



## News

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## LSU's Newest Supercomputer – SuperMike-II

LSU is pleased to continue its decades-long leadership role in high performance computing with the addition of SuperMike-II (to be read, SuperMike the second) to its stable of supercomputing systems. This system introduces two novel capabilities for University researchers: graphical processing unit (GPU) accelerators and large-memory symmetric multiprocessing (SMP). The system's theoretical peak performance capability is in excess of 212 TeraFlops (or 212 thousand-billion floating point operations per second).

SuperMike-II represents the third generation of supercomputers deployed at LSU. It provides 10 times the processing power of Tezpur, the second generation machine installed in 2007, and over 100 times that of LSU's original SuperMike machine that was brought on-line in 2002. SuperMike-II provides enhanced support to the current science and engineering user-base for research ranging from numerical relativity to coastal modeling to molecular dynamics and protein folding. The SMP component will allow new work to be done in the area of graph theory, genome sequencing, and quantum mechanics. The GPU accelerators will be utilized for the design of new materials and new medicines using novel computational methods, and will be used to advance LSU's commitment to digital media research and production facilities.

Built by Dell, Inc., the \$2.6 million SuperMike-II features a total of 440 compute nodes (servers), each of which has 2 Intel Sandy Bridge 8-core processors running at 2.6GHz. Thus the system provides a grand total of 7040 computational cores. The nodes are interconnected by a 40Gbps Mellanox InfiniBand network. While most of the nodes (382) have 32GB of memory, 8 are equipped with 256GB each and joined via ScaleMP software to give a single SMP machine with 128 processing cores and 2TB of memory. Fifty nodes are each equipped with 64GB of memory, and two NVIDIA Tesla M2090 GPUs.

SuperMike-II's services are provided to LSU scientists and engineers who are tackling the most complex problems and require the use of 1,000 or more computational cores at once. By providing large numbers of GPU accelerators, and a symmetric multiprocessor subsystem, entirely new classes of problems can be approached that were totally infeasible before. With the processing power of SuperMike-II, CCT will also encourage new economic development activities by supporting Louisiana's burgeoning digital media production services.

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