

Cyclotron computing

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The enhancement of computing resources at the Cyclotron Institute in the past year was concentrated on extending disk storage capabilities, network capabilities, and further development of waveform digitizer capabilities.

The appetite for data storage continues to increase with time. Experiments continue to become more sophisticated acquiring more and more parameters. In addition, there is a move toward using waveform digitizers to consolidate functionality in triggering, timing, pulse height, and/or charge integration. Some experiments also need to leverage information contained in the waveform itself. Such requirements drive this need for increased storage. To that end, we rolled out two new file servers that are currently provisioned with 4 6Tb disk drives in RAID for 12 Tb of usable space. They have the capacity of 8 more 6Tb drives for a total usable capacity of 60Tb. The extra drives will be added as necessary in order to take advantage of price decreases that occur with time.

We made an incremental network upgrade in order to keep up with the data demands by implementing new switches with 10Gb backbones. In addition, we outfitted the file servers with 10Gb cards in order to enhance the speed with which we can access the data on these servers.

Over the past few years, we have moved various administration computers not having significant requirements of CPU, memory, or disk resources to small off the shelf commodity computers that can be purchased for less than \$100. Most of the computers of this nature are Raspberry pi computers. In the past year, we have taken advantage of the low price of outfitting these computers to increase the redundancy of our authentication systems.

The migration of our email to the Texas A & M University Exchange Server is complete. The Institute mail server was turned off when the last user was migrated and the MX record was changed to point to the Exchange Server.

New experiments are showing increasing demand for waveform digitizers. We purchased two model 3316 digitizers from Struck Innovative Systems in the past year to add to the several that were purchased earlier. We have used them successfully in several experiments and the combined functionality that they provide is significant. Many software enhancements have been made to more completely leverage the significant capabilities that these modules possess. In addition, the company has made enhancements to the firmware in order to provide additional capabilities.