

IMAP, JMAP and the future of email standards

Bron Gondwana <brong@fastmailteam.com>

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Hi everyone, my name is Bron. I'm from Fastmail and based in Melbourne, Australia. Last time I spoke at Fosdem was 2015, and I did a lightning talk about the proposed JMAP protocol.

DISCLAIMER

- This talk and the protocols covered are for client / server email only
- I do NOT address server / server SMTP
- I do NOT address end-to-end encryption

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Before I begin, I want to make it clear that this is a talk entirely about client to server protocols. I'm not addressing server to server SMTP, and I'm not addressing end-to-end encryption.

I know there's a lot of interest in those topics, here, within the IETF, and within the wider world, but I've deliberately avoided going down that rabbit hole in my work. I just want to make the client experience better.

Email client/server protocols

- POP3 + pop-before-SMTP
- IMAP4 + extensions + SMTP
 - Including vendor-specific extensions
 - + CalDAV/CardDAV or LDAP
- Microsoft protocols (EAS, Activesync, OWA)
- Gmail app proprietary + rest API
- InboxApp / Nilas and other custom protocols

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This is still pretty much the landscape. Yes, people do still use POP3, but most open clients speak either IMAP, possibly with some vendor extensions, possibly with some open extensions.

And there's various connectors to the proprietary APIs too.

JMAP: a modern, open alternative

- One protocol for Email, Submission, Calendar, Contacts, etc
- Evolved from FastMail's vendor-specific API
- Informed by experience with IMAP QRESYNC and *DAV sync-collection

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FastMail originally built our own JSON protocol for our webmail, based on our needs and on my experience rebuilding the core of the Cyrus IMAP server to support QRESYNC, so the protocol was informed by existing open standards.

One of our key goals was to have a single protocol for everything, because as a company who provides technical support to customers... issues with partial firewall failure or partial credential failure are disturbingly common. e.g. you can send email, but saving the sent copy fails – or you can read email but not reply.

FastMail protocol simplified

- Always wanted to do an open standard rather than yet another walled garden proprietary API
- Originally self published
- Clear that it was a popular idea, but needed IETF RFC status for better adoption

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JMAP was born from simplifying the FastMail protocol. Originally we self published, however it became clear that we would only get adoption if it was a real standard, so we took it to the IETF.

Internet Engineering Task Force

- IETF has been meeting for 34 years
- Custodians of the standards of the internet
- Fantastic resource for anybody working on a protocol
- Many improvements to JMAP via IETF group
 - Both simpler and more powerful!

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The IETF is the Internet Engineering Task Force, they've been meeting 3 times per year for 34 years now, and they are the custodians of the standards that the internet is built upon.

We at FastMail have been doing email for 20 years, but at the IETF we had access to people who've been working with email for even longer, and in more diverse environments than us. It's such a fantastic resource for anybody working on a protocol.

Standards: foundations of software

- Best things happen at the boundary between freedom and constraints
- Standards constrain software so it can communicate with the rest of the world
 - Great basis for a test suite too!
- Good standards last much longer than software, worth taking the time to get it right!

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As open source developers, standards are the fixed points that we build around. Without getting too philosophical, the best things happen at the boundary between freedom and constraints.

Standards are a constraint that shapes your software and how it communicates with the rest of the world (and they're also a great guideline to build your test suite around).

Good standards last much longer and change much slower than software, so it's really important to take the time to get them right!

EXTRA: improving IMAP

- JMAP – glorious future / IMAP – protocol of now
- One of the most prolific working groups at IETF
- Collected up unpublished extensions and ideas
- Work from AOL/Verizon, Isode, Huawei, Oracle, Dovecot/Open-Exchange and of course FastMail!
- Makes IMAP more useful for everybody

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Of course, while JMAP is the great and glorious future, IMAP is the basis of most open email right now! Soon after I joined the IETF, I was also asked to co-chair a working group to maintain and improve the existing standards in the email space. This group is called EXTRA, and has been one of the most prolific working groups at the IETF.

These new extensions make IMAP more useful for everybody. Some of them are very small, just a keyword or an additional status item, but by making them standard, everybody can use them and you only need to implement the client software once.

The Dovecot / open-exchange people will be talking tomorrow in the RTC room about another new thing they're working on - come along!

EXTRA and JMAP together

- My very own spec: OBJECTID RFC8474
 - Maps to existing Gmail extension for X-GM-THRID and X-GM-MSGID
 - Unique identifiers to match JMAP emailId
- IMAP4rev2 work underway

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Of course I'm very proud of my own contribution here, the OBJECTID extension, RFC8474. This standardises something which was previously just a Gmail extension - unique identifiers per email which stay with it when it's moved to different folders, as well as a correlating identifier for threads so the client can easily find related messages without needing to fetch data and run a local algorithm.

The working group is also working on a second revision of IMAP. IMAP4rev1 was published in 2003, and is carrying tons of extensions. A baseline profile for modern IMAP will make life easier for both clients and servers.

You can get involved!

- IETF is a great place to bring work
 - Even if you don't have a new protocol proposal, adding your expertise to ongoing discussions helps
- We were sceptical at first, but IETF has been very welcoming
- Access to deep expertise in writing long-lived documents is super valuable
- Conferences cost, but mailing lists and remote participation are free

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I know many of you work with open source software. If you have an idea for something which should be a standard, and it's related to internet protocols... even if it's not yet fully formed, the IETF is a great place to bring it. Even if you don't have a specific idea, your input and energy is very valuable to the IETF.

Having access to people with deep experience in writing documents that need to remain useful over long time frames is invaluable. This is the opposite of agile.

The conferences do cost money, but you can join the mailing lists or participate remotely for free - and your voice is considered just as valuable regardless of how you participate.

Summary, where we're at

- IMAP extensions
- JMAP
- Next IETF is in Prague, March 23-29 (weekend is a hackathon)
- CalConnect in Zurich next week!
- <https://jmap.io> - see who's using it, learn how

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So we have IMAP extensions, we have JMAP, and there's heaps of other stuff happening at the IETF. Come along, next meeting is in Prague in late March.

If you have ideas for email that have just been too hard in IMAP, maybe they'll be easier in JMAP - come have a chat, I'll be around all weekend, then I'm off to CalConnect in Zurich to work on Calendar and Contacts formats, which are already slated to be added to JMAP soon.

Check out <https://jmap.io> to see who's already using JMAP, and to get involved and learn how to use JMAP for your next email project!

Play with JMAP now!

- <https://github.com/cyrusimap/cyrus-imapd/>
 - master branch has very complete support
- <https://www.fastmail.com/>
 - free trial account, play with JMAP via the web, and IMAP extensions via `imap.fastmail.com` direct to Cyrus.
- <https://proxy.jmap.io/>
 - note: currently outdated, but I'm working on it!

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Cyrus has full JMAP support in the master branch!

All new FastMail accounts are using our extended JMAP support by default. It's JMAP plus our own extensions for account management, aliases, domains, etc.

Thank you!

- <https://jmap.io/>
- <https://www.fastmail.com/> & <https://www.topicbox.com/>
- <https://www.cyrusimap.org/> (open source server)
- <https://datatracker.ietf.org/group/jmap/about/>
- <https://datatracker.ietf.org/group/extra/about/>
- <https://www.ietf.org/newcomers.html>

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Thank you for your time, and your support of open standards and open software!

Here are some links to resources, including of course FastMail's own products which are built on top of JMAP and where you can sign up for a free trial right away if you want to play with it.

And I'll ask now for any questions!