Cyclotron computing

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This past year we continued to enhance the Cyclotron Institute's computing capacity and infrastructure. The primary improvements were: operating system upgrades, increased file and backup server capacity, new computational server, data acquisition (DAQ) server enhancements, new DAQ network infrastructure, and wireless access. These enhancements are an important part of the services we provide the Institute's personnel, empowering them to carry out their research programs and the Institute's mission.

In the past we maintained several flavors of Linux for the servers we manage. We have now standardized on Scientific Linux (SL). We retired Red Hat Linux as our primary operating system. This was an important change in operating systems for servers which we manage. When Red Hat discontinued support for the free Red Hat Linux and offered a subscription based service (RHEL), we switched to Fermi Linux and then to Scientific Linux (SL) as our primary operating system for computational, data analysis, and administrative services. Scientific Linux is a free, stable and capable operating system which uniquely fits the needs and mission of our Institute. This past year we finished the migration of all computational servers to SL 4. We plan to continue running SL 4 on all current and new computational and data analysis servers until necessity requires that we migrate to SL 5. DAQ frontend servers will continue to run Red Hat Linux 7, as required by their hardware configuration, until drivers for hardware are rewritten. We plan to run SL 5 on all current and new administrative servers and so gain experience and expertise useful in upgrading our computational servers from SL 4 to SL 5 when required. We started the migration of current administrative servers to SL 5 and so far migrated the lab's ssh gateway, web, backup, syslog, and radius servers to SL 5.

In an effort to satisfy the Institute's growing demand for data storage and computational power, the previous year we had upgraded the file server with eight SATA drive slots [1], four of which were populated with 2TBytes of data storage capacity. In the past year we populated the remaining four slots, maxing out our data storage capacity at 5TBytes. We also added a 300GByte SCSI disk to the file server for expanding user's home directories as needed. In order to maintain adequate backups of our expanding home directory structure and critical files on our servers, we upgraded the new backup server [1] by increasing internal storage to 2TByte and increasing our offsite storage to 700GBytes. We also added one new computational server, a Dell PowerEdge 1950 with two Xeon 2.66GHz Quad Core processors and 8GBytes of RAM and brought it on-line with SL 4. We now have a total of 12 computational servers available for general lab usage where Condor feeds these servers with jobs on demand.

The DAQ Backend server was upgraded with extended capabilities and a significant increase in data storage capacity to satisfy the ever growing demands of the experiments preformed at the Institute. We also upgraded the data acquisition network, replacing the 10Mbit Fiber hubs and converters with 100Mbit Fiber switches.

This past year we added secure (WPA) wireless to the Institute. Authentication, authorization, and accounting is granted and logged via a stand-alone SL 5 radius server as required by the university's security regulations.

In an effort to supply the Institute with the resources it needs in a secure and cost effective environment, we chose a free operation system maintained by the national labs Fermi Lab and CERN which uniquely fits our Institute's needs and mission. We significantly increased our Institute's storage capacity augmented with computational power. We enhanced the capabilities of the DAQ Backend server, rebuilt its network infrastructure and added wireless to the Institute.

[1] R. Burch, K. Hagel, Progress in Research, Cyclotron Institute, Texas A&M University (2006-2007), p.V-7.