

Research Support Strategy

Introduction

CiCS have traditionally provided support for research, both directly in the form of various generations of the High Throughput/Performance Compute facility, and indirectly through training and systems administration for departments who need other forms of computer support. We also provide the network infrastructure on which much of the University's research activity depends. What has not always been clear for our customers is the nature and level of support we can provide to research. This research support strategy seeks to clarify what we are currently doing, and what we plan to do in the future.

HPC

Current Provision

For research computing CiCS provides the high performance computer Iceberg, which in its current form consists of 568 processors, 2 TB memory and 3 tereflops processing power. Usage of the cluster is reasonably spread, with engineering and science taking most of the processing cycles. We have a rolling plan of investment which enables upgrade every two, and replacement every four years.

Future provision

The upgrade plan only allows stepwise upgrades of the installation, which has existed in its current form for over four years. The HPC as it stands at 3 teraflops is considerably less powerful than those of competitor institutions, and is not in the top 15. There is considerable demand for greater computing capacity from the research community, particularly for parallel computing jobs, which have now become a mainstream activity at Sheffield. Many research groups have local clusters which, while they provide a valuable facility for those groups using them, are not as efficient and effective as a central facility. A considerable amount of research income, around £12.6M over the last five years, is dependent on computational modelling provided by both the central and department facilities. We therefore propose a step change in computing capacity to provide a computing infrastructure which will more fully meet the needs of researchers, will reduce or remove the need for local clusters, and place us in the top ten for computing support.

This strategy will necessitate a new model for funding, and this is discussed below.

Storage

Current Provision

CiCS provides storage, at a cost, to researchers who have medium or long-term data storage and security requirements. The cost of this storage is, however, perceived to be high by many in the research community, and with exponentially increasing amounts of data (Gartner estimate that over the next five years capacity will need to treble to keep pace), the solutions currently provided will become even less affordable.

Future Provision

Moves are afoot to provide regional and national solutions to the data storage problem, and CiCS is monitoring these closely to ensure that we continue to provide the best possible service. However, we believe that local storage, along with local processing power, will be increasingly necessary. CiCS are already investigating ways of fulfilling this need, and will continue to do so, with the aim of providing a cost-effective service by the start of the academic year 2010. Again this is subject to an appropriate funding model.

Collaboration

Collaborative working is increasingly a feature of research activity, both with internal university partners and externally.

CiCS has already introduced a social business network environment (uSpace) which addresses the need for virtual communities of interest. We will ensure that the next generation of calendaring software is similarly flexible in allowing, for example, the setup of meetings with both internal and external partners. We also continue to provide the more traditional collaborative technologies such as shared file storage and email.

Our membership of the White Rose Grid community has given us useful insight into the ways that the technology can be and is used. It is clear that greater uptake of these facilities is possible. We will make increasing use of the portal technologies outlined in 'Support and Training' to lower the barriers to usage.

The White Rose Grid e-Science centre at Sheffield aims to provide a sustainable and dynamic collection of resources, applications and tools that facilitate research computing. The strategy for research computing provision is underpinned by the centre's role as a provider of training within the White Rose Grid e-Science centre. Through training and user support the research computing group supports a collaborative multidisciplinary research computing capability. This enables partnership in local, regional, national and international collaborative projects. The strategy is supported by the research computing advisory group which enables effective coordination of liaison activities with a research community drawing on the benefits of e-science and supporting infrastructure.

Improvements in desktop video-conferencing and virtual meeting software mean that our current support for high end video conferencing can be supplemented by simpler and more readily accessible solutions, and we will update and improve our advice and support for this way of working.

Support and Training

Current Provision

CiCS staff resource directly aligned to research support stands at 3, with further input from application support staff. One of these posts is funded 80% by EPSRC and is therefore not guaranteed long-term. Currently much of the support given is directed towards more scientific disciplines which make use of the HPC facility. For these users, we will continue to provide a range of training courses, extending and enhancing the content where possible. We will also continue to provide support in the usage of the facility. For researchers who choose not to learn complex computing systems we have built a portal which allows researchers to submit distributed jobs to iceberg with minimal IT knowledge. We will continue to develop the use of this portal or similar technologies.

In addition to the support given to HPC users, we have also broadened the scope of our support to include other disciplines. However, a more sustainable model is necessary for research projects which have a limited life but which produce results which need to be retained. The Virtual Vellum project is a case in point.

Future Provision

As has been stated elsewhere, we will seek to increase direct support from CiCS with the appointment of a research co-ordinator, when funds allow. The co-ordinator role will enable us to widen our support for research, and will act as a point of contact for researchers wanting to explore what support we can provide.

In order to ensure that our support is aligned with University strategy and objectives, we will build closer links with the research community both through the Research Computing Advisory group and through the liaison structure with Faculty Directors of Research and the PVC for Research.

Finance

Current Provision

CiCS funds the HPC and research support from its own budget. This includes hardware, generally used software, and staff. Some departments have funded additions to the cluster directly from research funds, in order to guarantee use of a proportion of the system. We have formulated a costing model for such purchases/rentals. Otherwise there is no direct link between CiCS budget and any costs which the research grant application may assign to computing support.

Future Provision

Current resource allocation is inadequate for the aims outlined above. In collaboration with the research community, we propose a model for funding which will allow increases in our support in line with the amount of income generated from research. We will achieve this by formulating a clear model for research computing support which can be fed into research grant applications directly. We will also put in place a model for CiCS staff support which will enable researchers to include an appropriate element for CiCS staff support within their research grant applications. This will create a rolling fund for employment of extra support staff within CiCS.

Summary

The strategy proposed will set CiCS support for research on a sound footing, and is designed to match more closely the changing requirements of our research community.