



High End Computing (HEC)

HEC is a centrally run service to support the computational research needs of researchers and research students at Lancaster University.



HEC supports computational workloads needing:

- Large numbers of cores
- High amounts of memory
- Specialist research software



HEC is available to all researchers and research students at Lancaster:

- Free at point of use
- A broad range of users from different departments
- Heaviest users - Physics and Environmental Science



HEC is centrally funded:

- Heavy users are encouraged to contribute to expansion and upkeep

More about HEC and user guide at:

www.lancaster.ac.uk/iss/hec

Information
Systems Services

Lancaster
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HEC details

400 Compute Nodes

- 5,500 cores total
- 40TB aggregate memory

Uses Intel Nehalem Ivy Bridge and Haswell CPUs

- Best-in-class price/performance/watt

Network connectivity via ethernet

- 2 x 1Gb per compute node (older nodes)
- 1 x 10Gb per compute node (newer nodes)



Cluster software

Cluster management uses Open Source solutions

- Operating System is Scientific Linux
- Son of Grid Engine (SGE) used for job scheduling
- Cobbler used node imaging/provisioning

Choice of compilers: Intel, Portland Group, Gnu

- Support for parallel codes (OpenMP and Message Passing Interface)

High performance libraries

- Intel Math Kernel Library, GNU Scientific Library, Linear Programming

Popular numerical analysis packages

- R
- Matlab
- Stata etc.



Local research using HEC

Bioinformatics

School of Health & Medicine

Financial Market Modelling

Accounting and Finance

Quantum Transport of Carbon Nanotube

Physics

Pollution Modelling

Geography

Labour Market Analysis

e-Science

Flood Prediction

Hydrology

Functionality of Quantum Computing Devices

Physics

EEG Data Analysis

Psychology

ATLAS (CERN)

Physics

Micro-Macro Interlock Simulation

Management Science

Neural network forecast modelling for the UK economy

Economics

Animal Epidemic Modelling

Maths and Stats