UNIVERSITY OF CAMBRIDGE COMPUTER LABORATORY

Report of the Review Group on IT Services in the Computer Laboratory

David Hartley David Cottingham Mike Gordon Lise Gough Simon Moore Roger Stratford

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Summary of conclusions and recommendations

In January 2005 the Head of the Computer Laboratory asked us to look into the provision of IT facilities and related support services in the Laboratory. We have consulted widely within the department by inviting written submissions and by conducting a series of representative interviews.

Our observations and conclusions are presented in this report. Generally, we found that the IT Support staff are a highly skilled and hard-working group whose services are much appreciated in the Laboratory, which we believe is one of the best served University departments in this respect.

Inevitably in such a wide-ranging review issues came to light, and the most important of these is the need for clarity in who should decide policy, such as the facilities and services provided, the long-term strategy, the use and control of funds, &c. Our main recommendation is for the establishment of an IT Strategy Committee, chaired by the Head of Department or a Deputy Head of Department. The Head of the IT Support group should report to the the chairman of the IT Strategy Committee.

All other issues presented in this report are matters for the consideration of the IT Strategy Committee, and the actions that should follow should be determined by them. In summary, our recommendations are:

- The introduction of improved practices for staff development.
- Consideration should be given to a trial scheme whereby every computer staff member is associated with some Laboratory constituency to provide front-desk support.
- Microsoft Windows facilities should continue to be supported as should Apple Macintosh computers.
- Investigation of a more commodity-like Linux configuration with a view to allowing a mixture of user and central management.
- Facilities for visitors and for remote access to the Laboratory should be improved.
- The policy for the provision and funding of research student systems and other central facilities should be reviewed.
- The induction process for new staff and research students Laboratory needs to be more effective.
- A concerted effort is needed to complete the assimilation of the Digital Technology group.
- The possibility of extending use of the PWF to support all teaching should be explored.
- There should be an explicit policy on formats for document exchange.
- The administration group should have its own IT development programme.
- A web project which provides standard styles and facilities but enables distributed authorship of content with improved web services should be established.
- The scope of IT Support staff duties should be formally determined.

Introduction

1. As part of a wider review of the operation of the Computer Laboratory, the Head of Department established our group to review the provision of IT support services to staff and students. One purpose was to tackle issues that were the concern of both users and IT support staff. This report presents our findings and conclusions, and recommends possible courses of action to improve the comprehensive and high quality services that are currently provided.

Procedure

- 2. We began our task by inviting written submissions giving information and views relevant to our terms of reference. The invitation, which gave the membership and terms of reference of the review group and is reproduced in Annex 1, was sent to all staff, including those providing IT services, and research students. The Chairman of the Staff-Student Consultative Committee was asked to gather views from undergraduates.
- 3. Written input was received from some 29 individuals or groups, mainly in the form of email messages; a list of those responding is shown in Annex 2. The comments received gave us a general picture of the state of IT services in the Laboratory from the viewpoints of both those providing them and those receiving them.
- 4. We then arranged a series of interviews to discuss matters arising from the written submissions. As well as representatives of certain research groups and other specific areas of interest, we met Martyn Johnson, as head of the IT Support group, and had a separate meeting with the remaining computer staff¹. We also met the Head of Department, the Deputy Head of Department, the Departmental Secretary and the incoming Chairman of the Teaching Committee. A list of the those interviewed is shown in Annex 3.

Overall view

- 5. Generally, we find that the computer staff are a highly skilled and hard-working group whose services are much appreciated within the Laboratory. Given the challenges of providing computer facilities and services in an academic environment, the Laboratory is one of the best served departments in the University. On the other hand, it would have been surprising not to have found any problems, and these can be summarised as the following issues of strategic importance:
 - The computer staff team has been operating over many years and built up substantial skills. Given that technology continues to change, staff training is an important requirement. Similarly, the staff have developed good facilities, but these too require to be re-thought from time to time.
 - The Laboratory has expanded greatly in recent years, which has created something of a policy vacuum. It is no longer sufficient for the policies of IT Support to be determined through the personal attention of the Head of the Laboratory, together with occasional consultation at the Wednesday meeting and somewhat irregular meetings of consultative groups.
 - The functions of computer staff are two-fold: firstly to maintain and operate, and to some extent develop, core central systems common to the Laboratory as a whole; secondly, to provide expert technical assistance and advice to groups and individuals. Both are important but require different skills and aptitudes.
 - Questions of management and organisational structure have been raised and need to be considered.

¹ The term computer staff is used to cover those who work in the IT Support group; currently one Senior Computer Officer, five Computer Officers, two Computer Associates and one Technician.

- There are cases where commercial off-the-shelf solutions may be more appropriate than the expertly crafted tailor-made systems that are sometimes provided.
- There is a culture gap between the computer staff and some non-academic administrative staff. Ways of improving the support service provided to non-expert computer users need to be developed.

Policy making

Observations

- 6. There is currently no policy-making framework governing the provision of IT Support services. Many of our observations, conclusions and recommendations concern issues that can and should be resolved within such a framework.
- 7. The following problems emerged during our investigations:
 - The IT support team spend much time developing policies under the pressure of day-to-day operations, which creates a tendency for decisions to be technically driven rather than Laboratory driven. Computer staff do their best to balance competing arguments, but they are sometimes not best placed to decide things on their own.
 - There are no clear rules as to what facilities, particularly personal facilities, should be provided to various categories of Laboratory member, be they academic staff, visitors, administrative staff, research students, etc. Nor is it clear who pays for what, and the extent to which anything is centrally funded; there is no obvious budget to support both the necessary capital and recurrent costs. It is also not clear the extent to which services should be funded centrally or charged directly to the client group or individual.
 - The System Coordination Group, which was established some time ago to provide management for IT Support appears to have an idiosyncratic membership and is becoming dysfunctional.

Conclusions

- 8. There is a need to establish an appropriate governance regime for IT Support so that strategic policy issues are considered and determined within the authority of the department as a whole. Such a mechanism must involve senior staff, and should provide appropriate consultative procedures to ensure that policy decisions reflect the needs of teaching, research and other support areas. Some kind of strategy committee is required, with a membership chosen to represent the Laboratory's strategic interests.
- 9. The same governance regime must be concerned with the financial aspects of IT services, deciding who should be provided with what and at whose expense. Services provided as a 'free good' must be budgeted for and controlled like any other basic facility, while charging and payment mechanisms may be appropriate in other circumstances.
- 10. The Laboratory has to adopt various standards, deciding for example what basic IT facilities should be used and supported for various groups of staff and students. Within the constraints of general efficiency, these standards should recognise the different needs of different groups. The determination of such standards must be the business of the governance regime which should both be informed by user needs and advised by IT Support.
- 11. The governance regime must also contain a managerial element; in particular, the head of IT Support must report to someone. We understand that the Laboratory is likely to establish a second Deputy Head of Department. On the assumption that the Head of Department will distribute various areas of responsibility between himself and his deputies, IT Support should be one of those areas. Either the Head or a Deputy Head should personally take responsibility

for IT Support, and should both chair the strategy committee and be line manager to the Head of IT Support

- 12. Overall, the governance regime must respond to the general needs and policies of the Laboratory, while giving guidance and authority to the work of the IT support team. It would be particularly important that the policies developed and adopted are promulgated to the Laboratory as a whole.
- 13. The matter of policy making should not be confused with the need for good user liaison. Appropriately convened working groups might be set up to gather comments and suggestions, and hold discussions with users on matters of mutual concern.
- 14. We therefore recommend:
 - (a) The establishment of an IT Strategy Committee to determine strategic policy including the facilities to be provided, the types of IT systems to be supported and financial policies. Its business would not be highly technical; working groups should be set up to deal with such matters. The membership should be as small as possible consistent with it representing the various needs of the Laboratory; for example, it should include a research student. The Director of the University Computing Service could be offered membership. It is for consideration whether or not this should be a committee of the Computer Science Syndicate.
 - (b) A senior staff member should be delegated by the Head of the Laboratory to act as line manager for the Head of IT Support and to chair the IT Strategy Committee.

Organisation, management and staffing

Observations

- 15. The size of the IT Support team is about right in the context of University departments generally. Indeed, by comparison, their capacity and range of skills are generally higher than are found elsewhere in Cambridge. They enjoyed a close relationship with the University Computing Service before the move to West Cambridge and the Service became a separate department; unfortunately, this is beginning to wane.
- 16. Computer staff have two basic functions: maintenance of core central systems and services, and the provision of expert technical assistance and advice to groups and individuals. The skills are different and, in a larger organisation such as the Department of Engineering, it is possible to divide staff into those *in the back room* and those *on the front desk*. We received evidence of the need to improve and strengthen the front-desk function.
- 17. There are some in the Laboratory who stated a preference for some or all computer staff to be wholly assigned to specific groups (e.g. research groups, teaching, administration, etc). In discussion, it became clear that this was obviously impractical, although many seemed attracted by the idea of a hybrid approach.
- 18. Also related to the previous point is the issue of where computer staff are located, and some wish to return to an arrangement similar to the old Laboratory where of necessity computer staff were scattered around the building.
- 19. It was suggested to us that computer staff might be supplemented by the employment of research student labour especially for front desk activities, but in discussion the idea was generally not favoured.

Conclusions

- 20. There is clearly scope for the Laboratory to be more pro-active in computer staff development. The apparent lack of a training budget discourages take up, as does no formal requirement to consider training within the staff appraisal process. Looking further afield it would be worth someone, say the Head of IT Support with the assistance of the Head of Department, to open up discussions with the Director of the University Computing Service to investigate the possibilities of staff secondments and/or exchanges.
- 21. There is general support for computer staff to be involved either in particular specialties or in development projects as a way of enhancing job satisfaction as well as providing additional benefit to the Laboratory. The expertise of one member in TeX was cited as a good example. The scope for such involvement would necessarily be limited by skills and experience.
- 22. We are convinced that something should be done to improve the front-desk aspect of the IT Support activities, and we suggest some experiments are undertaken. One idea we discussed is to give every staff member an explicit dual role: each would continue to look after their specific area of central activity and thus hone their skills, but they would also spend some time undertaking the front-desk function, perhaps on a rota basis.
- 23. Another idea we offer for consideration, which has some support, is to associate each staff member with one or more of the Laboratory's functional constituencies: e.g. particular research groups, teaching, administration etc. The word *associated* is chosen with care: the staff member would be a point of contact for help and advice in their respective constituency (though people would be free to go directly to others when appropriate). The goal is for each staff member to get to know the activities and requirements of their constituency, and for the constituency to get to know them. The staff member *would not belong* to their constituency and would be fully under the management of IT Support.
- 24. There would be managerial consequences of such an arrangement. It may be appropriate, for example, for a senior member of IT Support to coordinate front-desk activities to ensure quality of service and to monitor personal relationships². In addition, a daily or weekly meeting of all IT Support staff might be a useful device, particularly for ensuring proper cover for holiday and sickness absences. The assignment of staff to constituencies might needs careful matching of interests and skill sets, and staff rotation amongst constituencies may be appropriate but on a long-term basis only. However, it should in principle be possible for any IT professional to provide front-desk support to any constituency.
- 25. If the foregoing is implemented, then the location of computer staff within the building can be reviewed in light of this. Some opposition to distribution was voiced. We feel that one advantage of distribution over centralisation would be to help get staff known by their constituencies; they know their colleagues and will have plenty of opportunities to meet and communicate anyway. However, the benefits or otherwise can only be determined by experiment.
- 26. We therefore recommend:
 - (c) The introduction of modern practices for staff development including the establishment of a training budget, regular appraisal of training needs and the exploration of opportunities for external staff secondment or exchange. Where opportunities arise, individuals should

² We were made aware of a number of instances where either a user or a member of IT Support had not behaved with due respect to another. Intolerant attitudes on either side should never be condoned and require immediate managerial action when they occur.

be given opportunities for developing special interests or be involved with project work consistent with the needs of the Laboratory. Job descriptions should be reviewed with staff in light of any changes.

(d) Consider establishing a scheme whereby every computer staff member is associated with some Laboratory constituency to provide front-desk support. This could be on a trial basis for a period of, say, 12 months The rules of the association should be made explicit, and the scheme should be closely monitored. Consideration should also be given to locating computer staff in proximity with their respective constituencies.

Core service policies

Observations

- 27. More than one person said to us that the Laboratory should as a rule use standard "commodity" systems and facilities, whether purchased commercially or provided by the University Computing Service. It was also suggested that the Laboratory should not develop its own systems except in cases where there was a compelling case to do otherwise.
- 28. This follows a clear trend in IT generally, where it becomes cost-effective to buy complete systems, with their inevitable imperfections and infelicities, rather than use not-inexpensive inhouse resources to tailor make and maintain something nearer to perfection. The lack of proper budgeting exacerbates the situation. The trend, which is already seen in parts of the Laboratory and in IT Support, needs to be more consciously recognised.
- 29. By continuing to maintain tailor-made systems, the Laboratory has tended towards a managed workstation structure. It is clear from the experience of some groups (Security, Systems, Digital Technology, etc.) that this is unsuitable for their research, particularly in the Linux world. Microsoft Windows works well for most people due to it being a commodity product, that has appropriate security features and enables users to install software easily without the intervention of an expert.
- 30. We noted that there are many cases, involving both research and administrative staff, in which facilities for remote working are highly beneficial, and it is clearly important to encourage the provision and use of such systems in appropriate situations, particularly when they can reduce the need for users to have two separate machines, which is not only more costly but can take up valuable space.

Conclusions

- 31. There is a case to move towards packaged systems where maintenance routes and documentation are provided. Microsoft Windows is already popular in the Laboratory and there is a growing movement to Apple Macintosh equipment. In the case of Linux, it would be desirable to minimally customise a distribution (e.g. *Red-Hat* or *SuSe*) to aid management and avoiding too much "black magic" scripting. We observed that some experiments with SuSe were pushing in this direction.
- 32. The accent on system security that comes from a managed workstation structure needs to be considered in more detail. Some people argued to us that it was unnecessary and out-dated. We were advised that an alternative is to operate bulletproof central facilities accessed from relatively insecure machines: flexibility is gained at less central cost. The emergence of NFS version 4 may help with this revised security model.

- 33. We therefore recommend:
 - (e) Further investigation of a more commodity-like Linux configuration, supported by relevant central services, with the goal of reducing concern about local system security and providing more flexibility to those that need it.
 - (f) Microsoft Windows facilities should continue to be supported as they are now, and IT Support should recognise the growth in popularity of Apple Macintosh computers and provide an appropriate level of assistance.

Networking

Observations

- 34. The Laboratory (and the University) generally enjoys good network facilities, but we received many criticisms about the lack of easy connectivity for visitors, conferences etc. Some of the problems stem from the restrictive JANET Acceptable Use Policy, which the University necessarily must follow, but there are now ways round this.
- 35. Along with this is a growing expectation of wireless connectivity, particularly in the context of visitors. The security of wireless networking is, of course, a problem area, but one that is now being tackled.
- 36. Some concern was expressed about the ability of staff to work from home or elsewhere outside the University. We observed that broadband links to homes are often paid for by the Laboratory. Choice of service providers seems ad hoc and the cost on accountancy time appears high. Given the current competitive broadband market, bulk purchase may lower cost and lower account administration time.

Conclusions

- 37. The issues of connectivity and accessibility can and should now be addressed. For example, a leased commercial ADSL or cable line could readily overcome the restrictions of the University and JANET networks, while the installation of wireless access in appropriate areas of the building could be achieved at small cost and very quickly. These measures are already being taken by University departments and colleges to meet similar requirements.
- 38. We therefore recommend:
 - (g) Visitors should be better served by enabling quick and easy connection of laptop computers with the minimum of administration.
 - (h) The facilities available to staff accessing the Laboratory remotely should be reviewed.

Research support

Observations

39. There are a number of issues relating to the support of research students, and other less wellestablished members of staff. Firstly, there needs to be a clearer policy about how their IT systems are funded, as well as the kind of system they have. At the same time there are difficulties in arranging their induction, basically because students have a tendency not to attend induction meetings or read documentation. This will become an even larger issue with the introduction of the new MPhil course and the expansion in the number of research students. 40. Progress has been made in integrating the Digital Technology group following their transfer from the Department of Engineering. Given that they have come from a very different regime, together with the nature of their use of technology, it is not surprising that there have been difficulties. But there is more to do.

Conclusions

- 41. The question of who funds what personal facilities is clearly a policy issue for the new IT Strategy Committee. It would be worth investigating an approach where funding is somehow to the account of the person or the group to which he/she belongs and, at the same time, the decision as to what is provided is also at the choice of the person or group rather than wholly centralised. The policy should keep choices within reasonable limits, and there may need to be some earmarking of funds to ensure provision based on need.
- 42. The use of a central filing system with good back-up facilities was welcomed by many groups, although several groups expressed the need for larger home and group file spaces. The issue may be more financial than technical, and perhaps costs should be apportioned to grants and other budgets to secure the necessary funds.
- 43. Two suggestions were made to us concerning the induction problem. First, more use could be made of informal mentoring. Secondly, more attention should be paid to providing web-based information, so that when some information is needed it is readily and easily available. We return to this later.
- 44. On the matter of Digital Technology, there is a need to review the situation at a high level and to draw up an agreed plan of action with milestones. We suggest that Martyn Johnson and Piete Brooks on the one hand, and one or two senior members of the group, perhaps together a senior member of Systems Research, should meet to start this process.
- 45. We therefore recommend:
 - (i) The IT Strategy Committee, as an early task, determine the policy for the provision and funding of research student systems and other appropriate central facilities.
 - (j) The Laboratory (perhaps initially through discussion at a Wednesday meeting) should consider how to improve the induction process for new staff and research students.
 - (k) A concerted effort should be made to arrive at an agreed position for the support of Digital Technology group.

Teaching support

Observations

- 46. Computer Science Tripos students are provided for by the PWF maintained by the University Computing Service; this appears to be a satisfactory situation. The MPhil course in Natural Language is using donated equipment, and is due for replacement; those planning the new MPhil have yet to make a decision on IT provision.
- 47. Students sometimes need administrative control over a machine, or an unusual configuration, in order to get project work completed.

Conclusions

48. Our conclusions that the Laboratory should have a policy to move towards commodity systems applies even more strongly in the case of teaching.

- 49. We therefore recommend:
 - (1) The Laboratory should seriously consider using the PWF for all teaching, including the old and new MPhil courses. If PWF Linux needs to be changed then collaborative action with the University Computing Service should be sought.

Administration support

Observations

- 50. The Laboratory's administration is caught between the various IT cultures in the Laboratory, and they necessarily have their own culture. This creates particular difficulties since they also provide a support service, and they need good IT support as much, if not more than anyone else.
- 51. We learnt that their various IT systems are not standardised, and they have problems coping with different document formats used across the department. They need help with various administrative application difficulties. An attempt had been made to obtain staff resources to maintain departmental information on the web, but this was lost to IT Support.

Conclusions

- 52. An effort needs to be made to resolve the document standardisation issue. Firstly, serious consideration should be given to see whether, in spite of cultural and emotional views, one or possibly two document standards could be agreed for the whole department. If a standard cannot be achieved, then clear guidance on protocols and procedures must be established.
- 53. There seems no reason why administration computers should not be standardised, and a programme of IT training should be drawn up for all administrative staff. We would also hope that the association of a specific member of IT Support to the administration group would be particularly valuable in establishing a higher level of confidence.
- 54. We therefore recommend:
 - (m) The IT Strategy Committee should consider the issue of the standardisation of document formats.
 - (n) A member of the administration group should be selected to lead a programme to standardise computers, to plan staff training and to improve various applications; technical assistance should be provided by the associated member of IT Support.

Web matters

Observations

- 55. The state of the Laboratory's web site and facilities is universally admitted to be in poor shape. Much is out of date, and facilities are not available to let those who are sources of information update the web site consistently and conveniently.
- 56. Whilst at least one research project has a dedicated machine for this purpose, there is a case for a managed facility available to all.

Conclusions

57. The Laboratory needs to make a concerted effort to enhance its web services. Firstly, someone (not in IT Support) should be appointed as editor-in-chief with a remit to control overall style and to assist information providers to maintain web pages in their respective domains. The Laboratory's Librarian may be an obvious choice for this role. IT Support's role should be

limited to obtaining and maintaining the necessary web content management software and providing documentation about their services.

- 58. We therefore recommend:
 - (o) A web project should be established with an editor-in-chief to control web style, and information providers trained to maintain pages associated with various domains. The project as a whole, including the choice of web authoring software and other web services, should be determined by the IT Strategy Committee.

Other areas of activity

Observations

59. It became clear to us that there is no clear definition of the remit of IT Support. Because the members of the team are generally technically competent and by the nature of their jobs, helpful there is a tendency for them to take on a wider range of duties than might be appropriate. This was probably the result of taking over the new building which, of course, was a major undertaking.

Conclusions

- 60. As technology spreads, new maintenance and configuration challenges arise such as computer driven building services, security or lecture theatre equipment. These new jobs should not fall to IT Support by default. Where these services can be best managed by IT Support (for example, in the case of audio-visual aids), workloads need to be considered and the number of staff may need to be increased.
- 61. We therefore recommend:
 - (p) The assignment of duties to IT Support should be a conscious decision of the IT Strategy Committee.

Conclusion.

62. Finally, we reiterate that we found widespread appreciation of the Laboratory's IT Support, which delivers comprehensive and high-quality services to many people. However there are issues that require to be resolved, services that should be improved and gaps that need attention. The establishment of a more formal governance regime is the key to these matters both now and in the future.

Annex 1 - Call for Input

To: all Computer Laboratory staff and research students

As part of a wider review of the operation of the Computer Laboratory the Head of department has established a group to review the provision of IT support services to staff and students. One purpose of the review is to tackle issues that are the concern of both users and IT support staff.

Members of the Review Group are:

David Hartley (Steward, Clare College) - Chairman David Cottingham (Research Student, CL) Mike Gordon (Professor, CL) Lise Gough (Student Administration, CL) Simon Moore (Senior Lecturer, CL) Roger Stratford (Head of Institution Liaison, University Computing Service)

The group has the following terms of reference:

To review the IT facilities and related services provided in support of teaching, research and administration in the Computer Laboratory, with reference to:

- The needs of staff, students and visitors
- The range of hardware and software facilities (including the Managed Cluster) and the support functions provided, and how these are determined
- The provision, management and structure of staff resources

To consult widely within the Laboratory, including both those receiving support and those providing it.

To report and make recommendations to the Head of the Laboratory.

The Review Group invites you to submit in writing any information or views you hold that are relevant to its terms of reference. This can be as brief as you like; we are not necessarily looking for long essays. We want to know if you have any views or suggestions about the IT support services provided to you or your group. Obviously, if you think something is wrong or should be improved, we should like to know. Equally, if there are matters that are particularly good or valuable, we should like to know that too.

Some of the following bullet points might be relevant to you and help you to frame your input:

- Are you provided with the facilities and support that you need? Tell us what you need that is not provided; tell us about the good things as well as any bad things.
- How should IT support policies be decided? Should there be a formal mechanism to monitor the quality of services? How much should be provided within the department, and how much externally?
- IT facilities and support, both in terms of equipment and manpower, cost money. Do you have any views on how the Laboratory decides how much to spend on what?

Please submit your views, which will be treated in confidence, either electronically to david.hartley@clare.cam.ac.uk or on paper to Lise Gough, Room GC06, William Gates Building.

The Review Group will study all submissions it receives, and will then schedule a series of meetings with appropriate representative groups of members of the Laboratory. They expect to submit their conclusions and recommendations to the Head of the Laboratory before the end of the present academic year. They also hope that their report will be published widely within the department.

David Hartley, Chairman 9 March 2005

Annex 2 - Written submissions

Administration & Support Joint submission

Automated Reasoning Larry Paulson

Natural Language Processing Shahzad Khan Karen Sparck Jones

Rainbow William Billingsley

Mark Grundland Theo Markettos Peter Robinson

Security

Ross Anderson Richard Clayton George Danezis Markus Kuhn Andy Ozment

Opera

Jean Bacon Nathan Dimmock

Networks and Operating Systems Ian Leslie Anil Madhavapeddy Tolga Uzuner

Digital Technology (LCE)

Jonathan Davies Robert Harle Alan Jones Marcelo Pias

CSTIT MPhil Miltiadis Kokkonidis

Staff-Student Consultative Committee Arthur Norman

IT Support Martyn Johnson

Ian Grant Chris Hadley Brian Jones Graham Titmus

Annex 3 - Interviews

Head of Department Andy Hopper

Deputy Head of Department Peter Robinson

Departmental Secretary Margaret Levitt

Teaching Committee Chairman (from October 2005) Neil Dodgson

MPhil Course Coordinator Ted Briscoe

Senior Computer Officer Martyn Johnson

Computer staff

Nick Batterham Piete Brooks Robin Fairbairns Ian Grant Chris Hadley Jiang He Brian Jones Graham Titmus

Networks and Operating Systems Group Ian Pratt

Opera Group Jean Bacon David Eyers Eiko Yoneki Luis Vargas

Security Group Markus Kuhn

Digital Technology Group Jonathan Davies Robert Harle