

# NTU unveils green and fastest supercomputer in ASEAN in collaboration with leading IT giants

22-Jul-2009

Singapore's main science and technology university, Nanyang Technological University (NTU), receives a significant boost in its research efforts with the installation of a green supercomputer at its new High Performance Computing (HPC) Centre on campus. This achievement is in partnership with Jardine OneSolution (2001) Pte Ltd, IBM (NYSE: IBM) - maker of nearly half of the world's 500 fastest computers, Intel, the world leader in silicon innovation, and Red Hat, the world's leading open source solutions provider.

NTU's HPC Centre, expected to be operational in October 2009, will be based on the first IBM System x iDataplex cluster in the Association of Southsast Asian Nations (ASEAN) and the largest in Asia-Pacific. It is powered by the new Intel® Xeon® processor 5500 series that automatically adjusts to specified energy usage levels and speed data centre transactions, thus reducing electricity consumption. With its measured computing power (Rmax) of over 28 teraflops (trillion mathematical calculations per second), NTU's HPC system will be the fastest in ASEAN. This HPC Centre's supercomputer is currently placed at No. 267 of the world's most powerful supercomputers, according to the latest TOP500 List. It is also the 24th most energy efficient system on the Green500 list with 266.68 Mflops (millions of floating point operations per second) per watt.

Today, advancement in research in a wide range of scientific fields is increasingly dependent on the generation and analysis of massive data sets and innovations in high performance computing, networking, storage and analytical capabilities. This initiative thus closes a gap in high performance computational capacity in the University, readying it to meet computational complexities encountered in a myriad of multidisciplinary research problems and to create new synergies and strengths in discoveries.

With this HPC system, the impact will be extensive across disciplines, from developing future energy sources, studying global climate change, designing new materials, to understanding biological systems and physics of complex socio-economic systems, among others. More can also be achieved in research such as in the modelling of volcanic activities, to understanding the earth's tectonic movements, research in the study of water treatment process, as well as the simulation of flight dynamics.

"With growing HPC adoption worldwide, we are excited that the new facility will put NTU at the forefront of high performance computing. By offering it as a central computing resource to the 2,800 faculty and researchers in the University, we cater to the varied computing needs demanded by the academic disciplines in the Institution and facilitate advancement of our many strategic research initiatives," said Professor Bertil Andersson, Provost, NTU.

"IBM is actively engaged with universities throughout the world, working to put the latest technology into the hands of leading researchers. We are delighted to partner with NTU on such a bold and technologically advanced HPC System," said Teresa Lim, Managing Director, IBM Singapore. "Designed to meet varying demands across a number of academic disciplines, the IBM system will enable NTU's faculty and researchers to work on larger, more complex problems and help find the answers to some of life's most perplexing problems."

"The enterprise-class Intel® Xeon® processor 5500 series can play a key role in scientific discoveries by researchers who use supercomputers as their foundation for research, all whilst delivering great energy efficiency for reduced electricity costs," said Patrick Liew, Singapore Country Manager, Intel Technology Asia. "This HPC cluster by NTU will create opportunities to solve the world's most complex challenges and push the limits of science and technology."

The IBM System x iDataplex cluster solution uses Quad Data Rate (QDR) InfiniBand as the Node Interconnect as well as the IBM System Storage DCS9900 Storage System. The Voltaire Infiniband QDR interconnect Director-class switches in the HPC system configuration makes NTU the first in Asia to utilise a leading-edge technology that couples input ports and output ports to realise significantly improved performance. In addition, the IBM System Storage DCS9900, a high performance storage system designed

for the storage needs of highly scalable, data streaming applications, is arguably one of the fastest and densest storage solutions available today. IBM's full suite of HPC software will also be used to manage the full cluster, including IBM's General Parallel File System (GPFS), a workhorse file system that powers many of the world's largest supercomputer sites.

Performance in the NTU's HPC system is further boosted by the Intel Xeon processor 5500 series which offers energy-efficiency features and more than three times the memory bandwidth than the dual-socket architecture. This translates to significant and immediate gains in application performance by up to three times without the need for further investment in software development or increased power and cooling support for the data centre.

The NTU HPC system will run on the industry's leading enterprise open source operating environment, Red Hat Enterprise Linux (RHEL).

"Today, most of the world's HPC centres already run on RHEL and has proven to offer true mission-critical stability, operational flexibility, world-class performance, security, and stability," said Patrick Lim, ASEAN General Manager, Red Hat Asia Pacific. "Based on Top 500 supercomputer sites, Linux commands an almost ninety percent share for operating systems for High Performance Computing."

Besides performance, with power and cooling the number one issue facing many HPC sites, the system at NTU will be one of the greenest HPC systems in the region. NTU's HPC system maximises performance with a unique water-cooled technology - IBM's Rear Door Heat eXchanger for the iDataplex Rack. This liquid-cooled panel on the back of the unit will eliminate the need for computer-room air conditioners, allowing for room-temperature operation. The IBM Rear Door Heat eXchanger for iDataplex will also allow NTU to have a high-density data centre environment that will not increase cooling demands – and may actually lower them.

\*\*\*END\*\*\*

Media contact:

Hisham Hambari, Assistant Director, Corporate Communications Office  
Tel: 6790 6447; Mobile: 9616 4844; Email: [mhisham@ntu.edu.sg](mailto:mhisham@ntu.edu.sg)

Javan Ng  
Brand and Communications Manager,  
IBM Singapore Pte Ltd  
Tel: 6418 1525; Mobile: 8138 2676; Email: [ngkhj@sg.ibm.com](mailto:ngkhj@sg.ibm.com)

**About Nanyang Technological University**