

Enhancing the learning experience of MSc Computing students in grid computing

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Background

Grid computing is arguably the most exciting development in the area of massively distributed computing in recent times and there are a number of UK and European initiatives. The researcher had worked for two years with a grid computing group in Trieste, Italy. He had also been the director of a two day workshop in Sri Lanka and had received an approach to undertake collaborative work with Birkbeck University. The project aimed to extend the collaboration by inviting colleagues from the Democritos Project in Italy (<http://www.democritos.it>) to work more closely with the Department of Computing at CCCU.

The grid is used to carry out computations that are too large to do on a normal computer – currently the grid is distributed in every continent, across millions of computers. The users of grids are not necessarily scientists or computational mathematicians. For example, social scientists are using the grid for large scale geodemographic modelling and historians to carry out text analysis and data mining using centuries old documents.

Although the researcher had been teaching the theory underpinning grid computing, lack of infrastructure within CCCU had prevented him from properly integrating this important topic into the teaching of MSc Computing students within the University and students had not been able to undertake Masters level project work in this area. Colleagues in the Department of Geography and Life Sciences had a number of research areas that needed a grid computing platform. Staff and students from other faculties and departments will also benefit from the resource.

Approach/methodology

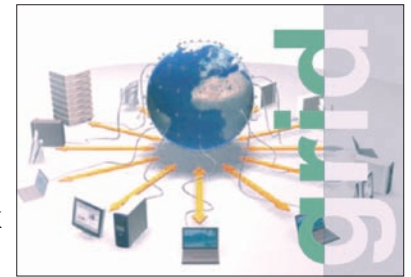
A computing platform with specialist software is being built to enhance the engagement of students undertaking laboratory work in grid computing.

The Technical Director of the UK National Grid Service (NGS) (<http://www.ngs.ac.uk>) and the Director for Cyberinfrastructure Development, Centre for Computation and Technology (CCT) of the Louisiana State University, USA were invited to give seminars and workshops on porting scientific applications onto computational grids and installing a grid computing node at CCCU using software supported by the NGS. These were attended by the MSc Computing students.

Agreement was reached with Computing Services to access the UK National Grid service, which is the UK e-Science programme mandatory grid service for the UK, because traditionally CCCU has not allowed external access to any of its systems, for very good reasons. Computing Services have now mapped out the way this could be done without affecting the rest of the University network and the software installation in the grid node is currently underway. Testing is about to begin.

Outcomes

- Canterbury Christ Church University became a Registration Authority (RA) for the UK Certification Authority. Dr Abhaya Induruwa functions as the RA Manager for Canterbury.



- Dr Induruwa is a funded member of the UK National e-Science Programme.
- Dr Induruwa has been invited as the UK NGS Campus Grid Champion for Canterbury.
- An NGS Roadshow and Grid Training event was held at CCCU on 25 February 2010 and was attended by grid enthusiasts external to the University. The presentation material is available at: <http://www.ngs.ac.uk/canterbury-roadshow>.
- MSc Computing students who attended the NGS Roadshow and Grid Training were given a chance to experiment with submitting and running jobs on the NGS grid platform.
- Researchers in the Departments of Computing and Law and Criminal Justice of the University will collaborate with the University of Leeds in the area of prediction of crime using census and crime data. Research will be carried out using a simulation model developed by the University of Leeds and run on the NGS. If successful this will be further expanded and incorporated into the PhD project work of one of the CCCU researchers.

Enhancing RIT

Too early to comment. This will be known probably later in 2010.

Advice for others

Although the technology could be ready and available, administrative and bureaucratic delays could mean missing targets that seriously affect progress.

Reflections and any future plans

Almost after two years, the project is nearly ready for use. Grid computing resources will be used to teach MSc Computing and Year 3 Bioinformatics students in the Department of Geography and Life Sciences. CCCU has a very large concentration of active applied social science researchers who can benefit from the availability of high throughput computational capability offered by the grid. The project is expected to not only give benefits to the Computing staff and students but the expertise developed within the Department is useful to other staff and students in the University.

Seminars and workshops will be organised with the support of NGS and other grid collaborators to showcase the application of grid computing in the areas of humanities, art and social science research. The Department of Computing will have in-house technical expertise to help researchers in other disciplines to exploit the opportunities offered by grid computing to enhance their teaching/research capability and to expand into areas hitherto considered impossible for reasons of lack of on-campus large scale computing resources.

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