

BPF-datapath extensions for Kubernetes workloads

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With the rapid adoption of Cilium as the BPF-based datapath for Kubernetes as well as integration into popular devops tooling such as kind [0] which allows for running local Kubernetes clusters using Docker container 'nodes', we see more advanced use (and corner) cases which have not yet been tackled from an BPF and networking angle. Therefore, in this slot, we discuss on various loosely coupled issues in the networking stack which we are working on in the context of Cilium's BPF datapath:

- Mixed cgroup v1/v2 interference related to BPF cgroup programs
- TCP socket pacing for Pods out of the init network namespace
- Managed neighbor entries for load-balancer backends
- Wildcarded map lookups for Cilium's n-Tuple PCAP Recorder [1]

We will provide a brief overview of the use cases related to the above, and give an outline for kernel extensions we are looking into.

[0] <https://kind.sigs.k8s.io/>

[1] <https://cilium.io/blog/2021/05/20/cilium-110#standalone1b>

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