Energy-efficient supercomputer helps heat building

The Fraunhofer Institute for Industrial Mathematics ITWM in Kaiserslautern has a built a fast and energy-efficient supercomputer. Herkules uses solar power and an innovative heat recovery to process data at a rate of 100 million Flops/W.

This places it at number 48 on the Green500 – a reordering of the Top500 supercomputer centres based on energy efficiency. However, it's a close-run contest, with IBM's BlueGene computer taking top ranking with an efficiency of 112 million Flops/W.

Herkules achieved its placing through a combination of well-chosen components and an innovative design. Instead of an energy-consuming air-conditioning system, the computer uses a smart ventilation system with integrated heat recovery. This makes use of an absorption refrigerator to cool the CPUs, and also uses the excess heat to warm the building in cool weather.

The components include power-saving dual core processors and efficient power supplies. 'We deliberately chose not to use the very fastest CPUs for our computer, but those that yield the best performance per watt,' says Dr Franz-Josef Pfeundt, the head of IT at the institute.

Microsoft joins forces with Spanish supercomputing centre

The Barcelona Supercomputing Centre (BSC) and Microsoft have created the BSC-Microsoft Research Centre, which will focus on the future design of microprocessors and software for the mobile and desktop markets over the next 10 years or so.

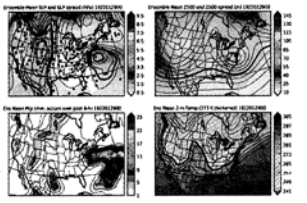
Computer architecture experts at BSC have teamed up with computer scientists at Microsoft Research Cambridge (MSRC) in the UK to look for innovative solutions to the challenges and opportunities that massively parallel processing represents.

The vision of the centre is of a top-down computer architecture in which software requirements drive the hardware innovation forward rather than letting the hardware design condition software development. In addition to fundamental and applied research in transactional memory, a promising technology that facilitates writing of parallel programs for multi-core processors, hardware support for managed runtimes will be conducted in the initial research projects.

Mateo Valero, director of BSC, said: 'Two years after the initial agreement, we are reaffirming our research commitment by establishing a research centre in Barcelona, building upon the successful collaboration of a group of researchers from the Computer Architecture team in BSC and Microsoft Research. To optimise the designs and interactions of multi-core processors and software, we need to start from parallel programming. The way to deal with this multi-core architecture challenge is to bring together computer architects and programming language experts.'

Tony Hey, corporate vice president of External Research in Microsoft Research, said: 'We are pleased to partner with the Barcelona Supercomputing Centre to create this new research centre.'

Eco-research to rack up 10.4 million hours of supercomputing time



The US Department of Energy has allocated about 10.4 million CPU hours on supercomputers at the National Energy Research Scientific Computing Center (NERSC) at Lawrence Berkeley National Laboratory as part of a programme to accelerate scientific discoveries in multiple disciplines including climate, physics, combustion and material science.

The one-year allocations will go to 11 projects by researchers in universities, national labs and industry. Last year, the DOE allotted nine million CPU hours at NERSC. The awards are part of the Innovative and Novel Computational Impact on Theory and Experiment (INCITE) programme, launched in 2003.

INCITE, supported by the DOE Office of Science, selects projects requiring intensive use of supercomputers and also promising a significant advance in science and engineering.

HPC simulation predicts hundreds of roving black holes

The latest supercomputer simulations have revealed that the Milky Way could be populated with many more 'rogue' black holes than had previously been expected. These black holes could be travelling across the galaxy at very high speeds, absorbing anything that crosses their path.

While scientists have observed supermassive black holes at the centre of galaxies and small black holes formed at the end of a star's life, there is little observational evidence for medium-weight black holes somewhere between the two extremes. It was previously assumed that these 'intermediate mass' black holes are hiding in large clusters of stars. However, new models performed at the universities of Vanderbilt, Pennsylvania and Michigan in America, have shown that if these black holes collide and merge with other objects they receive a 'kick' that pushes them out of the cluster at speeds of up to 4,000km/s.

'This is much higher than predicted. Even the average kick velocity of 200km/s is extremely high when compared to the escape velocities of typical astronomical objects,' says Kelly Holley-Bockelmann, an astronomer at Vanderbilt University.

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● Cluster Resources has appointed Ian Gilbert to the position of director of Business Development in EMEA. In this role, Gilbert will be responsible for expanding and directing Cluster Resources' presence in the Europe, Middle East and Africa markets.