Thesis B.Sc.

Thesis M.Sc.

IDP, Guided Research

Writing Network Drivers in Python

Motivation

More and more drivers are moving from the kernel to the user space, for example, DPDK (https://dpdk.org) moves NIC drivers to the user space to increase performance. However, these new drivers are usually still written in C. Notable exceptions are Snabb (https://snabb.org) with a driver in Lua and pfq (https://pfq.io) featuring Haskell for parts of the network stack (but a C driver). Network drivers are relatively simple: we have written a simple user space network driver for Intel 10 Gbit/s in 1000 lines of C code: https://github.com/emmericp/ixy.

Research questions are: Why not write network drivers in Python? Are there advantages over other languages? Are there disadvantages?

Your Task

Your task is to write a driver for the Intel 82599ES NIC from scratch in Python. Avoid using a FFI or calls to C functions where possible and keep the code in idiomatic Python.

- Look at our 82599ES implementation in ixy (https://github.com/emmericp/ixy)
- Implement a driver for the Intel 82599ES in idiomatic Python
- Compare its performance with our C implementation
- Draw conclusions: should all drivers be written in Python?

Contact

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