

# IETF67 / San Diego

Contexts for IMAP  
draft-cridland-imap-context-00

Curtis King  
Dave Cridland

At <http://dave.cridland.net/slides.html>  
in OpenOffice.org, PDF, HTML, with notes.

# Contexts

- CONTEXTs give us:
  - Filtered views (Provided by IMAP SEARCH/SORT)
  - Virtual Scrollbars (PARTIAL)
  - Updated Results (NOTIFY)
  - Sorted views
  - Multiple views

# Virtual Mailboxes

- Real virtual mailboxes (VFOLDER) gives us:
  - Filtered views (Using IMAP SEARCH criteria)
  - Virtual Scrollbars (Using IMAP Mailbox model)
  - Updated results (As above, EXISTS/EXPUNGE)
  - No sorted views
  - Only single view (or use multiple sessions)

# Major Differences

- CONTEXTs good for SEARCHes using flags, keywords, annotations, etc. VFOLDER has problems here.
- CONTEXTs cannot provide anything to naïve clients. VFOLDER can, but this is a concern to some.
- CONTEXTs views can be ad-hoc, on-the-fly. VFOLDERS must be predefined.

# Minimal Implementation

- SEARCH CONTEXTs can be implemented easily. SORT are harder.
- Servers:
  - Re-execute SEARCH for every PARTIAL.
  - Ignore CONTEXT.
  - Small amount of special code for NOTIFY.
  - No need to hold results.
- Obvious optimizations.

# Multiple use-cases

- Virtual Mailboxes:
  - Construct “virtual mailbox” on the fly using NOTIFY.
- UID based notifications:
  - tag UID SEARCH RETURN (NOTIFY) ALL
- Multiple CONTEXTs concurrently:
  - Grouped views?
  - Use one for view, one for notifications for incoming/changed messages, or highlighting.

# For ACAP People

- CONTEXTs crucial feature of ACAP
- CONTEXTs tricky in ACAP, not in IMAP:
  - No non-NOTIFY contexts – no snapshots
  - RANGE search criterion becomes PARTIAL return option; no method for SEARCHing CONTEXTs.
  - But no method for creating a CONTEXT, only a hint.
- But basic functionality lifted from ACAP

# Most importantly

- 'X' character in capability string.
  - No 'X' at all in “VFOLDER”, so no contest.



# Open Issues

- Turn CONTEXT from hint to requirement?
  - No way to know when this broken: PARTIAL / NOTIFY essentially imply CONTEXT anyway.
- Do we try for SORT now, or later?
  - SORT support really nice, but raises the bar.
  - Could do CONTEXTS=SORT in this doc or a later one.

# Open Issues 2

- Resynchronization is hard.
  - Probably get away without it, because bandwidth costs are low, and initial handling can be pipelined, but needs investigating.

# Questions?

- Dave is on Jabber:
  - So use the microphone,
  - Or just type the question.
- Questions later?
  - <mailto:dave@criland.net>
  - <xmpp:dwd@jabber.org>

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This presentation will assume that you've either read draft-cridland-imap-context-00.txt, or that you're simply seeking an overview. It will also help to be aware of the various mechanisms currently or previously proposed for virtual mailboxes.

These include VIEW, VIEW, WINDOW and VFOLDER. (One of the VIEWS became VFOLDER. You get to pick which.)

The design for contexts emerged from a discussion between Curtis King, a server developer, and Dave Cridland, a client developer. At the time, only Curtis worked for Isode.

# Contexts

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  - Filtered views (Provided by IMAP SEARCH/SORT)
  - Virtual Scrollbars (PARTIAL)
  - Updated Results (NOTIFY)
  - Sorted views
  - Multiple views

This is an extension for IMAP's SEARCH, and adds the tools needed for the client to handle efficient view filters. It adds essentially two new return options for SEARCH and SORT, plus a hint clients can use to tell servers they're going to use them.

# Virtual Mailboxes

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VFOLDER provides a mailbox-like interface onto SEARCH results. They don't do SORT, and like mailboxes, they're a stateful interface.

## Major Differences

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- CONTEXTs cannot provide anything to naïve clients. VFOLDER can, but this is a concern to some.
- CONTEXTs views can be ad-hoc, on-the-fly. VFOLDERS must be predefined.

CONTEXTs are “just a SEARCH”, so they work well with dynamic data. VIEW has to re-issue UIDs, so can potentially cause a client to redownload static message data. CONTEXTs uses the existing UIDs, so identifiers don't change.

VFOLDER-created mailboxes can be used by naïve clients, which is a big advantage, but this may cause redownload of static data, and is thought by some to be a serious problem, as a naïve client may download all available mailboxes completely, whether virtual or not. CONTEXTs can't be used unless the client is aware, and viewing a CONTEXT based view will use the same message data as view the mailbox directly.

CONTEXTs can be created and viewed with a single round-trip. VIEWs must be explicitly created.

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In general, true virtual folders are promoted by servers with database backends, for which all mailboxes are virtual to an extent. Most servers aren't built this way, though.

CONTEXTs are designed to be easily implementable, and it's possible to write a very simple implementation very easily – it would be a little slow for PARTIAL, but NOTIFY can be done this way quite fast. SORT-based CONTEXTs are harder, though.

Obviously, an optimized implementation is possible, in the simplest case by holding results, and potentially by keeping frequently used criteria indexed.



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As a toolbox extension, client authors can achieve much more than a virtual mailbox.

Client authors wishing for UIDs of newly received and deleted messages can get this with a remarkably simple single command. REMOVEFROM isn't subject to the EXPUNGE rules, so servers can notify sooner with UIDs, and ADDTO contains a UID set of new messages.

Because it's a SEARCH at heart, multiple contexts can be created, perhaps for a grouped view, perhaps using different contexts for different purposes, like notifications and summary view highlighting.

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ACAP has contexts, and they're one of the most useful features of the protocol.

ACAP's contexts are, however, quite tricky for server implementors, so IMAP's contexts have been pruned to make them much easier.

Snapshot contexts are a real pain in ACAP. They'd be less so in IMAP, but still, no ACAP client has ever asked for one, so I ditched them.

RANGE, and the ability to base a SEARCH on a CONTEXT, has been ditched. RANGE's functionality is present in PARTIAL, but only for filtering results.

But there's no way to formally create a CONTEXT in IMAP, clients merely imply they exist. However, the basic functionality is in use in ACAP today, and works well, so the basic model has been shamelessly stolen.

## Most importantly

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# Open Issues

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- Do we try for SORT now, or later?
  - SORT support really nice, but raises the bar.
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CONTEXT is most useful when the client wants to know MIN, MAX, or COUNT – from ESEARCH – before doing other CONTEXT-like stuff, and doesn't want to use NOTIFY. I think this is quite contrived.

Moreover, it's very difficult to know when the client has failed to do this, unless we mandate an additional round-trip – one to create the CONTEXT before its first use. I'd rather not do this.

SORT would be really nice, but the cost – both implementation and specification – is much higher. We could specify it as a “sub-extension” of CONTEXTS in draft-cridland-imap-context, rather than implied by SORT and CONTEXTS.

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- Resynchronization is hard.
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There are some notes in the draft on this.

# Questions?

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See? XMPP has an X. That's why it's so good.