Doing more with lore and b4
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In the beginning...

- There was email
- And it was good
Directed by

ROBERT B. WEIDE
RFC2822 is more than just email

- usenet (the lists before the lists)
- it was nice, but it didn’t deal well with abuse
- people jumped ship to mailing lists (and web boards)
- abuse intensified, resulting in
  - SPF, DKIM, DMARC
  - continued centralization
- DMARC broke delivery from many lists
  - but not because it’s inherently incompatible with lists
  - it’s easy to do both DMARC and lists, ask me how
- RFC2822 is not protocol-specific
  - it doesn’t need to arrive via smtp
Why still use email?

- The only standard, widely used p2p messaging system
- Decentralized, vendor-neutral
- Provides full address portability
  - assuming you use your own domain
- Provides strong domain-level attestation
  - if yours isn’t, it should! DKIM is a *good* thing!
- Manages to handle abuse
  - not great still, but improving year after year
- Allows for mixed messages
  - this part for humans, this part for robots
- Everything is in one place: the inbox
Death by 10,000 shortcuts

- Maintainers don’t scale
- Maintainers don’t like have time to learn new UIs
  - Linus maintains uEmacs because of “muscle memory”
  - Oblig. XKCD Ref: 1782
- We want maintainers to focus on maintaining
  - If something is working well for a maintainer, avoid breaking it
- DON’T BREAK MAINTAINERFLOW?
  - sometimes it is inevitable because reasons
  - let me tell you about that one time when I turned off `finger kernel.org`
- MUA workflows allow maintainers to scale
Patches sent via email

- Patches are conversations
  - Hey, my name is Alex Eagerdev
  - I have a suggestion about coolfeature
  - This is how you are doing it now
  - I think you should do it this way

- From, Subject, Date, Explanation, Patch
- Interleaved email replies are natural
- Great workflow for reviews
- Not so great for anything else
Ye Olde Maintainer Workflow

- Save submission as an mbox file
  - or use tools like quilt
- Edit it manually to rearrange the series in the right order
- Collect and fill in code review trailers
  - Acked-by, Reviewed-By, Tested-by, etc
- Make a git branch
- Apply the mbox file
- Merge into your main branch
- Provide as much relevant info as possible in the merge message
- Ask upstream maintainer to pull
Email archives

● Decision crumb trail
  ○ “Who approved this?”
  ○ “Was this even tested?”
  ○ “I never said I reviewed this!”

● The great gmane.org meltdown

● The great lkml.org meltdown

● There was a need for distributable archives
  ○ that are easy to update
  ○ kind of like a feed
  ○ or a git repo?
  ○ is that even sane?
Public-inbox
  - clonable backend
    - archives are git repositories
  - fast search
    - using xapian
  - developer-friendly search
    - dfn: match filename from diff
      - dfn:MAINTAINERS
    - dfhh: match diff hunk header context
      - dfhh:apic_bus_freq_is_known
    - dfpost: match post-image git blob ID
      - dfpost:0466106d16
lore.kernel.org

- Can be mirrored in its entirety
  - in fact, lore.kernel.org is 3 geo-distributed mirror nodes
- 100% free software
- Anyone can set up a full clone and keep it updated
- Started out as just an archive collection site
- But it also allows for greater workflow automation
- The name is a Star Trek reference
  - Blame vger for this whole theme
- I regret the clever name because it’s hard to search
  - “b4” is a valid hex code
- You can install it from:
  - pypi (pip install --user b4)
  - your distro (though it probably has an older version)
  - by cloning the repo
    - I try to be very conservative with dependencies
- It’s seen some adoption by maintainers
**b4 mbox**

- grab whole threads from lore.kernel.org
  - threads are aggregated from across all lists
  - you can append them to existing mailboxes
- `b4 mbox -fo ~/Mail <msgid>`
  - downloads the whole thread and saves in your mailbox
  - filters out dupes already present in your mailbox
  - great for use with mutt:
    - macro index 4 "<pipe-message>b4 mbox -fo ~/Mail<return>"
  - press “4” to fetch the rest of the thread from lore
  - great for when someone cc’d you in the middle of a thread
b4 am

- Maintainer’s workhorse
- `b4 am <msgid>`
  - gets the thread
  - applies any follow-up trailers
  - checks DKIM signatures and crypto attestations
  - makes a mbox file ready for “git am”
- Doesn’t need to use lore.kernel.org
  - `-m ~/Mail` will get it from your local source
  - configuration settings can point it at any other public-inbox instance
  - configuration is stored in git config files
- Check out: `b4 am --help`
b4 am: lesser known features

- **-g, --guess-base**
  - guess where in the tree this patch series belongs
  - will work backwards from the date of patch submission
  - will try to match a tree corresponding to git index values
  - use `--guess-lookback` to extend beyond the default 14 days
  - not a perfect fix for lack of base-commit info, but better than nothing

- **-3, --prep-3way**
  - gets your local tree ready for 3way patching
  - I don’t actually know what this means, but I’m told it’s very useful

- **-c, --check-newer-revisions**
  - Check if a newer series revision is available
Show a range-diff between patch revisions
  - keeps contributors honest :)
Requires that index objects are present in the tree
Can range-diff arbitrary revisions (if it finds them)
  - b4 diff <msgid> -v 3 5
b4 pr

- Helps process pull requests
- b4 pr <msgid>
  - fetches the remote into FETCH_HEAD
  - checks PGP signature
  - verifies that the commit sha in the message matches remote
- --explode
  - turns a pull request into individual commits
  - saves as a mbox/maildir
  - copies the To/Cc addresses
  - you can open it with your MUA and respond to objectionable things
- will soon be offered as automation ("GitHub pr-bot")
b4 ty

- Automates “thanks, applied” responses
- Auto-Thankanator Gun `b4 ty --auto``
  - Looks at all patches/series you’ve downloaded with `b4 am` or `b4 pr`.
  - Tries to find them applied to the current tree.
  - Writes out .thanks files according to the template.
  - Future version will also send them out by itself.
**b4 attest**

- Cryptographic attestation of patches
- Moved to its own library `patatt`
  - Adapts the DKIM standard for in-header cryptographic signatures
  - Can use OpenPGP or ed25519 sigs
  - Set up once and forget (as long as `git-send-email` is used)
- `b4 am` will automatically check attestations
  - DKIM
  - patatt
- See my presentation to the Linux Security Summit next week
Attestation passing

Checking attestation on all messages, may take a moment...
---
✓ [PATCH v2] binfmt_elf: Reintroduce using MAP_FIXED_NOREPLACE
---
✓ Signed: openpgp/keescook@chromium.org
✓ Signed: DKIM/chromium.org
Attestation failing

Checking attestation on all messages, may take a moment...

---
✗ [PATCH v2] binfmt_elf: Reintroduce using MAP_FIXED_NOREPLACE
---
✗ BADSIG: openpgp/keescook@chromium.org
✗ BADSIG: DKIM/chromium.org
Share your b4 feedback

- I am not a kernel developer
- Sometimes I assume things and I’m wrong
- Your feedback is welcome and important
  - if you’re working around the tool’s quirks, it means I probably got it wrong
- Email tools@linux.kernel.org
Death by 10,000 mailing lists

● There is no “LKML”
  ○ nobody really reads linux-kernel@vger.kernel.org
  ○ it’s like yelling into a fire hose
● vger, infradead, linux.dev, oh my
● “where do I send this trivial typo patch?”
  ○ get-maintainer.pl is daunting for one-off contributors
● Can we harness the power of lore.kernel.org for good?
lore, meet lei

- public-inbox local email interface (lei)
  - query remote sources and deliver them locally
  - supports search-based queries
  - can deliver to local maildirs, or remote imap targets
  - can query lore.kernel.org/all/
Example: MAINTAINERS

OPEN Firmware AND DEVICE TREE OVERLAYS
M: Pantelis Antoniou <pantelis.antoniou@konsulko.com>
M: Frank Rowand <frowand.list@gmail.com>
L: devicetree@vger.kernel.org
S: Maintained
F: Documentation/devicetree/dynamic-resolution-notes.rst
F: Documentation/devicetree/overlay-notes.rst
F: drivers/of/overlay.c
F: drivers/of/resolver.c
K: of_overlay_notifier_
lore query

F: Documentation/devicetree/dynamic-resolution-notes.rst
F: Documentation/devicetree/overlay-notes.rst
F: drivers/of/overlay.c
F: drivers/of/resolver.c
K: of_overlay_notifier_

  dfn:Documentation/devicetree/dynamic-resolution-notes.rst
OR dfn:Documentation/devicetree/overlay-notes.rst
OR dfn:drivers/of/overlay.c
OR dfn:drivers/of/resolver.c
OR dfctx:of_overlay_notifier_*

Live lore link
lei command

lei q -o ~/Mail/overlay -I https://lore.kernel.org/all/ \ 
  -t '(dfn:Documentation/devicetree/dynamic-resolution-notes.rst \ 
    OR dfn:Documentation/devicetree/overlay-notes.rst \ 
    OR dfn:drivers/of/overlay.c OR dfn:drivers/of/resolver.c \ 
    OR dfctx:of_overlay_notifier_*) AND rt:6.months.ago..' 

● -t: means “whole threads” (you may not want that!)
● rt:6.months.ago.. (the last “..” is important)
  ○ Change it to “rt:1.week.ago..” after the first run
● -o imaps://imap.gmail.com/lore/overlay
lei up and friends

- `lei edit-search ~/Mail/overlay`
  - tweak search parameters
  - highly recommended to change `rt: after the initial run`
  - exclude things with: `AND NOT ([foo] OR [bar] OR [baz])`

- `lei up ~/Mail/overlay`
  - fetch the latest results
  - you can delete messages from the folder, they won’t get re-added

- `lei up --all`
  - set up `git-credential-helper` for imap creds

- `lei ls-search`

- `lei forget-search ~/Mail/overlay`
**Status of lei**

- **under heavy development**
  - core functionality stable and working well
  - documentation is being written
  - new features are forged all the time

- **your feedback is needed!**
  - email meta@public-inbox.org

- **installing lei**
  - [https://public-inbox.org/INSTALL.html](https://public-inbox.org/INSTALL.html)
  - lots of perl dependencies, but all present on Debian
  - I hope to package it for Fedora soon
  - you can use my toolbox instructions
Neat ideas

● pseudo mailing lists
  ○ kernel.org manages query-based searches
  ○ results are offered via read-only IMAP (and POP3, not yet available)
    ■ remote POP3 folders can be added to gmail
    ■ allows you to use L: linux-kernel@vger.kernel.org
  ○ “Just send patches to LKML, I’ll see them”
  ○ “Just mention my subsystem in the email, I’ll see that”
    ■ Including in a follow-up, if grabbing full threads
  ○ Easy onboarding for new maintainers
  ○ Can be used for patchwork projects

● Read-write IMAP for individual maintainers?
Main goals

● Help maintainers scale
  ○ turn up the signal, turn down the noise

● Keep things decentralized
  ○ anyone can set up a full mirror

● But hopefully not confusing or frustrating
  ○ you can do it yourself, but we’ll also do it for you, if you like

● Don’t break maintainerflow
  ○ adding new without disrupting old
  ○ introducing new tools without any “everyone must switch” flag days

● Simplify things for contributors
Keeping in touch

- **workflows@vger.kernel.org**
  - discuss maintainer workflows

- **tools@linux.kernel.org**
  - talk about b4 or other maintainer tooling
  - or just mention “b4” in an email, I’ll see it
    - this is 100% normal and non-creepy

- **meta@public-inbox.org**
  - feedback for public-inbox and lei