High Precision Profiling of Network Paths

To analyse the efficiency of routing algorithms together with TSN [2] on the networking path in a precise way is difficult with information such as positions of packets, queue filling level, and coincidences between packets. Changing the payload or other important content of the packets is not possible, as the applications still need to be able to process them. A way is needed to generate and process data such as precise timestamps on ingress and egress of each node in the network and collect them together without losing the information of packet and flow connections.

Moreover, using techniques such as eBPF together with XDP and Linux TC it is possible to access packet data at an early point and add information to the packet [1]. Furthermore, there are protocols such as Parallel Redundancy Protocol [3], which add information to the packet at points, which do not change the relevant payload part and do not bother the end-applications.

The aim of thesis is to implement a proof of concept for a new Protocol called Flexible Profiling Protocol using the concepts of adding information to a packet based on , develop the eBPF code to use the protocol and perform first analysis of the network path using the newly generated implementation of the protocol.

Motivation

General interest in computer networks
Experience with C Programming
Interest in Kernel Programming

Your Profile

Your Tasks

Conducting research on profiling Packet paths
Implement the proof-of-concept for Flexible Profiling Protocol
Analyse the possible results
Evaluate and discuss the potentials of this solution

Literature


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