Informatics Computing Plan 2015

School of Informatics

February 20, 2015

1 Long-term vision and strategic objectives

Informatics Computing serves over 300 staff (220 teaching and research), 320 research students, 200 taught postgraduate students, 780 undergraduates, and over 100 visitors and associates.

The aim of the Informatics Computing staff 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, fit to users' requirements, good value for money and use open standards. Appendix A outlines the evaluation processes that we have established to ensure that we are fulfilling this aim.

Strategic objectives

We have five principal aims underpinning the Informatics Computing Strategy:

S1 Maintenance, review and update of a computing environment fit for the purposes of all members of the School.

S2 Maintaining an optimum level of interoperability of Informatics Computing with College and IS services.

S3 Engagement with international best practice.

S4 Provision of expertise to support the teaching and research activities of the School.

S5 Providing added value over services offered by College and IS.

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, Farr Institute, Digital Health).

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

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

T2 Support appropriate assessment of students (eg online examinations).

T3 Provision of expertise to support teaching activities

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.

Interaction with IS

We shall focus :-

- on being early adopters of services that may or may not become commodity
- on developing new services that are specific to, or inspired by, our environment

We shall use IS services wherever possible, unless there are sound academic reasons for not doing so. However, we shall take a careful approach when considering migration from a School service to the equivalent IS service.

2 Report on 2014

Goals

1. **Goal** Implement any required changes as a result of review of Computing team structure
   Progress No structural changes were required. Reworking of the project management framework.
2. **Goal** Continued consideration of appropriate use of central data storage facilities, specifically investigate AFS over DataStore
   Progress Project underway to test AFS over DataStore. Cell created, now performance testing.
3. **Goal** Engage in requirements capture for and design of proposed central archiving service
   Progress Attempted, but little visible progress upstream (awaiting external review).
4. **Goal** Continue engagement with shared timetabling project
   Progress Project ran out of money, so no meaningful engagement possible. Room bookings for Forum and AT were to move to shared TT system, but this was abandoned as new system missing critical functionality of existing School solution.
5. **Goal** Continue engagement with the PURE project to meet identified requirements for knowledge management functions other than those related to teaching administration (eg research grant management)
   Progress No progress.
6. **Goal** Await invitation to discuss future business model for ECDF funding. Continue investigations with using ECDF for Hadoop requirements
   Progress Still no news on ECDF funding. Project underway to investigate Hadoop on ECDF - currently under testing.
7. **Goal** Review impact of University activities wrt. teaching - timetabling, VLEs, Distance Learning (including MOOCS) , EUCLID developments.
   Progress Running a MOOC course ”Code Yourself” for school pupils. A few distance learning courses are being considered by Board of Studies.
8. **Goal** Further develop virtualised DICE for use on students’ personal machines, if required.
   Progress Made easier to use elsewhere in UoE, not just Informatics.
9. **Goal** Consider how the School’s computing staff could contribute to teaching activities
   Progress No progress.
10. **Goal** Complete the re-factoring of School Database back-end (database engine and client), and complete the move of data and users from old system to new (particularly HR).
    Progress Re-factoring is still ongoing. All but the School Inventory is now in the new system (separate project).
11. **Goal** Further develop data feed integration (from central services) - eg maximise use of HR feed and take first feed from SAT.
    Progress Using HR feed and VRS feed, Shortly to start using IDM feed. VRS feed has data inconsistencies acknowledged by IS. Project to revamp VRS (and fix BIS VRS) scrapped/postponed. This is annoying as the feed cannot be trusted for active UUN or Email data. No news as yet whether data inconsistencies will be addressed as normal operations.
12. **Goal** Further consider how best to maximise benefit of new School Database by review-

ing which additional, often standalone, services can be brought into or better integrated with the School Database.

Progress Just Projects DB left to do and Webmark integration (eg direct marks entry).

13. **Goal** Capture requirements for CDTs (Centres for Doctoral Training) and implement.
    Progress Completed. Some report changes and additions required, nothing structural.
14. **Goal** Adopt central space management system and drop our internal room booking system
    Progress Abandoned as central system missing critical functionality (eg booking more than a year in advance)
15. **Goal** Engage with design of central IS Drupal service, or produce own Drupal service
    Progress Have attended meetings and provided feedback. Have agreed changes to our outward facing polopoly pages to allow migration to the central Drupal service in March 2015. We believe that the IS Drupal distribution will be suitable for replacing our Plone CMS service.
16. **Goal** Port of LCFG to Scientific Linux 7 (or other RHEL7 derivative)
    Progress RHEL 7 released later than anticipated and much more work required than for previous upgrades. Nearly complete for desktops.
17. **Goal** Upgrade DICE desktops and servers to Scientific Linux 7 (or other RHEL7 derivative)
    Progress Not achieved - see previous goal.
18. **Goal** Act on results of virtualisation/cloud provision survey, as appropriate.
    Progress Conclusions were no (significant) strategic action required. Awaiting IS delivery of cloud virtualisation service.
19. **Goal** Produce guidance on resources available for research projects (eg software repositories, wikis, VMs for software preservation etc).
    Progress Some progress, but not as much as hoped for
20. **Goal** Improve access to School services from mobile devices (eg printing, AV, lab availability, school web accessibility, OpenVPN, VDI)
    Progress OpenVPN, ssh, AV under testing. Printing being investigated.
21. **Goal** Decide on whether to outsource DICE authentication to EASE, and produce a migration plan if necessary
    Progress Decided not to outsource DICE authentication at this time as we would lose critical functionality (eg iFriend and close coupling with our account management system). A report will be published.
22. **Goal** Continue development work to take advantage of new account management framework (eg implement account life-cycle)
    Progress Account life-cycle implemented - go-live is expected in January 2015.
23. **Goal** Complete redevelopment of new equipment inventory system
    Progress No progress. Effort stolen by Farr project.
24. **Goal** Consider infrastructure requirements for refurbished Appleton Tower and plan for 2015 decant
    Progress Decanting to South College St and Wilkie Building. Have been involved in spec of both those spaces. Decant planning about to start. No call for infrastructure requirements for AT yet.
25. **Goal** Revamp ISS/IGS web presence (for current students)
    Progress School project to drive this forward. New Web group formed to coordinate. Planning to use IS Drupal distribution.

26. **Goal** Review energy usage of research servers - perhaps sleeping idle servers and virtualising little used servers.
    Progress No Progress
27. **Goal** Perform an audit of all research data within the School
    Progress Project started
28. **Goal** Produce a register of medium-high risk data and a mechanism for users to self populate the register
    Progress have held back in anticipation of University wide Data Asset Register, but little progress on that - currently pending external review. A CCPAG subgroup has been formed to consider this across the college.
29. **Goal** Implement improvements to security of web services
    Progress Active project
30. **Goal** Planning to improve awareness of medium-high risk data at induction of new staff
    Progress Decided to produce an A4 sheet on the issue to be provided to new staff.
31. **Recurring Goal** Aim for a minimum of 20% of development time to be dedicated to user submitted projects
    Progress This has not been achieved. Possibly due to the slow transition to the new project methodology.
32. **Recurring Goal** Further promote School developed solutions to the rest of the University and beyond
    Progress Floss UK talk on Security. Worked with GeoSciences to seed their own admin DB development.
33. **Recurring Goal** Further improve communication between users and computing staff
    Progress Computing units individually gave talks, explaining the work of their unit, to new staff and postgraduates. Additional introductory lecture given to incoming 2nd year undergraduates.
34. **Recurring Goal** Ring-fencing 5% of individual computing staff's time for staff development, including user support staff.
    Progress Have achieved this.
35. **Recurring Goal** Consideration of ways to minimise our energy footprint, eg identifying under-used research servers
    Progress Little progress - some elderly servers retired.

Unplanned activities

1. Farr
2. Award of CDTs - increase in PhD numbers let to pressure on Forum office space resulting in almost half the CO team decanting to Appleton Tower. Other Forum occupants were also re-homed, with resulting support costs.
3. Security incidents - eg HeartBleed and ShellShock

Activities to be considered for de-prioritisation

- **Goal** School Beowulf cluster
  Progress This is in the process of being decommissioned.
- **Goal** Authentication

Progress Decided not to outsource DICE authentication at this time as we would lose critical functionality (eg iFriend and close coupling with our account management system). A report will be published.

- **Goal** Room booking system
  Progress This was abandoned as the central system is missing some functionality that is critical to us (eg booking events more than a year in advance).

Collaboration with others

We would like to register our appreciation of the assistance of Angus Rae, who has acted as a very responsive and effective interface with IS.

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

1. We continue to provide the base LCFG Linux platform to other schools (via IS).
2. A number of CSE schools are looking at deploying aspects of Theon, with our assistance.
3. We have been trying to collaborate with IS on investigating AFS on top of the new Research Data platform, but effort availability (on both sides) has hampered this.
4. Staff attended Floss Spring 2014, Usenix LISA 2014 and OpenAFS 2014 conferences.

3 Revised plan for 2015

It should be noted that we have a significant number of large mandatory projects this year. This will affect our ability to react to unplanned work.

Each project has a cost effort estimate, where small is 1 to 3 FTE weeks, medium is 4 to 7 weeks and large is 8+ weeks.

Mandatory goals

1. Appleton Tower decant to Forrest Hill and Wilkie
   Who: School, Cost: large
2. Consider infrastructure requirements for refurbished Appleton Tower and plan for return from Forrest Hill and Wilkie
   Who: School, Cost: small
3. Complete DICE SL7 desktop platform
   Who: Teaching/Research, Cost: large
4. Upgrade DICE desktops to Scientific Linux 7 (or other RHEL7 derivative)
   Who: Teaching/Research, Cost: large
5. Deploy CDT dedicated computing clusters
   Who: Research, Cost: medium
6. Web review and revamp (including migration of polopoly pages to IS Drupal service)
   Who: School, Cost: large
7. Produce a register of medium-high risk data and a mechanism for users to self populate the register
   Who: School, Cost: small
8. Identify and implement modifications to Theon required by the taught assessment regulation changes and the introduction of progression boards
   Who: Teaching, Cost: small/medium

Goals

1. Continued consideration of appropriate use of central data storage facilities, specifically investigate AFS over DataStore.
   Who: Research, Cost: small
2. Engage in requirements capture for and design of proposed central archiving service
   Who: Research, Cost: small
3. Continue engagement 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: small
4. Continue investigations with using ECDF for Hadoop requirements
   Who: Research/Teaching/Energy, Cost: small
5. Engage in requirements capture for central media services, particularly with respect to similar in-house services
   Who: School, Cost: small

6. Review impact of University activities wrt. teaching - timetabling, VLEs, Distance Learning (including MOOCS) , EUCLID developments.
   Who: Teaching, Cost: small
7. Further develop virtualised DICE for use on students' personal machines, if required. For example, more frequent updates?
   Who: Teaching, Cost: small
8. Consider how the School's computing staff could contribute to teaching activities
   Who: Teaching, Cost: small
9. Consider online exams in IS public labs (perhaps using virtualisation)
   Who: Teaching, Cost: small
10. Complete the re-factoring of School Database back-end (database engine and client)
    Who: Admin, Cost: medium
11. 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. Specifically - UG projects DB, Integration with RT, Reform. *Who: Admin, Cost: medium*
12. Deploy an instantiation of IS Drupal distribution to replace the existing School Plone CMS
    Who: School, Cost: medium
13. Migrate existing content off Plone CMS service to School Drupal service (based on IS Drupal distribution)
    Who: School, Cost: medium
14. Revamp ISS/IGS web presence (for current students)
    Who: Admin, Cost: small
15. Start work on LCFG Scientific Linux 7 server platform
    Who: School, Cost: large
16. Produce guidance on resources available for research projects (eg software repositories, wikis, VMs for software preservation, DIY DICE, etc).
    Who: Research, Cost: small
17. Improve access to School services from mobile devices (eg printing, AV, lab availability, school web accessibility, OpenVPN, VDI)
    Who: Teaching/Research, Cost: small
18. Videoconferencing (low hanging fruit)
    Who: Research, Cost: small
19. Continue development work to take advantage of new account management framework (eg multi-faceted identities)
    Who: Infrastructure, Cost: medium
20. Complete redevelopment of new equipment inventory system
    Who: Admin, Cost: medium
21. Review energy usage of research servers - perhaps sleeping idle servers and virtualising little used servers
    Who: Research, Cost: small
22. Review of self-managed servers (due to space, energy and security concerns)
    Who: Research, Cost: small
23. Start work on migration to IPV6 (initial investigations and planning)
    Who: School, Cost: small
24. Perform an audit of all research data within the School

Who: School, Cost: medium

25. Continue to implement improvements to security of web services
    Who: School, Cost: small
26. Implement College security action plan (mandatory)
    Who: School, Cost: small

Recurring goals

1. Aim for a minimum of 20% of development time to be dedicated to user submitted projects
2. Further promote School developed solutions to the rest of the University and beyond
3. Further improve/maintain communication between users and computing staff
4. Ring-fencing 5% of individual computing staff's time for staff development, including user support staff.
5. Consideration of ways to minimise our energy footprint, eg identifying under-used research servers
6. Further consideration of migration to central services (big ticket items only)

Activities to be considered for de-prioritisation

- Legacy web sites
- Legacy email domains
- Legacy filespace

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 shall assist other schools in deploying our Theon database technology.
3. We shall work with IS on investigating the feasibility of providing AFS on top of DataStore.
4. We shall work with IS on investigating the feasibility of providing Hadoop on Eddie.
5. We are contributing effort to the Eddie-refresh procurement.

What we would like of IS

- Provision for data archiving and, perhaps, curation. Note that this archiving should not be limited to research data.
- We are interested in the proposed ECDF cloud virtualisation service.
- Provide support for S/MIME and PGP encryption and signing of email, including institutional key- and certificate-signing

- Renewed assistance with investigating the feasibility of hosting our online exams in the central IS labs.
- Effective use of IS labs for 1st and 2nd year students - DICE virtualisation/ NX? We are being squeezed 2015-2016 re FH space.
- 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. The ability to feed into Grouper, from our School Database, might reduce this barrier. We welcome the invitation to be involved in the Grouper enhancement project.
- Procurement of IT systems - would appreciate consideration to use of open-standards and interaction with School systems, for example via published APIs, when procuring central IT systems.
- We are concerned that IS continues to schedule downtime of certain critical services during the working day.

4 Plan for 2016

Goals

1. Consider use of students' own laptops in exams
2. Implement any ideas arising from consideration of computing staff involvement in teaching
3. Return from Forrest Hill/Wilkie to Appleton Tower
4. Full review of requirements and options for videoconferencing, particularly with external organisations in order to reduce travel. Including holding an Innovation meeting.
5. Continue work on migration to IPV6
6. Upgrade DICE servers to SL7.
7. Investigate 802.1X for some or all of School network ports
8. Further consideration of migration to central services (big ticket items only)
9. Further promote School developed solutions to the rest of the University and beyond
10. Further improve communication between users and computing staff
11. Ring-fencing 5% of individual computing staff's time for staff development.
12. 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

- Legacy web sites
- Legacy email domains
- Legacy filespace

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. Any member of the School can submit a project proposal via a web form. Each project is categorised into one of three prioritised categories - Mandatory, Strategic (meets one of the goals in Section 2 of this document) or Objective (meets one of the Strategic Objectives in Section 1). Projects are resourced in priority order when effort becomes available. There is a target of 20% of development time to be dedicated to user submitted projects. Teaching software requirements are met through a stable and well established system. 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 reports on activities in the past four months and future plans for work in the forthcoming four months. It includes figures on effort spent on development activities.

The School's Computing Strategy Committee (Head of School, Director of Computing, Director of Teaching, Head of Computing, Deputy Head of Computing, School Administrator) provides oversite of the above processes.

B Staffing and Resources

The school employs 20 computing staff (19.8 FTE).

There are 675 managed DICE (Linux) desktops; 365 personal machines for staff and research students, and 310 in student labs (7 undergraduate teaching labs and 2 tutorial rooms). There are a further 70 managed Windows desktops for administrative staff.

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

There are 310 managed DICE (Linux) servers (165 physical, 135 virtual) and a further 24 beowulf compute nodes. There are an additional 50 physical self-managed servers. 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 FLOSS (UKUUG) through workshops, conferences and tutorials.

D Categories and activities