



# Louisiana EPSCoR

Volume 2  
Number 5  
May 2005

## Experimental Program to Stimulate Competitive Research

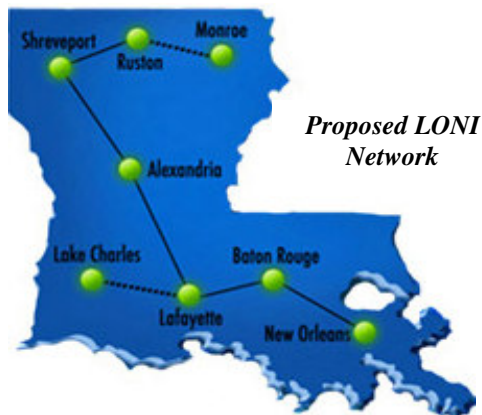
### LONI/NLR Fast Becoming a Reality

The first tangible step linking Louisiana to the National LambdaRail (NLR) and into the exclusive cadre of U.S. research universities connected to the ultra-high speed research network is scheduled to take place in July.

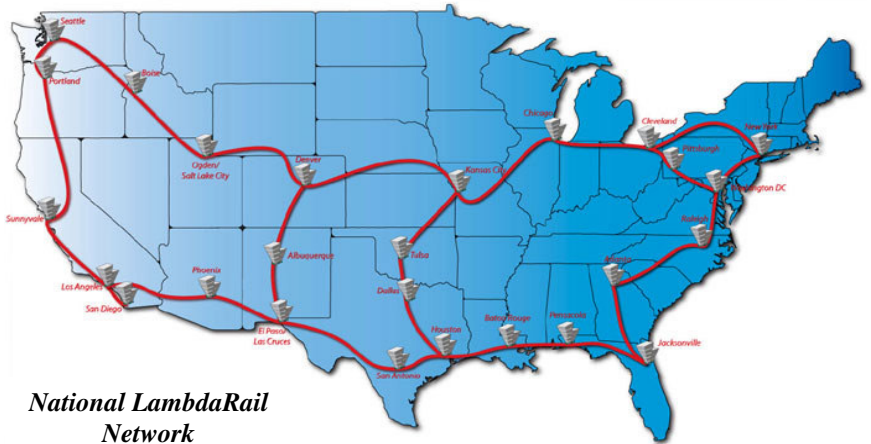
That's when the hardware node that will connect Louisiana to NLR will be installed on Third Street in downtown Baton Rouge. The goal is to have the State's eight research institutions connected to NLR by January 2006, according to Mike Abbiatti, Board of Regents' associate commissioner for information and learning technology.

The first full East-West phase of the NLR deployment – between Denver and Chicago, Atlanta and Jacksonville, and Seattle and Denver – was completed in September 2004. Louisiana is included in the second phase, which will also include universities from Texas, Oklahoma, New Mexico, Arizona, Utah and New York. The Baton Rouge NLR node is a critical link to the Gulf Coast states between Houston and Jacksonville.

The Board of Regents recently joined NLR, a consortium of research universities and technology companies deploying a nationwide networking infrastructure supporting research in science, engineering, health care, and education. The first research network of its kind, NLR is linking the universities via an all-optical network consisting of thousands of miles of fiber.



Funding of the Louisiana Optical Network Initiative (LONI) by the Board of Regents, Louisiana State University, Tulane University, and the Governor and Legislature opened the door to NLR membership. The statewide initiative will link universities at a speed thousands of times faster than currently possible, and connect Louisiana to NLR. Five IBM high speed grid computing platforms



*National LambdaRail  
Network*

connecting research universities in five cities are scheduled for installation in August-September.

At the statewide September 2004 LONI Forum, Governor Kathleen Blanco announced the State is committing \$40 million to LONI. The two-day forum was sponsored by the Office of the Governor, Board of Regents' Louisiana EPSCoR, and the LSU Center for Computation & Technology (CCT) at LSU.

"The LONI/NLR relationship will make Louisiana a national player in high-speed networking and Grid computing, which some experts consider the most important breakthrough for research since the Internet," says Abbiatti, Board of Regents LONI liaison. "It will enable 'real telepresence' and the ability to video conference at HDTV quality – a billion bits per second – between scientists in the same state or a different continent."

Noting that major innovations are frequently born from novel research by university faculty and students, Dr. Les Guice, chair of the Regents' LONI Management Council and Vice President for Research and Development at Louisiana Tech, says: "LONI and NLR will provide us wonderful opportunities to develop things that we could not even conceive before."

"It positions Louisiana to enhance its competitiveness for research and, in the process, expand economic development throughout the state. LONI has attracted the attention of major funding agencies, as well as industry."

#### Grid computing

"Grid computing is a means of sharing computer power and data storage by linking together multiple computers to think about the same problem at the same time," says Abbiatti. "You can also opt to have a subset of the computers working on the same problem; the number you employ will determine how fast the process will go. With LONI, our researchers will be able to extend their investigations at all four levels: local, regional, national and international."

*Continued on pg 2*

*Continued from pg 1*

The standard for data transfer has been 1.54 megabits per second over copper wires for quite awhile, but today's fiber optic networks transport programmable wavelengths of laser light at speeds approaching 10 gigabits per second or ten billion bits per second," says Abbiatti.

### **The importance of high-speed computing**

"The value of speed lies in the ability it gives recipients of data to make decisions much faster and with greater accuracy," says Abbiatti. "The more rapidly researchers receive data which can be represented by any type of input/output, including video, audio and strokes on a keyboard, the faster they can make decisions."

Coastal erosion is, he says, a good example. "Ocean sensors transmitting organized data to a grid network give researchers a picture of what's going on in real time. This is invaluable information on which to base decisions."

Another example is hurricane forecasting. Combining visualization of current data with that collected in years past, Louisiana researchers can task LONI's high speed grid computing platforms to create simulations resulting in more accurate predictions.

That same simulation method can be used to make medical diagnoses, for surgical training, the creation of new drugs, and to train doctors. A medical resident in a rural healthcare setting needing information on tropical diseases can, for example, interact with a "virtual patient" – ask questions and receive answers...order tests and receive results...interview nurses and other doctors... and issue the treatment. Through leveraging the multiple capabilities of the LONI infrastructure, Louisiana can experience true telemedicine, telehealth, and resources for both the provider community and patient community that were heretofore unavailable.

### **LONI vs. routed/commercial Internet networks**

"You can't compare the Internet with LONI. LONI is not designed to compete with commercial providers," says Abbiatti. "It is a high speed data transport system for large, complex research applications that routinely start and stop. LONI is a point-to-point network, not a routed network like the commodity Internet."

### **Research Applications Showcased at Regional LONI Symposium**

Some 140 university researchers, internationally-respected network computing experts and representatives of technology-oriented corporations attended the first LONI Symposium, held May 4-5, at Louisiana Tech's Institute for Micromanufacturing.

The first of several symposia planned for campuses across the state, it showcased a wide variety of exciting research applications that LONI will both facilitate and make possible at Louisiana research universities. These included presentations, demonstrations and displays on bioinformatics, biocomputing, computer modeling and simulation, interactive visualization and applications in creative arts and technologies such as video games and digital animation.

"It's a network of networks in which several projects can be going on at once and two-way collaborations allowing researchers to interact with one another are possible on a global scale. These collaborations can take place using voice, video, and advanced visualization technologies."

Emphasizing the importance and potential impact of LONI and NLR on Louisiana, Abbiatti says: "We, all of us, from the Governor on down – are actually in the process of changing the way we view ourselves, and the State. We are reassessing how Louisiana will do business as researchers ply their trades and students learn. LONI's tremendous economic development and research possibilities are the basis of its funding. The entire state is working toward that goal."

He adds that NLR members at other states are primarily flagship institutions. In Louisiana, on the other hand, the plan is to initially connect its public and private research universities, and eventually provide all of its postsecondary institutions with access to LONI as appropriate to the mission of the institution and fiscal realities.

"The real key is to be sure that LONI maintains its focus as a tool to empower our talented research community to step forward and lead the way into the global economy," adds Abbiatti. "LONI clearly states that, in the highly competitive research arena, Louisiana is open for business."



Louisiana EPSCoR  
P.O. Box 3677  
Baton Rouge, LA 70821-3677