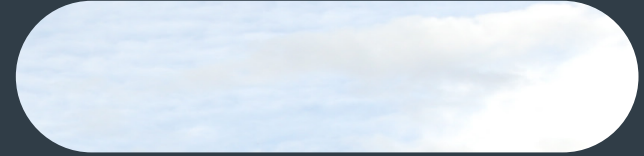
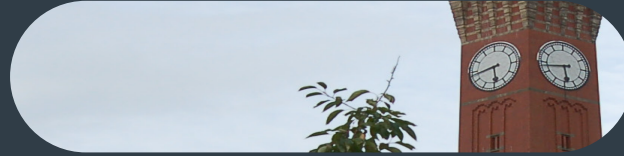




UNIVERSITY OF  
BIRMINGHAM



# University of Birmingham

## Furthering scientific research into some of mankind's greatest challenges

To better understand the world around us, scientists need to turn huge swathes of data into meaningful information. With a powerful, new supercomputer from Lenovo, researchers at the University of Birmingham can increase the scale and scope of their work – and get results back faster.

Lenovo™





For scientists working to solve some of the biggest challenges of our time – from climate change to antibiotic resistance to energy security – access to high-performance computing resources is crucial to research.

At the University of Birmingham, one of the UK's leading research universities, students and staff from every faculty have access to the Birmingham Environment for Academic Research (BEAR). BEAR, a collection of IT resources, is available to the entire university community to support research across all disciplines, as well as to qualified external scientists.

The University of Birmingham recently upgraded its data center with a powerful new supercomputer from Lenovo.

Known as BlueBEAR, the cluster is made up of Lenovo NeXtScale nx360 M5 compute nodes and equipped with high-performance Intel® Xeon® E5 processors.

Available as part of the BEAR service, researchers from across the university are using the BlueBEAR supercomputer to crunch data in record time. One example of a current research project is in genome sequencing.

Professor Nick Loman, Professor of Microbial Genomics and Bioinformatics at the University of Birmingham, elaborates: “Genome sequencing can generate rapid insights into the scale and patterns-of-spread of important epidemics. When Zika struck the Americas, we were able to respond rapidly by deploying portable sequencing to affected areas, generating sequence data in days.



“Comparative genome sequence analysis requires significant computation and storage requirements. The new system provides rapid, on-demand computation to speed up the analysis. We can instantly access hundreds of CPUs, thousands of gigabytes of RAM and tens of terabytes of storage. This means we can keep pace with the rapid data generation, and quickly release important new findings to the scientific and public health community in order to assist epidemic response efforts.”

Meanwhile, a team of physicists, engineers and oncologists are working to advance proton therapy treatment for cancer patients. Proton therapy targets tumors using an extremely precise proton beam, which causes less damage to surrounding tissue than conventional radiotherapy.

And dozens of other research teams are taking advantage of BlueBEAR's enormous compute power to further their own projects in energy sustainability, economics, dentistry, linguistics, mechanical engineering... to name just a few!

BlueBEAR delivers fast, efficient processing capacity for researchers, accelerating time-to-results, while also minimizing energy consumption.

Since upgrading to Lenovo NeXtScale with Water Cool Technology, the university has improved cooling energy usage by as much as 83%. With direct, on-chip warm water cooling technology, the system takes water into the rear of the servers at 45°C. After circulating the CPUs, in-line dual memory modules, I/O and other components, the water leaves the system up to 10°C higher – drawing heat from the cluster.



Simon Thompson, Research Computing Infrastructure Architect at the University of Birmingham, says: “Operational cooling costs are significantly lower, compared to requiring chilled water systems such as rear door heat exchanger.”

He adds: “The fact that we can add compute nodes to the cluster in a modular manner is another fantastic feature of the Lenovo NeXtScale solution. This means that we can boost capacity and performance to meet demand from researchers.”

The university is also using Lenovo Distributed Storage Solution for IBM Spectrum Scale to seamlessly increase the storage capacity of its long-term data repository as research data volumes continue to grow.

Today, with access to world-class high-performance computing resources via BEAR and BlueBEAR, researchers at the University of Birmingham have the tools they need to delve deeper into their data – and find answers to mankind’s biggest challenges.

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– Simon Thompson, Research Computing Infrastructure Architect, University of Birmingham



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