

Offline IMAP

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1 About This Document

This document reflects the design for a feature that is in progress. A first pass at the offline IMAP feature was implemented in Windows Eudora 7.0. As expected, this initial implementation was incomplete and the plan is to refine this feature based on feedback from the initial implementation. Some portions of this document have been implemented and some portions reflect possible future directions. Portions that reflect possible future directions are in [blue](#).

2 Introduction

Previously IMAP users were pretty much limited to working online. Other than opening previously downloaded mail there was essentially nothing a user could do with mail from an IMAP account without an active connection to the IMAP server. If a user attempted to do any other action while offline Eudora would ask the user if they wished to go online and if they did not the action would be cancelled. It is desirable to allow users to perform some operations while offline and have Eudora update the server the next time they go online.

3 Supported Actions

Different Eudora actions are supported in different ways offline. Some actions can be performed locally offline, some actions cannot be performed until Eudora is online and some actions will behave differently depending on the online state.

3.1 Offline Actions

The following user actions are performed locally offline then have the server portion performed when online.

- Mark Message Deleted/Undeleted (STORE \Deleted) – Delete (no fancy trash) or undelete a message.
- Mark Message Replied (STORE \Answered) – Mark a message as having been replied to.
- Mark Message Flagged (STORE \Flagged) – Mark a message as flagged (corresponding to one of Eudora's labels). The \Flagged attribute is currently only used on the Mac.

- Mark Message Draft (STORE \Draft) – Mark a composition message as a draft (unsent). The \Draft attribute is not currently supported on either platform.
- Copy/Transfer Message on Same Account (COPY, possibly followed by STORE \Deleted) – Copy a message (downloaded or not) from one mailbox to another mailbox on the same account. If transferring then also mark the message as deleted. Note that transfer includes the delete (using fancy trash), junk and not junk actions.
- Copy Downloaded Message Across Accounts (APPEND) – Copy a previously downloaded message from a mailbox on one account to a mailbox on a different account.
- Create Mailbox (CREATE) – Create a new mailbox.
- Rename Mailbox (RENAME) – Rename a mailbox.
- Delete Mailbox (DELETE) – Delete a mailbox.

3.2 Deferred Online Actions

The following user actions cannot be completed unless Eudora is online because we need to communicate with the server to complete these actions. We allow the user to queue these actions while offline and have them performed later when online.

- Download One or More Parts of a Message
- Copy Undownloaded Message Across Accounts
- Refresh Mailbox List
- Resync a Mailbox
- Expunge a Mailbox

3.3 Conditional Actions

The following user actions respond differently in the case where Eudora is online vs. offline:

- Open a Mailbox – If Eudora is online the mailbox is synced when opened. If Eudora is offline then the mailbox window is simply opened with the cached contents shown.

4 Infrastructure Changes

There are a number of changes to the basic IMAP infrastructure that were made prior to coding offline support. It should be noted that both of the following have already been implemented for Mac Eudora.

4.1 Optional Hiding of Deleted IMAP Messages

Eudora allows deleted IMAP messages to be omitted from a mailbox's TOC view. Mac Eudora does this by supporting a hidden IMAP cache mailbox which holds the messages which have been marked as deleted. Windows Eudora keeps deleted IMAP messages in the mailbox and TOC files along with the other messages but selectively omits those messages from the view. This is a per mailbox setting but it can be set for all mailboxes in a tree via a single action.

4.2 Batch Commands

Eudora supports issuing a single command on a range of messages as an alternative to sending the same command repeatedly on multiple messages. This is not strictly necessary for offline support but it is important for the purpose of optimizing current IMAP handling as well as optimizing offline reconciliation. [We should make sure that Eudora knows how to take advantage of all commands that can operate on ranges. Specifically, fetching message bodies is still done by issuing one command per message to be downloaded.](#)

5 Action Queue

Eudora maintains a queue of actions that need to be performed online at a later time. Where possible these actions have already been performed locally. This queue serves two purposes: performance when online and functionality when offline.

When Eudora is online, queueable actions are performed locally, cached and performed online during a subsequent idle time, resulting in improved performance from a user perspective. For example, a transfer action can happen almost instantaneously rather than forcing the user to wait for two or more "round trips" between the client and the server, possibly taking several seconds.

When Eudora is offline, queueable actions are performed offline, cached and performed the next time Eudora is online. That might happen later in the same Eudora session or on a subsequent launch of Eudora.

Implementation details of the action queue are discussed in the "IMAP Action Queue" document.

6 Failure Management

Eudora will need to handle the case where a queued IMAP action cannot be reconciled online. There are any number of reasons this might happen and one of the more potentially complicated is where the user makes one or more changes offline and then, before the changes are reconciled, makes a conflicting change via another machine, another client, etc. For example, a user moves a message from mailbox A to B offline, then online deletes mailbox B. When Eudora attempts to reconcile the offline changes, the mailbox B is no longer there. Although there are different potential causes for a failure, all Eudora will know is that the particular command failed.

6.1 Resolving Conflicts

If a message action fails because the source mailbox could not be found or the message could not be found in the mailbox then Eudora should ignore that action and any further actions on that message. If the source mailbox could not be found Eudora should ignore any further actions on messages in that source mailbox.

If a transfer action fails because the destination mailbox could not be found then Eudora should ignore that action. The copy of the message should be removed from the local cache of the destination mailbox. There are several possibilities for what to do with the original copy of the message in the source mailbox. I think Eudora should undelete the message and leave the copy in the source mailbox. Leaving the message in the source mailbox in its deleted state (which OE does) is unacceptable, especially if the user is hiding deleted messages.

If a copy action fails because the destination mailbox could not be found then Eudora should ignore the action and any further actions on the copy of the message. The copy of the message should be removed from the local cache of the destination mailbox. Further actions on the original message in the source mailbox can be reconciled.

If a mailbox action fails Eudora should ignore the action and it is probably reasonable to ignore any additional actions on that mailbox. It is possible that one mailbox action might fail but another might succeed, but I don't see any problem with declaring a mailbox to be a lost cause after the first failure.

6.2 Reporting Errors

All of the email clients tested are cryptic when reporting failures. Eudora should provide more helpful error messages to the user.

The first time an action fails on a particular message Eudora should extract data about the message from the local cache and use that information to indicate to the user which message failed. Likewise, the first time an action fails on a particular mailbox Eudora

should get the name of the mailbox so error reports can indicate which mailbox failed. After the log replay is complete, Eudora will present a dialog to the user with text like “Some IMAP commands could not be completed.” This dialog would have two buttons “OK” and “Details”. The Details button would display details of the actions that failed via text like the following:

The following mailboxes could not be found so all offline actions on those mailboxes have been ignored:

Foo

Bar

The following messages could not be found so all offline actions on those messages have been ignored:

Crashes in msvcr7.dll, Mon, 14 Feb 2005 15:49:43 in the “Baz” mailbox

...

6.3 Lost Log File

The loss of the log file should be a rare event but would result in the local cache and the server state being out of sync with no good way to resolve those differences. The best we can hope to do is restore the local data to match the data on the server, effectively ignoring any changes made locally. Further details are discussed in the “IMAP Action Queue” document.

6.4 Orphaned Message Mailbox

If a message truly becomes orphaned by the process of replaying offline actions then Eudora will create a new mailbox to collect any orphaned messages.

If conflict handling is dynamic enough, truly orphaned messages should be the exception but could still be possible. For example, assume a user is offline and moves a message from mailbox A to mailbox B and then deletes mailbox A. Further assume that when the user goes online the message transfer fails (perhaps because mailbox B was renamed via another client) but the deletion of mailbox A succeeds. The user clearly wanted to keep the message but we no longer have a home for this message. In this case the message would be moved to the orphaned message mailbox.

7 User Interface Issues

There are a number of interface changes we will need to make to support offline capability.

7.1 Entering/Leaving Offline State

If Eudora detects that the computer does not have a network connection, then we should present to the user a dialog indicating that there is no network connection and asking the user if they wish to put Eudora into its offline state. If the user chooses to remain in the online state, Eudora will not prompt the user again if future online actions fail.

Eudora's method for manually going offline is quite obscure. Eudora should offer a menu item "File|Go Offline/Online" that will toggle the mode. (This feature is provided by most of the other clients.) One reason a user might want to manually enter the offline state is a situation where they have multiple accounts and for various reasons one of those accounts is not accessible at the moment. Eudora would not strictly be offline and if the user attempted any online actions on an IMAP account Eudora would not allow the actions since it is currently online. (Yes, this scenario might argue for an individual online/offline state for each personality.)

Most of the other clients also offer some sort of indication whether Eudora is currently online or offline. This is often a subtle thing, such as an icon tucked away in a corner. We might want to consider offering this kind of feedback as well.

7.2 Progress Replaying Actions

It would be useful to have an indication of how much progress Eudora has made in replaying actions that have been queued. An obvious way to do this would be to have an entry in the Task Status window indicating how many total actions were in the queue at the time replay started and how many presently remain in the queue.

8 Transition States

Here are a few considerations for actions to perform when switching between online and offline states.

8.1 Going Offline

It has been suggested that when a user sets Eudora to offline mode they should be given the option of downloading data to work on while offline. For example, with Thunderbird you can mark certain mailboxes as available for offline use. When you tell Thunderbird

to go offline it asks you if you wish to download data to work offline. If you do, Thunderbird will download all of the data for the mailboxes you have marked as available for offline use. This is a potentially useful feature but is the sort of thing we might delay until later in the beta cycle or even until 7.1.

8.2 Going Online

It isn't clear to me that there is anything particularly useful to do when going online, except asking for passwords we don't have for any accounts that have offline actions associated with them.

9 Future Considerations

This section contains ideas that were rejected, lacked enthusiasm or are for future consideration.

9.1 Allow Offline Action Setting

We could provide an option to allow the user to specify whether or not IMAP actions can be performed while Eudora is offline (defaulting to allowing offline actions). This would allow a user to keep the current behavior where they are asked if they attempt an action that requires a server connection. This could serve as a safety feature to prevent unwanted changes, but might end up being an unused setting. No other clients offer such a setting.