Cyclotron Computing

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This past year, we finished the evaluation of SL (Scientific Linux) as our principle operating system for lab's analysis and administrative servers [1]. "SL is a Linux release put together by Fermilab, CERN, and various other labs and universities around the world. Its primary purpose is to reduce duplicated effort of the labs, and to have a common install base for the various experimenters. The base SL distribution is basically [Redhat] Enterprise Linux, recompiled from source [2]. SL uniquely fits our lab's mission as a nuclear research institute. It has proved to be robust and simple to install and maintain, and it contains the applications, preconfigured, that enable and enhance the lab's ability to execute its mission. Based on our evaluation, we chose the SL 4 distribution that utilizes the newer 2.6 kernel. We have since upgraded all the general lab analysis servers to SL 4, upgraded sjygroup's analysis servers to SL 4 and intergrated retgroup's analysis servers into the lab's analysis farm. Here SL 3.0.5 was chosen to maintain required compatibility with STAR system computers, as requested.

We have since rebuilt our fileserver, migrating it from Fermi Linux 3.0.1 [1] to SL 4. After the migration and nfs optimization, we find that data throughput is limited by network bandwidth: 100Mega Bit at each analysis server, 1 Giga Bit at the fileserver. In order to keep abreast of the lab's ever growing need for storage, we added a Dell PowerVault SCSI enclosure, added 750 Giga bytes of disk space for general lab data usage. We added 1 Tera byte (500 Giga bytes reserved) for sjygroup and 500 Giga bytes for snapshot backups of critical directories both using SATA drives and an external SATA enclosure. We are experimenting with SATA drives which are cheaper considerably than SCSI drives. Total disk storage mounted on the fileserver has reached 14 disks totaling 2.7 Tera bytes of capacity.

The new SL 4 based mail server [1] has been in production since November. It is very successful at its task, currently delivering between 2500-3500 email daily while it correctly tags and "defangs" between 5-20 viruses (Phishing attempts mostly) daily and tags between 100-150 messages as ***SPAM*** daily. The SL 4based WebMail application we integrated also allows user to change their password without administrator intervention, which they must now do every 90 days in accordance with university policy.

We added 8 new high performance analysis servers to the lab's analysis farm: totaling 10 for general lab use, 5 dedicated to sjygroup, and 3 dedicated to retgroup. Condor [3], a load balancing job submission system was integrated to the analysis farm. It enables the submission of a large number of jobs to a central server which then migrates the jobs to other analysis servers based on resource availability, priority, and ownership.

[1] R. Burch and K. Hagel, *Progress in Research*, Cyclotron Institute, Texas A&M University (2004-2005), p.V-5.

[2] https://www.scientificlinux.org/

[3] http://www.cs.wisc.edu/condor