hkml: Mailing Tool for Simple Linux Kernel Development

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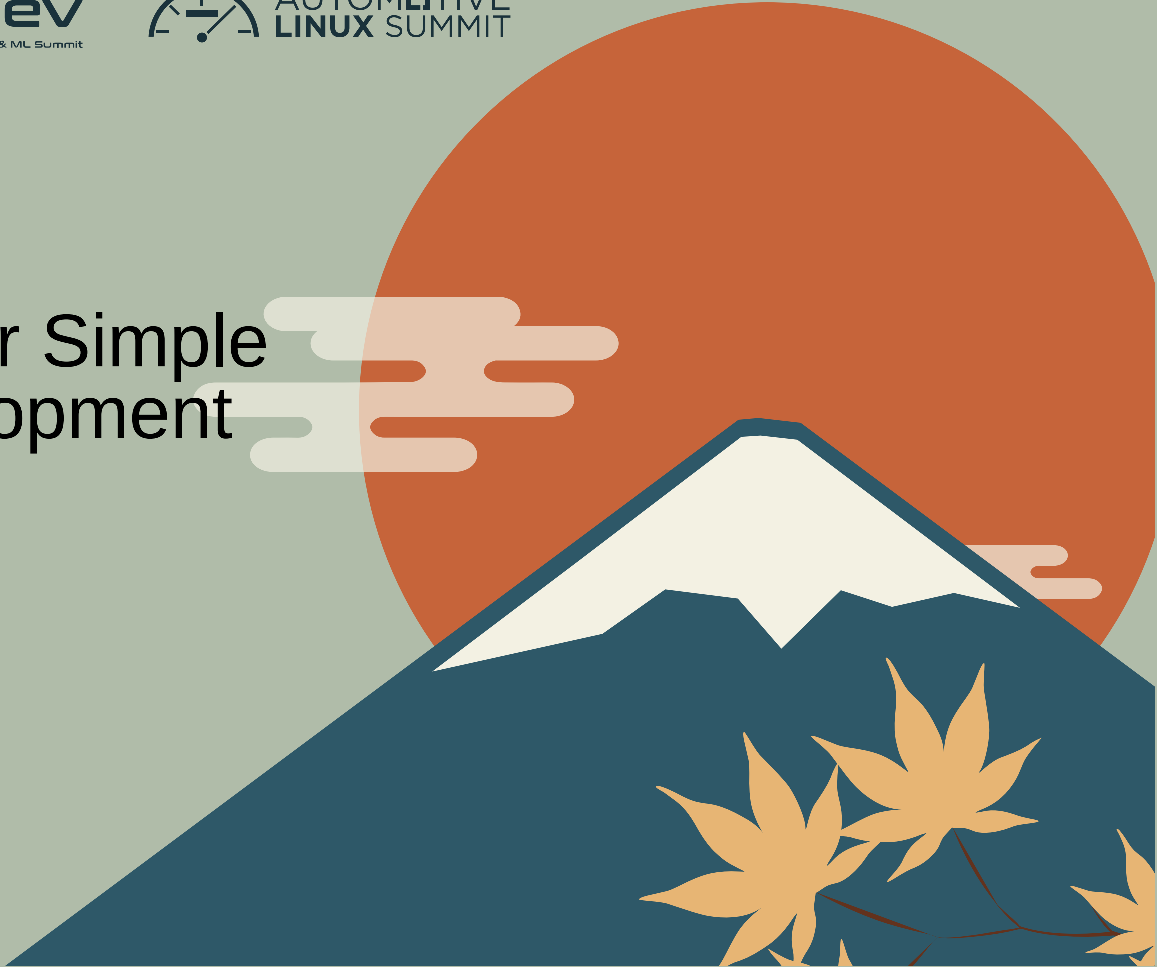
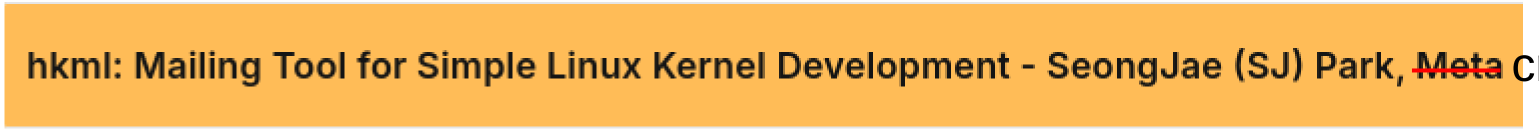


About The Speaker: SJ

- Kernel Programmer, maintaining DAMON
- Working for crusoe.ai (we are hiring!)
- Was working for Meta when this talk was submitted
  - And don’t know how to update talk intro on the webpage (sorry if it confused you)
  - All opinions are always speaker’s own, though



hkml: Mailing Tool for Simple Linux Kernel Development - SeongJae (SJ) Park, ~~Meta~~ crusoe.ai

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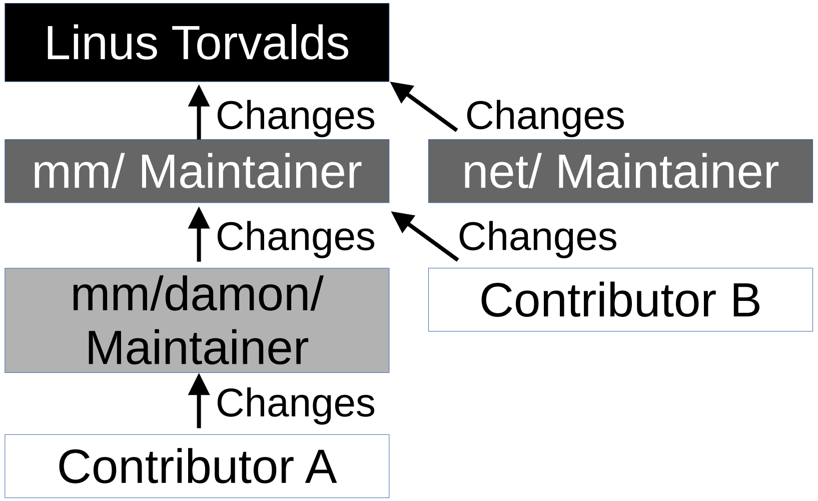
Linux Kernel Development Process and Challenging Points

Achievement of The Process

- Survived from the test of time, since 1991
- Keeping and even accelerating development speed
  - ~2,000 developers, ~15,000 commits, per ~9 weeks
- Being used nearly everywhere
- Most successful and active open source software

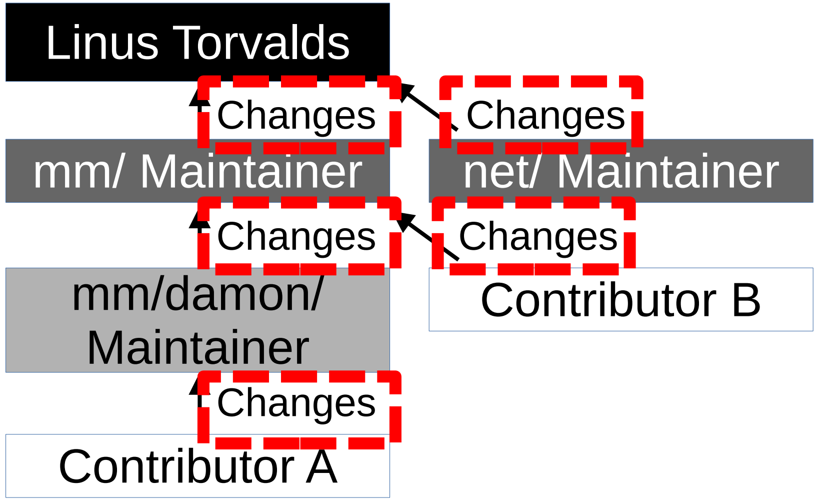
Kernel Development Process, 1000 ft View

- Kernel: A set of (recursive) subsystems
- One maintainer team per subsystem
- Contributors send changes to maintainers
- Maintainers send changes to upper level maintainer
- Distributed, scalable, simple



Individual Code Change Process, 100 ft View

- Make local changes
- Convert changes into human-readable form
- Send it to the relevant people
- Discuss about the proposal with the people
- Repeat until accept/reject
- Straightforward



Making Change Request, 10 ft View

- Standardized tool ('git') and resources available
- Make local changes
  - '`git commit`'
- Convert changes into human-readable form
  - '`git format-patch`' or '`git request-pull`'

- Make local changes
- Convert changes into human-readable form
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Sending Change Request, 10 ft View

- Send it as a plain text email
- Standardized tool (‘git’) makes this semi-automated and doable
- Finding relevant people
  - Maintainers, reviewers, and mailing list of the subsystem
  - `MAINTAINERS` file and `get_maintainer.pl` can be used
- Sending the patch or pull request
  - ‘`git send-email`’

- Make local changes
- Convert changes into human-readable form
- Send it to the relevant people
- Discuss about the proposal with the people
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- Straightforward

Change Request Discussion, 10 ft View

- How to reply?
  - Bring your own mailing tool (Note: Gmail is sub-optimum)
- How to read others' mails?
  - Subscribe to mailing list, or
  - Search mailing list archives
- How to convince others?
  - Out of the scope of this talk

- Make local changes
- Convert changes into human-readable form
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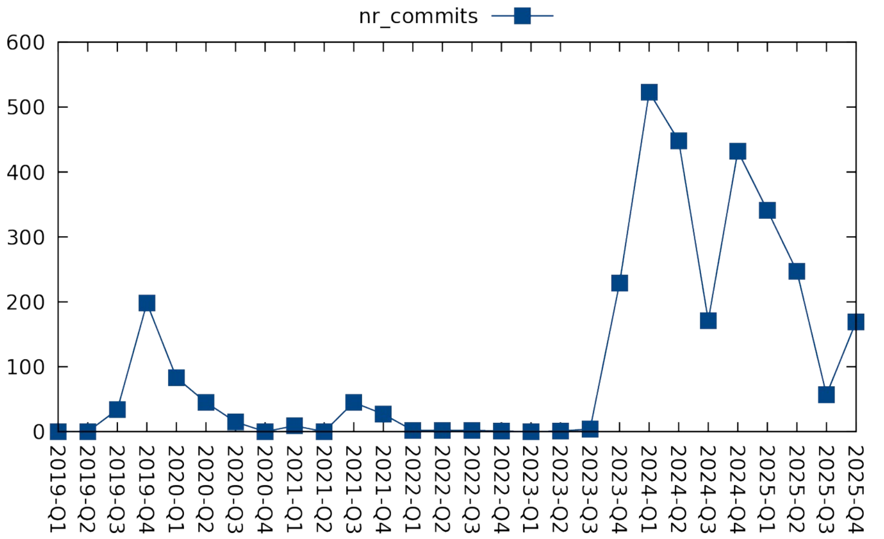
Change Request Discussion Challenges

- Finding proper email client
  - There are more than two ways to do that
    - Kernel official documentation introduces 15 tools
- Reading other’s email
  - Subscribing doesn’t work for busy subsystems (hundreds of mails per day)
  - Public archives (lore.kernel.org) lack comfy of private inbox
    - No reply button, difficult personalization
- Pain points for some people including beginners

hkml: Hackers’ Mailing Tool

Evolution of a Tool

- 2019: Public-inbox based hack
  - Supported only listing and reading mails
  - Only for the developer's personal usage
- 2021: DAMON maintenance mailing tool
  - Extended for formatting and sending mails
  - Still a hack for personal usages
- 2024: Linux kernel developers mailing tool
  - Extended for mbox support, interactive UI, etc
  - Officially committed to support all Linux kernel developers including DAMON community



hkml: Mailing tool for Mails-driven development

- Design goals: minimum setup and resources
- Support reading public-inbox archives and mbox files
- Highly optimized for Linux kernel development
- Known users: DAMON maintainer and a few cool folks
- Available at https://github.com/sjp38/hackermail

This QR code is generated from https://www.qr-code-generator.com

hkml Demo Time

Setup

- `git clone https://github.com/sjp38/hackermail`
- That’s it!

Reading Mails from Mailing Lists

- `hkml list <list name, e.g., damon>`
- Show the mails of the list with an interactive UI
- The interactive UI supports most works
  - Replying, Finding patches to review, etc
  - Press ‘?’ for shortcut keys
  - Press ‘`m`’ for menus

Reading Mails of a Thread on Mailing List

- hkml list <msgid or lore.kernel.org link>
  - e.g.,

    ‘html list \
        https://lore.kernel.org/20251125015841.76180-1-sj@kernel.org’, or

    ‘hkml list 20251125015841.76180-1-sj@kernel.org’

Reading Personal Mails (Unsent to Mailing Lists)

- Save the mail[s] as an mbox file
  - Modern email clients including Gmail support this
- `hkml list <mbox file>`

Tagging Mails

- From the list, open menu (press ‘`m`’) → ‘`manage tags`’
- To read mails of a tag,
  - `hkml list <tag name>`

Replying to Mails

- From the list, open menu (press ‘`m`’) → ‘`reply`’
  - ‘`hkml`’ will help users for writing/sending the reply
  - The mail will be tagged as ‘`drafts`’ or ‘`sent`’ depend on user’s following action
  - ‘`hkml`’ can find previous drafts and suggest using it

Writing and Sending a Mail

- ‘`hkml write`’ from the terminal
  - Works similar to replying feature

Downloading Patches

- From the list, open menu → ‘`handle as patches`’
  - → ‘`export patch[es]`’
- Save the patches on the user-specified path
- Collect {Reviewed,Acked,Tested}-by: tags in replies
- Merge cover letter into first patch’s commit message (mm style) if requested

Testing Patches

- From the list, open menu → ‘`handle as patches`’
  - → ‘check `patch[es]`’
  - Download the patches and run `checkpatch.pl`

Applying Patches

- From the list, open menu → ‘`handle as patches`’
  - → ‘apply `patch[es]`’
- Download the patches and apply on the current tree
- Make a merge commit having cover letter’s description as its commit message, if requested

Formatting and Sending Patches

- From terminal, ‘`hkml patch format <commits>`’
  - Setup CV with commit message of
    - first commit’s parent, or merge commit of given commits
  - Add recipients based on `get_maintainer.pl`
    - Only coverletter gets all recipients
  - Run `checkpatch.pl` for each patch
  - Give user a moment to review subjects and reviewers
  - Finally send the patches
  - User can abort the process at each step

hkml Advanced Features Demo
(Depending on time, this might be skipped)

Remote tags synchronization

- `hkml sync --remote <your private git repo>`

Mails Monitoring

- `hkml monitor add ...`
- `hkml monitor start`
  - Periodically run ‘hkml list’ with specified filter/decoration options
    - Only new mails are git-fetched; no overhead to lore.kernel.org
  - Send the output as an email to user

And more hidden features

- Flexible mails filtering
- Flexible mails display options
- Refer to USAGE.md
- Suggest/contribute your features

QnA

- Feel free to use
  - sj@kernel.org
  - https://github.com/sjp38/hackermail/issues

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