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LSU Deploys New IBM Supercomputer "Delta" to Advance Big Data Research in Louisiana

BATON ROUGE – LSU has collaborated with IBM to deploy a powerful supercomputer to advance big data research in Louisiana. The new computer has been named Delta, referencing both the Mississippi delta region and the use of the term in the sciences to mean "change." Delta's unique design brings a new way of conducting computational research to LSU. The supercomputer will be housed at the LSU Center for Computation & Technology, or CCT.

The Delta supercomputer is based on the IBM POWER8 platform that provides scalable High Performance Computing, or HPC, capabilities necessary to accommodate a broad spectrum of data-enabled research activities. LSU joins leading supercomputing agencies globally – the Department of Energy's Oak Ridge and Lawrence Livermore National Labs and the U.K. government's Science and Technology Facilities Council's Hartree Centre – that have recently selected IBM's POWER8 platform for cutting edge HPC research.

The IBM POWER8 processor architecture – open to development and supported by more than 150 members of the OpenPOWER Foundation, including LSU – features a groundbreaking new approach to computing that uses a Coherent Accelerator Processor Interface, or CAPI, to help create powerful solutions that are highly customizable. Louisiana researchers plan to utilize CAPI and tap into other innovations contributed by fellow members of the OpenPOWER Foundation to develop and implement unique algorithms to address specific data-driven challenges across a variety of science and engineering fields.

"The need for large-scale analytics in the scientific community has exploded," said Ravi Arimilli, IBM Fellow and Chief Architect for Analytics and Big Data Platforms. "The POWER8 platform was designed to meet changing research needs across different domains of science."

Arimilli is an LSU graduate and in 2008 was inducted into the LSU Alumni Hall of Distinction. He has been instrumental in forging a strong partnership between LSU and IBM. The deployment of the Delta supercomputer is part of a series of ongoing collaborations to facilitate big data research in the state.

"Funding agencies are investing in interdisciplinary research to address the grand challenges facing society," according to K.T. Valsaraj, LSU vice president for research and economic development. "Scientific discovery at this scale frequently requires the analysis of large volumes of data. The LSU Office of Research & Economic Development is spearheading initiatives to provide the needed resources for data-rich, interdisciplinary research at LSU and throughout Louisiana. The Delta supercomputer is an important step in that direction."

Delta will initially be utilized to expand biomedical research capabilities in the life sciences. Delta will be equipped with the IBM Reference Architecture for Genomics, increasing scale and speed for genomics computing and enabling the development of new tools for sequencing and analysis.

"LSU is a leader in biomedical research, which is an important economic driver for the state. Computational biology and bioinformatics have become linchpins for progress in biomedical and biotechnology research. Delta will enable quantitative analysis and interpretation of large biological genomics data generated at LSU," said Gus Kousoulas, associate vice president for research and economic development.

In addition to bioinformatics and computational biology, computer scientists with IBM and CCT are working with LSU researchers in the coastal sciences. Delta will enable the integration of vast quantities of heterogeneous environmental data and the development of tools and computational models essential to improving the sustainability and resilience of sensitive coastal environments.

According to CCT Director Ram Ramanujam, "CCT is making targeted investments in data analytics to enable a variety of research endeavors LSU-wide. We expect significant growth in new areas of research including bioinformatics and cyber security."

The Delta supercomputer has been designed to continue expanding the platform's capabilities and to meet the changing needs of the science community. Due to the scale of the project, the implementation and customization of the supercomputer will be managed with the assistance of CMA Technologies of Baton Rouge.

"The new research capabilities offered by the IBM Delta supercomputer represent a tremendous opportunity for LSU researchers," said LSU President F. King Alexander. "We look forward to continuing our collaboration, which benefits not only our university and IBM, but the entire state of Louisiana."

Publish Date:
11-09-2015

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