

Implementation and Performance Evaluation of PDM using eBPF

draft-elkins-ebpf-pdm-ebpf-00

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IETF-119 maprg Meeting @ Brisbane, AU

Objective

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- Exploration of use of eBPF in networking
- Implementation of IPv6 extension headers in eBPF
- Performance analysis of eBPF implementation over traditional kernel implementation
- Analyze performance overhead of eBPF implementation and optimize

Interested Working Groups,

- bpf WG
- v6ops WG

IETF 119 Agenda Slots,

- bpf wg
- v6ops wg
- map rg
- IEPEG

Work Done

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- Implementation of PDM extension header in eBPF (using tc bpf)
- Performance Analysis of eBPF program contrasted with kernel implementation of PDM
 - CPU Cycles
 - eBPF program: 8.60e10 cyc.
 - Kernel program: 2.29e9 cyc.
 - Network Throughput
 - Without PDM: 18.80 Gbps
 - Kernel PDM Implementation: 18.52 Gbps
 - eBPF Implementation: 18.03 Gbps
 - Packet Processing Latency (per packet)
 - PDM Kernel Implementation - 0.707 μ s
 - eBPF Implementation - (5.808 - 4.528) μ s = **1.28 μ s**