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Cyberinfrastructure--Essential to Louisiana's Research, Education, and Economic Development Activities

"LSU and Louisiana's entire higher education system have adopted and are steadily implementing a strategic vision for cyberinfrastructure, assigning it a central role in research, education, and economic development," said Joel Tohline, director of the LSU Center for Computation & Technology (CCT) and professor of LSU Physics & Astronomy.

A great opportunity to facilitate implementation of this vision is the $499,758 grant the National Science Foundation recently awarded LSU for CADIS, or more accurately put, a CC-NIE Network Infrastructure -- Cyberinfrastructure Advancing Data-Interactive Sciences (CADIS) project.

"CADIS will greatly expand the cyberinfrastructure for the state of Louisiana," said Tohline. "It will build upon LSU's recent purchase of a new 440-node GPU-enabled High Performance Computing (HPC) cluster and the state's construction of a 94,000 square foot building, the Louisiana Digital Media Center (LDMC), which by January 2013 will house both CCT and EA Sports. The creation of CADIS seeks to integrate tightly the LDMC with the Louisiana Optical Network Initiative (LONI), with LSU's new HPC cluster, SuperMike-II, and with Internet2 (I2)."

The goal of the project is to acquire and install an aggregation router, such as Cisco's ASR 9010, with an appropriate set of cards and adapters in order to do several things. First, to extend the current data transport capabilities of LONI and I2 to researcher desktops and to the LDMC's 4K theatre via dedicated 10 Gbps network connections. Second, to build a 40 Gbps data-transport pipe between LSU's new GPU enabled SuperMike-II cluster and the LDMC's primary visualization laboratory. Finally, to provide straightforward paths for upgrading laboratories and offices to higher bandwidth connectivity as the capabilities of LONI and I2 expand.

The LDMC will gather the University's primary base of HPC users under one roof where, via the activities of the CCT, a unified focus on interactive digital media and HPC is provided. Students, postdocs, research scientists, and faculty from diverse disciplinary backgrounds who seek to harness HPC resources to simulate and/or analyze complex phenomena will effectively collaborate with other researchers who have expertise in scientific computing, the development of HPC algorithms, visualization and image processing, and the manipulation and analysis of large datasets.

"CADIS will create many opportunities for LSU's diverse research community to more effectively interact with huge data sets that are generated on local (LSU), regional (LONI), and national (XSEDE) HPC resources, angling new scientific and engineering discoveries. And, through CCT's collaborative interactions with Louisiana's rapidly growing collection of digital media industries, the CADIS project is expected to positively impact key economic development activities across Louisiana," said Tohline.

The project team includes Honggao Liu, deputy director of CCT and site lead for LONI; James A. Lupo, assistant director of computational enablement at CCT; Lonnie Leger, director of networking at LONI; Brygg Ullmer, associate professor of computer science and CCT; Ric Simmons, deputy CIO and executive director of network infrastructure at LSU; and Sean G. Robbins, director of network engineering, LSU Information Technology Services.

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