

Thesis  
B.Sc.

Thesis  
M.Sc.

IDP,  
Guided  
Research

# Writing Network Drivers in Haskell

## 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 Haskell? 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 Haskell. Avoid using a FFI or calls to C functions where possible and keep the code in idiomatic Haskell.

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

## Contact

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