Informatics Computing Plan 2012

School of Informatics

July 31, 2012

1. Long-term vision and strategic objectives

Informatics Computing serves over 300 staff (230 teaching and research), nearly 300 research students, over 200 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, by IS or by external organisations.

I1 Review and evaluate computing infrastructure change taking account of changing user needs and general computing trends.

I2 Development of new services.

I3 Provision of Informatics know-how and technologies to college and university level, and beyond.

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, CSBE).

R4 Development of prototype services from R&D projects (eg Data Intensive Research machine)

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.

Management Information   We shall support the ISS business processes. We also aim to support planning and decision making through the timely and effective maintenance and provision of Management Information.

2. Report on 2011

Goals

1. **Goal** Review of Computing team role and structure
   Progress Was not performed due to higher priority work. Carried forward to 2012.

2. **Goal** Consideration of our existing commitments given decreasing salary and non-salary budgets.
   Progress Ongoing work on identifying the priorities of our existing commitments. Spending plan for next three years produced which takes into account significant cut to capital equipment budget.

3. **Goal** Migrate to central IS subversion system
   Progress Progress has been made. Initially hampered due to charging mechanism, but this has since been relaxed. Awkward to use for teaching due to manual authorisation configuration - School service was tightly integrated to School DB. The migration has disenfranchised some users.

4. **Goal** Consideration of relationship with IS help desk
   Progress Consideration has been given and we have concluded that using the IS Help desk as the first port of call for our users would be highly inefficient as almost all queries would be passed to our computing staff.

5. **Goal** Migrate to new UniDesk system
   Progress Having gained more experience of using UniDesk over the past year and after much discussion [1], we have concluded that the UniDesk system is barely usable and that it would be a retrograde step for us to migrate to it from our existing RT system. In any case, we need to keep running an RT system for ISS (Informatics Student Services).

6. **Goal** Review requirement for Condor deployment given increase in ECDF capacity
   Progress After review, Condor has been deprecated.

7. **Goal** Continued consideration of appropriate use of central data storage facilities
   Progress Continuing. We consider existing (and currently proposed) systems unsuitable for our needs - eg proposed ECDF file service offers only CIFS/NFS access, and not AFS.

8. **Goal** Engage in requirements capture for and design of proposed central archiving service
   Progress We are not aware of any recent progress of this project. We are still very interested in this.

9. **Goal** Continued migration of school web site content to polopoly, where appropriate
   Progress We have migrated as much of our content that we feel appropriate, at this time, to host on Polopoly.

10. **Goal** Migrate content of old School web service to new CMS service, where appropriate

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[1] see http://wiki.inf.ed.ac.uk/DICE/Project177SummaryPaper

Progress Ongoing. Formed an oversight group to accelerate this. There is an active project to produce a Drupal service - we are in discussion with other Drupal users within the University.

11. **Goal** Move content from School Wiki to IS wiki
    Progress We have concluded that the work required to migrate existing content would outweigh the savings. All new Wiki requirements will be met by the IS wiki.

12. **Goal** Migrate to IS mailing list service
    Progress The new IS service does not allow for automated creation of mailing lists. Our existing School service does support this and we make use of this to create mailing lists targeted to various student groupings (eg tutorial group). We are considering what use we can make of this service, if any.

13. **Goal** Complete re-factoring of School Database (database engine and client), and complete move of data and users from old system to new. Review what re-factoring is necessary for remaining "legacy" aspects.
    Progress Re-factoring of the database is complete and users have been moved to the new system using the new interface. IGS, ISS duties allocation and HTBN (Hours To Be Notified) have all been completed. ITO functionality is almost complete. HR data has still to be completed.

14. **Goal** Consider how best to maximise benefit of new School Database by reviewing which additional, often standalone, services can be brought into or better integrated with the School Database.
    Progress Webmark and UG project database projects identified and will be implemented in 2012.

15. **Goal** Implement additional School Database functionality to support ISS planning and budgeting
    Progress We have implemented HTBN. functionality.

16. **Goal** Implement Course-in-a-Box driven by School Database
    Progress A prototype has been produced. Discussions ongoing on how to proceed.

17. **Goal** Consider requirements for knowledge management functions other than those related to teaching administration (eg research grant management)
    Progress Requirements have been identified and our hope is that PURE will support most of these knowledge management requirements.

18. **Goal** Consider relationship to shared timetabling project
    Progress We are engaged with this project both at a user and technical level. Consideration will continue in 2012.

19. **Goal** Improve process for capturing teaching course computing requirements
    Progress We have produced an agreed paper process.

20. **Goal** With other CSE schools, identify a suitable VLE system.
    Progress We have discussed with other CSE schools, but as it is now likely that a central IS system may prove suitable this action has been put on hold.

21. **Goal** Support ISS in developing their open courseware vision.
    Progress There have been many initiatives in this area at the University level - we are engaging with these.

22. **Goal** Port of LCFG to Scientific Linux 6 (or other RHEL6 derivative)
    Progress Completed. Now in use in Informatics and various other CSE schools.

23. **Goal** Upgrade DICE desktops and servers to Scientific Linux 6 (or other RHEL6 derivative)
    Progress DICE desktops have all been upgraded to Scientific Linux 6. Servers shall be upgraded in 2012.

24. **Goal** Rewrite of the LCFG core to improve maintainability and extensibility (continued from 2008/2009/2010)
    Progress Some important code improvement was carried out on the server side of the LCFG core, which will improve maintainability. We now need to perform a similar exercise on the client side, hopefully in 2012.

25. **Goal** Move machines to central IS virtualisation service where appropriate
    Progress No machines have been moved. The IS service requires Windows for client management and there is no serial console access possible which makes remote management (eg from home) difficult.

26. **Goal** Continue developing in-house virtualisation service (likely using technology developed in EPCC)
    Progress KVM under SL6 is sufficiently mature for deployment. We will shortly introduce a KVM hosting service and will deprecate our VMware based hosting service in 2012.

27. **Goal** Extend use of desktop virtualisation by encouraging users to adopt the technology - and facilitate this.
    Progress We are now promoting desktop virtualisation where a user may previously have been allocated a second (elderly) physical desktop for specific research needs. We need to improve documentation in 2012.

28. **Goal** Consider how desktop virtualisation can be extended into a laboratory environment.
    Progress A project to consider this will shortly produce its findings. We are in discussions with IS wrt what is possible in the IS central labs.

29. **Goal** Continue development work to take advantage of new account management framework (eg implement account lifecycle)
    Progress The new framework has been deployed. Lifecycle code is still in development.

30. **Goal** Continue updating structure and content of end user documentation
    Progress Decided on use of Drupal and structure. Content is in process of being migrated.

31. **Goal** Produce guidance on resources available for research projects (eg software repositories, wikis, VMs for software preservation etc).
    Progress No progress.

32. **Goal** Consider how to improve access to School services from mobile devices
    Progress No progress.

33. **Goal** Implement remaining improvements identified as result of review of resilience to disasters.
    Progress Offsite DR services for LCFG, web and wiki have been deployed. Offsite DR for School database is pending an upgrade to PostgreSQL.

34. **Recurring Goal** Further consideration of migration to central services
    Progress Consideration has been given, but have not identified any services which would be cost-effective to migrate.

35. **Recurring Goal** Further promote School developed solutions to the rest of the University and beyond
    Progress We are discussing export of our Theon database to IS and other Schools.

36. **Recurring Goal** Invest in automating frequently performed manual tasks, where cost effective to do so.
    Progress We have automated certain aspects of AFS service management.

37. **Recurring Goal** Further improve communication between users and computing staff
    Progress We have introduced a Systems blog.

38. **Recurring Goal** Ring-fencing 5% of individual computing staff's time for staff development
    Progress Figures show that we have been meeting this goal for many, but not all, of the computing staff.

De-prioritised areas

- **Goal** Retrospect Remote backups for Apple Macs and Windows
  Progress The TiBS backup system has been fully deployed.

- **Goal** Condor
  Progress Users now use the ECDF service.

Relationship with IS (and other schools)

1. We continue to provide the base LCFG Linux platform to other schools (via IS). We recently upgraded this platform to Scientific Linux 6 (SL6).
2. We are now using the IS Pcounter service for managing our printer costs in our teaching labs. We are working with IS to further develop their service by providing code to automate setting credit for users.
3. The migration to the central IS subversion system has not been popular with our staff nor students as we have lost functionality for little gain. In future, we shall take a more considered approach to identifying those services we migrate to IS.

3. Revised plan for 2012

Goals

1. Review of Computing team role and structure
   Who: School, Cost: 1w
2. Continued consideration of appropriate use of central data storage facilities
   Who: Research, Cost: 1w
3. Engage in requirements capture for and design of proposed central archiving service
   Who: Research, Cost: 1w
4. Continue engagement with shared timetabling project
   Who: Admin, Cost: 1w
5. Engage with the PURE project to meet identified requirements for knowledge management functions other than those related to teaching administration (eg research grant management)
   Who: Admin, Cost: 1w
6. Consider the most effective usage of our share of ECDF
   Who: Research/Teaching/Energy, Cost: 1w
7. Review impact of University activites wrt. teaching - timetabling, Personal Tutors, VLEs, Distance Learning, EUCLID developments *Who: Teaching, Cost:*
8. Continue with work on providing a virtualised DICE for use on students' personal machines *Who: Teaching, Cost:*
9. Complete re-factoring of School Database (database engine and client), and complete move of data and users from old system to new.
   Who: Admin, Cost: ??
10. Further consider how best to maximise benefit of new School Database by reviewing which additional, often standalone, services can be brought into or better integrated with the School Database.
    Who: Admin, Cost: 1w
11. Identify enhancements to the School database to better support tutors and demonstrators
    Who: , Cost:
12. Produce drupal service...
    Who: School, Cost: 10w??
13. Windows 7 upgrade for admin staff desktops
    Who: Admin, Cost:
14. Extend use of desktop virtualisation by encouraging users to adopt the technology - and facilitate this.
    Who: Energy, Cost: 1w
15. Complete migration of user documentation to new site.
    Who: School, Cost: ??
16. Improve quality and validity of user documentation
    Who: School, Cost: ??
17. Produce guidance on resources available for research projects (eg software repositories, wikis, VMs for software preservation etc).
    Who: Research, Cost: 2w
18. Consider how to improve access to School services from mobile devices
    Who: ?, Cost: ?

19. Improve security of services, particularly against external attacks
    Who: School, Cost: 4w
20. Code improvement on LCFG core client side
    Who: Infrastructure, Cost: 4w
21. Migrate from VMware service to KVM service
    Who: Infrastructure, Cost: 0w
22. Continue development work to take advantage of new account management framework (eg implement account lifecycle)
    Who: Infrastructure, Cost: ??
23. Upgrade DICE servers to Scientific Linux 6 (or other RHEL6 derivative)
    Who: Infrastructure, Cost: 25w
24. Accelerate replacement of physical servers with virtualised servers to reduce energy consumption and meet reduced capital budget
    Who: Energy, Cost: None
25. Implement remaining improvements identified as result of review of resilience to disasters - offsite DR for School DB
    Who: Admin, Cost: ?

Recurring goals

1. Consideration of our existing commitments given reduced salary and non-salary budgets.
2. Further promote School developed solutions to the rest of the University and beyond
3. Further improve communication between users and computing staff
4. Ring-fencing 5% of individual computing staff's time for staff development
5. Consideration of ways to minimise our energy footprint

Activities to be considered for de-prioritisation

- School Beowulf cluster

Collaboration with others

We are very keen to collaborate with other CSE schools on development and even service delivery.

1. We shall continue to collaborate closely with other Schools deploying our LCFG technology.
2. We are collaborating with other Schools in developing Drupal best practice, and perhaps even technology
3. We shall investigate how we can export aspects of our Theon database technology to other schools.

What we would like of IS

- Concern over continued lack of progress in deploying CaptureED in Forum
- Provision for data archiving and, perhaps, curation.

- Audio Visual support from LTSTS for non Informatics events in the Forum
- We are keen to make effective use of our share of the ECDF service with a view to deprecating our remaining Beowulf cluster. We would be particularly interested in the possibility of running Hadoop on the ECDF cluster. We are also interested in the proposed ECDF Cloud service.
- A barrier to further migration of services to "equivalent" central IS services is the tight integration of our services with our authorisation roles service which is fed from our School Database - allowing us, for example, to create mailing lists and subversion repositories for individual tutorial groups.
- 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. This continues to be a problem - eg the new mailing list service.

4. Plan for 2013

Goals

1. Implement any changes to CO team structure as a result of review undertaken in 2012
2. AV and video capture installed in tutorial rooms
3. Further promote School developed solutions to the rest of the University and beyond
4. Further improve communication between users and computing staff
5. Ring-fencing 5% of individual computing staff's time for staff development
6. Further consider how best to maximise benefit of new School Database by reviewing which additional, often standalone, services can be brought into or better integrated with the School Database.

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 triannual 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 21 computing staff (20.0 FTE).

There are 680 managed DICE (Linux) desktops; 370 personal machines for staff and research students, and 310 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 230 managed DICE (Linux) servers (190 physical, 40 virtual), and a further 24 beowulf nodes. Our servers are housed in 3 air-conditioned machine rooms, with a total area of around 160 m^2.

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 with organizations such as Usenix and UKUUG through workshops, conferences and tutorials.

D. Categories and activities

Support					
Front Line	Documentation	General Web	Online Exams	Procurement	
User accounts	AV	Inventory	Exam prep	Corpora	

File				
AFS				
Samba (admin)				
Backups (user)				
iFile				
SVN				

Web							
Web (CVS)	CMS plone	Wiki	Group web	Homepages	I in a Box	Legacy	Tomcat

Admin					
Theon	ISS desktop	IGS desktop	HR desktop	ISS RT	RBS

Misc							
ssh servers	Printing	Mailing lists	Licence servers	Postgresql	Coltex	Inspace	DICE labs

Desktop			
DICE desktop	Teaching s/w	Research s/w	MDP

Compute				
DICE compute	Grant servers	Beowulf	Gridengine	Hadoop

Infrastructure			
Linux platform	LCFG	Kerberos	Directory	Network
S/W repository	pkgforge	Cosign	Authorisation	Network services
Server rooms	Consoles	Monitoring	Prometheus	System backups
Virtualisation				