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UK Scientific Research Gets a Turbo-Charge

At a Glance

- University of Westminster upgrades to new 96-node High Performance Computer Cluster (HPCC)
- New HPCC enables the University to offer greater compute power to private sector companies, students and neighbouring faculties looking to advance their research, technical developments, and operations
- New HPCC also provides a significant threefold increase in the School's contribution to the UK's National Grid Service enabling researchers from around the UK to complete research and evaluation projects more quickly

Background

Formed in 1838 as Britain's first polytechnic, and based in Central and North-West London, The University of Westminster teaches more than 22,000 UK and International students undertaking degrees, Masters, research, professional programmes and short courses.

One of its core facilities was a 32-node High Performance Compute Cluster (HPCC) operating from The School of Informatics' Centre for Parallel Computing. It was in frequent use by students, neighbouring faculties and by external, private-sector organisations looking to advance their research, technical developments, and operations.

The HPCC also linked directly to the National Grid Service (NGS) – a collective of compute clusters available to and, in use by, researchers across the UK. Established in 2004, the NGS now has 500 accredited users.





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Challenge

Driven by a natural IT refresh cycle, the need to replace its ageing legacy HPC system, and the availability of additional Science Research Investment Fund (SRIF) funds, in 2008, the School of Informatics took the decision to upgrade the previous 32-node high-performance compute cluster (HPCC) with a new 96-node HPCC.

Solution

The University tendered for the upgrade and received half a dozen proposals very quickly - this was whittled down to a strong and established partnership formed between HPCC reseller and integrator, OCF plc and hardware vendor, IBM.

Responsible for the new HPCC's entire bespoke design, rapid install and maintenance, OCF implemented a new HPCC which consists of 82 IBM System X 3455's - 328 Cores of AMD Opteron – using Cisco Infiniband high speed interconnects, supported with IBM GPFS (General Parallel File System) and IBM DS4200 Storage Controllers. The hardware was delivered to site on time by OCF's distribution partner, Interface Solutions (ISI).

“We chose OCF because HPC by its very nature has very high levels of entry and requires deep experience – we were not looking for a new kid on the block,” says Stephen Winter, Dean of School, School of Informatics. “Through OCF we have an integration partner that demonstrates the required HPC experience, plus strong established vendor relationships, flexibility and the ability to deliver on its Quality of Service agreements.”

One of the School's primary remits is to encourage the use of the HPCC facility by non high tech savvy individuals – academics and private. As a result, it has developed its own software which provides an easy to use interface that includes graphical computational workflow design and management tools.





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Winter adds: "We have found that the workflow concept is something that most non-technical users are familiar with, and this provides a useful language in which to conduct a computationally-oriented dialog between ourselves and non-technical clients. Some clients can even design their own workflows using our graphical interface. We are in the process of developing bespoke interfaces for different industry areas – biological, chemical and finance for example. An easily understood interface helps the non-IT experts understand the system and understand the benefits."

Results

The upgrade from the previous 32 node HPCC to the new 96 node HPCC, is providing a significant threefold increase in the School's contribution to the UK's NGS.

Winter adds: "The previous 32-node cluster was considered a very useful contribution to the NGS and that has of course now been significantly enhanced by our 92-node upgrade. Westminster University is making a valuable contribution to UK scientific research."

Amongst other projects, researchers from around the UK are accessing the NGS and drawing on its new additional power to more quickly understand how molecules, such as cancer or HIV interact with each other under certain stimuli. The faster researchers can do this, the more possibilities they can evaluate and the quicker potential life saving treatments can be discovered.

Outside of the NGS environment, University of Westminster is offering a number of private sector companies from the local government, transport and post-production sectors, looking to benefit from the power of HPC, direct usage time and support on its newly upgraded cluster. It is also currently running a competition to encourage a greater number of bio-tech firms to use the cluster.

