



NC State University

**Evaluation of Student Email Services:
Options for the Future**

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March 2009

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Evaluation of Student Email Services: Options for the Future

Executive Summary

Task Force Charge

- Evaluate current student email services
- Determine best path for supporting current and future student needs
- Consider closely-related IT services and possible improvements
- Identify ways to reduce costs and improve services

Options Evaluated

- Enhancement of existing Cyrus system
- Forward-only service
- Outsourcing to Zimbra (a Yahoo company)
- Outsourcing to Microsoft
- Outsourcing to Google

Recommendations

- Migrate student email services to Google Apps Education Edition.
 - Email services would be improved
 - Cost savings of at least \$60,800 per year are anticipated if student email is hosted offsite by Google. Additional savings could eventually be achieved if campus reduced www4 file space and had students use Google Sites.
 - Additional tools would be available to students with little if any additional support needed
 - Support from the vendor of the service would be acceptable
 - Some administrative/support functionality (like detailed logs and multiple tools) would be lost, but is acceptable
- Create an implementation team to continue working on the initiative that includes key OIT staff and significant representation from the current task force.
 - More extensive piloting is needed.
 - There are many policy and process issues needing further consideration as part of an implementation process.
 - Continuing the communication with students and other campus stakeholders is critical.
 - Extension of a migration to Google Apps Education Edition to the faculty/staff population should be considered and would result in significant cost savings.

Introduction

Task Force Charge & Composition

In October 2008 NC State CIO Marc Hoit launched a student email initiative for NC State. He appointed a task force to evaluate the current student email services provided by the Office of Information Technology (OIT) and make recommendations about how best to provide these services to meet current and future student needs. The charge also included considering other closely related opportunities that might improve IT services for students, while ideally also reducing the costs compared with providing the current student email services. Specifically, the committee was tasked with considering at minimum the following options:

- Continuing the current Cyrus email environment with possible enhancements for increased storage and an improved interface
- Moving to an external host provider
- No longer providing mail service for students, but instead providing a forwarding service that uses an ncsu.edu address to point to students' off-campus email accounts.

The student email task force had representation from staff that currently provide and support our current email system as well as many campus stakeholders for the services. The task force met weekly and smaller working groups were convened to gather and analyze data and other needed information. (See appendix A for a list of task force members.)

Rationale for the Student Email Initiative

In discussing this initiative with various campus groups, the following question was posed several times: "Why are we providing email to students as a service?" The task force offers the following in response to that question, and to clarify the rationale for this initiative.

- Email is now an official form of communication that the university uses to conduct business with students. As such, the Unity email address provided by the university has been designated as the only email address to be used for official university communication. The university needs to provide email service to students to ensure that campus departments, faculty and staff can send and receive email to and from students with a high level of confidence that the information has been successfully delivered while easily identifying the student as being associated with the university.
- In addition to being used for conducting business with students, email is also part of an ever-expanding set of collaborative tools used by students, faculty and staff for academics. Unlike U.S. postal mail, the use of which is typically one-way to provide static information, email is used for on-going communication among students, and between students and the departments and individual faculty and staff that teach and serve those students. The university is well served in providing email to students to ensure maximum effectiveness of this tool.
- There is a need to find economic efficiencies - not only as a good business practice, but particularly in light of the current budget crisis.
- While the current email service is highly reliable and well-supported, without modifications it no longer meets current needs.
 - Students find the quota to be much too small.
 - The web client interface lacks some functionality and ease of use that is more standard in other email systems that students use.
 - Students want and need (and often seek through off-campus services) a broader suite of integrated tools that allow them to collaborate with other students. These include easy-to-use calendaring, collaborative document sharing/editing, instant messaging, web site creation/hosting and other tools that allow students to meet their educational goals.

Overview of External Options

The leading vendor products that provide hosted email and collaborative tool services in the higher education arena are Google Apps Education Edition, Microsoft Live@edu (Hotmail and Exchange Labs, recently rebranded as "Outlook Live"), and the Zimbra Collaboration Suite. Cisco is developing a collaborative suite that includes the PostPath email product; however, it does not have a business model in place that makes it a viable service option at this time.

A review of Gartner research provided an overview of the major vendors' offerings and a number of case studies of schools migrating to hosted services. Gartner also provided a useful review of the pros and cons of moving student mail to a forwarding only service.

Evaluation Process

The task force attempted to be open and collaborative about the process throughout its evaluation. Members established a web site, available at <http://oit.ncsu.edu/student-email-initiative> to document relevant information. A significant goal was to get as much student feedback as possible in the given amount of time for the study.

Several teams were formed to share the work load and leverage the expertise of various task force members. In addition to the members noted below, the task force consulted with other individuals from campus and involved them in the various groups and projects.

- Benchmarking of Other Institutions
 - Nick Young, Rick Liston, Tim Lowman, Stan North Martin
- Stakeholder Feedback
 - Leslie Dare, Chris Coggin, Sarah Noell, Jason Maners
- Product Reviews
 - Cyrus Environment: Tim Lowman, Jeff Anderson
 - Other Products: Stan North Martin, Justin Davies, Jeff Anderson, Rick Liston, Jason Maners

Peer Benchmarking Summary

As part of the research into which vendor solutions may be successful at NC State, the task force looked at several other institutions that either had or were planning to implement a hosted student email solution.

- UC Davis moved 30,000 student accounts from an in-house Cyrus service to Google Apps in 2008. East Carolina University is in the process of moving their student accounts to Microsoft's Live@edu Exchange Labs solution. Nick Young used an extensive set of questions to talk with these campuses to gather as much information as possible about their planning, implementation and ongoing support. UC Davis provided a very comprehensive set of information, which is included in appendix B.
- UNC-Greensboro implemented Google Apps for all of their students more than a year ago, and is working to move faculty and staff in the near future.
- Other institutions task force members gathered data from were:
 - Appalachian State University (Gmail)
 - Boston College (plan to move to forwarding only service)
 - Eastern Michigan University (Zimbra through third-party hosting service)
 - Guilford College (Google Apps)
 - Indiana University (Google Apps and Microsoft Live@edu)
 - Kansas State University (Zimbra)
 - UNC Chapel Hill (considering Live@edu/Exchange Labs)

- UNC Pembroke (Microsoft Live@edu/Exchange Labs)
- UNC Wilmington (staying with on-premises Exchange solution)
- University of Florida (in process of implementing Google Apps)
- University of Virginia (Google Apps and Microsoft Live@edu)
- University of Southern California (Google Apps)
- University of Wisconsin-Madison (staying with on-premises SunOne solution)

This benchmarking provided a starting point from which to work out whether NC State could employ similar solutions, or if we had a more unique set of requirements. In nearly all cases, other institutions had already examined the concerns the task force were considering, whether related to security, legal, technical, or policy issues. How those concerns were addressed varied somewhat, but generally the experiences among schools implementing the same solutions were similar. The peer reviews provided valuable information to the task force, allowing it to examine issues that are not localized to our campus.

Stakeholder Feedback

The backgrounds of the task force members were varied and individually each brought a unique perspective that help inform the process. The group also sought the opinions of a variety of campus constituents to broaden the discussion including students, faculty, university departments and technical support staff.

Students

- **E 115 Focus Group**

A formal focus group consisting of 6 TAs for the E115 - Introduction to Computing Environments course was conducted on Nov. 25, 2008. As the first focus group of students, topics of conversation focused on current likes and dislikes of the email system and their thoughts on other options. No direct mentions of outside vendors or outsourcing were made until the students posed questions about such options.

- More storage space was paramount to these students. Several of the focus group members forward their email for the simple fact of storage space.
- Students felt the current environment was reliable and well run.
- All students maintained multiple email accounts and kept personal and school/work materials separate between accounts.
- All students saw the need for not just a web client but also ubiquitous access across various platforms including fat clients (Outlook, Thunderbird, Mail, etc) and other mobile devices (iPhone and Blackberry were specifically mentioned). The students also identified that not everyone will like any one web interface but that if given the choice for multiple access methods a user should be able to find one that they like to use.
- When posed with the idea of Free/Busy search or shared calendar, all students expressed the usefulness for such tools especially with the ever-increasing group work in courses. The students identified how it would be easier to schedule group meetings, resources, etc. if a common system were in place.
- The final issue this group of students identified was the importance of spam and virus protection along with reliable delivery of email.

- **Graduate Student Association**

Working with the leadership of the University Graduate Student Association, Rick Liston solicited feedback from UGSA representatives who in turn shared the request with their constituents. The UGSA president received numerous responses. A compilation of more than 20 open-ended responses was provided to the task force.

- The biggest complaint was about lack of storage space.
- A number of students did not like the forwarding only option but others felt there should always be an option to forward email to another provider.
- There was reluctance on the part of some students for the University to outsource email service due to privacy concerns, access and reliability.

- Others were in favor of outsourcing, with most being interested in Google, primarily for the added space and a few of the extra features like calendaring and collaborative tools.
- **Facebook**
A Facebook Group was created to garner feedback and provide a communication path to students and others interested in the student email initiative. Membership was limited to the NC State network on the social networking site and included students, faculty, and staff.
 - 115 members joined the group.
 - Several responses and opinions were generated but did not result in substantive dialogue on a great scale.
 - Opinions varied from "total outsource" to "NCSU has lots of smart people we should do it ourselves."
 - The number one resounding comment was increasing storage space.
- **Inter Residence Council**
An informal Q&A / focus group with the approximately 40 students at the Feb. 5, 2009, IRC meeting reiterated what the task force had already heard in terms of the need for more file space and an improved web interface than the current system provided.
Other salient observations:
 - About two-thirds use an online calendar for scheduling
 - Many were interested in keeping their NCSU email address long-term
 - Many were frustrated with having to login to multiple areas of the NC State web environment, e.g. portal, email, WRAPped sites, etc.
 - They expressed strong interest in having existing email moved to any new service rather than starting from scratch or having to move it themselves
 - Probably 90% said they forwarded their mail to another service. Most were doing this via webmail (sieve) rules with varying degrees of success. Many fewer were aware of the USMDB forwarding tool
 - Even with as much forwarding as they claimed to do, the students were overwhelmingly opposed to moving to a forwarding only service.
 - Overall there was a definite preference for the campus to move to Google for student email over Exchange Labs. However, it should also be noted that IRC--like a number of other student organizations--makes extensive use of Google Apps' calendar and collaborative tools for its organization.
- **Student Forum**
Microsoft and Google representatives provided an overview of their hosted solutions at this two-hour event on Feb. 16, 2009. There were 21 students and several staff in attendance.
 - Participants tended to be more technically-inclined.
 - Because students were generally less familiar with the Microsoft offering, they asked more questions about it than Google. In general, there was much stronger support for Google Apps over Microsoft Exchange Labs.
 - Following the presentations, participants completed an online survey. Sixteen turned in responses. See appendix C for results.
- **Pilot Testing of Google and Microsoft Services**
The task force worked with Microsoft and Google representatives to set up test environments of the companies' hosted services. They made available a limited number of pilot test accounts for campus users to try out Microsoft Live@edu/Exchange Labs and Google Apps Education Edition and provide feedback to the task force.

Pre-Pilot Questionnaire

As part of signing up for the pilot test accounts most users were asked questions about how they used their current account, whether they forward to another account, the method they use to access their NCSU email, and what features they believed they would be interested in using as part of an email package.

- Of the 275 responses, 95% used their accounts for NCSU purposes, and 49% said they used

their accounts for personal communication.

- All but two respondents indicated they use more than one email account.
- 82% said they used a web client to access their NCSU email, 45% said they used a desktop client, and 32% said they used a mobile device.
- The majority of respondents said they were interested in large mailbox storage size, integrated calendar, global address book, and collaborative document sharing.
- See appendix D for additional details.

Post-Pilot Questionnaire of Google Apps and Microsoft Exchange Labs

After users were given pilot accounts to test Google's or Microsoft's offerings, they were asked to complete a brief survey.

- 70 Microsoft pilot users and 149 Google pilot users responded.
- Users were asked to rate the service from 1-10 with 10 being the highest. The average rating of Google Apps was 8.91 with a standard deviation of 1.77. The average rating of Exchange Labs was 6.11 with a standard deviation of 2.66.
- Overwhelmingly, the response from the Google users was more positive than the feedback about Exchange Labs.
- Exchange Labs had many more criticisms of its service, most commonly surrounding its cross platform compatibility issues.
- See appendix E for a more detailed summary of results.

• **Online Web Forum**

As part of the student email initiative web site, the task force set up a web forum where campus users could post their questions, thoughts and concerns about the initiative. The web site and forum were publicized through various announcements including articles in *Technician*, promotion in classes and email messages including a posting in The Howl, the student email list run by the student body president. Students and staff posted to the forum more than 80 times with a mix of ideas and opinions the task force took into consideration as part of its deliberations.

• **WolfWeb**

Members also used the WolfWeb bulletin board service to create discussion about student email. One thread began following initial articles in *Technician* about the initiative and another thread helped promote the Student Email Forum. The thread about the student forum generated 25+ posts. In general this communication avenue served to promote interest and discussion more than generating significant feedback about what the university should do.

• **Anecdotal**

Most members of the task force had opportunities to discuss this initiative with students in a variety of venues. Overall, there was more support for Google Apps over Microsoft Exchange Labs.

Faculty

- Task force membership included a representative from the Faculty Senate and several of the task force members are or have been instructors. Additionally, many task force members spoke informally with other faculty on campus to gather input. A theme that continues to echo from previous years is that students be provided with a standard campus email address that can be used for easy contact, including via tools such as the university's learning management systems. A close second in importance would seem to be that students be able and encouraged to send mail using their ncsu.edu address so it can be easily distinguished from other mail. More than one faculty member also mentioned the perceived benefits of all students having access to a set of online collaborative tools like the vendors provide. There is a strong interest among some staff and faculty to also have access to these tools and services. This theme was also evident when talking with representatives from other campuses.

University Departments

- **Alumni Affairs**

Alumni Affairs currently provides a free email forwarding service for alumni through a third-party vendor that is in the form of "user-selected-name@alumni.ncsu.edu." They are very interested in partnering to provide a full email service for their constituents. There has been a steady increase in the use of the current service. Alumni Affairs receives an average of 2-3 help requests per day related to the forwarding service. If a different tertiary domain is used, they would prefer it not include reference to the school mascot. I.e. not wolfsack.ncsu.edu or something like that since there is already a great deal of confusion between the Alumni Association, the Wolfpack Club and the Annual Fund.

- **DELTA**

The primary concern for distance education students would be to have a consistent email address affiliated with NC State. For some distance learners there is concern that email associated with external providers may be blocked by their employers. I.e. some can not access Gmail, Yahoo or Hotmail accounts from work. While this is likely handled by domain names rather than IP addresses, it is unknown whether some might have difficulties accessing NCSU services that are hosted by these providers.

- **Office of Student Conduct**

Currently this office uses email log files, content and attachments for threat assessment and to process judicial cases (an estimated 30-40 cases utilize this information per semester). It is anticipated that the need for access to email information will become increasingly important for the work of the Behavior Intervention Team. If outsourcing results in no longer having access to this information, then this office's ability to complete those tasks would be hampered.

- **Registration & Records**

This office's primary issue related to student email is to ensure that privacy blocks can be properly put into place to ensure that aspect of FERPA compliance. I.e. when populating global address lists, there needs to be a method in place to prevent displaying the information of students who have requested their directory information not be available. This office is well aware of the need to not include FERPA-protected information in email, but to instead use it to inform students how to access that information securely. This is a message that continues to need to be relayed throughout campus whether or not student email is outsourced.

Tech Support

- **Help Desk**

The NC State Help Desk had concerns about outsourcing email from the perspective of support tools and expectations. Currently, given that OIT has total control of the email infrastructure, tools can be (and have been) developed that allow front-line support folks access to a lot of information about email accounts, servers, status, etc. Access to these tools means that the Help Desk can quickly resolve many problems, and the fear is that this would be lost if the service was outsourced. There was also a general worry about what support would be expected of the Help Desk, both from the vendor and from campus, and what training and documentation would be available to provide that support.

- **Systems**

The overall concern is the change from the current operating paradigm. This includes loss of backups, loss of control (ability to do upgrades) and loss of logs. There are also potential issues that would need to be resolved related to an outsourced model meshing with existing systems and account provisioning.

- **Security**

The primary issues the OIT Security group has with moving from the current environment to an outsourced model relate to access to detailed log files to be able to trace and track down security-

related issues. None of the hosted providers have as rich a set of tools or provide as unfettered access as having the system in-house. Based on initial product reviews, it appears that Microsoft provides a greater set of access tools and APIs than do Google or Zimbra hosted services. There have been additional tools made available by Google in recent months, with the promise of more on the way. However, they will never be able to fully replace what is currently available since OIT has complete control of the current environment.

- **University IT Committee & Academic IT Directors**

Members of the UITC have generally been supportive of exploring the feasibility of outsourcing student email. Some would encourage taking the further step of moving to a forward-only service, while others expressed interest in Google's or Microsoft's features. Some have raised privacy concerns, particularly for graduate students performing research or if the service were extended to faculty and staff. There has been no formal poll of either constituency; however, the AITD representative on the task force endorses the decision to go with Google Apps.

Product Review

To help evaluate the outsource providers the task force developed an extensive questionnaire that included items across a number of categories. A subgroup of the task force along with representatives from OIT Security & Compliance and the Internal Audit Division met with the vendors via web/teleconference to review the products and respond to the questionnaire. Members conducted an internal review session to complete the questionnaire for the campus Cyrus offering, using the presumption that the service would be upgraded to provide at least 1GB of mail store quota.

Information below for the services is a brief summary. Responses to the questionnaire were put into a matrix which is available as appendix F

After initial investigations of the options, the task force set up test environments for Google Apps and Microsoft Live@edu Exchange Labs. Ultimately there were 288 accounts provisioned on the Google pilot environment and 195 provisioned for the Microsoft pilot. Additionally, following a new release, a second Microsoft pilot was set up. A few task force members tested the latest release.

Mail Forwarding

The student email task force investigated the option of discontinuing current student email service and providing only a university email address which would automatically forward mail to an account of their choosing. The forwarding option could provide the following advantages:

- Students would be able to select what email service they wanted their mail to go to; possibly one they already have (comfort, ease of use) and one they use regularly.
- The University could still use a standardized email address ending in '@ncsu.edu' or '@something.ncsu.edu'.
- Email can continue to be an official means of communication, but it would take the University out of the email business, thus providing cost savings.

Unfortunately, however attractive in terms of potential cost savings, the forwarding option has the following drawbacks:

- No single point of responsibility; no way to know about and/or have any impact on down time (varies per vendor), uncertain reliability,
- Not being able to determine whether or how students set their "from" addresses (could and would they setup to use their 'ncsu' address?),
- Would still require university IT support and hardware (mail relays) likely similar to having a vendor provide a no-cost hosted solution,
- The expectation on the campus community's part would still be some level of service or support.

This could be much more difficult when the university support community has no control over the service chosen.

- Does not provide the value add-ons that could be provided to students with a hosted solution. If the university provides collaborative tools and other value add-ons in addition to email, the forwarding option provides no easy way to integrate mail with the tools, potentially fragmenting the service offerings.
- Security concerns (tracking, investigation of misconduct or potential threats, etc.) would be heightened significantly.
- Spam concerns for campus mail relays and 'ncsu' domain. Even if mail is run through NC State's mail relays with spam controls, the university is at the discretion of the service providers if they choose to block mail. The university would have less control over influencing other providers to accept mail from the ncsu.edu domain.
- Lack of potential integration with other campus systems (portals, learning management systems)

Based on the findings above, the task force decided that the forward only option was not one of our top choices and thus removed it from consideration.

Zimbra

While the application is well developed and used on many major university campuses, Zimbra is a relative newcomer to the hosted email service provider offerings for universities and their students. Zimbra has primarily offered on-premises solutions to universities or through third-party hosted services running the Zimbra software.

When the task force first spoke with Zimbra, they had five solutions from which to choose, with a noticeable bias toward their two on-premises offerings. The task force focused on one of the three hosted services models they offer.

- The first hosted solution was free, but it did not provide the functionality the campus needs. It was aimed more at alumni.
 - Ads were turned on by default
 - Yahoo co-branding with limited University branding
 - Very limited mobile support
 - Support via the web only
- The next tier was a hosted model that initially listed at \$2 user/year and included the following features among others
 - 7 GB of mail storage with POP and IMAP support
 - iCal and CalDAV compliant calendar
 - Strong integrated web client
 - Document/file storage and sharing environment
 - No advertising
 - University branding available with more limited Yahoo branding
 - More privacy controls available
 - 24*7 support & web support
 - Uptime SLA of 99.9%
- The third tier hosted solution was aimed at university employees or businesses and listed at \$35 user/year.

Zimbra was removed from consideration because of the per user cost, the less comprehensive set of collaborative tools and value add-ons it offered and its lack of any significant track record offering its hosted solution. It should be noted that Zimbra did come back after our initial interview and offer the ad-free \$2 model for no charge. By this time, however, the task force had determined that while Zimbra had some attractive offerings and would likely compete very well as an on-premises solution for faculty and staff, the task force was comfortable with having removed them from consideration for the other reasons mentioned above.

Cyrus Email

The Cyrus-based service, probably better known as the Unity email system, has been provided on campus for many years. Carnegie Mellon University developed the project and released it as open source. The Systems group implemented a webmail interface to the service in the late 1990s. The service has proved to be very stable and many tools and utilities have been created on campus or adapted from elsewhere to support the service and related infrastructure.

- **Email**

The current default mail store is 50MB. Campus users can allocate additional amounts of available user quota up to 250MB total and additional space can be purchased. In the last fiscal year OIT purchased storage that would enable default quota sizes of at least 1GB. The service is compatible with IMAP-capable email clients.

- **Filtering**

Advanced server-based (sieve) filters are available. Also the use of the Sophos Pure Message package allows for the successful filtering of viruses and spam.

- **Webmail interface**

Currently uses SquirrelMail, an entirely HTML-based client. While a very stable client and one that works well across a wide variety of browsers, it does not provide similar functionality as modern web mail clients do that students use on a regular basis. E.g. advanced search functions and rendering of html-embedded messages.

- **Administration**

Because of the open source and in-house nature of the Cyrus email product, NC State system administrators and help-desk staff have vast access to information contained within the system. This allows for a great level of support for users.

Cyrus, while a robust system that is currently well-known and offers great administrative access and control, did not have the future path that the task force felt an out-sourced solution could provide. Looking at simply increasing email storage—far and away the number one complaint users have with the current system—the associated costs to bring a user to 5GB of quota (even considering a significant over-subscription) would be substantial, and likely unrealistic at a time when resources are even more constrained. Even if the webmail interface was improved as many students requested, the current service would not add the potential value to the educational experience that calendaring, document collaboration, chat, etc. can provide.

Microsoft's Live@edu Exchange Labs

Microsoft along with Google is one of the leaders in providing hosted email solutions for higher education. Microsoft first offered their Hotmail and Live tools and more recently added Exchange Labs to the offering. In February Microsoft upgraded the Exchange Labs service and re-branded it as Outlook Live. Because the Exchange Labs version of the mail service is based on the Exchange Server and the offering provides additional features and more file space, the task force chose to test this service rather than the Hotmail version of Live@edu service.

- **Email**

Provides 10GB of mail/attachment storage, now expandable by 500MB each month as user gets close to their limit. Supports IMAP, though it was not at all intuitive to set up this interface. Supports MAPI use with Outlook 2007.

- **Calendar**

Integrated into email interface. “Premium” version of Outlook Web Access is fairly customizable. Recommended local client is Outlook 2007.

- **Platform / Browser Compatibility**

The latest versions of Internet Explorer allows display of the “Premium” interface. All other

browsers tested display a "Light" interface which provides significantly fewer configuration options. E.g. the only view of the calendar is via day at a time, mail headers can not be viewed. Despite the promise from Microsoft for Release Candidate 3 (RC3) to solve these issues, the RC3 test domain the campus was provided did not resolve this issue.

- **Storage and Collaboration Tools**

Provides a variety of distinct tools

- Office Live/ Live Docs "stores 1000+ documents." Offline/online document synchronization (not a completely online interface)
- SkyDrive storage provides 25GB of storage space for any file type. Can set up folders to share with others.
- Mesh provides a way to synchronize files on multiple devices automatically through their Mesh service (including mobile devices) with 5GB of storage.

- **Chat**

Live Messenger is not integrated into email interface, but accessible to users with a Windows Live ID. The client supports PC to PC voice calling. Can be used with other chat clients like Pidgin.

- **Global Address List**

Can be provisioned via LDAP or Active Directory

- **Administration**

Basic operations for adding individual users and distribution lists is performed via the web interface. Batch processes were possible through Windows Vista-based PowerShell or downloaded executables.

If Microsoft Live@edu/Exchange Labs were adopted, it would hold the possibility of integrating the hosted service with an on-campus Exchange implementation, allowing integrated calendar searching and address books. This was seen as a possible next-generation solution for faculty & staff.

If adopted as a full-scale model, the university would need to invest in Microsoft's Identity Lifecycle Manager (ILM) to provision and manage accounts. This additional software would also necessitate running MS Server and MS SQL instances. It is unclear whether this could be run in a virtual environment.

Google Apps Education Edition

In terms of number of schools and volume, Google Apps appears to be the leader in providing hosted solutions for higher ed institutions. Their service offering is currently not as extensive as Microsoft's though it is more closely integrated.

- **Email**

The service currently provides 7+GB of storage and increases daily. Supports both secure IMAP and secure POP access. Also supports HTTPS access via the web browser for enhanced security.

- **Calendar**

A domain-level calendar is offered that allows users to schedule appointments with other users as well as schedule resources. Individuals can select the level of access others have to see the details of their schedule or just a simple free/busy search.

- **Platform / Browser Compatibility**

Google's offering appears to be "platform agnostic," working equally well for Windows, Macintosh, and Linux/Unix systems. The fully supported browsers include recent versions of Internet Explorer, Firefox, Safari and Chrome. Other browsers with JavaScript support appear to work equally well. Browser support is slightly different for the different features beyond email in the

Google Apps suite though the most popular browsers across platforms are fully supported.

- **Storage and Collaboration Tools**
 - Google Apps offers users the ability to share documents and have multiple users simultaneously update them, entirely within the browser environment, without the requirement of having MS Office or any other application installed.
 - Google Sites allows users to create custom websites using the Google Site creator and share access with teams or publicly. Sites allows for the embedding of calendars, documents, and other resources. It also allows the ability to attach files for sharing as well.
- **Chat**

Users can instant message with other users from within the Gmail interface or use the Google Talk client. Also allows voice and video chat. Uses the open XMPP protocol so can be integrated with third-party clients such as Pidgin or iChat.
- **Global Contact List**

Google Apps provides the ability to allow for a Global Contact List for all users within a domain. Currently either all or no users in the domain are included, though Google says it is working on a solution to provide an opt-out mechanism to comply with privacy block requests. Users can specify and create their own contacts in addition to the global list.
- **Calendar & Contact Synchronization:** Google Apps has recently announced a beta service for synchronizing calendar and contacts with various mobile devices (including cell phones and computer based fat clients) using various pieces of technology including the licensed Active Sync technology from Microsoft. For a complete support device list visit: <http://www.google.com/sync>.
- **Administration**

Managed through a centralized web-based console or via APIs. Tools are available for single-sign on if chosen (via SAML), user provisioning and management, email migration as well as reporting.

If Google Apps was chosen as the service provider, no additional hardware or software should be needed to provision, manage or support accounts. Google provides a number of resources to assist with the migration process. Staff would need to develop additional tools via the provided APIs.

Summary Comparison of Microsoft and Google Options

Microsoft presented a number of strong features that in several cases were well beyond Google's offering. However, the overall implementation and support for the product fell significantly short of expectations. Initial setup administration of the pilot service proved to be a little easier with Microsoft than with Google to setup, though the process of creating Microsoft test user accounts was problematic. This was due in part to some built-in settings preventing accounts from having the same passwords, display names, or usernames. Account creation and management was much easier with Google. Attempts to migrate existing mail to a Microsoft test account via IMAP failed, apparently due to system timeouts. Similar migrations to Google were easily accomplished.

Browser and cross-platform compatibility are still being worked out for Microsoft, with the current implementation still quite restricted on non-Internet Explorer browsers, which are used heavily at NC State. This was a significant concern of the task force.

Team members and a number of testers noted that the various tools in the Live suite appeared to be created in a vacuum and sometimes overlapped, rather than as part of a cohesive suite. Some users complained about the difficulty of using them and navigating among them.

Pilot testing also showed significant flaws with Microsoft's spam and virus filters compared with Google and the current Cyrus system. Many users had a significant number of false positives once

junk mail filtering was activated, including from many campus accounts. In at least one case up to a third of mail marked as junk was valid email. Testing also showed several messages containing viruses were not blocked but instead delivered to the inbox. Google handled spam and virus testing much more effectively.

While not a major concern of the task force, some of the Live@edu tools such as the SkyDrive pages would still include advertising since they are part of the general MS Live interface. Advertising is not a part of the integrated email and calendar Exchange Labs interface. No advertising is included within Google Apps Education Edition.

Every school contacted that had or were in the process of implementing Live@edu shared significant complaints about the level of support needed and provided during and following implementation. Microsoft representatives told the task force this had been remedied recently through an improved support infrastructure, though stories continue to surface about the difficulty in getting issues resolved. While no migration went flawlessly, representatives from schools working with Google overwhelmingly had more positive experiences working with them.

In order to fully implement the administrative and support environment of Live@edu, new hardware and software would be needed. No additional hardware is anticipated if Google is selected.

Cost of Current Email Service and Potential Savings

Background

The task force acquired data regarding the costs of running the campus Cyrus system from the Data/Messaging group within ComTech which maintained the system and also consulted with the ISO Provisioning and Systems & Hosted Services groups. The committee looked primarily at the costs for hardware and software of running the existing system.

While there should be opportunity to reallocate a portion of the approximately one FTE of systems personnel resources dedicated to maintaining the Cyrus and webmail services if student email is outsourced, the specific amount would be largely dependent upon the ultimate implementation path of the project. However, at least a portion of this FTE could be allocated to other responsibilities.

Cyrus Cost Estimates

When we are able to follow a 3-year server replacement cycle NC State spends approximately \$235,870 per year on the Cyrus email system including mail relays (which are also used for other campus mail services). This system currently provides service to students as well as a portion of the faculty and staff of the university. These costs break down as follows:

Item	Cost	Amortized Yearly Cost (3-year lifecycle)
Email Servers (37 total @ average of \$7,500 each, including maintenance) - 12 IMAP servers - 8 Web frontend servers - 16 Mail relay servers (serve more than just Cyrus) - 1 Pure Message DB server	\$277,500	\$92,500
Storage (currently 6TB @ \$3,300 per year)	\$19,800	\$19,800
Pure Message License	\$123,570	\$123,570
Totals:	\$420,870	\$235,870

Other Considerations and Potential Savings

While evaluating potential savings in moving student email to a hosted environment, several factors must be considered in order to adequately calculate those potential savings:

- The current campus email and calendaring solution for most faculty and staff is Novell GroupWise, which requires per-user licensing and significant hardware to support.
- There are currently about 7,000 faculty and staff accounts on Cyrus that were not initially accounted for in the current costs of shifting Oracle/Cyrus users to the WolfWise/GroupWise environment. Shifting those users to GroupWise will result in increased licensing costs of \$31,545 (annually) for the GroupWise system, thereby diminishing potential savings in shifting student email to a hosted solution.
- The above server calculations are based on a three-year lifecycle. Lengthening that to a four or five year replacement cycle will result in increased savings.
- For students to maintain an @ncsu.edu address (rather than an @<something>.ncsu.edu address), the campus will need to maintain several more email relay servers than if all student email were routed directly to the host provider. Students (and faculty/staff) clearly prefer to have an address without a tertiary domain.
- Even if outsourced student email was not routed through campus mail relays, the university would need to maintain some relays in addition to those fronting the GroupWise service to provide service for mailing lists, mail aliases and mail routing from other campus machines. This will also require them being tied into a spam and virus filtering solution.

Given these wide variety of factors, the committee looked at several multi-faceted options for making changes to the current Cyrus system, including two options for increasing the storage quota for the existing Cyrus system. The spreadsheet which outlines and explains each of these options is available as appendix G.

Assuming a four-year hardware replacement cycle, the migration of all faculty and staff accounts to WolfWise, and the maintenance of all mail relays, the estimated annual cost savings would be about \$60,800. If the mail relays were reduced from 12 to 4, an estimated additional \$15,600 could be saved annually plus a portion of an FTE dedicated to maintaining the mail relays could be reallocated.

Recommendations of the Task Force

Outsource to Google Apps Education Edition

Overview

In the early phases of the task force's work, it was determined that simply significantly increasing storage capacity of the email system was not enough to label the initiative a success, particularly due to the additional cost this would present. Due to the value associated with offering email to students, we sought to look for ways to add to the education experience and opportunity here on campus.

It is our recommendation that NC State's Office of Information Technology proceed with the implementation of Google Apps Education Edition for our students. The components of Google's service offering match up with what the task force evaluated as the most important factors for students – email storage space, ubiquitous access, online collaboration, and full-featured calendaring. While other products such as Microsoft's Live@edu service or Zimbra offered similar options and features, it was the maturity, relative stability, support, and greater ease of implementation that made Google stand out.

At this stage the task force does not anticipate any additional hardware or software costs in migrating to the Google option. The primary costs in moving to this new solution would be in the form of personnel resources, which we assume would be absorbed by the current personnel dedicated to the existing Cyrus system. Beyond the initial implementation phase, there should not be any significant

increase in the amount of Help Desk support needed for this solution, while at the same time it will provide significant additional functionality for our primary constituency. In time, additional cost savings in storage and web servers could be seen if students' www4 web space was transitioned to Google Sites.

Concerns and Considerations

By recommending an outsourced solution, there are a number of concerns and considerations that will have to be addressed during the implementation stages. Several of these will require development of new tools or changes in policy.

- **Accessibility**

The primary function of the task force was to consider ways to improve student email and clearly any solution needs to be accessible. The standard web-based version of Gmail is very difficult to navigate with screen reading software. There is a basic HTML version of Gmail though it is more limited in its functionality. Likely a much better solution is to use another client such as Outlook or Thunderbird to access Google email via IMAP. The same holds true for the calendar and chat features of Google Apps; using other clients can provide a fully-functional accessible alternative. There is a concern about the accessibility of the Google Apps tools for mobility impaired users or those utilizing screen reading software. Investigation into solutions or implementation strategies will need to be considered. Further conversations with other campuses that have already implemented Google Apps may prove fruitful. Google reports that the Documents interface is now usable via a keyboard, using a limited number of browsers and screen readers that support [ARIA](#).

- **Legal Requests for Information**

When a subpoena is presented, these requests would be directed towards Google as the provider of the email service. Depending on the terms of the contract, NC State would likely not have any interaction as the discovery agent.

- **Institutional Requests for Information**

In the case of the Office of Student Conduct, there are instances where requests are made to OIT security administrators to have access to email between students as evidence in reference to cases of cheating or harassment, or in cases of potential threat to themselves or the campus community. Currently, if a student uses an off campus email service, Student Conduct cannot gain access to that information. To accommodate this there will either need to be a change in policy or incorporation of tools using the OAuth authorization protocol that Google has implemented. Guidelines for accessing this information would continue to follow the Computer Use Regulation, but additional guidelines and protocols may need to be developed.

- **Security & Privacy Concerns**

University Legal has reviewed the current Google Apps Education Edition terms and conditions. There are a number of concerns that will need to be addressed and negotiated with Google if the recommendation moves forward. That said, many other campuses, including several UNC schools, have successfully negotiated acceptable contracts with Google. The task force feels confident based on conversations with other campuses and with Google representatives that campus security and privacy concerns can be addressed.

- **Utilization by Faculty/Staff**

In an effort to interact on a more collaborative level with students, many faculty and staff will want to have accounts within the Google domain. Accounts can be created for all faculty and staff and some services and features can be disabled on a per user basis. This would allow Faculty to collaborate on documents, share calendars, or chat with students but allow their email to be provided through another service such as WolfWise to abide with campus records retention needs. This could also have the potential to provide a transition point should the decision be made to migrate faculty and staff to Google.

- **Role as Student and Employee**
There are many members of the campus community who have roles as both students and university employees. These people should likely be given both a full Google Apps and a WolfWise account. Processes will need to be implemented to determine which is the primary account. E.g. if the person is a permanent employee, the WolfWise account may serve as the primary, whereas those with temp positions may have their student accounts serve as their primary contact.
- **Culture**
There is clearly a difference in the culture of Google compared with many other vendors. A significant example of this is their habit of rolling out minor upgrades and tweaks on a regular basis--usually about every two weeks--rather than a new release on a more limited basis. This strategy can serve to ease training by allowing new features to be learned and integrated gradually, though it can also keep support staff on their toes with what new feature will be released. The positive side is that new innovations are always coming out.
- **Preparing for change**
Beyond making a recommendation on a path forward, a significant value of the work of the task force was to prepare the campus for the possibility of a change. This work will continue to be critical should the decision be made to move forward with outsourcing student email.
- **Exit strategy**
The campus would need to develop an exit strategy if and when there's a decision to discontinue the relationship with the outsource provider. Consideration of this should also be included in the contract.

Implementation

Implementation Team

The implementation team should be comprised of members from Systems, Data/Messaging, Identity & Access Management, Security, the Help Desk and Outreach, Communications & Consulting within OIT. The feeling of the task force is that the implementation team should also include many of the current committee members to provide continuity and progress in the implementation as well as providing a diverse representation of the campus constituents. It may be worth having several working groups responsible for different aspects of the implementation, led by an oversight group.

In addition, the committee feels that other stakeholders will continue to need to be consulted regularly throughout the process in order to ensure that their needs and interests are also considered. Specifically, the committee has identified the following groups that will need to be consulted during the implementation planning process:

- DELTA
- Enrollment Management (Admissions, Financial Aid, Registration & Records)
- University Cashier's Office
- Alumni Affairs
- Office of Student Conduct & the Behavior Intervention Team
- Faculty Senate
- Other co-curricular organizations such as Student Government, the Libraries, Career Center, etc.

Timeline and Rollout

The committee recommends that rollout and implementation to Google Apps for student email begin in late fall 2009 or early spring 2010. The suggested timeline attempts to take into consideration that accounts are already being provisioned for incoming Fall students, Freshman orientation occurs in

July, and some of the technical staff that would need to be involved in the project are currently tied up in the migration from Oracle/Cyrus to WolfWise for faculty and staff accounts.

- Tentative timeline for rollout would be:
 - Spring 2009 - Flesh out implementation project plan, pursue contract agreement, and begin work to resolve business process issues.
 - Summer 2009 - Continue working through business process issues, development of scripts for provisioning, authentication, and support
 - Fall 2009 – Broader pilot environment enabled to allow automated provisioning, with possible test group(s) migrating. Extensive publicity. New accounts for students beginning in spring 2010 are provisioned in Google.
 - January 2010 - All new students who began in fall 2009 migrated to the Google system.
 - February 2010 – All students can begin optionally converting to the Google system; final preparations for full conversion/migration.
 - May 2010 – All migrations from Cyrus to Google to be completed
- This timeline will provide adequate timing to ensure:
 - Proper communication to students and other stakeholders
 - Support staff education and training
 - Establishment of appropriate policy and implementation procedures for the new system
 - Consideration and planning for potential changes to existing services and business processes
 - Resolution of Google domain issues (aliases, forwards, etc.)

Other Considerations

Another implementation consideration which arose in committee discussions was the potential of Google as an ultimate migration point for faculty and staff email. As referenced in the costs of the current system section of this document, the committee noticed that potential savings for eliminating the Cyrus system are potentially diminished by the operating and licensing costs of the GroupWise environment. While this committee is primarily charged with assessment and improvement recommendations of the current student email system, it is hard to avoid the fact that much greater campus financial savings would be realized by migrating faculty and staff email to Google – a solution which would also provide the campus with a truly unified and cost-effective calendaring system.

Appendix A: Members of Student Email Task Force

Chris Coggin	Student Representative, Associate Webmaster	Student Government
Chris King	Assistant Director, Help Desk Services	Technology Support Services
Jason Maners	Coordinator of Student Owned Computing	College of Engineering-ITECS
Jeff Anderson	Operations & Systems Specialist	Communication Technologies / Infrastructure, Systems & Operations
Justin Daves	AITD Representative, Director of IT	College of Humanities & Social Sciences -
Leslie Dare	Director	Student Affairs-Distance Education & Tech Services
Nick Young	Technology Support Specialist	Outreach, Communications & Consulting
Rick Liston	Asst Dean for Operations & Fiscal Affairs	Graduate School
Sarah Noell (co-chair)	Asst. Director	Outreach, Communications & Consulting
Sharon Ferguson-Broere	Asst. Director, DE Admin Services	DELTA
Stan North Martin (co-chair)	Director	Outreach, Communications & Consulting
Tim Lowman	Operations & Systems Specialist	Infrastructure, Systems & Operations
Tom Honeycutt	Faculty Senate Representative, Associate Professor	Computer Science

Appendix B: Peer Benchmark - UC Davis

Author: Nick Young 3/17/2009 5:24:40 PM

Peer Contact information

- University of California, Davis
- PM Name: Name: Gaston De Ferrari
- PM Email: gdeferrari@ucdavis.edu
- PM Phone: 530-754-6277
- Com. Mgr: Caren Weintraub
- URL: <http://vpiet.ucdavis.edu/student.email.cfm>
- Solution: Google Apps for Education
(www.google.com/apps/intl/en/terms/user_terms.html)

Planning questions

- **What was the existing service that you wanted to replace/update?**
 - Cyrus Email Service
 - They offered email only as a central service (No IM, Forum, Apps etc)
- **How long had the existing service been in place?**
 - They had just updated the 'Cyrus' interface between May and August 2007, but had been running Cyrus as their student email solution for a very long time. Details here: <http://vpiet.ucdavis.edu/email.storage.cfm>
 - Existing servers that they had color coded were migrated to Cyrus, while Exchange Server accounts and departmental servers were left in place. This was just for employee email, not for students (although some students may have had accounts in individual departments out on campus somewhere).
 - Students were on "Geckomail"
- **When did you begin the planning/investigation/research process for this project?**
 - April 2006 was the true start of thinking about the project, whereas January 2007 was the start of the actual vetting and planning process with Microsoft and Google.
- **What were the initial reasons for your assessment/implementation of a new service?**
 - *The electronic messaging landscape is changing as many students come to universities with their own e-mail accounts through providers such as Microsoft, Google or Yahoo.*
 - *An increasing percentage of students forward their university e-mail to these accounts.*

- *Simultaneously, universities are challenged to provide the rich feature sets provided by these companies and are struggling with the increased costs associated with higher storage volumes, virus protection, and spam filtering.*
- *Outsourcing student e-mail may provide a more economical method of addressing these challenges.*
- *“About the Gmail Pilot: Two years ago, the campus began exploring alternatives to the current Web email program with the goal being to find an email option for students that would provide a rich set of features. After reviewing a number of possible email alternatives, the decision was made to take a closer look at Google's Gmail. As a result, the campus provided the opportunity for a group of students to help determine if Gmail is the right choice for UC Davis. Roughly 300 graduate and undergraduate students from a variety of class standings, colleges and majors participated in the pilot. Students were randomly selected through the campus computing accounts database and were asked to complete two surveys about their experience using the service. Based on the endorsements and/or support from ASUCD, Alumni Relations, development officers in academic departments, the 300+ students who participated in the pilot and the broader community through the vetting process pursuant to PPM 200-45, the campus released a final recommendation in July to roll out Gmail during the fall 2008 quarter.”*

Stakeholders

- **Define the stakeholders of the project / recipients of the prospective service**
 - All Undergraduates (23,500)
 - All Graduate Students (7,000)
 - Total Population: 30,500 (2007 Statistics)
 - * *There are no current plans to migrate faculty and staff email at this time (October 2008).*
- **How did each stakeholder group feel about the existing service?**
 - They did NOT like Cyrus for their email. Although it worked (kind of), it was not up to par with other external offerings. It did not have integrated calendar, IM, documents, forums etc. Almost all students wanted a change.
 - The only groups that did not seem to be on board, were the more technical crowd of faculty/staff and their students who just wanted to stay the same.
- **What were the suggestions/requirements of the stakeholders?**
 - Provide a richer set of collaborative tools for student messaging needs
 - Provide closer linkage to other student communications services (cell phones, IM, etc.)
 - Reduce duplication of services for users that already forward e-mail
 - Reduce costs and complexity of campus data center infrastructure
 - Lifetime accounts were already offered, but they just had to forward their mail upon graduation. This was a necessary feature for the solution that would be chosen.

- Both desktop and web clients were necessary, and although Google only offered POP at the time of the pilot program, it was a very nice bonus when they gave IMAP availability to the students as well.
- IMAP/POP access using fat clients was necessary to meet the needs of accessibility requirements.
- What would an ideal system provide to them?
 - Integrated services for communicating.
- What reservations do they have about moving to a new service?
 - Nearly all students were very willing to move to a new service, especially Google, which many of them already had accounts with.
- **How did you gather data from the stakeholders to discover their expectations / requirements / satisfaction level?**
 - Online surveys, focus groups, open forums
 - All of the above
- **Were any groups opposed to the possibility of a change in service?**
 - How did you deal with those concerns?
 - Listened to them, gave them a forum to express their concerns, and communicated with them along the way.
- **Endorsements came from:**
 - The Deans' Technology Council
 - The Technology Infrastructure Forum
 - Campus counsel
 - The Campus Council for Information Technology
 - An ad hoc committee of campus privacy specialists including: Jeanne Wilson, Director, Student Judicial Affairs; Anna Orlowski, Health System Counsel; Robert Loessberg-Zahl, Assistant Executive Vice Chancellor; Ahmad Hakim-Elahi, Director, Sponsored Programs, Office of Research (also Acting Director, IRB); Steve Drown, Campus Counsel; and Robert Ono, IET Security Coordinator
 - UC Office of the President
 - The campus technical community through the vetting process pursuant to PPM 200-45
 - The Gmail Pilot Advisory group including: Janet Gong, Student Affairs; Paul Drobney, Student Affairs; Lisa Lapin, University Communications; Julia Ann Easley, University Communications; Ravi Deepak, ASUCD; Kareem Salem, ASUCD; Anna Pruitt, graduate student
 - The Gmail Advisory group including: Julia Ann Easley, University Communications; James Butler, School of Law; Neil Freese, Alumni Relations; Randal Larson-Maynard, Office of the University Registrar; Christopher Dietrich, ASUCD; Rebecca Schwartz, ASUCD

- ASUCD
- Graduate School of Management
- Cal Aggie Alumni Association
- University Relations
- University Communications
- Student Affairs
- College of Engineering
- Technical Support Coordinators
- Students

Legal, privacy, policy issues

- What were your pre-requisites for privacy issues? (FERPA, HIPAA etc). What were your pre-requisites for other legal or institutional policy issues? Did any vendors not meet any of these prerequisites?
 - These concerns and requirements were largely already addressed in existing policies and documentation about best practices. The policies simply had to be re-communicated to the stakeholders, and sometimes augmented to include the new language about the outsourced location of email storage. This did not change their policies, just because they use Google now.
 - Policy and contract negotiation took almost a year to complete to UC Davis' requirements.
- **From UC Davis' Documentation**
 - *"As required by federal law and university policy, the university will not share personally identifiable confidential information with Google or any other third parties. An ad hoc privacy committee at UC Davis also reviewed the Google agreement, and found no concerns that prevent using the service here. Students will have to agree to terms of service that will remind them of best practices and campus policy regarding e-mail. A copy of the terms can be found at gmail.ucdavis.edu."*

Miscellaneous prerequisites & features

- **Integration with existing systems and services?**
 - *The switch over to Gmail from Geckomail will be a relatively simple one, de Ferrari said. Continuing students will not need to change their e-mail addresses and can still have messages forwarded to any desired e-mail, just as before. Users will also use their campus Kerberos username and password to log on," de Ferrari said. "So there is no need to learn a new e-mail address, a username, or password." The only thing that continuing users will be required to do is register*

for Gmail. However, de Ferrari said that the process is very straightforward. Students will access the computing accounts page to register for the service, de Ferrari (Project manager) said. The process takes about five minutes. Ninety-three percent of Gmail pilot users that responded to the survey found the process to be easy to follow."

- **Securing and synchronizing passwords to outsourced account to match on campus systems**
 - System in place: Kerberos
 - How does the synchronizing occur? If Any?
 - Script runs through their existing system that the student can use to manage their passwords and accounts. This same system manages the creation and decommissioning of accounts.
- Bandwidth concerns? (due to shifting some traffic off campus)
 - Not a concern
- **Are there any Data retention / archiving / account size issues?**
 - 7Gb storage for Gmail account
 - 10.5Gb for Google Sites
 - Any archiving/data retention issues?
 - This was not a concern for student email accounts, however it may be in the future when a possible employee migration to Google Apps is looked at.
- **How to deal with changes to account settings**
 - Currently, students are not allowed/able to change their email address. The official statement on the UC Davis documentation is that *"This functionality is not available at this point."*
 - Students that graduate and return are able to use the same account.
 - Students who graduate and return as a staff member are not able to use the DavisMail (Gmail) account as their employee email address. The Faculty/Staff Gmail project is considered "Phase Two" and is being investigated currently, as to whether Gmail will be an effective solution for employees as well.
- **Transitioning from student -> staff -> alumni possible? (Keep same address or get new one?)**
 - Students who graduate will keep their account. No change is necessary or possible (refer to the first bullet point above). The only change is that advertising (google ads) will begin to display just like a non-UC Davis Gmail account would operate for anyone else in the world.
- Domain Names / Sub-Domains possible / Different ones for each stakeholder?
 - This is possible with Google, and they allow infinite sub-domains, but UC Davis is not using this, due to the management overhead being too high. They do acknowledge that some departments want to have certain sub-domains for their students in their own programs, but the central office is not allowing yet. It may

be offered in future, but not until the administrative overhead can be kept to an acceptable level.

- Is there any Integrated address book / central contacts system?
 - No
 - This is the main request from students at the moment, and they are investigating how to provide it. More than likely it will be a non-Google solution, as the institution already has a 'list' of all the accounts, but just needs to put them online or in an address book that can be accessed using the Google API.

Vendors

- **At what stage did you begin to talk to vendors?**
 - Early on, before January, MS and Google met with the university and very high levels to discuss the project.
- **How did you choose and subsequently eliminate vendors from the bidding process?**
 - Which vendors did you approach initially?
 - MS and Google
 - Which vendors were brought in to demonstrate/pitch their products in more detail?
 - MS and Google
 - 1 hour presentation to students and anyone who wanted to come
 - 45 minute discussion followed the presentations (they were done back to back on the same day)
 - How many bake-offs (if any) did you accommodate?
 - Both on the same day.
 - MS seemed to talk about the future and more flashy services that weren't available yet.
 - Google did more in depth presentation on what was already available, and the end-user experience. This seemed to win over the students/audience a lot more than the MS presentation.
- **What kind of support do they provide?**
 - Pre-implementation, during implementation, post-implementation?
 - They have a representative, an Admin Control Panel that provides a call number and PIN# that randomly change, so that only customers can get upper tiered support. They have been very happy with the support so far, and mostly get a same-day turn around on issues.
 - Support for technical administrators, end-users?
 - For email issues, UC Davis Helpdesk fields questions
 - For Google Apps issues, they direct them to the Google help documents and services.
 - Phone support / Online documentation / professional development or training workshops?

- Not much training needed due to the interface that is familiar to most users anyway
- **Agreement / Contract?**
 - The agreement gives UC Davis exclusive control of UC Davis e-mail accounts, and lets the campus back out of the relationship at any time. UC Davis is the first campus in the system to adopt Gmail.

Implementation

- **When did you begin the implementation of the new service?**
 - Pilot program: November 2007 through April 2008.
 - Pilot approved: April 10th, 2008
 - Final Implementation: 2nd Week of October -> December
- **How much time after beginning the implementation was the service available for use?**
 - Immediate during each migration period.
 - An email was sent to the accounts as they were completed to let the user know that their mailbox was fully migrated to Google.
- **Services / Features Implemented**
 - **DavisMail**
 - Almost 7 gigabytes of storage
 - Continue to use your same UC Davis email address
 - Search capacities
 - Increased spam protection
 - Access email from your cell phone, BlackBerry or other mobile device
 - Email forwarding
 - Keeps track of your contacts for you
 - **UC Davis Start Page**
 - Access online services and campus related information
 - Customize to add fun and useful content
 - Home of Google calendar
 - **Google Calendar**
 - View your whole schedule
 - Create different calendars and share with friends, family, student groups, clubs, and sports teams
 - **Google Talk**
 - Switch easily between instant messaging and email
 - Make voice calls through your computer

- **Google Docs**
 - Create, share, store, and publish online documents, spreadsheets, and presentations on a Web-based application
- **Google Sites**
 - 10.5 GB of storage space to create multiple sites with multiple pages
Ideal for a team to collaborate and have a single place to collect information in the form of text, videos, presentations, attachments, calendars, etc.
- **Was there a service interruption during the implementation of the new service?**
 - Only during the individual's mailbox migration (they are moving everyone's mail to Google for them)
- **How did you move the stakeholders into the new service?**
 - Graduate School of Management and Law School Week 1 (October 6-10)
Seniors Week 2 (October 13-17)
Juniors Week 3 (October 20-24)
Sophomores & Freshmen Week 4 (October 27-31) *
Graduate Students Week 5 (November 3-7)
 - Who decided who went first?
 - Smaller sized group first (management school), then the groups in order after that.
- **Did you need to training users on the new service?**
 - An FAQ site was developed, and is listed in Appendix A at the end of this document (based on the North Western FAQ page)
 - Not much training needed due to the interface that is familiar to most users anyway
- **What were the true implementation costs to get the service up and running?**
 - Hardware, software, staffing cycles?
 - No additional hardware
 - No additional staff.
 - They are migrating 1800-2000 accounts per day, from which they get an average of 10 (ten) support calls. Most of these calls have to do with IMAP/POP fat client issues, not the actual Google apps software.

Post-implementation

- What features did you concede or not implement because of the choice of vendor/solution?
 - None conceded, mostly added (Google Docs etc, when they roll out new services)
- How do you manage 'up-time' and disaster recovery issues?
 - Real-time monitoring?

- They maintain logs of calls about each issue type and where it came from to analyze the effectiveness of the solution.
- Do you manage backups for the new service?
 - Not required.
- How do you manage & schedule upgrades or outages?
 - Not required

Looking back, looking forward

- How are you measuring improvements to services that were replaced or upgraded?
 - Every 3 months, they will create benchmark data based on support calls, issue types, request origin, so that they can compare each quarter, as well as year to year.
- **Was it cost effective?**
 - Google is providing this service at no cost to the university.
 - How are you measuring cost-effectiveness?
 - Constant communication with students/stakeholders about their experience and satisfaction.
- **Do you have a project plan publicly available?**
 - <http://davismail.ucdavis.edu>
- **What plans do you have for the future of this service?**
 - **What is the life-expectancy of this solution?:**
 - *“The University of California Office of the President signed a systemwide, seven-year, Gmail contract with Google, which is providing the service at no cost to the university. The agreement gives UC Davis exclusive control of UC Davis email accounts, and lets the campus back out of the relationship at any time. Davis is the first campus in the system to adopt Gmail.”*
 - **What is the timeline for reexamining this service?**
 - 7 year contract, will be examined in the lead up to that ‘expiration’ date
 - Do you have exit strategies for migrating to a future solution, and if so, did that affect your choice of solution?
 - Too far in future at this stage to investigate
- **What is the overall impression from the stakeholders?**
 - **Pilot program...**

More than 300 graduates and undergraduates participated in the six-week pilot, which included two surveys. Both received high response rates (73 and 82 percent, respectively). Each survey asked the students if they would recommend the UC Davis Gmail service to their friends; more than 90 percent said they would after the first survey, and that number grew to just shy of 94 percent at the end of the pilot. In a comments section, one student wrote, “the storage space is excellent, the search mechanism in which I can quickly find specific emails is convenient, the chat feature is interesting, and the simple format is visually appealing.” On April 10, the Senate of the Associated Students of the University

of California Davis unanimously approved a resolution "recommending the implementation of the UC Davis Gmail program."

- **Final implementation...**
300 students participated in a pilot study conducted by the campus's Information and Educational Technology last winter. After using the Gmail system, 94 percent of the students said they would recommend the new UC Davis service, powered by Google, to their friends.
- What did you wish you asked before you implemented it? What would you have changed if you could do it all over again?
 - Wished they had a better, more documented project plan to manage something of this scope. They figured it out as they went along, and this caused some problems, but not any they couldn't overcome or correct at the time.
- **Did you blog or document this project's timeline and milestones? Are they publicly available?**
 - <http://davismail.ucdavis.edu/>
- Google can provide marketing materials to the campus to promote the solution
 - They created a project page on UC Davis' website, as well as a face-book page to get the word out, and to grow support and interest in the stakeholder community.

Best Quote:

“This project was 90% communication and 10% technology.”

Their explanation: They believed that it was important to the success of the project that they gained grass roots support from the student newspaper and many other student groups before launching anything. Those groups then helped market the project and make it a successful enterprise.

The [original version](#) of this document also includes the DavisMail FAQ Website.

Appendix C: Student Email Forum Evaluation Results

February 16, 2009

Limitations of This Data

1. Participants were self-selected.
2. The total number of participants was 16, which is not representative.
3. While the results may spark some relevant discussion for the Task Force, the data can not be extrapolated to the entire campus population, or even a sub-set of the student population. The results are still very informative, especially in that they are very similar to other student feedback, but are not generalizable to the full student population.

Summary – Email Features & Functionality

1. All but one feature were rated as at least "somewhat important" or higher.
2. The "lifetime email address w/NC State" was rated as "somewhat unimportant."

Summary – Cyrus Unity Email

1. Majority of respondents say they don't have enough space for files and email.
2. Majority of respondents are forwarding Unity email to Gmail.

Summary – Google Apps

1. Most respondents anticipate very little difficulty if switched to Gmail.
2. Respondents like the clean and open design of Google solutions, and are already familiar with the products.
3. Concerns include IMAP translations and privacy.

Summary – Microsoft Live @EDU Exchange Labs

1. Respondents are mixed in their ability to switch to MS.
2. Respondents like the interactive features, Mesh and SkyDesign.
3. Concerns include incompatibility with Unix, cluttered design

Summary – Other

1. Respondents support outsourcing over enhancing current systems 15 to 1.
2. The direct "@ncsu.edu" address is highly desired among respondents.

Selected Results

1. Features - In Order from Most Important to Least Important

Feature	Mean	Scale
Ability to send and receive large email attachments	3.73	4 = Very Important 3 = Somewhat Important 2 = Somewhat Unimportant 1 = Very Unimportant
"@ncsu.edu" versus "@something.ncsu.edu"	3.50	
My email address branded with an NC State presence	3.63	
Other features not listed above	3.50	
An email system where ads could be suppressed	3.47	
Shared access to documents I may create	3.44	
A large quantity of storage space available	3.44	
Ability to set server-side filters	3.33	
Mobile device support for email	3.31	
Shared access to document workspace	3.31	
Personal, online calendar, and share with others	3.31	
Address book that is tied to the campus-wide directory	3.31	
Search calendars and schedule meetings with faculty	3.25	
A spam folder that can be reviewed	3.19	
Ability to organize email by categories	3.19	
Web-based applications such as word processing	3.06	
Mobile device support for calendaring	3.00	
Chat capability (instant messaging)	3.00	
A lifetime email address affiliated with NC State	2.81	

2. Outsourcing

Item	Mean	Scale
Difficulty learning if switched from Unity to Gmail	1.25	4 = Very Difficult 3 = Somewhat Difficult 2 = Somewhat Easy 1 = Very Easy
Difficulty learning if switched from Unity to Microsoft	2.25	

Item	Percent	
Should NC State outsource or enhance the current email system?	93.8	Outsource
	6.3	Enhance

Appendix D: Responses to Pre-Pilot Questionnaire

Members of the Student Email Task Force provided a limited number of pilot test accounts for campus users to try out Microsoft Live@Edu/Exchange Labs and Google Apps Education Edition and provide feedback to the task force. As part of signing up for the test accounts most users were asked a few questions about their current and anticipated email habits.

Please note that this is not a representative sample of students. The responses were largely similar to those received via other feedback mechanisms used by the task force, however, participants were self-selected and results cannot be extrapolated to the rest of the campus. It does provide a view of those who were aware of the email initiative and invested the time to request a pilot account.

Total Respondents: 275

1. Do you currently use your NCSU email Account?

Yes (272)

No (3)

1a. If Yes, what do you use your account for? (select all that apply)

NCSU related communications (262)

Personal communications (non-ncsu) (136)

2. Do you forward your NCSU email to another account?

Yes (272)

No (3)

2a. If Yes, which service do you forward to? (select all that apply)

Google (106)

Hotmail (4)

Yahoo (5)

Other: (5)

- AOL (1)
- Apple Mail (1)
- MobileMe (1)
- None (1)
- Personal Email, no name given (1)

3. How do you access your email account? (select all that apply)

Web Client (webmail.ncsu.edu) (227)

Desktop Application (Outlook, Thunderbird, MacMail etc) (126)

Mobile Device (90)

4. Do you have and use more than one email account?

Yes - I use more than one email account (273)

No - I only use one email account (2)

5. Are there any particular features of an email package that are appealing to you, and that you would use frequently? Check the boxes for the features you would like to have access to, and that you believe you would use on a regular basis (select all that apply):

Large Storage Size (More than 5Gb) (225)

Integrated Calendar (219)

Address Book for all NCSU email addresses (202)

Collaborative Document Sharing (188)

Other (9)

- Updated Graphics and ability to view graphics.
- Threading emails of the same subject/sender for faster search
- The ability to use the new "Offline" feature from Google. That way even if you don't have a desktop client, you can still access your e-mail if you are currently offline.
- Text formatting (i.e. rich text)
- Storage space is the number 1 important thing for me!
- Storage is definitely the most important to me. I have continually run into a full quota while using my email for research and literature data transfer. Document sharing would be useful, but isn't that important to me. An integrated calendar, though I have not used one in the past, would be a great tool to learn how to use.
- Sending event notifications and changes thru an integrated calendar like microsoft outlook...or now even the google calendar..is a must...absence of this wastes a lot of time exchanging emails..inviting people..knowing there responses..
- search, spam and virus protection, folders/tags, advanced filters
- Priorities: integrated campus-wide address book and calendar! mobile access! large storage! great web interface!

6. Do you anticipate using any of the collaborative tools that come packaged with the Microsoft and Google accounts? Check the box for each tool you believe you will use (select all that apply) :

Calendar (233)

Documents (189)

Chat (161)

Other (3)

- The Google Chat is so convenient!
- Tags, Search, Forms
- powerful address books, auto complete of address while sending mails.

Appendix E: Post-Pilot Questionnaire Results Summary

Members of the Student Email Task Force provided a limited number of pilot test accounts for campus users to try out Microsoft Live@edu/Exchange Labs and Google Apps Education Edition. Significant efforts were made to publicize the availability of test accounts to many students on campus, though those who chose to participate were self-selected. In total, 195 requested Microsoft pilot accounts and 288 requested Google pilot accounts. After account holders had some time to test either or both of the systems, they were sent a brief survey asking about their opinions of the products.

Post-Pilot Survey Metrics at a Glance

Respondents were asked to rate the service from 1-10, with 10 being the highest.

	Microsoft	Google
# of Responses	70	149
Minimum Rating	1	1
Maximum Rating	10	10
Mean	6.11	8.91
Mode	5, 6 & 8	10
Standard Deviation	2.66	1.77

Individual Ratings

Rating out of 10	Microsoft # of Responses	Microsoft %	Google # of Responses	Google %
1	4	5.7	1	0.6
2	6	8.5	1	0.6
3	3	4.2	2	1.3
4	4	5.7	2	1.3
5	11	15.7	5	3.4
6	11	15.7	2	1.3
7	5	7.1	9	6.0
8	11	15.7	13	8.7
9	7	10.0	33	22.1
10	8	11.4	81	54.4

Summary of Qualitative Responses: Google Apps

1. What did you like about Google?

Top response:

- Layout / User Interface (54)

2nd and 3rd most common responses:

- Collaborative Services / Suite of Applications / Integrated Applications (~42)
- Storage (~40)

Other Common Responses in order of frequency

- Calendar (~20)
- Chat (~16)
- Google Docs (~11)
- Reputation / Familiarity (~10)
- Mobile options / abilities (~6)
- Contacts (~7)
- Cross browser / cross platform compatibility (~4)
- No Advertising (~3)

2. What did you not like about Google?

Top response:

- Nothing (~45)

2nd & 3rd most common responses:

- Did not like the user interface (~12)
- Lack of Labs / Themes options like regular gmail (~11)

Other Common Responses in order of frequency

- Does not integrate with on campus services or other apps (~7)
- Does not integrate with existing gmail accounts (~6)
- Do not like the labels / lack of folders (~5)
- We can already do this for free on our own, why do we need NCSU to do it? (~4)
- Why didn't we do this earlier? (~4)
- Applications not as good, or not as integrated as those on exchange labs (~4)
- Lack of G-Drive / online file storage for more than just google docs (~3)
- Extra tabs open when you go between applications instead of opening in the same window (~2)
- No backups (~1)
- Privacy concerns (~1)
- Not compatible with MS Office 2007 (~1)
- Advertising (~1)

Summary of Qualitative Responses: Microsoft Live@edu Exchange Labs

1. What did you like about Microsoft Exchange Labs?

Top response:

- Interface / Layout (~51)

Other Common Responses in order of frequency

- Integration of Tools (~7)
- Nothing (~5)
- That it is not squirrel mail or groupwise (~4)
- Global address book (~4)
- Synchronizing tools (~4)
- Storage space (~4)
- Out of office assistant (~1)
- Responsiveness of Interface (~1)
- Sharing calendars (~1)
- Mesh Service (~1)
- Worked as well on mobile device as gmail (~1)
- Tasks (~1)

2. What did you not like Microsoft Exchange Labs?

Top responses:

- Inconsistency of features across platforms and browser types (~15)
- User Interface (~15)

Other Common Responses in order of frequency

- Lengthy sign up process (~8)
- No document management (~7)
- No customization / no themes (~7)
- Complexity / intuitiveness (~7)
- Lack of features (~5)
- Nothing (~5)
- Ability to put trust in microsoft / microsoft's ability to "not suck" (~4)
- Search (~4)
- Married to microsoft tools (~4)
- Importing /exporting calendar and contacts (~3)
- Handling of attachments (~3)
- No forwarding (~3)
- No way to examine headers to determine legitimacy (~2)
- No chat feature (~2)
- Mostly web based (~2)
- Speed (slow) (~2)
- Adding a mobile device process (~1)
- No mobile application (~1)

Appendix F:
Responses to Vendor Questionnaire

Questions were given to the service providers prior to web/phone conferences with them. Representatives from Google and Zimbra provided written responses. Responses to the Microsoft product were completed based on answers during the web conference and subsequent research. Responses for the Cyrus system were provided collectively by task force members and assume the service would be upgraded to provide at least 1GB of storage.

	Google Apps	Microsoft	Yahoo/Zimbra	Upgrading Cyrus
Functionality / Toolkit / Features				
<i>What is the quota for the service? Are there options for larger quotas for individuals, groups or all?</i>	7.2 GB and growing. At this time, we do not have options for larger quotas, but if this is something you are interested in, we are definitely willing to explore.	10 GB. Not an option to increase at this point. "31GB of additional collaboration and virtual file storage capabilities w/ real time sharing" beyond the email storage. This is spread out among 1GB in Office Live workspace, 5GB on SkyDrive, plus photo albums/spaces, Mesh, etc.	7 gigs we can make it larger but that is the baseline size.	1GB per account. Options for purchasing additional storage
<i>How is the address book handled for campus directory, and how does it integrate with personal address books and auto-fill fields (To, cc, etc.)?</i>	At this time, you can only search for Google Apps users. You can turn on contact sharing and look for anyone in your domain. Right now it is all or nothing if do contact sharing but we do plan to have an opt-out to comply with FERPA.	Can tie in with campus directory, via LDAP, AD, etc.	The Zimbra Hosted solution will leverage the contact information in the Zimbra system as the Global Address List (GAL). The administrator can configure which address book entries are included in the GAL by using the delegated administrative interface, or in the SOAP request during provisioning.	LDAP address book available for thick clients. Available in Webmail client via separate search page.
<i>What browsers and what platforms are fully supported?</i>	Full: Google Chrome, Firefox 2.0+, Internet Explorer 7.0, Safari 3.0. See http://mail.google.com/support/bin/answer.py?hl=en&answer=6557 for Gmail and http://www.google.com/support/a/bin/answer.py?hl=en&answer=33864 for Google Docs	Currently: "Premium" version supported on IE for Windows, Light version on Safari and Firefox for Mac and most other browsers.	Mozilla, Firefox, Safari and IE. We support them on Windows, Macs and linux boxes.	All modern browsers (Firefox, IE, Safari, Opera, etc.)
<i>What is the attachment size limit?</i>	20 MB	20 MB	10 megs with a max of 25 megs for the message. In the on premise solution, you may choose to configure and limits you want.	15MB as currently implemented. Note: this is a mail relay limitation that would affect any on-campus solution. But, it is not a hard limit, and can be changed if needed.

Appendix F:
Responses to Vendor Questionnaire

	Google Apps	Microsoft	Yahoo/Zimbra	Upgrading Cyrus
<i>Is there any way for users to archive their email, address books, settings, other information?</i>	Yes, if they want to do this on their own desktop, they can do so with POP or IMAP.	Via Outlook client users can download the information locally and save as Outlook files. User can use IMAP and bring to their desktop.	Zdesktop will allow users to archive data off to local folders. You also have the ability to export the address book. Can also use IMAP so can pull to local desktop.	Archiving available via fat client
<i>Is there any "undelete" or recovery of data (email/appts/documents) by the user or by sys admins? If so, what's the process?</i>	An email will stay in a user's trash for 30 days. After that, it will be deleted forever. We do have options for message archiving and recovery with Google Apps Message Security and Compliance (formerly Postini). This is offered at a 66% discount for educational institutions.	Goes into trash for 15 days, and recoverable for 15 days beyond that by sysadmin.	The user and sysadmin do not have the ability to restore deleted mail in the hosted version. If a mail is needed to be restored in the hosted version you enter a ticket to have the mailbox restored. In the on prem solution the admin can do this themselves.	All email is backed up nightly. Provide email restores via Help desk request
<i>Is there any way to differentiate service offerings among users (e.g. some groups have access to a richer set of features/services)</i>	Not at this time - Lauren Can provide Apps only, without mail. - Jaime	Not at this time	There are three options for the hosted solution. In the on prem solution you can add and remove what ever features you like.	All users have access to all features
<i>What attributes are stored with the account information? e.g. Is there a way to "tag" accounts with various attributes?</i>	There is not a way to tag accounts with attributes at this time. But, you can set up email lists, as we discussed on the call. The user attributes would be stored on your directory.	Not at this time	Only with on prem solution	Happens in LDAP directory

Appendix F:
Responses to Vendor Questionnaire

	Google Apps	Microsoft	Yahoo/Zimbra	Upgrading Cyrus
<i>Can users connect with clients other than vendor-provided ones? POP, IMAP, both? Is there a "Recommended" list? Is there an integrated calendar feature?</i>	<p>Yes, we support both POP and IMAP. Here are our list of supported clients for each: POP and IMAP.</p> <p>We do believe that it will also work with other clients that we do not specifically support: POP and IMAP</p> <p>We do have calendar syncing capabilities as well. Here is additional information: http://www.google.com/support/a/bin/answer.py?hl=en&answer=60763</p>	<p>Yes, IMAP, POP, MAPI, WebDav. Yes with Exchange Labs. Recommended client is Outlook.</p>	<p>Yes, you can use what ever standard pop, imap clients you'd like. Yes, we have an integrated calendar in the hosted solution and on prem</p>	<p>IMAP support. Thunderbird, Apple Mail, Outlook, Webmail, GroupWise fat client and other IMAP capable clients. No integrated calendar</p>
<i>Do you support syncML for calendar, i.e. to allow phones to synchronize with calendar</i>	<p>I found the following blog post about syncML: http://googlesystem.blogspot.com/2007/06/sync-your-mobile-phone-with-google.html Reading other information, it looks like GCalSync is another recommended way to do this with mobile phones.</p>	<p>MS uses ActiveSync</p>	<p>Not supported, we use BES and windows mobile to achieve that functionality.</p>	<p>N/A</p>

Appendix F:
Responses to Vendor Questionnaire

	Google Apps	Microsoft	Yahoo/Zimbra	Upgrading Cyrus
<p>Are there any other mobile support platforms available?</p>	<p>These are minimum requirements to access Gmail for mobile web browsers:</p> <ul style="list-style-type: none"> * Your web browser needs to be XHTML compliant. To determine whether your browser is compatible, please point it to www.google.com/xhtml and perform a search. If it doesn't work, your browser may not be XHTML compliant. * Your phone's browser should have cookies enabled and your mobile network should also allow cookies. The setting for cookies is usually located in your phone's browser settings. Contact your mobile service provider to determine if they allow cookies on their network. * Your mobile phone network should allow secure SSL traffic. Contact your mobile provider to check this too. 	<p>Mobile devices capable of running Exchange / ActiveSync.</p>	<p>BES, windows mobile, iPhone,</p>	<p>any mobile IMAP device</p>

Appendix F:
Responses to Vendor Questionnaire

	Google Apps	Microsoft	Yahoo/Zimbra	Upgrading Cyrus
<i>Are aliases allowed? If so, are they user configurable?</i>	<p>Domain name aliases are additional domain names associated with your primary domain and function with your current set of user accounts (nicknames are not included). For instance, if you own the domains abc.com, def.com and ghi.com, you can create a primary Google Apps account for abc.com and add def.com and ghi.com as domain aliases to abc.com. This will help you access all emails addressed to user@def.com and user@ghi.com in your user@abc.com Apps account.</p> <p>You can also send mail from a domain alias.</p>	Admins could set up proxy addresses.	Alias are available but they are not user configurable	Alias allowed for faculty/staff/grad students. Configured by administrators
<i>What measures are in place to prevent duplicate accounts?</i>	<p>You will manage this as you have full control over the creation of usernames. Here is information about what happens when you delete a username: http://www.google.com/support/a/bin/answer.py?answer=33562&ctx=sibling</p>	Dependent upon which way accounts are provisioned. Done beforehand with command line/batch file process. ILM draws from LDAP, AD, etc.	The internal ldap does not allow duplicate names, emails addresses	Happens at account creation layer.
<i>Is there any way to integrate with SMS, other texting, (unified messaging)? Planned?</i>	<p>We do have SMS integrated with calendar for users: http://www.google.com/support/calendar/bin/answer.py?hl=en&answer=37228</p> <p>I do not yet have an ETA on when this will be in other products, but we can discuss on a roadmap conversation.</p>	LiveMesh allows syncing between devices including some via SMS	Not on the hosted side as of yet. The on prem has support for SMS textign via zimlets.	NO

Appendix F:
Responses to Vendor Questionnaire

	Google Apps	Microsoft	Yahoo/Zimbra	Upgrading Cyrus
Technical				
<i>Would we need to provide an auth service? What about for access via mobile devices? (I.e. some schools have implemented a mechanism to authenticate via campus servers and hand off credentials, but when logging in directly to service must use a host-specific password.)</i>	<p>You can authorize your users using our APIs. Specifically, this is done with our SSO API.</p> <p>Here is additional information on doing this with Shibboleth.</p>	<p>MS provides auth services, but will also do SSO. Dependent upon provisioning methods and policy.</p>	<p>Zimbra's Hosted solution will allow for an organization to store the user IDs and passwords in our hosted environment. The local authentication offering is expected to be available in Q1 09</p>	<p>Auth service already provided</p>
<i>Do you have any tools available for data migration (email, address books, docs, calendar, etc.)?</i>	<p>Yes, here is additional information about the different ways you can do migration: http://www.google.com/support/abin/answer.py?hl=en&answer=57920 Here is information about migrating calendar from other application that are iCal compatible: http://www.google.com/support/calendar/bin/answer.py?hl=en&answer=83126 We also have a lot of partners who have done this migration for schools. I can give you recommendations if you are interested.</p> <p>If a user is using gmail already, he/she can add the school account as an owner to all documents, sites, and calendar events to make it easy to access the data from the new school account.</p>	<p>Sent/to/etc. intact, but date changes to migration date.</p>	<p>Yes, we use imapsync and we have tools for excahgne migration, groupwise and lotus notes.</p>	<p>Tools available for address book migration only. IMAP by nature provides email migration potential</p>

Appendix F:
Responses to Vendor Questionnaire

	Google Apps	Microsoft	Yahoo/Zimbra	Upgrading Cyrus
<i>How are domains/sub-domains handled? Can you have more than one? Can you migrate accounts between them? I.e. if migrating from a pilot environment to production, begin with @pack.ncsu.edu and move to @ncsu.edu, or @e.ncsu.edu to @alumni.ncsu.edu?</i>	<p>We have several options for piloting. I would recommend setting up a sub domain of ncsu.edu; such as, gtest.ncsu.edu for Google Apps. You can do this here: http://www.google.com/a/cpanel/education/new.</p> <p>As I mentioned, there is not a simple way to simply switch the domain on an account. Right now you would need to migrate all of the data from one to the other. Another way that you can test is using email routing.</p> <p>This will allow you to test on ncsu.edu and only have a small pilot group on Google. Here are instructions: http://www.google.com/support/a/bin/answer.py?hl=en&answer=77183</p>	<p>Can change domains a user is in, however, user currently loses information from inbox. (From web site.) MS strongly suggests using a tertiary domain (xxx.ncsu.edu). See FAQ tertiary domains.</p>	<p>Sub domains are supported, you need to provide MX record. Data can be migrated from one sub domain to another.</p>	<p>Currently provide unlimited subdomains as determined by administrators</p>
<i>Are there developer tools, hooks into the environment, etc. to customize/integrate services?</i>	<p>You can see many of the open source type things you can do with Google Apps at: http://code.google.com/</p>	<p>Yes, see http://dev.live.com/ .net, Silverlight, etc. access</p>	<p>Only hooks for SOAP calls for pre auth and account creation.</p>	<p>N/A</p>
Security/privacy				
<i>What kind of data privacy do you provide? Is user data mined, and if so, what is the extent of its use?</i>	<p>Here is a link to our privacy policy: http://www.google.com/intl/en/privacy.html</p> <p>I am also sending you our contract that has been through many versions based on the schools we have worked with.</p> <p>Terms of Service: http://www.google.com/apps/intl/en/terms/education_terms.html</p>	<p>"Email content is not scanned, privacy is a top concern." "Content is never scanned for targeted ads." - slides from demo</p> <p>http://privacy.microsoft.com/en-us/default.mspx</p>	<p>In addition to segregation of data networks, Zimbra supports: - secure transport of data via TLS, - Dedicated security department that constantly scans and enforces security policy, - Segregation of duties for physical, system, data and application access - Limited system access by function.</p>	<p>No data mining. Only for administrative purposes</p>

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	Google Apps	Microsoft	Yahoo/Zimbra	Upgrading Cyrus
<i>Who has access to the user information stored by the service?</i>	You are the only one who has access to user information. If you use SSO, we do not even have access to their usernames.	Microsoft and NCSU admins have access to user information, according to my read of the slides and scan of privacy document. http://privacy.microsoft.com/en-us/default.mspx	We do not mine data. Yahoo has formal security training for new employees, security related ongoing training, and regular product security reviews.	Administrators only and user
<i>What kind of encryption do you support and what do you require for login and data transmission? I.e. HTTPS, secure IMAP, secure POP, secure MAPI, Start/TLS.</i>	All Google Apps services provide the ability to access all data using encryption and customers can choose to require this option for their users. This helps ensure that no one except the user has access to his or her data. This is true for access to our mail, calendar, and chat data via our web applications. The mobile email client also uses encrypted access to ensure the privacy of communications. As an admin, you can enable SSL Connections: http://www.google.com/support/a/bin/answer.py?hl=en&answer=100181 IMAP and POP are both by default secure.	HTTPS for web-based OWA, Uncertain whether use secure IMAP, etc. on for fat clients, but believe it does	Yes	HTTPS, secure IMAP, Start/TLS
<i>How are "record holds" handled for a legal subpoena? What are the steps involved to carry this out? Turnaround time?</i>	You would send this to our legal team to handle. If you are using Postini, you can search across all emails and do this yourself with eDiscovery.	We seem to recall that admins would have the ability to retrieve data.	You are responsible for the delivery of the subpoena. Support can set a legal intercept and we will act in a timely manner to protect everyone's rights.	Through Security & Compliance group. Data retention is handled via other medium (CD/DVD/etc). Turn around time is near instant

Appendix F:
Responses to Vendor Questionnaire

	Google Apps	Microsoft	Yahoo/Zimbra	Upgrading Cyrus
<i>Will security officers have the ability to read student email for investigations (bomb threats, cheating allegations, cyber-stalking etc.) What is the process for this?</i>	<p>There are a few options for doing this:</p> <ul style="list-style-type: none"> - You can do this with Google Message Security and Compliance add-ons. - You can set up an email gateway to save a copy of every message. - Utilizing our APIs, you can programatically create the script so that you can authenticate login to other accounts and view emails. <p>Since the only thing we need sent back to us is the username, there are several ways that you can write the script to do this from an admin level.</p>	<p>We seem to recall that admins would have the ability to retrieve data.</p>	<p>You are responsible for the delivery of the subpoena. Support can set a legal intercept and we will act in a timely manner to protect everyone's rights.</p>	<p>Yes - full access</p>
<i>Who owns the data that resides in user space? (email, documents, etc.)</i>	<p>You own the data. You can learn more about this in our contract and privacy policy.</p>	<p>Roxie on 12/16 indicated a new contract would show the school owns the accounts. Not certain that means that the university owns the content.</p>	<p>The customer</p>	<p>NCSU</p>
<i>How are DMCA notifications processed for shared documents/sites/etc.?</i>	<p>I believe it is the end user since they sign an end user terms of service. Please take a look at the contract, and if you do not feel from that you have a good understanding, I can go back to my legal team.</p>	<p>Presumably campus sysadmins would handle. Not certain.</p>	<p>http://info.yahoo.com/copyright/</p>	<p>Handled through the University Copyright Officer</p>

Appendix F:
Responses to Vendor Questionnaire

	Google Apps	Microsoft	Yahoo/Zimbra	Upgrading Cyrus
<i>What is your mechanism for SPAM control? How much flexibility does the end-user have as far as approving or rejecting messages? Does the university have a say in that as well?</i>	We use our own Google created SPAM controls. Here is information about how we control for SPAM: http://www.google.com/support/a/bin/answer.py?hl=en&answer=107835 In addition, as we discussed on the call you can whitelist a domain and the end user can individually blacklist. The end user has the ability to mark things as spam and not spam. In addition, they can filter out messages they do not want to receive.	Microsoft has built-in spam/virus filtering service. Univ. does not control beyond providing a list of white-listed IPs. Users can indicate certain senders are not considered junk mail.	We presently use the Yahoo spam guard for hosted. The on prem solution allows you to control the spam settings and users can define spam.	Pure Message is used to tag SPAM as opposed to filter. Only filter out what we know is 100% virus. Will attempt to fix viruses and forward data stream. Users have control of setting SPAM levels. Default filters are set up for all new accounts.
<i>Are messages/attachments scanned for viruses?</i>	Yes	yes		Yes and fixes are attempted
<i>Is there any monitoring for phishing attacks? Do you close the reply mechanism upon awareness?</i>	Yes, we do monitor for phishing If you suspect this is occurring, you can suspend a user so that they will not be able to send or receive mail. You can also contact support and they can take further action. http://www.google.com/support/a/bin/answer.py?hl=en&answer=33312	Likely, but they do not close the reply mechanism	For URLs categorized as 'phish,' any email that contains the domain/URL will be outright rejected by our MTAs. For phishing, we mostly do IP and URL filtering.	Yes we handle and yes we close off replies
<i>Can you retroactively purge messages that match certain characteristics?</i>	No, an end user would have to delete.	No	A customer care request must be entered for hosted solution. For on prem the admin can perform this using cli.	Yes it is possible

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Responses to Vendor Questionnaire

	Google Apps	Microsoft	Yahoo/Zimbra	Upgrading Cyrus
<i>If passwords are handled on the hosting system, what is the password standard and do we have the ability to modify it? (I.e., length and complexity requirements, expiration frequency, re-use, initial password, resets, characters allowed in passwords.)</i>	<p>You can use the provisioning api to create passwords for your users. As far as the required passwords, here is information on how we rate passwords: http://www.google.com/support/accounts/bin/answer.py?answer=32040&topic=10459 Additional information on usernames and passwords: http://www.google.com/support/a/bin/answer.py?hl=en&answer=33386 With the Provisioning API you can set the expiration frequency, and resets. I do not believe you can force them not to reuse an old password. If you are using SSO, you can on your system.</p>	Shows strength meter, but we don't think there is anything beyond a 6-8 character minimum.		Password standards are in place. http://www.ncsu.edu/password
Support/SLA		FAQ for Admins: http://technet.microsoft.com/en-us/exchangelabshelp/bb821964.aspx		
<i>Are university sys admins able to disable accounts without deleting accounts? If so, what is the process? For how long can they be disabled without losing user data?</i>	Yes, you can suspend a user indefinitely until you renable the account. When suspended, the user will not receive email.	Yes, via changing the password for the user. If account is not touched for 6 months, it becomes inactive (bounces messages), but theoretically can reactivate account for another 6 months.	The customer care interface allows you to place accounts in closed. Either the customer or Yahoo may move an account to a variety of states that are inactive. These include locked, locked out, and closed.	Yes. Indefinitely

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Responses to Vendor Questionnaire

	Google Apps	Microsoft	Yahoo/Zimbra	Upgrading Cyrus
<i>Are you able to accommodate account name changes?</i>	This is a common feature request we have heard. We cannot simply change a username at this time, but you can create a nickname. Or, you can migrate to a new username.	From online FAQ: Answer is no, not today, but it is on the roadmap and will be coming soon. Until then you can configure ILM to create a new account for users when you rename their account and then that user can migrate their email and settings. Premier Online can help with this configuration.	yes	Yes
<i>What is process for transitioning from student to alumni accounts?</i>	As we discussed, this is not something that we have in place right now.	As part of provisioning process, field tag is set as student or alumni/former student.	A script must be created that moves students from undergrad to alumni at the end of every semester. You would need to provide us with a list of students moving to alumni and whether their data goes with them. The would require a pro services engagement to set this up.	No alumni accounts available. 4 month grace period after graduation is provided for alumni to transition email
<i>What kind of support is provided to end users?</i>	We have an online help center for users. If they cannot find the answer here, they would go to your help desk.	Campus provides primary support. Web site and forums available for end users.	The customer care agents (NCSU admins) are responsible for end user communication. End users submitting cases directly to Zimbra Hosted Support will be asked to contact their customer care provider.	Hand holding help desk (see Chris K). Including vast documentation online and training is available upon request
<i>Will campus support groups (Help Desk) have any tools, documentation, or access to resources for local support?</i>	Yes. We do have a robust help center for your support groups to use. In addition, any admin of your account has access to our education edition specific support team. This is 24x7 support by email and phone. There is no additional cost for our support.	Premier support is available. Free support is limited to email/form.	The Customer care interface will provide those tools	Lookup tools, backup/restore tool, IMAP folder viewer (quota), webmail preferences and login history

Appendix F:
Responses to Vendor Questionnaire

	Google Apps	Microsoft	Yahoo/Zimbra	Upgrading Cyrus
<i>Can local support escalate calls to vendor tech support? Are there additional costs involved to receive that support?</i>	Yes. We do have a robust help center for your support groups to use. In addition, any admin of your account has access to our education edition specific support team. This is 24x7 support by email and phone. There is no additional cost for our support.	Only through Premier support rep on campus. This is an extra cost service.	Yes, via customer care	N/A
<i>What is the level of support available for campus sys admins? What are stated and typical response times?</i>	As mentioned above, there is 24x7 support for system admins by email and phone. Our response time is typically within 5 hours with a SLA of within 24 hours. By phone it is immediate and if it is the weekend, within an hour.	See above. Stated that they'll respond within 24 hours.	Please refer to page 7 & 12 in the EDU Hosted Deck we sent you. Also will send you a PDF hosted_support_plan808 it goes into great detail regarding these questions.	Specialized sys admin support available upon request
<i>What kind of access to logs is available?</i>	You are able to see the last time a user logged in and the quota size being used in the control panel. We have additional reporting that you can find out by using our Reporting API.	Web management interface or Remote PowerShell. From http://technet.microsoft.com/en-us/exchangelabshelp/cc546278.aspx "Windows PowerShell Remoting lets you perform many tasks that aren't currently available in the Web management interface for Exchange Labs, such as mail flow management between specific users, creation of keyword filters, bulk management of user accounts and other objects, report generation, and scripting of automated solutions."	Limited access to logs is provided in the hosted environment. Quotas, account lookups, logins are all available.	Whatever we want
<i>- quota / account sizes</i>	You are able to see the last time a user logged in and the quota size being used in the control panel. We have additional reporting that you can find out by using our Reporting API.	???	Limited access to logs is provided in the hosted environment. Quotas, account lookups, logins are all available.	Yes

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	Google Apps	Microsoft	Yahoo/Zimbra	Upgrading Cyrus
- <i>account lookups</i>	You are able to see the last time a user logged in and the quota size being used in the control panel. We have additional reporting that you can find out by using our Reporting API.	Web management tools allows account lookups. Also controlled through ILM	Limited access to logs is provided in the hosted environment. Quotas, account lookups, logins are all available.	Yes
- <i>delivery logs, (particularly if we were not going to use our own relays.)</i>	You are able to see the last time a user logged in and the quota size being used in the control panel. We have additional reporting that you can find out by using our Reporting API.	Can verify delivery if sent internally within the system. Via the admin console you can see things that do come in. Can use remote power shell to generate many different types of reports.	Limited access to logs is provided in the hosted environment. Quotas, account lookups, logins are all available.	Yes
- <i>sending logs (particularly if we were not going to use our own relays.)</i>	You are able to see the last time a user logged in and the quota size being used in the control panel. We have additional reporting that you can find out by using our Reporting API.	Can see using the admin console.	Limited access to logs is provided in the hosted environment. Quotas, account lookups, logins are all available.	Yes
- <i>logins (date/time)</i>	You are able to see the last time a user logged in and the quota size being used in the control panel. We have additional reporting that you can find out by using our Reporting API.	Can see using the admin console.	Limited access to logs is provided in the hosted environment. Quotas, account lookups, logins are all available.	Yes
<i>What is the bulk and broadcast message process? Is there a process for injecting messages into accounts without having to send individually to all or a subset of accounts?</i>	You have the ability as an admin to send an email to everyone in your domain. You can also set up individual email lists. These can be generated dynamically via the provisioning API (http://code.google.com/apis/apps/gdata_provisioning_api_v2.0_reference.html) More info on groups: http://www.google.com/support/a/bin/answer.py?hl=en&answer=33329	Must use mailing lists or dynamic distribution lists. Distribution lists created using Remote PowerShell. See http://technet.microsoft.com/en-us/exchangelabshelp/cc546291.aspx	It's not possible to do a single send that comes out as a message to a bunch of users. There's a RFE for that.	Bulk Email Broadcast Tools (in house developed)

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	Google Apps	Microsoft	Yahoo/Zimbra	Upgrading Cyrus
<i>Any special procedures/services available for emergency notification?</i>	Mailing list/group availability described above	Must use mailing or dynamic distribution lists. Admins can create dynamic distribution lists using Remote PowerShell. See http://technet.microsoft.com/en-us/exchangelabshelp/cc546291.aspx	We're developing a procedure so that we can do notifications to domain administrators at logins. But it will be content provided by yahoo, not by the customer. NCSU can create a folder that has their messages in it. Then they can share that folder with every user and mount it with SOAP on account creation.	Yes
<i>What is the backup policy? Is there a disaster recovery model in place? Are we able to see that documentation?</i>	I would recommend looking at our SAS 70 (http://en.wikipedia.org/wiki/SAS_70) certification for this. Here is our blog post on this. http://appshelpforum.blogspot.com/2008/11/changes-to-terms-of-services-sas-70.html	Triple redundant servers are used. From the Admin FAQ: "Traditional backups are not performed on Exchange Labs mailboxes. Instead, Exchange Labs uses highly available mailboxes and servers."	Backups are run daily, and tapes are stored off site. Solutions subscribing to the Business Continuity Plan (BCP) would have their data snap-mirrored at the filer level to the alternative colo. Configurations and other options would be restored and DNS would be re-pointed to the failover colo, afterwhich services would then resume at alternative colo. Dual external internet services: Yahoo has diverse paths, redundant carriers at every data center. N+1 Yahoo uses of RHCS 8+2 deployments, 25% excess capacity on LDAP, MTA's, proxies. Load balancers.	4 weeks rotated backup. Tapes are vaulted to other Data Center (eventually further off site)
<i>What is the overhead for administration?</i>	Accounts are managed either in a bulk upload, or more likely using our Provisioning API (previously referenced).	Several options for doing this. ILM or scripted, most logical for us. http://get.liveatedu.com/Education/Connect/Deployment/ SDK supports SOAP calls.		Approximatley 2 FTE, including Cyrus and mail relays
<i>How are accounts provisioned?</i>	Accounts are managed either in a bulk upload, or more likely using our Provisioning API (previously referenced).	Several options for doing this. ILM or scripted, most logical for us. http://get.liveatedu.com/Education/Connect/Deployment/ SDK supports SOAP calls.	They can be bulk created and we have integration documents for soap calls that can directly interface into the directory services of NCSU	Automatic

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	Google Apps	Microsoft	Yahoo/Zimbra	Upgrading Cyrus
<i>How are accounts de-provisioned?</i>	Accounts are managed either in a bulk upload, or more likely using our Provisioning API (previously referenced).	Several options for doing this. ILM or scripted, most logical for us. http://get.liveedu.com/Education/Connect/Deployment/	Accounts can be locked and then closed at a designated time later. Thereby protecting a student that takes a semester off.	Automatic
<i>What are the uptime expectations? Is there an SLA provided for uptime service? Are there ramifications if SLA is not met?</i>	We recently released our 99.9% SLA across all of our applications. Here is the blog post about this. http://googleblog.blogspot.com/2008/10/what-we-learned-from-1-million.html SLA Terms: http://www.google.com/apps/intl/en/terms/sla.html	FAQ: "We can only offer broad data and guidance but can be more specific under NDA. The availability goal for Windows Live is 99.9%."	99.9 See page 23 & 24 in the EDU hosted Deck we sent you.	100% expectation. Current uptime is measured as 99.78594%
Other				
<i>What is your pricing model for student accounts and what's included with that?</i>	This is free service.	There is no charge for the services	Free see page 7 for more details	\$6/account. Does not include personnel cost
<i>Are there optional services for an additional fee?</i>	We do have optional services; such as, Google Message Security and Compliance and Google Video for Education.	Premier support, initial provisioning support	See page 7, also we offer professional services to help you with the migration process for \$2,000 per day your only billed for what you use. You might need 5-15 days depends on the level of help you want.	Increased storage available on a per user basis. Shared mailbox service also available

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	Google Apps	Microsoft	Yahoo/Zimbra	Upgrading Cyrus
<p><i>What do you see as the primary advantages of your solution over your two primary competitors?</i></p>	<p>I went over this with you, but wanted to send you the detailed information about enabling the new features in a Google Apps account: http://www.google.com/support/a/bin/answer.py?hl=en&answer=82691</p>	<p>See slide stack from 12/16 demo http://oit.ncsu.edu/student-email-initiative/microsoft-liveedu</p>	<p>Zimbra recently announced its newest cutting edge product, Yahoo! Zimbra Desktop, which adds offline capabilities to the ZCS. Now, when users out of the office without an internet connection, they can keep working without missing a beat. Any changes made while working offline are automatically synced, and users are immune to hiccups and interruptions caused by server latency.</p> <p>Yahoo! Zimbra Desktop gives users access to the same sleek Zimbra experience, and showcases the latest technologies that have until now only been available via Web-based applications including mash-ups with other services; powerful search that can quickly scan a user's e-mail and pull up relevant content; built-in organization capabilities; and advanced calendaring that gives users access to their most important appointments and schedule even when they are on the go.</p> <p>2. Zimlets (customizable mash-ups) Zimbra leverages Web 2.0 technology to incorporate customizable enterprise mash-ups, called Zimlets, into the body of e-mail messages and calendar appointments. For instance,</p>	<p>Flexibility, Control, Ease of Access, User Support</p>

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	Google Apps	Microsoft	Yahoo/Zimbra	Upgrading Cyrus
<p><i>Are there other large, research-intensive universities using your hosted solution on a wide-scale basis? If so, which ones?</i></p>	<p>Yes. I would take a look at our list of references that we have here: http://www.google.com/a/help/intl/en/edu/customers.html It sounds like you have already spoken to a good deal of schools that we have worked with. If you want additional contacts, please let me know.</p>	<p>Georgia State, ECU</p>		<p>Many universities use Cyrus service</p>

Appendix G:
Student Email Hardware/Software Costs and Savings Estimates

Option Desc.	Total Servers used	Cost Per Server (includes maint.)	Server cost total	TB Used	Yearly Storage Cost *	Additional GW Cost (yearly)	Total 5 Yr. Cost for option	5 Year Savings Over 3 Yearr Lifecycle	Savings/Year (Avg)
Three-year replacement cycle									
Current Implementation with ideal 3 year replacement cycle (inc. maintenance)	37	\$7,500	\$277,500	6	\$39,600	\$0	\$660,500	\$0	\$0
Current Implementation with 1GB* of storage quota with 3 year replacement cycle (inc. maintenance)	37	\$7,500	\$277,500	16	\$42,398	\$0	\$674,489	(\$13,989)	(\$2,798)
Current Implementation with 5GB* of storage quota with 3 year replacement cycle (inc. maintenance)	37	\$7,500	\$277,500	81	\$211,989	\$0	\$1,522,446	(\$861,946)	(\$172,389)
- Outsource Student Email - Move all faculty/staff to GroupWise - maintain all mail relays - 3 year life cycle on equipment (inc. maintenance)	17	\$7,500	\$127,500	2	\$6,600	\$31,545	\$403,225	\$257,275	\$51,455
- Outsource Student Email - Keep current faculty/staff that are using Cyrus on Cyrus system - maintain all mail relays - 3 year life cycle on equipment (inc. maintenance)	17	\$7,500	\$127,500	2	\$6,600	\$0	\$245,500	\$415,000	\$83,000
- Outsource Student Email - Move all faculty/staff to GroupWise - Reduce mail relays from 12 to 4 (students have an @xxx.ncsu.edu address rather than @ncsu.edu) - 3 year life cycle on equipment (inc. maintenance)	9	\$7,500	\$67,500	2	\$6,600	\$31,545	\$303,225	\$357,275	\$71,455
- Outsource Student Email - Keep current faculty/staff that are using Cyrus on Cyrus system - Reduce mail relays from 12 to 4 (students have an @xxx.ncsu.edu address rather than @ncsu.edu) - 3 year life cycle on equipment (inc. maintenance)	9	\$7,500	\$67,500	2	\$6,600	\$0	\$145,500	\$515,000	\$103,000

* The current cost for primary IMAP storage is \$3,300 TB/year * 2 (since it's mirrored). OIT would use less expensive storage for the 75% infrequently accessed if increasing quota. (\$3,300 * 2 * .25) + (\$1,300 * 2 * .75) per TB.

Appendix G:
Student Email Hardware/Software Costs and Savings Estimates

Option Desc.	Total Servers used	Cost Per Server (includes maint.)	Server cost total	TB Used	Yearly Storage Cost *	Additional GW Cost (yearly)	Total 5 Yr. Cost for option	5 Year Savings Over 3 Yearr Lifecycle	Savings/Year (Avg)
Four-year replacement cycle									
Current Implementation with 4 year replacement cycle (inc. maintenance)	37	\$7,800	\$288,600	6	\$39,600	\$0	\$558,750	\$101,750	\$20,350
Current Implementation with 1GB* of storage quota with 4 year replacement cycle (inc. maintenance)	37	\$7,800	\$288,600	16	\$42,398	\$0	\$572,739	\$87,761	\$17,552
Current Implementation with 5GB* of storage quota with 4 year replacement cycle (inc. maintenance)	37	\$7,800	\$288,600	81	\$211,989	\$0	\$1,420,696	(\$760,196)	(\$152,039)
- Outsource Student Email - Move all faculty/staff to GroupWise - maintain all mail relays - 4 year life cycle on equipment (inc. maintenance)	17	\$7,800	\$132,600	2	\$6,600	\$31,545	\$356,475	\$304,025	\$60,805
- Outsource Student Email - Keep current faculty/staff that are using Cyrus on Cyrus system - maintain all mail relays - 4 year life cycle on equipment (inc. maintenance)	17	\$7,800	\$132,600	2	\$6,600	\$0	\$198,750	\$461,750	\$92,350
- Outsource Student Email - Move all faculty/staff to GroupWise - Reduce mail relays from 12 to 4 (students have an @xxx.ncsu.edu address rather than @ncsu.edu) - 4 year life cycle on equipment (inc. maintenance)	9	\$7,800	\$70,200	2	\$6,600	\$31,545	\$278,475	\$382,025	\$76,405
- Outsource Student Email - Keep current faculty/staff that are using Cyrus on Cyrus system - Reduce mail relays from 12 to 4 (students have an @xxx.ncsu.edu address rather than @ncsu.edu) - 4 year life cycle on equipment (inc. maintenance)	9	\$7,800	\$70,200	2	\$6,600	\$0	\$120,750	\$539,750	\$107,950
* The current cost for primary IMAP storage is \$3,300 TB/year * 2 (since it's mirrored). OIT would use less expensive storage for the 75% infrequently accessed if increasing quota. (\$3,300 * 2 * .25) + (\$1,300 * 2 * .75) per TB.									

Appendix G:
Student Email Hardware/Software Costs and Savings Estimates

Option Desc.	Total Servers used	Cost Per Server (includes maint.)	Server cost total	TB Used	Yearly Storage Cost *	Additional GW Cost (yearly)	Total 5 Yr. Cost for option	5 Year Savings Over 3 Yearr Lifecycle	Savings/Year (Avg)
Five-year replacement cycle									
Current Implementation with 5 year replacement cycle (inc. maintenance)	37	\$8,100	\$299,700	6	\$39,600	\$0	\$497,700	\$162,800	\$32,560
Current Implementation with 1GB* of storage quota with 5 year replacement cycle (inc. maintenance)	37	\$8,100	\$299,700	16	\$42,398	\$0	\$511,689	\$148,811	\$29,762
Current Implementation with 5GB* of storage quota with 5 year replacement cycle (inc. maintenance)	37	\$8,100	\$299,700	81	\$211,989	\$0	\$1,359,646	(\$699,146)	(\$139,829)
- Outsource Student Email - Move all faculty/staff to GroupWise - maintain all mail relays - 5 year life cycle on equipment (inc. maintenance)	17	\$8,100	\$137,700	2	\$6,600	\$31,545	\$328,425	\$332,075	\$66,415
- Outsource Student Email - Keep current faculty/staff that are using Cyrus on Cyrus system - maintain all mail relays - 5 year life cycle on equipment (inc. maintenance)	17	\$8,100	\$137,700	2	\$6,600	\$0	\$170,700	\$489,800	\$97,960
- Outsource Student Email - Move all faculty/staff to GroupWise - Reduce mail relays from 12 to 4 (students have an @xxx.ncsu.edu address rather than @ncsu.edu) - 5 year life cycle on equipment (inc. maintenance)	9	\$8,100	\$72,900	2	\$6,600	\$31,545	\$263,625	\$396,875	\$79,375
- Outsource Student Email - Keep current faculty/staff that are using Cyrus on Cyrus system - Reduce mail relays from 12 to 4 (students have an @xxx.ncsu.edu address rather than @ncsu.edu) - 5 year life cycle on equipment (inc. maintenance)	9	\$8,100	\$72,900	2	\$6,600	\$0	\$105,900	\$554,600	\$110,920

* The current cost for primary IMAP storage is \$3,300 TB/year * 2 (since it's mirrored). OIT would use less expensive storage for the 75% infrequently accessed if increasing quota. $(\$3,300 * 2 * .25) + (\$1,300 * 2 * .75)$ per TB.