BPF Documentation/ Standardization Progress

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IETF Standardization status

- Joel Halpern (Ericsson & an IETF Trustee) had raised two issues:
  - He believed it was out of scope for IETF
  - He believed that there were legal issues in bringing BPF work to IETF due to Linux kernel GPL
- March 25-31 IETF 116 ([proceedings](#))
  - Hackathon: other groups using BPF, had meeting with one group
  - Meeting with IETF leadership & IETF lawyer: explained legal state
    - Lawyer confident that there was a way forwarded, provided statement for BOF
  - BPF/eBPF BOF: Meeting to propose a working group and charter
    - Chaired by Suresh Krishnan (Cisco, past IETF AD) and Lorenzo Colitti (Google Android)
  - Hackdemo hour: BPF table answered questions and handed out swag
  - IETF plenary: BPF got a special mention by the IETF chair
  - Side meeting: Worked on charter text

Summary of BOF Discussion

- Over 100 attendees in person, plus more virtually
  - Included half of the eBPF Foundation's BPF Steering Committee
- Goal is to standardize cross-platform BPF specifications
  - Presentations from Alexei (Linux history), Dave (Windows), Lorenzo (Android's use)
- Chairs showed statement from lawyer, legal discussion thus out of scope for BOF discussion
  - I later talked to Joel who apparently got similar answer from own lawyer
- Overwhelming support for IETF taking on the work
  - IETF Chair (Lars Eggert) said BPF is central to IETF's mission to remain relevant
  - 2 people (Joel and one other) spoke against, everyone else strongly for
- Chairs did consensus call for creation of WG: very strong support

IETF Process for WG creation

- Decision owner is sponsoring IETF Area Director: Erik Kline (Aalyria)
- Needs the following things:
  1) Community consensus (done at BOF)
  2) Chairs selected by AD (done: Suresh Krishnan, David Vernet)
  3) Charter to vote on (draft done prior to IETF and edited in IETF side meeting)
  4) Legal OK in this case
  5) Vote among IETF Area Directors

Progress on legal

- Last night, IETF lawyer sent written legal analysis to Erik, IETF Chair, IETF Executive Director, and me
  - Looks good to all of us
  - I will make one wording tweak to the ISA I-D Acknowledgements section
    - "to which a number of individuals have contributed over time" ->
    - "to which a number of individuals have authored contributions over time"
- "IETF Note Well" discussed at IETF and with lawyer
  - Ideally document contributors would be presented with the IETF Note Well text
  - BSD license ok but it refers to "code" and "software"
- All this has been discussed with the IETF chair and senior wg chair at the IESG-IAB retreat today

Progress from Erik (last night)

Mail from Erik last night:

- "we have received a thumbs up from counsel"

- "[proponents] should re-review the [proposed charter](#) to see if it's ready for [broader] review"
- "some process steps I'll need to take:
  - inform the Trust of our intent to proceed
  - inform the IESG of [counsel]'s review
  - have our charter on either the next telechat or … 2023-06-08"

Next telechat is May 25th

Draft (e)BPF working group charter (1/3)

https://datatracker.ietf.org/doc/charter-ietf-bpf/

- eBPF (which is no longer an acronym for anything), also commonly referred to as BPF, is a revolutionary technology with origins in the Linux kernel that can run sandboxed programs in a privileged context such as the operating system kernel.

- eBPF is increasingly being used beyond just the Linux kernel, with implementations in network interface cards, Microsoft Windows, etc.

- There is currently no formal standard for eBPF and no clear scope for what is part of eBPF and what is not.

- The bpf working group is initially tasked with **documenting the existing state** of the eBPF ecosystem, and a clear **process for extensions**, including initial extension that are widely useful and showcase the process.

Draft (e)BPF working group charter (2/3)

The working group will produce one or more documents on the following work item topics:

- The eBPF **instruction set** architecture (ISA) that defines the instructions and low-level virtual machine for eBPF programs.
- **Verifier expectations** and building blocks for allowing safe execution of untrusted eBPF programs
- the **BPF Type Format** (BTF) that defines debug information and introspection capabilities for eBPF programs
- the eBPF bindings for the **ELF executable file format**
- the **platform support ABI**, including calling convention, linker requirements, and relocations
- **Cross-platform map types** allowing native data structure access from eBPF programs
- **Cross-platform eBPF program types** that define the higher level execution environment for eBPF programs
- and an **architecture** and framework informational document.

Q: what about cross-platform helper functions, e.g., map lookup/update? Include in #6?

Draft (e)BPF working group charter (3/3)

- The bpf working group shall actively engage the eBPF foundation and all major users of eBPF to ensure inclusion in the IETF's consensus-driven process.

- The working group is intended to only work on cross-platform aspects of eBPF that are useful to the wider internet community and not operating or otherwise platform specific.

\<milestone dates TBD\>

Document logistics between Linux kernel repo, IETF github repo, and Internet Draft submission

- Today:
  - RST files in Linux kernel git repo under ./Documentation/bpf
  - Merging controlled by Linux bpf-next maintainers
  - Mirror in https://github.com/ebpffoundation/ebpf-docs
  - I-D skeleton lives in above mirror, and auto-includes RST content and adds front/back matter (boilerplate, acknowledgements, references, etc.)
  - Github workflow on push does I-D conversion using https://github.com/dthaler/rst2rfcxml and checks in result
  - Manual I-D submission of resulting I-D snapshot

- Proposed:
  - Replace ebpffoundation repo with IETF repo
  - Automate mirror?

Handling of IETF "Note Well"

- IETF IPR rules
  - https://trustee.ietf.org/about/faq/
  - https://www.ietf.org/about/note-well/
- Don't allow copying any existing code into such docs
- Side meeting discussed an approach like:
  - Create a subdirectory under Documentation/bpf (e.g., "IETF")
  - Put IETF Note Well into some README-like file in that directory
  - Put everything used to derive the IETF docs in that directory

Note Well

This is a reminder of IETF policies in effect on various topics such as patents or code of conduct. It is only meant to point you in the right direction. Exceptions may apply. The IETF's patent policy and the definition of an IETF "contribution" and "participation" are set forth in BCP 79; please read it carefully.

As a reminder:

- By participating in the IETF, you agree to follow IETF processes and policies.
- If you are aware that any IETF contribution is covered by patents or patent applications that are owned or controlled by you or your sponsor, you must disclose that fact, or not participate in the discussion.
- As a participant in or attendee to any IETF activity you acknowledge that written, audio, video, and photographic records of meetings may be made public.
- Personal information that you provide to IETF will be handled in accordance with the IETF Privacy Statement.
- As a participant or attendee, you agree to work respectfully with other participants; please contact the ombudsteam (https://www.ietf.org/contact/ombudsteam/) if you have questions or concerns about this.

Definitive information is in the documents listed below and other IETF BCPs. For advice, please talk to WG chairs or ADs:

- BCP 9 (Internet Standards Process)
- BCP 25 (Working Group processes)
- BCP 25 (Anti-Harassment Procedures)
- BCP 54 (Code of Conduct)
- BCP 78 (Copyright)
- BCP 79 (Patents, Participation)
- https://www.ietf.org/privacy-policy/(Privacy Policy)

Tracking of issues on documents

- My proposal: Use IETF github repo for issue tracking

- When is an issue closed? (WG chairs can decide)
  - A) When patch is merged?
  - B) When I-D is submitted?
  - C) When chairs confirm consensus on result?

Questions?

- IETF 117: San Francisco, July 22-28
    - Registration is now open
    - Onsite or Remote attendance
- IETF 118: Prague, November 4-10