Cyclotron computing

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This past year we, as per our mission to provide the Cyclotron Institute personnel the computational and network infrastructure necessary to execute their research programs in a timely and secure manner, added computational capacity, network infrastructure, and reallocated some of our commodity services to employ low power computers. We also upgraded the operating systems and compilers on the computational servers to enhance usability and maintainability. We are pursuing the migration of commodity and administrative services to inexpensive low power computers to better utilize rack space, power, and cooling in the server room.

The old condor submit server and the old condor management server were retired because of their large power/cooling footprint vs effective core ratio as well as because their hardware was not 64 bit capable. We therefore added two new lab computational servers, one replacing the lab's condor submit/compute server and a second for additional computational power. We also reallocated an old computational server to upgrade the condor management server. Both new servers were dual processor, threaded 8 core (32 effective cores) with 64 GByte RAM yielding an effective lab core count of 228. Together with servers owned by individual groups having an effective core count of approximately 500 for jobs

Since Scientific Linux (SL) updates are no longer being pushed out by the upstream vendor, we upgraded the operating systems on all lab and group computational servers from SL 4.x 32bit to SL 6.x 64bit. We also updated our Portland Group Fortran and Intel Fortran compilers to better take advantage of the hardware and software 64bit capability.

In an effort to further reduce replacement cost and server power/cooling footprint, we are in the process of migrating our web services from a ~400 Watt server to a ~35 Watt small form-factor fan-less PC. The 35 Watt server has been serving several of our web bases resourced with no sign of strain. Additionally, we are testing Raspberry-PI's (~6 Watt credit card sized fan-less PC's, ~$50 each) as possible replacement computers for our Dell PowerEdge authentication server and some web services to further reduce cost and power/cooling requirements.

The Cyclotron Institute building expansion was completed this year and we gained access to the Institute's new third floor. We provisioned the new floor with networking hardware, moving the student area network rack into the new third floor's IDF room and added a new rack and two 48port gigabit switches. The new IDF room provides for networking drops for both the second and third floor offices. In addition to the added wired capacity, we added wireless capacity; installing 5 wireless access ports, one in the data acquisition area, two on the second floor and two on the third floor. These access point are administered centrally allowing us to authenticate, monitor and, if need be, block wireless clients easily. All switches and access points are protected by several UPS's to guard against power issues and maintain network integrity.

The continued maintenance, search for faster, cooler, smaller, and cheaper hardware as well as upgrading software allows us to continue to supply the Institute with the stable, fast, and secure resources it needs to execute its mission.