Ishmail: Managing Massive Amounts of Mail

Charles Isbell
Georgia Tech
College of Computing
isbell@cc.gatech.edu

Brian Amento
Steve Whittaker
AT&T Labs – Research
brian@research.att.com
stevew@research.att.com

Gavin Bell
6th Column
cue@6thcolumn.org

Jon Helfman
jon@imagebeat.com

ABSTRACT
We describe Ishmail, a java-based client-server email system for users who receive a great deal of email.

Keywords: archiving, email, messaging. visualization

INTRODUCTION AND RELATED WORK
We describe Ishmail, a java-based email system for users who receive a great deal of email. For many online users, email has become a central organizing mechanism for both work and recreation. It is a repository for to-do lists, family communication, hobbies, and workflow. These users are as concerned with spam as anyone else, but theirs is better described as a problem of maintaining a sane view of the overwhelming amount of *relevant* mail messages they receive constantly. Our approach is to provide users with tools that allow them to manage their messages using not only automatic filtering but also message archiving, email deferral, multiple persona management, and mailbox decay. Ishmail reduces information overload by providing advanced ways to sort messages into differnt mailboxes and re-order those mailboxes based on importance. Ishmail minimizes the effort required to manipulate email by providing a GUI with message and mailbox summary logs that act as both views and interactive controls.

The system described here is based on an earlier email client built with an Emacs front end [3]. Although, that version provided some of the current functionality, the new iteration has some advanced features for managing email as workflow as well as a better GUI implemented in Java.

Ishmail seeks to support the three basic types of email users identified in [4]: 1) users who don't file messages, relying on search tools to find messages; 2) users who file frequently into mailboxes and 3) users who file intermittently into mailboxes every few months.

A study conducted by Bälter [0] showed that for users with more than a few hundred messages, a moderate number of folders increased their efficiency in locating filed messages; however, extensive hierarchy is not as efficient as a relatively flat structure: the time spent filing outweighs the time saved on searches. Unfortunately, Ducheneaut and Bellotti [2] found that most users in their survey didn't use filters because they simply hadn't figured out. By facilitating the use of mailboxes through more powerful but easier to use filtering and increasing the effectiveness of search in Ishmail, we hope to increase the efficiency of both filing and locating messages.

ISHMAIL ARCHITECTURE
The original Ishmail was a POP-based email client. Although this was a reasonable approach, the proliferation of fast connections in the home, and mobile wireless devices has made this approach inadequate. Users are now connected to central mail systems from different devices simultaneously. As such, the current Ishmail system is server-based. All of the "work" of maintaining global statistics, logs, rules, and other relevant information is actually handled by the server. It communicates using an extension of the IMAP protocol, and is compatible with any IMAP client. Ishmail clients understand the IMAP extensions and are able to receive pushed messages that keep them abreast of any changes that have occurred for the user without polling. We have implemented a java-based client that takes full advantage of these extensions, as well as a simple emacs-based telnet interface.

ISHMAIL FEATURES

Filtering messages into mailboxes with custom alarms
For Ishmail, the mailbox is a central organizing repository. It uses classification filters to sort messages into different mailboxes, providing a comprehensive set of predefined filters that users may parameterize and combine with *and*, *or* and *not*. A filter is applied to incoming and/or outgoing messages, depending upon the preference of its mailbox.

Along with a classification filter, each mailbox also has an *alarm* filter. For example, one alarm may indicate that a mailbox contains more than 10 unread messages while another designates that a mailbox is filled with more than 200 messages (read or unread) and so requires cleaning.

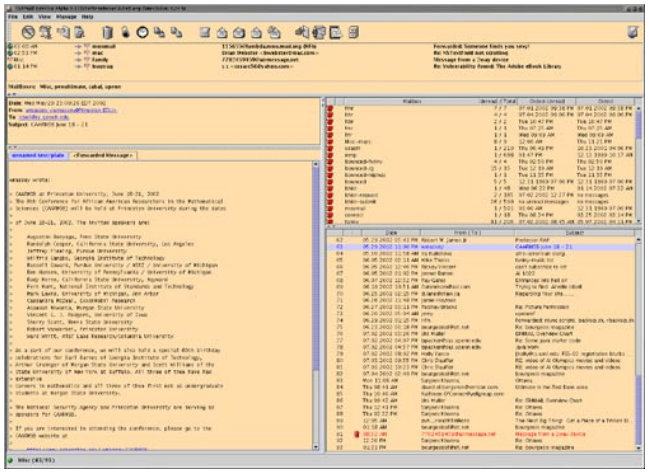

Figure 1: A screenshot of the Ishmail client, showing the activity log, the prioritized mailboxes, the current message, and the list of messages in the current mailbox. The log shows when messages have arrived and to what mailbox they were sorted, as well as the mail's author and it's subject. The prioritized view lists a mailboxes alarm state and information about the number and ages of its messages both read and unread. The current message shows different MIME parts in a tabbed view, and the list of messages indicates individual message state, such as whether it has been deleted, locked or deferred.

In the prioritized mailbox view, users see a list of their mailboxes, along with relevant statistics. Mailboxes are ordered based on alarm state, number of unread messages, size, and a user defined priority. Users can quickly see which mailboxes require immediate attention. In addition, Ishmail also provides an activity log. This log contains a list of all activities since the last time it was cleared. For example, incoming and outgoing messages are listed with an indication of their home mailbox. When a user returns to her desk, she can quickly see any recent email activity. This provides the temporal bottom-up view of messages that is lost in the top-down prioritized view.

Deferral of messages to more appropriate delivery time

Another novel feature of Ishmail is *message deferral*. Many messages that arrive in a user's mailbox are important but not immediately relevant (*e.g.* meeting and talk announcements, or project or paper deadlines). Instead of having the message get lost in the flood of new messages, users can defer a message's delivery. This means that the message is deleted and then "resent" when the user is ready to deal with it.

Multi-level automatic archiving

One concern with deleting messages is the possibility that important messages will be lost. Each Ishmail mailbox can be set to archive its messages automatically into weekly, monthly and yearly archives. Users can also set a mailbox to delete old messages. For example, a mailbox for messages from a mailing list may be set up to maintain a constant size of 25 messages. With archiving turned on, the mailbox will work to always maintain only the 25 most recent messages with older messages easily found in the archives.

Personas

Many users often maintain different online personas. Some deal with this by maintaining several mail accounts. Ishmail allows users to manage their multiple lives by associating a persona with each mailbox. A persona allows users to specify a specific signature file, as well as values for header fields (including X-URL and From) to be used for outgoing messages.

USER STUDIES

An earlier version of Ishmail was in constant use by 20-30 users. The current version has been in use by 5 users for about a month. Initial feedback has been very positive. Once used to multiple sorted mailboxes, users realize the potential of dealing with small clusters of related messages. As with the original Ishmail, users did not want to return to their old models for dealing with mail.

A more complete field trial is underway with a larger number of users. Along with usage data recorded by our logger we also plan to administer questionnaires that can show us which features were most useful and whether or not the system as a whole can improve users perceived performance when dealing with email.

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