

Information Services

Information Technology Committee

21 June 2011

E-mail and e-diary in the Cloud

Brief description of the paper

The paper recommends to the Colleges, Support Groups and EUSA moving the University's e-mail and e-diary provision to the cloud service Office 365 provided by Microsoft.

Action requested

For the Colleges, Support Groups and EUSA to indicate whether they wish to proceed to the next stages of implementation by early September 2011

Resource implications

Does the paper have resource implications? Yes

If 'Yes', in which section(s) of the paper are they described? Benefits section

Risk Assessment

Does the paper include a risk analysis? Yes

If 'Yes', in which section(s) of the paper is it set out? Disadvantages

Equality and Diversity

Does the paper have equality and diversity implications? No

Originator of the paper

*Simon Marsden
15/06/2011*

Freedom of information

Can this paper be included in open business? Yes

E-mail & e-diary in the cloud

Recommendation

On the basis of the evaluation, IS would recommend proceeding with the Email in the Cloud project subject to approval from the Colleges, Support Groups and EUSA. The report of the evaluation group is appended to this paper.

The basis for this recommendation is that:

- There are significant cost savings, approx £200k pa, for the University with respect to the three email and one e-diary systems we are currently operating
- The great bulk of users, Windows, Macs, and Thunderbird users on Linux will see very little change
- For those users who use the IMAP features of Staffmail, primarily the Linux community, the range of choice of clients is more limited than at present but reasonable alternatives exist although some features will work in different ways
- The risks associated with outsourcing and potential exit strategies are acceptable
- Reports from other Universities using the Microsoft email in the cloud service, backed up by reports from industry analysts Gartner, show that customers are pleased with the service they receive from Microsoft.

In any proposed change of this scale for a top priority service there are a range of different views as to the relative balance between cost savings, change in functionality, and the risks of using outsourcing. There has been wide consultation through the working group and at a range of committee meetings and briefings. Whilst it has not been possible to achieve complete consensus, it is not because the different views have not been heard and considered; it is simply not realistic to please everyone.

Benefits

The project will save the University around £200k per annum. This saving would be made in IS. After some additional modest support costs during the service transition, costs in Schools and Support Services are expected to be similar to those at present.

The service would provide a **significantly enhanced service for students** with a much improved web based user interface, each student getting a quota increase from 1Gb in the current service up to 25Gb. Students will also get a further 25Gb of file storage with Microsoft Office tools on-line. For staff improvements are less significant; the ability to share/integrate diaries with external collaborators, increased storage - nominally 8Gb to 25Gb, single address list for all users and improved web interface are all welcome but are not compelling in themselves.

Over the past three years IS has been looking to reduce the cost of running its services so as to provide the investment necessary to provide new services eg wiki service, mobile campus, resilient infrastructure, smart cards, university web site, support for Euclid, shared academic timetabling, lecture capture and podcasting, extending the service to accommodate growth in numbers of staff and students as well as new units acquired through mergers, etc. As we face 5% year on year cuts if we are unable to continue to reduce the cost of delivering our existing services we will lose the flexibility to invest in new technologies eg mobile classroom/online meetings, upgrades to the virtual learning environment, desktop software upgrades, research data storage, etc.

Disadvantages

There appear to be two main disadvantages:

1. Change or loss of functionality for some users. The Windows, Mac and Thunderbird users on Linux have identical or similar functionality to at present. For Linux users the diary will only be accessible via the Firefox web browser. Users who do not use Thunderbird, Outlook, Entourage, Mail.app/iCal or the web may have to change the client they use or work around issues where particular functions do not work as at present (or at all). The IS view is that on balance the changes that are required are acceptable when weighed against the benefits. IS also recognises that not all those affected will agree with this weighting of the decision.
2. The risks associated with outsourcing – these fall into different categories:
 - a. risk of not meeting UK/EU data protection legislation where we have assurances from the records management section that the way the Microsoft service is operated meets our legal obligations.
 - b. Risk that Microsoft will not operate the facility to the standard required by the University. Microsoft have reported their availability figures which exceed our targets, they are fully certified to high standards for their security operation, and we are the data controller – not Microsoft – and they do not use our data for market research, advertising, tuning their search engine, etc.
 - c. The risk that Microsoft being a US company will be required by the US government to handover our mail to the government or would be required by the US government to stop the service from sending/delivering mail from US embargoed countries. There is no evidence of this happening and at present there are no restrictions on where the service can be used.
 - d. Our collaborators may choose to not work with us because they may perceive the risk of Microsoft handling the mail as too high. There is no evidence of this being an issue. Microsoft has a number of high profile clients eg Glaxo, Coca Cola, University College London for whom confidentiality and confidence of their collaborators is important and there are no reported problems.

Many of the risks identified above are already being taken by staff who are using cloud services such as dropbox, gmail, blogger, without necessarily applying the appropriate due diligence to evaluation of risk. It was described by one head of school as ‘the genie is already out of the bottle’. This is not to say we should not consider risks around outsourcing, more to recognise that an over controlling approach will not work. Again the IS view is that these risks are very low.

Going Forward

We wish to take a decision as to whether to proceed by early September. It is recognised that this is not ideal timing (over the summer) but we would not wish to hold up progress unduly. To be able to make the decision we require a view from each College Support Group and EUSA. Members of IS will be available to consult with Colleges, Support Groups and EUSA during the period up to the beginning of September in case they would like further explanation or detail information. At the end of this period, we would only proceed to implementation if all seven Colleges, Support Groups and EUSA were in agreement, ie any one unit can veto the decision. If the decision is not to proceed IS will not offer to evaluate any other comparable solutions.

If the decision to proceed is taken, detailed planning for implementation would begin. The working party has highlighted some issues with integration, authentication and spam filtering where there has not been sufficient time to test that what is documented about the service actually works as we expect. These would need to be tested first and assuming that they pass our

tests we would move to start implementation with a small pilot of volunteers probably from IS before moving on to students. Only after a period of prolonged successful running would we start staff migration. Summer 2012 is the earliest this could start. The work required by the School and Support Service IT teams is expected to be a combination of help with planning, communication and supporting users through the transition. IS have already experience of this activity taking some 2,500 users from staffmail to exseed which was a largely trouble free process.

S L Marsden
12/6/2011

Evaluation of Office 365 (formerly Live@edu)

Dave Berry, Working Group Convenor
7th June 2011

Summary

We have investigated what the service would comprise of, what the user experience would be on a range of clients, how we would handle authentication, what options are available for UoE branding, what provision will be available for configuring mail routing and spam handling, and how we can migrate existing mailboxes. We have collected and assessed potential risks regarding outsourcing and user concerns (particularly, though not exclusively, among academics) over loss of control of our data and service availability. We have also discussed with other HEI's regarding their experiences of adopting the service.

From this process we have found three broad user communities within the university with different needs and expectations. For two of these communities, adoption of Office 365 will meet their needs. However, some Staffmail users will lose certain features and may experience problems that affect particular mail clients. No single issue is a show-stopper but the combination of effects needs to be assessed and balanced against the cost savings for the university.

The service

Microsoft are in the process of moving their free service for education, *Live@edu*, onto their new *Office 365* platform. Office 365 is the same infrastructure that Microsoft will use for their commercial customers. This is currently in beta test and forms the basis of our evaluation. Staff and students at the university would have 25GB mailboxes. Students would additionally have free access to 25GB of online storage and online versions of Office applications. Users would connect to the mail service using a desktop mail client, a supported web browser, or a mobile phone or tablet. Their mail addresses will be unchanged.

The system would be integrated with the university's identity management systems, so accounts will continue to be created and taken down automatically as people join or leave the institution. User support and control of the data will remain with the university; Microsoft will provide and maintain the mail server infrastructure.

Our user communities

Most undergraduate students have fairly basic e-mail requirements. Currently, hardly any students use the central e-diary¹. These students tend to use web mail as a primary means of accessing mail. Some postgraduate students (particularly research students) have requirements more similar to Staffmail users.

Staffmail is mostly used by academics and some parts of IS. The system provides a flexible, standards-based e-mail service that is much appreciated by its users. Users can and do use a variety of programs to read their e-mail; probably more than a dozen clients are in active use. A web interface is also provided. Most academics do not use the university e-diary. For Linux users who do use the university e-diary, the open-source Davmail gateway is a vital part of the service.

The Exchange e-mail and e-diary service is mostly used by support groups and some research areas. The system provides an integrated e-mail and e-diary service that is much appreciated by its users. Users tend to use Outlook on Windows and Entourage on Macs. Some people also use

¹ This may change when the new academic timetabling system is deployed, as the new system will put personalised timetables for each student in the central e-diary system.

high-end mobile phones, including those supported by IS, or tablet computers. For many in this group, the university e-diary is an essential tool for collaborative working.

All user representatives stressed that e-mail is at the core of how the university works. Many people spend a large proportion of their working lives using the system.

The existence of these three communities has two main consequences. One is that a move to a single platform has the potential to reduce maintenance and support costs, to provide a common address list, and to simplify integration with other university systems. The other is that it is a challenging goal to provide all three communities with their current level of functionality from a single platform.

Experience of other HEIs

Live@edu is being used by at least 30 UK universities for student mail². A few, including UCL, are rolling it out to staff as well. Many of these institutions had problems with their previous systems, such as restricted mailbox size, multiple incompatible systems, and/or poor spam configuration tools. UoE's existing systems are in much better shape and have evolved to fit our business needs.

We have had detailed conversations with selected universities and general feedback from the broader community. These institutions report that Live@edu is giving a better user experience and lower support costs than their previous systems. All were generally satisfied with the service.

One issue raised from our conversations was the need to manage changes to the service at short notice. Also, support for Linux is a low priority or non-existent for several of these institutions, so we have paid particular attention to this.

User experience

The Office 365 platform is based on Exchange 2010. This is a newer release of Exchange than the version we are currently running on our in-house system. In addition, the online service provides extra features beyond those supplied with the in-house version of Exchange 2010. One new feature is that Office 365 allows users to arrange meetings with other people who use Google Calendar or other iCal servers.

Office 365 has better browser support than our current Exchange service. It supports IE, Firefox, Chrome and Safari. This is not as good as supporting all standards-compliant browsers but does cover the vast majority of browsers in use on the desktop/laptop.

On the desktop, some clients support Exchange via Microsoft-specific protocols: these include Microsoft Outlook on Windows and Macs, and Mail.app/iCal on Macs. Other clients will access Office 365 mail using IMAP. The open-source Davmail system should provide diary access, once it has been updated to the new version of Exchange.

Access via mobile phones and similar devices will be the same or similar to that currently provided by our current Exchange service. Full access will require a phone or device that supports Microsoft's ActiveSync system; other devices may use an IMAP client to access e-mail. Most high-end phones support ActiveSync.

Authentication to the system will be via users' usual UUN and password.³ As at present, people using the supported Windows desktop will not be asked for these credentials. However, anyone accessing the system using an IMAP client will have to enter their UUN and password, unlike their current experience with Staffmail. This will be required when they start an e-mail session

² Microsoft will migrate these universities to Office 365 in due course.

³ A tabular presentation of the authentication experience for different systems can be found at <https://www.wiki.ed.ac.uk/display/ITS063/Authentication+User+Experiences>

and again when they send the first message in any session. Usernames and passwords will be required for the browser as well, instead of the current authentication via EASE.^{4,5}

The Disability Office have reviewed the system. They report that the browser interface is quite good for many disabled users and have given advice regarding its suitability for particular disabilities. Many disabled users may prefer to access the system using Outlook, which has been evaluated previously.

Staffmail users who have set up more complex filters for incoming mail may find that the filtering options on Exchange are more limited or less precise than those available on Staffmail.

Implications for IMAP users

Those users who are unable or unwilling to use an Exchange-aware client will have to read mail from Office 365 using the open IMAP standard. There are long-standing problems with the Exchange implementation of IMAP that affect several mail clients. This will especially affect Linux users, as there are no clients available for Linux that support Exchange via Microsoft-specific protocols. In addition, Exchange does not support all the features of the IMAP standard that are in use on Staffmail.

The Evolution IMAP client seems to encounter fatal problems with large mailboxes. This is a concern even though Evolution isn't officially supported by IS, as this client is provided out-of-the-box with several major Linux distributions, including Ubuntu, Scientific Linux and Fedora. We have also noted some non-fatal but annoying issues when using Office 365 with the IS-supported IMAP clients Thunderbird and Alpine. There is a configuration workaround for Thunderbird but Alpine will display warning messages for every plain text message or any message with an attachment – which taken together implies an error message for most messages. We have not tested all the IMAP clients in use within the university and this list of problems reflects only those we have discovered to date.

Staffmail users will lose support for shared folders and will have to find other ways of achieving the same goals. There are currently over 11,000 shared folders on the Staffmail system.

Possible alternatives include sharing userids and passwords of shared accounts (which is less satisfactory than the current setup), or changing functional accounts to use Unidesk. Other use cases may need as yet unknown approaches.

Although Office 365 allows you to forward a message to another address, you can't redirect a message to look as if it were arriving from the original sender. Support staff currently use this functionality to redirect a request into an appropriate support queue.

Risks of outsourcing

Many people have raised concerns relating to service availability and security of our data. Most of these concerns eventually come back to some form of risk assessment and so we have recorded these issues in a risk register. This section summarises a selection of these risks. Many of these risks were collected by members of the School of Informatics and at the time of writing there remains disagreement between these members of staff and some IS staff about the severity of certain risks.

1. One risk is that the timing of system upgrades is in the hands of Microsoft. If an upgrade were to lead to downtime, or were to accidentally break support for certain IMAP clients or certain combinations of browser and OS, this could impact the work of the university. Currently we can schedule all service upgrades to occur at relatively safe periods.

⁴ Microsoft are working on an implementation of Shibboleth for Office 365. If and when this is deployed, people using browsers will be able to access the system via EASE again.

⁵ Many users may go against university's policy and store passwords in local preference settings and will therefore experience no challenge, whereas in fact their client or browser is simply hiding it.

2. Other UK universities have told us that Microsoft have given little warning when before service upgrades and that they have had to rush to update integration scripts or user documentation.
3. IS aim for our “priority one” services to deliver an uptime of 99.9% or higher. Microsoft have given us a figure for the availability of their current service (Live@edu) that meets this criteria. The Office 365 service will be based on their commercial infrastructure, which is backed with a financial SLA for their paying customers, although we note that some outages have occurred in North America recently on the previous version of their commercial infrastructure.
4. Several staff raised concerns about the security of data stored in Microsoft’s data centres. In response to this concern, Microsoft assure us that their data centres have been certified according to several industry standards for data security. They are serving millions of users and we are not aware of any security breaches of Microsoft’s data centres. IS note that our own infrastructure is also at risk of being hacked and that the major risk lies more with end user machines.
5. With regards to data protection legislation, the university will remain the data owner and the Records Management office believe that we will be able to discharge our responsibilities.
6. Microsoft, as a USA corporation, is bound by certain USA laws. The USA government could, as part of a criminal or terrorism investigation, ask Microsoft to hand over data related to that case without telling the university. Currently, university systems are bound by similar arrangements with the UK government, so the additional risk covers requests that the USA government might make without asking the UK government for support. Intelligence agencies already have other methods for obtaining data.
7. The USA government maintains a list of embargoed countries, which currently comprises Sudan, Syria, Iran, North Korea and Cuba. This has restricted the ability of some USA companies to offer services to people in those countries. We envisage that the university, rather than Microsoft, will be the service provider for end users, and that these regulations have not caused problems for any existing customers. Other UK universities are using the service without reporting problems. However, the university should take advice on this issue.
8. Schools or individuals may decide that the Office 365 service does not meet their specific needs and opt to use a different e-mail service. This could lead to a fragmented public image for the university and possible confusion as to when someone was speaking in an official or personal capacity.
9. Microsoft may, in the future, decide to withdraw their service or to start charging for it. A Gartner analysis suggests that this is unlikely to happen in the next five years, while Google and Microsoft compete for market share. If it does happen, then the cost may still be less than the current service. In the meantime, the university will have had the benefit of the free service before the charge is introduced, modulo the cost of migration.

Support

User support will continue to be provided by IS. Issues requiring changes to spam filtering and whitelisting will continue to be implemented by IS, as will requests to investigate the mail logs in order to confirm whether a message was successfully delivered.

If issues arise with the service provided by Microsoft, IS will raise support calls with Microsoft.

Branding

Office 365 does not currently support institutional branding. Users can choose themes to customise the appearance but there is no mechanism for an institution to apply a default brand. Microsoft say that this may be added later but were unable to give details.

A test instance of Live@edu, the current Microsoft service, allowed us to brand the web screens for mail and diary with UoE logo and colours and to customise the menus to replace Microsoft links with University-specific links. The web screens for the online Office applications and other Microsoft tools retained the Microsoft branding.

Infrastructure

We would expect to keep our in-house mail relays, mailing list service (Sympa) and reliable mail submission service. These are small, standalone services. IS would need to install new servers to integrate our provisioning and authentication systems with Office 365.

Whitelisting and spam management would be provided by Microsoft's *Forefront Online Protection for Exchange*, which is the same service that they sell to commercial clients. The documentation for this service suggests that it should provide an adequate service, although this is hard to judge because the internal structure of the service is opaque. The university would need to try this in practice, with a real mail workflow, in order to judge its performance. It would not be as configurable as our custom-built systems.

Migration

Microsoft provide tools for migrating mailboxes and diaries from Exchange servers and mailboxes from IMAP servers such as Staffmail and SMS. For Staffmail users, IS will have to prepare migration scripts to integrate mail folders from Staffmail and diary folders from Exchange. The migration process will be automated for e-mail and diaries. Users will have to manually import contacts/address books, and re-enter filters/rules and other personal configuration.

These tools need more investigation before we commit to them. We are aware of one bug that loses the dates of mail imported via IMAP. Some problems have been reported from other institutions.

Based on our experience with the EXSEED project, IS should be able to migrate users in batches, each migration running over a weekend. This would need to be confirmed based on actual experiments. Support effort will be required to set up the migrations and to resolve any problems.

One option would be to migrate a pilot group of staff before the rest, for a test period. Microsoft provide a facility that allows diaries to be shared between outsourced and in-house users, which would aid such a pilot. This facility would require the installation of a minimal Exchange 2010 server on our infrastructure and the effort to do this would need to be taken into account.

Dependencies

Office 365 will have to finish beta testing before we can adopt it as a "production" mail and diary service.

Outlook 2003, as currently deployed on the university supported desktop, is not compatible with Exchange 2010. The version of Outlook will be updated by the Windows 7 project. Therefore Windows users will need to be migrated to Windows 7 before they can be migrated to Office 365.

People who do not use the supported desktop will need to check that they have compatible clients and/or browsers installed.

Linux users will only be able to access the Office 365 diary via the browser until the open-source DavMail project has been fully updated to be compatible with Exchange 2010. An experimental version of DavMail is available but does not yet implement the full functionality.

Analysis

In order to assess the suitability of the service for the university, the following questions must be considered.

1. Is the functionality acceptable?

For most Windows and Mac users, and most students, the functionality provided by Office 365 is clearly acceptable. With the extra Microsoft tools as well, most students will probably receive a better service than our current provision.

IMAP users will need to authenticate access to the service via their username and password and will face lose support for some features. The lack of support for shared folders is the most problematic of these and the working group has not been able to assess the full impact of this change.

2. Are the level of availability and range of client support acceptable?

The general level of availability for Office 365 is similar to our current systems. The range of supported browsers covers the vast majority of those in use. Obviously the Outlook desktop client will be well supported and so will Apple clients.

Support for other mail clients is a significant concern. As noted above, we encountered problems with all three of the IMAP clients that we tested. This will affect Linux users in particular, although people currently use these clients (particularly Thunderbird) on other systems as well. There is also a risk that Microsoft might deploy a change to the service that accidentally affects some of these mail clients.

3. Are the risks of outsourcing acceptable?

IS are satisfied with Microsoft's provisions for data security. In practice, the weakest link in the security chain is likely to be users who make mistakes. It seems unlikely that demands from the USA government will impact the university's ability to provide a service.

Although the general availability of the service is generally good, outages do occur and we will have little control over the timing of upgrades.

There remains an internal risk that schools or users might switch to an alternate service. This could lead to institution-wide branding problems for the university.

Recommendations

Office 365 should provide a good service to the current users of the Exchange e-mail and e-diary service, to undergraduates and taught postgraduates. Staffmail users who do not use shared folders and who are willing to use Outlook on Windows, Apple's applications on Macs, or high-end mobile phones are also likely to be satisfied.

However, the working group has serious concerns about the implications for other staff. The lack of certain features in the Exchange implementation of the IMAP standard, combined with deviations from the standard that affect IMAP clients, will cause a reduction in quality of service for many members of staff.

On a technical level, it would be possible to outsource some users to Office 365 and leave others on in-house systems. This would not reduce IS costs as much as migrating all services and would have to be assessed in that light.

If ITC, the colleges and support units decide that the benefits of the savings outweigh the impact to services, the working group recommend the following actions.

- IS should create a minimal prototype system in order to test the integration of our provisioning and authentication systems, interaction with ed.ac.uk and other forwarding domains, spam and other filtering, and migration tools.
- IS should test other IMAP clients, raising support calls to Microsoft for any problems found.

- IS should undertake a detailed review of the terms and conditions. The university should also seek confirmation that we will not be affected by embargoes imposed by the USA government.
- IS should undertake a final acceptance test after the Office 365 system comes out of beta and the integration test described above has completed.

Appendix: Project outputs

The record of the evaluation can be found on the project web site⁶. This record includes the following:

- Reports of discussions with other universities.
- Test results for mail clients⁷
- A description of the elements of the current UoE mail infrastructure
- The options for authentication and provisioning, including their effect on user experience
- A record of formal Q&A with MS
- Risk register⁸

⁶ <https://www.wiki.ed.ac.uk/display/ITS063/Live+Edu++Project+%28ITS063%29>

⁷ <https://www.wiki.ed.ac.uk/display/ITS063/Revised+test+scripts>

⁸ <https://www.wiki.ed.ac.uk/display/ITS063/Risk+Register>