Title: The eBPF Verifier: Ensuring Safety and Security in Programmable Linux

Bolaji Gbadamosi, Karlstad University

Abstract: The Extended Berkeley Packet Filter (eBPF) has emerged as a powerful tool for enabling safe and efficient programmability within the Linux kernel. At the heart of eBPF's functionality lies its verifier, a crucial component responsible for ensuring the safety and security of eBPF programs. The verifier analyzes eBPF bytecode, employing techniques such as control-flow graph (CFG) analysis and symbolic execution to ensure memory safety, and proper resource management. We delve into the eBPF verification lifecycle, shedding light on the verifier's role in safeguarding the integrity of eBPF programs within the Linux ecosystem.