

Computing Strategy

School of Informatics

26th November 2009

1. Long-term vision and strategic objectives

Informatics Computing serves over 300 staff (230 academic), nearly 300 research students, around 140 taught postgraduate students, around 500 undergraduates, and over 100 visitors and associates.

The aim of the Informatics Computing Service is to ensure that members of the School of Informatics (staff, students and visitors) receive computing services necessary for their research, teaching and knowledge transfer activities. These services should be efficient, state-of-the-art, fit to users' requirements, and good value for money. Appendix A outlines the evaluation processes that we have established to ensure that we are fulfilling this aim.

Strategic objectives

We have four principal aims underpinning the Informatics Computing Strategy:

- S1** Maintenance, review and update of state-of-the-art computing environment for all members of the School.
- S2** Maintaining an optimum level of interoperability of Informatics Computing with College and IS services.
- S3** Development and deployment of new computing services.
- S4** Engagement with international best practice.

We have specific objectives relating to the computing infrastructure and to the activities of the School: research, teaching and knowledge transfer :-

Infrastructure We are committed to providing an infrastructure that ensures that members of the School get those services that they need. These services may be provided by the School or centrally. Using centrally provided services, particularly commodity services, releases effort to better meet specific research/teaching needs and to develop new services.

- I1** Transfer of commodity services to IS (or College), and working with IS to ensure that centrally provided services meet the needs of Informatics.
- I2** Provision of Informatics know-how and technologies to college and university level, and beyond.
- I3** Development of new services.
- I4** Review and evaluate computing infrastructure change taking account of changing user needs and general computing trends.

Research In addition to providing a flexible, responsive environment for research in the School, we must meet the specific research requirements across our research institutes, and structure research computing support to be well-matched to the ways researchers propose and carry out research projects.

R1 Continued development of lightweight, responsive support for research computing that is fully compatible with full economic costing of research

R2 Ensuring that Informatics users get efficient, responsive access to high performance research computing and storage facilities

R3 Provision of support for interdisciplinary and collaborative research projects (eg SICSA, InSpace).

R4 Development of prototype services from R&D projects (eg lecture recording and indexing)

Teaching In addition to providing a stable environment for the School's teaching activities, we shall develop appropriate instrumentation in the teaching environment to support research/teaching synergy.

T1 Support research-led teaching by providing support for the transfer of research tools to our standard teaching platform.

T2 Ensuring that our infrastructure complies with open e-learning standards where possible.

T3 Support appropriate assessment of students (eg online examinations).

Commercialization and knowledge transfer Informatics Computing can support the School's knowledge transfer activities by providing a bridge between research and use.

C1 Using the School's commercialization infrastructure as a driver to develop prototype services from applied research in Informatics.

Strategic assumptions

The computing strategy outlined in this document makes a number of assumptions.

- Informatics computing does not take place in a vacuum and our strategy reflects a number of general computing trends, such as mobility and multimedia computing.
- Several of these objectives require additional resourcing (eg via JISC, the Research Councils, SFC) and thus there needs to be some complementarity with the aims and objectives of the political and funding environment.

2. Report on 2008/2009

Goals

1. **Goal** Consolidation of all school servers at 3 sites (currently 5)
Progress We have vacated Buccleuch Place. We shall shortly be moving into the refurbished Appleton Tower server room, which will allow us to vacate Forrest Hill.
2. **Goal** Reviewing our existing commitments given a non front-line staff loss of 25% and plan how to cope with reduced effort
Progress We have not managed to substantially reduce our existing commitments: instead there has been a reduction on new work, with potential long term detrimental effect. We have reduced frontline responsiveness with CSOs taking on additional operational work previously performed by COs.
3. **Goal** Develop strategy for addressing the increasing move to portable and/or personal machines, and how this impacts our commodity computing provision.
Progress Completed
4. **Goal** Reduction in energy consumption by server consolidation using virtualisation technology
Progress A service based on VMware server has been deployed. This is interim pending University wide deliberations on virtualisation technologies.
5. **Goal** Development of the teaching environment as a “living lab” that supports innovation in teaching and informatics research in education.
Progress No progress due to a lack of specific requirements.
6. **Goal** Review school web provision in light of central web development project
Progress We have reached agreement with the University Web team as to the appropriate balance between polopoly hosted content and school hosted content. School hosted content will be serviced by a content management system, most likely Plone/Zope based.
7. **Goal** Consideration of migration to central services : use of central teaching labs
Progress For pedagogical reasons we have decided not to use central labs, but shall review should student numbers rise further.
8. **Goal** Consideration of migration to central services : source repository service (eg SVN)
Progress This service has only recently become available: we will consider suitability for end users in 2009/2010. We are discussing, with IS, adding iFriend access to this service to better support projects with external partners.
9. **Goal** Consideration of migration to central services : mailing list service
Progress Development of central service has been delayed.
10. **Goal** Consideration of migration to central services : room booking system

Progress Considered and rejected for practical reasons.

11. **Goal** Consideration of migration to central services : wireless provision

Progress Have migrated to central wireless service.

12. **Goal** Consideration of migration to central services : Wiki

Progress We are promoting use of the central service for most new wiki requirements, but have continued to use the School's Wiki for projects with external partners.

13. **Goal** Rewrite of the LCFG core to improve maintainability and extensibility

Progress This project has only just started and will carry on into 2009/2010 planning year.

14. **Goal** Deploy virtualisation for desktops (specialist teaching and research requirements).

Progress Completed.

15. **Goal** Complete and deploy new account management framework (including multi-tier authentication and lightweight accounts) to improve flexibility and manageability in securing School services.

Progress Development is almost complete. Aiming to deploy early in 2009/2010.

16. **Goal** Complete transition of users to AFS file service

Progress Completed.

17. **Goal** Reduction of energy footprint of the School's desktops. These are currently powered 24/7 for maintenance reasons, we will look at hibernating desktops overnight (weighing the benefits against use in Condor pools). Cost benefit estimate is £15-20k per annum.

Progress Technology developed and test rollout. Unfortunately limited by Linux hardware support.

18. **Goal** Ring-fencing 10% of individual computing staff's time for staff development

Progress A figure of 5% has been more typical, partly due to the reduced CO staffing level.

19. **Goal** Implement research computing support mechanism

Progress We have not been able to resource this mechanism due to a continued shortage of staff resource.

20. **Goal** Improve communication between users and computing staff

Progress We have a plan for some approaches to be tried.

21. **Goal** Consider a community based support mechanism

Progress We have concluded that a web based discussion forum is the most suitable mechanism and hope to use the new IS forum service for this when it becomes available (Jan 2010).

22. **Goal** Identify ways in which the School can align itself with the University's e-learning strategy
Progress Lecture and tutorial capture has been trialed. Trialed use of the WebCAT tool for providing on-line feedback for Java programming.
23. **Goal** School/EUCLID database enhancements. Develop business critical local enhancements to EUCLID; eg Post Application Visiting Day.
Progress A number of enhancements were completed (eg PAVD, PGT). This work will continue into the 2009/2010 planning session.
24. **Goal** Replace existing business critical feeds to School Database with feeds direct from IDMS and EUCLID.
Progress We received no feed from IDMS. We are still awaiting for IS to deliver on replacement feeds.
25. **Goal** Complete move of research publications from School Database to central ERA system.
Progress The Central ERA system is not yet ready to receive our publications.

De-prioritised areas

1. **Goal** "Vanilla" cluster computing—due to transition to ECDF, subject to ECDF continuing to meet research needs.
Progress Complete.
2. **Goal** Solaris platform — with move to AFS and Teradactyl backup technology
Progress Complete
3. **Goal** Forrest Hill and Buccleuch Place server rooms
Progress Buccleuch Place has been vacated. We shall shortly be vacating Forrest Hill, once the Appleton Tower server room refurbishment is complete.
4. **Goal** Wireless service
Progress We have completely moved over to the central service.

Relationship with IS (and other schools)

- We continued efforts to improve technical collaboration with IS and other schools :-
 - Continued LCFG SL5 platform maintenance, used by many schools in CSE.
 - Co-hosted, with IS, a workshop focusing on School's experiences of deploying LCFG.
 - Continued with regular LCFG deployers' group, with members from IS and various other schools.
 - Led a working party, consisting of representatives from CSE schools and other colleges, to identify what common teaching admin functionality was required that would not be met by EUCLID.

- Continued to represent CSE on deliberations on the new University IDMS.
- We provided the network infrastructure for the new residents of our old Forrest Hill and Buccleuch Place sites.

3. Revised plan for 2009/10

Goals

1. Continued consideration of migration to central IS services (mailing lists, Subversion, Pcounter for teaching lab printers)
2. Consideration of relationship with IS help desk
3. Consideration of appropriate use of central data storage facilities
4. Migrate School web site content to Polopoly
5. Migrate to existing central Call Management System
6. Consider move of content from School Wiki to IS Wiki and enact if appropriate
7. Complete move of research publications from School Database to central ERA system (continued from 2008/2009)
8. Continue identifying ways in which School can align itself with University e-Learning strategy.
9. Engage with University wide deliberations on server virtualisation technologies.
10. Continued consideration of our existing commitments given that there are no realistic prospects of regaining lost staff resources
11. Ring-fencing 5% of individual computing staff's time for staff development (with 10% as aspiration)
12. Implement strategy developed in 2008/2009 for addressing the increasing move to portable and/or personal machines.
13. Review and update structure and content of end user documentation.
14. Implement plan to improve communication between users and computing staff
15. Continue work on critical School/EUCLID database enhancements.
16. Consider requirements for knowledge management functions other than those related to teaching administration (eg research grant management)
17. Re-factor existing School database to improve maintainability, in light of significantly reduced EUCLID scope.
18. Deploy new account management framework (continue from 2008/2009)
19. Rewrite of the LCFG core to improve maintainability and extensibility (continue from 2008/2009)
20. Port of LCFG to Scientific Linux 6 (or other RHEL6 derivative)
21. Upgrade DICE desktops to Scientific Linux 6 (or other RHEL6 derivative)
22. Consolidation of existing backup services
23. Review of resilience to disasters.

De-prioritised areas

- School's call management system (RT)
- Wiki for new requirements - considering migration of existing content
- Subversion for end users
- Mailing list service

Relationship with IS and others

Our collaboration with IS, and with other schools in the College, is focused on a migration to central services where appropriate, significantly increased technical collaboration, and interactions at a technical and strategic level (also outlined in appendix C).

- We strongly hope that the port of LCFG to Scientific Linux 6 will be a collaborative venture with either IS or another school.
- Continued consideration of migration to central IS services.

EUCLID

The original plan for 2009/2010 included the following goals :-

- School Database review - re-implement remaining non EUCLID hosted database requirements on new lighter weight database service.
- Migration of student records and assessment to EUCLID

In early summer 2009 it became clear that EUCLID functionality was to be significantly reduced, and so we felt it necessary to bring forward the review of the School Database. This review concluded that the School Database would continue to be required to support almost all our core teaching data administration.

With the imminent arrival of EUCLID, which had promised to make obsolete a large fraction of our School Database functionality, the School had taken the strategic decision not to invest in ongoing development of the School Database. As a result the code base has fallen seriously behind in terms of an acceptable standard of maintainability. The descoping of EUCLID with relatively little notice has meant that substantial development work is urgently required to re-factor the code to improve maintainability.

Obstacles

- We continue to operate with a substantially (25%) reduced non front-line staff resource. This is having a detrimental effect on our ability to innovate.
- The lack of progress on the University's server procurement project has delayed us replacing old, energy-inefficient servers. We do not have sufficient resources to perform our own procurement exercises.

What we would like of IS

- When capturing requirements for a new proposed service, it would be very useful if IS were to clearly explain why any requested feature has been rejected. Too often, requested features have been seemingly ignored. This leads to frustration and individuals have become reluctant to expend effort in providing input to future requirement captures. Better communication during IS's decision making process might also sometimes help to discover cheaper ways of providing a feature. At the least, we would like to feel confident that, when a feature is rejected with the effect that we are unable to use a service at all, this is done for a good reason and not just because our requirements have been misunderstood or ignored.

- A clear focus on EUCLID development due to its pivotal role wrt. University business
- Provision for data archiving and, perhaps, curation.
- Engagement with our review of requirements for knowledge management functions other than those related to teaching administration.

4. Plan for 2010/2011

Goals

1. Further consideration of migration to central services
2. Migrate content of old School web service to new CMS service
3. Further promote School developed solutions to the rest of the University and beyond
4. Invest in automating frequently performed manual tasks, where cost effective to do so.
5. Further improve communication between users and computing staff
6. Ring-fencing 10% of individual computing staff's time for staff development

De-prioritised areas

Unknown at this stage.

Relationship with IS

More collaboration.

A. Evaluation

We have established a number of evaluation processes, to ensure that we are delivering a service in line with our strategic objectives.

- **Fit to requirements** User requirements are captured using various mechanisms. Teaching requirements are met through a stable and well established system for the collection, negotiation and delivery of computing requirements. We have implemented a newer mechanism to capture research computing needs, based on a basic level of recharge per researcher, in return for which certain services (eg disk space, network connectivity, cluster computing usage) are provided. Specific requirements are also captured in depth via focused innovation meetings, to which all members of the school may attend.
- **Value for money** This is a criterion for the annual review document, and is related to transparent support for research computing, centralised procurement that remains close to academic needs, and official audits of various research project expenditure.
- **Objective evaluation** Each unit provides a quarterly report, which includes proportions of staff time spent on various activities, projects undertaken, etc. This data is used to inform strategy, and management: for example, consistently lower proportions of time spent on development activities (due to operational demands) than planned can be identified, and emphases changed.

B. Staffing and Resources

The school employs 22 computing staff (21 FTE).

There are 830 managed DICE (Linux) desktops; 540 personal machines for staff and research students, and 290 in student labs (7 undergraduate teaching labs and 2 tutorial rooms). There are a further 90 managed Windows desktops for administrative staff.

In addition there are several hundred self-managed Linux, Mac OS and Windows desktops and laptops.

There are around 150 managed DICE (Linux) servers, and a further 24 beowulf nodes. Once we have fully migrated to the Forum, our servers will be housed in 3 air-conditioned machine rooms, with a total area of around 160 m².

C. College, University, External Relationships

The School has a high degree of interaction and engagement at the College and University level, arising in particular from the expertise within the School. We are engaged with university committees concerned with authentication, security, and information architecture, for example, and play a leading role in envisioning the development of computing at a university level. Externally, our computing staff interact intensively with organizations such as Usenix and UKUUG through workshops, conferences and tutorials.