



Intel® Omni-Path Architecture Prepares Northumbria University for the Future

Achieving academic excellence is at the heart of what makes Northumbria University tick. Renowned for their business focused and professional approach, they are today recognised as one of the UK's Top 50 Universities in The Guardian League Tables 2017. The institution is one of the top ten in the UK for graduates in post-study professional employment and sits within the Top 20 UK Universities recognised for quality student experience.

Technology is at the core of enabling the university to service the needs of the research rich institution which is home to 34,000 students and growing. Having a reputation for being at the pinnacle of further education, Northumbria have invested heavily into various schemes designed to enrich the lives of their students which resulted in an increase in numbers across all departments. Northumbria offer short courses and specialist training and has seen international success for bespoke training courses, leading to continued professional development; the deployment of specialist devices simulating a range of health conditions in adult, child and infant mannequins being one of these. Working with the Thai Ministry of Public Health, they can be programmed to have health issues from heart failure to an asthma attack, helping students practice and perform core skills and emergency procedures before working with real-life patients.

FUTURE INITIATIVES WITH PAST TECHNOLOGY

Based on their innovations, Northumbria have formulated the long-term objective of creating a state of the art, multipurpose compute facility. This necessitated employment of new technology to overcome the increased demand which was causing a compromise in performance, speed and quality. In order to continue and replicate the success of the project with the Thai Ministry of Public Health, it was imperative for the University's IT depart-

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ment to ensure super-fast, high-quality data connections in order to achieve a seamless user experience when processing high-resolution images or graphically-rich live feeds, as well as handling multiple users on a cluster with low latency or failure. The goal for Northumbria was to achieve the all this without breaking the bank.

A SERIES OF TESTS

Northumbria enlisted the help of BIOS-IT, a global IT consultancy and solution provider located in the City of London. BIOS-IT were tasked with architecting a solution to address the performance, usability and cost concerns faced by the university. The team performed a series of extensive benchmarking tests of frequently used HPC applications and executed performance/cost analysis across a number of optimised solutions. The conclusion of these exhaustive evaluations was that the industry leading Intel® Omni-Path Architecture (Intel® OPA) technology on Supermicro® 2U Twin architecture was the most fitting solution, due to the intense performance gains and advantages over competing products.

THE FORMIDABLE COMBINATION OF INTEL AND SUPERMICRO

BIOS-IT worked with Northumbria University to deploy Intel OPA on top quality, optimised Supermicro hardware. The team, now consisting of Supermicro, Intel, BIOS-IT and Northumbria, deployed Supermicro's unique 2U Twin architecture, which provides extreme density, incorporates industry leading components and has the advantage of extreme power and cost efficiency leveraging Supermicro's patented technology.

Deploying Intel technology with Supermicro hardware delivers a solution built to withstand high pressure HPC environments. The combination of Intel and Supermicro enables clustered multi-user capacity with the servers providing in excess of 1Tflops/s performance per node, as measured with the industry standard Linpack benchmark. The system caters effortlessly to the heavy demands of intense HPC applications and has the ability to scale to thousands of nodes as required thus preparing Northumbria for future workloads.

THE PROOF IS IN THE POWER

Immediate improvements have been noticeable across a multitude of departments for staff and students alike. Dr Leanne Wake, from the university's Geography department has explained the benefits for her students:

“The installation of the HPC cluster at Northumbria will enable researchers in the Geography department to efficiently perform multiple high-resolution simulations of Earth systems, thus allowing us to explore more deeply the interactions between the cryosphere and climate over a range of temporal and spatial scales.”

Not only has the installation proved a success for growing workload capabilities, but in the education of the students too. Dr Wake adds: “Additionally, the multi-user capacity of the cluster allows a unique opportunity for undergraduates on the Geography course to add a more computational dimension to their degree.”

Working with BIOS-IT, Intel and Supermicro has given Northumbria University the ability to manage current and future workloads faultlessly. This presents benefits to the entire ecosystem at the university, and will enable them to maintain their position as one of the UK's top universities for education and research.

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Dr Leanne Wake,
Geography Department,
Northumbria University