiple OpenStack Glance repositories.

On a single OpenStack cloud, Glance gives the user (with the appropriate credentials) the ability to use pre-configured images or upload customized images using the OpenStack Horizon web interface or command line interface. A user with access to multiple OpenStack clouds (each with separate credentials) will likely find that the set of pre-configured images will be different at each site and the user will need to upload their customized image to each cloud.

Glint is designed to streamline the distribution of application images to multiple clouds. Glint integrates into the OpenStack framework and provides access to its functions via the OpenStack Horizon web interface. It registers with the OpenStack Keystone Identity service during installation and authorizes requests by validating the user's security token with the local Keystone service. Glint gives the user ability to add remote clouds (with their credentials) and migrate images from one to many cloud sites.

We describe the features of Glint and its integration in the OpenStack framework. The initial use of Glint for HEP application is described. Future developments and potential integration into the OpenStack code base are discussed.

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