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LONI Supercomputer Set to Transform UNO Research Capacity

Pluto may no longer be a planet, but *Neptune* is alive and well, and it's poised to help transport the University of New Orleans - and Louisiana - into a new world of supercomputing and research capability. Neptune is UNO's new IBM P5-575 supercomputer, which will facilitate UNO's participation in the Louisiana Optical Network Initiative (commonly known as LONI), the state's fiber optics network interconnecting mainframe computers at Louisiana's major research universities, making possible computation speeds more than 1000 times faster than previously possible.

Not insignificantly, Neptune was delivered to UNO on August 29, the anniversary of Hurricane Katrina.

"We named our P5 *Neptune* in reference to the ancient Roman god of the sea," said Jim Burgard, UNO Assistant Vice Chancellor for University Computing and Communication. "With the devastation of Katrina in mind, the name is a sort of symbolic plea to spare New Orleans from future floods."

Burgard said that the most immediate benefit of LONI and Neptune is that it gives UNO the opportunity to upgrade its computer facilities as the university continues its long-term recovery from Katrina. Neptune is housed in UNO's Computer Center, which was spared flooding after the storm but experienced significant moisture damage because the air conditioning system, critical to the protection and operation of computing equipment, was off for an extended period before electrical power was restored to the campus. As a hedge against a repeat of that scenario, UNO has invested in a new natural gas generator to power the air conditioning system during future outages.

Of course, Neptune, in tandem with the LONI network and Louisiana's membership in the National LambdaRail, a nationwide supercomputing network (see below), will have a powerful impact on a variety of key research efforts at UNO. Among those projects, according to UNO Associate Vice Chancellor Scott Whittenburg, is the Ponchartrain Institute of Environmental Science (PIES), which concerns itself with modeling wetlands and coastal erosion.

"LONI's bandwidth greatly facilitates the transmission of large-scale satellite coastal images," said Whittenburg. "It allows researchers to interact on a near real-time basis."

Other important UNO research projects that stand to benefit from this exponential increase in computing power are the UNO Advanced Materials Research Institute, devoted to the exploration of nano-materials and nano-science, including modeling the magnetic behavior of nano-materials. The combined power of Neptune and LONI will allow more realistic simulation.

Several projects set to benefit from Neptune/LONI have very real economic development potential for Louisiana. One such effort is being pursued by UNO's Naval Marine Architecture Engineering Group, which has developed a design partnership with Avondale Shipyards in New Orleans that will be substantially enhanced by the new computation capacity.

Jim Burgard pointed out that Neptune is UNO's first true high-performance, grid-based supercomputer and as such will offer the campus and the New Orleans area a broad range of advantages.

"Obviously, the increased bandwidth and communication speed of the LONI network are a boon to faculty, staff and students," Burgard said, "but there are also significant implications for disaster recovery and preparedness. There is tremendous potential for using the bandwidth for transmission and offsite storage of mission-critical data. In fact, we already have hardware located at LSU in Baton Rouge and LSU Health Sciences Center in Shreveport to store data." Whittenburg added that the ability to recruit and retain faculty should also benefit significantly, noting that UNO lost some research faculty as a result of Katrina.

"This kind of computing capacity is a great incentive for attracting faculty to campus and keeping them here," Whittenburg said.

Governor Kathleen Babineaux Blanco has pledged $40 million over ten years for the LONI initiative. As an immediate benefit of LONI, the Louisiana Board of Regents has become a member of the National LambdaRail (NLR), a nationwide grid-computing infrastructure that is expected to have the same effect on our nation's technological development as the interstate highway system has had on interstate commerce. LONI and NLR have far-reaching implications for Louisiana's research competitiveness and long-term economic development potential. In fact, many Louisiana universities are already engaged in potentially-valuable research that will be exponentially enhanced by LONI and NLR. LONI will access the national grid by means of a node located in Baton Rouge, eventually connecting colleges and universities in every region of the state.

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