

## ■ Miami University Releases Cyber Tools To Share Its Spectrometer

Once you have raised the millions of dollars to fund an 850MHz NMR (nuclear magnetic resonance) spectrometer, then you build the darn thing, what do you do with it? Besides vital medical and biochemical research at your university, you pull out all stops to enable other users to share that spectrometer's remarkable capabilities.

At least that's what researchers, led by Professor Michael Kennedy, PhD, at Miami University have done with their rare instrument, the first in North America. They recently partnered with OSC (Ohio Supercomputer Center) to "cyber-enable the [NMR] by developing a cyberinfrastructure and software that leverage OSC's software development, image processing, networking, and storage resources for research and training," explains Prasad Calyam, a senior systems developer at OSC.

In other words, businesses, educators, and academics can now subscribe to a Remote Instrumentation Web portal, set up time with an administrator, and use the spectrometer remotely via KVMoIP (keyboard, video, and mouse over IP). A RICE (remote instrumentation collaboration environment) supports multiuser desktop sharing of the instrument. The portal also offers services to handle user accounts, privileges, setup for experiments and remote monitoring of those experiments.

As far as hardware and software powering the system, Calyam says, "At the NMR lab, hardware called IPSON contains the control electronics of all the physical NMR components. TopSpin is the software that controls IPSON and runs on a Red Hat Linux PC connected to the IPSON hardware. The RICE client can be used for remote observation/operation of the TopSpin computer."

Especially helpful to the end user is that results from experiments run on the spectrometer are automatically archived by a host server at OSC and can be retrieved later by researchers.

Although the spectrometer is currently used primarily by researchers, Miami University is looking to extend availability to new users. Calyam explains that they will begin locally. "MU will use the OSC-developed solutions along with instructional materials developed at the Eminent Scholar Laboratory to enable students to get hands-on learning via remote instrumentation at four Ohio institutions."