

## Cyclotron computing

R. Burch and K. Hagel

To continue our mission of providing the Cyclotron Institute personnel the computational and network resources necessary to their research programs, we have increased the Institute's computing capacity and infrastructure over this past year by adding three additional computational servers, replacing our aging main firewall, adding a secondary firewall, and adding a pair of servers to virtualize several administrative services offered. We completed the migration of administrative servers from Scientific Linux, SL 4.x to SL 5.x and started the migration of these servers/services to Ubuntu LTS. We are pursuing the virtualization of administrative servers to allow us to better utilize server room rack space, power and cooling by reducing our physical machine count.

To increase productivity and reduce turn-around time we added three new computational servers, increasing our capacity by 24 late model processors or up to 48 concurrent jobs. One server was provisioned with 1GByte of RAM per processor thread allowing lab users to analyze the more memory intensive jobs quickly. To continue protecting the lab from external networking threats, we replaced our aging firewall server with a Dell PowerEdge R610 equipped with an energy efficient Quad Core Xeon E5505 processor running Ubuntu and also added a second, reprovisioned, mostly closed firewall running Ubuntu to isolate the data acquisition network from the lab network.

In an effort to reduce the number of administrative servers in the data center, and thereby reduce administrative server rack, power and cooling requirements, we added a Dell PowerEdge R610 server with two energy efficient Quad Core Xeon E5520 processors and reprovisioned the Dell PowerEdge R610 with the 12 SATA disk enclosure [1]. The motivation for these two servers is to free up physical computers running administrative services, one machine for each service; data, mail, web, database, ssh-gateway, authentication, wireless, and other services by hosting all these services on one physical server as VM's (Virtual Machine), one for each service. Two servers are required to minimize down time in the event that the primary VM host fails. Currently, a data fileserver VM is in production with four of the twelve drive slots populated with Terabyte drives. We also have a ssh-gateway VM provisioned awaiting its disaster recovery plan verification and a web server VM in development.

These changes and additions allow us to supply the Institute with the resources it needs to execute its mission by increasing our computational and data serving capacity, by providing more security with updated firewall services, by reducing physical machine footprint via migration of administrative servers to SL 5.x and Ubuntu in a VM infrastructure and by providing a path for further expansion in the coming years.

[1] R.Burch and K.Hagel, *Progress in Research*, Cyclotron Institute, Texas A&M University (2007-2008), p.V-5.