Connecting restricted, high-availability, or low-latency resources to a seamless Global Pool for CMS

Connecting different Resource Types

- CMS makes use of many over the pledge compute resources opportunistically in the Global Pool. Most of these come from grid sites already part of the CMS collaboration. CMS and OSG work in close collaboration with each other and an effort was made to explore the possibility of using OSG VO resources for CMS general purpose computing. To that end special VO name TL_US_OSG was registered in the CMS site database.

- CMS HLT Integration

  CMS employs a multi-level triggering system to collect data from the detector on the farm. The first trigger level, known as the high level trigger (HLT) is a large, compute farm of over 10,000 cores and is owned and operated by OSG. The CAF activity can be bursting and have long idle periods due to its high availability and low-latency nature, so connecting them to the Global Pool and accessible with CRAB3, the modern analysis tool to submit jobs to the grid. The current framework relies on a server-client model, where the user interacts with the client and the server is in charge of submitting remotely to the CMS Global Pool, meaning lower local submission from the client is not possible.

- Opportunistic Resources OSG Resources

  CMS identifies sites in OSG globeRMS factories using a classAd named GLOBUS_IDENTITY. This classAd was set on all CE's which can opportunistically be utilized by OSG. The CMS VO specific globeRMS frontends then jobs as all entries matched with the TL_US_OSG_GLOBUS_IDENTITY classAd.

- Currently, TL_US_OSG contains the following resources:

  - These resources are used for production jobs. CMS cannot utilize local storage at these sites and hence can not run GEN-SIM workflows. Rather use for these workflows is done at FNAL where all the subsequent steps which process staged output then execute at FNAL. The following dashboard report shows production jobs committed on this resource.

- High Priority Access for a restricted User Community

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- Connecting institutional SCHEDDS to the Global Pool in a manageable way

  CMS Grid Sites pledge resources for the experiments to use and the prioritization of jobs is handled by the CMS computational Grid resource manager. But what happens when a Site wants to give priority to their local physics group on top of their pledge? The following diagram explains how a Site can add additional jobs on top of their pledged resources.

  - A list of sites (for VO/SGMs: eg. Stony Brook, Stony Brook, Stony Brook... etc.) is published by a site admin via CMS/SiteConnect. When the user submits a CRAB job, the CRAB server will look at CMS/SiteConnect for the VO/SGM list to see which sites will "local" and will create a condor classAd named "糙CMS Group". The Global Pool central infrastructure then looks up for the information and submits a special glidein with VO/SGM=糙CMS/Condor/local-pilot and the site can then use to give these glideins a higher priority.