Supercharging Raijin, Australia's fastest supercomputer

NCI, Australia's national research computing facility, looks to IBM Power Systems to deliver higher performance and efficiencies for researchers

Canberra - 26 Oct 2017: National Computational Infrastructure (NCI) has seamlessly integrated IBM's (NYSE: IBM) latest Power Systems with Raijin's existing x86 architecture, offering more choice to Australian researchers. The news means NCI for the first time will introduce an open architecture solution and IBM Power Systems for HPC technology into its data centre, providing increased flexibility, optimisation, efficiency and a bespoke solution that directly supports the needs of Australian researchers.

"To be the first ever Australian organisation to join the OpenPOWER Foundation provides recognition of NCI's standing, and represents a step toward a more heterogeneous architecture," said Allan Williams, Associate Director (Services and Technologies), NCI.

"IBM's Power Systems scale scientific simulation and modeling to new heights in NCI's Raijin supercomputer," said Dave Turek, Vice President of Exascale Systems at IBM. "The extraordinary bandwidth in Power Systems provides a significant performance advantage, and we look forward to scientists exploiting those capabilities now and into the future."

NCI staff have been working closely with Australia's scientific community to qualify a range of memory-intensive applications for use under IBM's architecture. With further input from NCI's optimisation team, these applications have produced impressive performance benchmarks using Power Systems.

For example, NCI is the first institution to port Q-Chem, a quantum chemistry package, over to Power Systems. Initial benchmarks of this optimisation have outpaced the same application running under Broadwell x86 architecture, opening new and immediate possibilities for computational chemists.

Additionally, NCI's optimisation of NAMD molecular dynamics code on Power Systems saw performance gains when compared to existing Broadwell x86 architecture. Initial benchmark results of MILC in Power Systems also saw modest to significant improvements over existing x86 systems.

Based on the benchmarks from the research testbed, it is anticipated that a wide range of scientific disciplines could eventually benefit from optimised performance under POWER architecture, including (but not limited to) the fields of physics, biology and chemistry.

This new software exists alongside over 3,000 other applications that have already been optimised by NCI's HPC optimisation team for the existing x86 and GPU systems that power Raijin. NCI will continue a process of Power Systems qualification and optimisation for other scientific applications to meet researcher demand.

NCI is the first institution to merge both POWER and x86 architectures into the same scheduling system, offering unparalleled diversity, accessibility and freedom of choice for researchers accessing HPC through NCI. The IBM Power Systems are accessible through the existing PBSPro scheduler, and have been integrated into NCI's LDAP and accounting systems.

Furthermore, the Power Systems will benefit from Mellanox EDR and FDR interconnect at speeds of up to 100Gbps, granting access to over 40PB of fast Lustre storage that is already available across other Raijin platforms.

NCI’s commitment to investing in the latest computing resources continues with the integration of IBM’s Power Systems into the Raijin cluster. This integration builds on NCI’s consolidated approach to advanced computing, combining high-performance CPU and GPU clusters with the fastest filesystems in the southern hemisphere – a heterogenous environment that will best serve the research community’s needs.

For more information about NCI: http://nci.org.au/about-nci

For more information about IBM Power Systems: http://www-03.ibm.com/systems/au/power/

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