

## Compiling P4 to Lua

### Motivation

P4 is a new language to program packet processing devices in a protocol-independent manner, see [p4.org](http://p4.org)<sup>a</sup> for details. Programs in this language describe packet processing logic on a forwarding device on a high level and need to be compiled to fast low-level code (e.g., C or eBPF) or a hardware description language for real hardware.



The goal of this thesis is to write a Lua target for P4. Lua is a fast scripting language that can be used to script packet processing, for example, in the Snabb<sup>b</sup> packet networking toolkit or in libmoon framework<sup>c</sup>. The language is well-suited as a target for compilers, for example, the pflua<sup>d</sup> project compiles libpcap filters to Lua, the resulting code then outperforms other implementations when run in LuaJIT.

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<sup>a</sup><http://p4.org>

<sup>b</sup><https://github.com/snabbco/snabb>

<sup>c</sup><https://github.com/libmoon/libmoon>

<sup>d</sup><https://github.com/lgalia/pflua>

### Your task

Implement a compiler that translates P4 to Lua.

Previous experiences with compilers are very helpful for this thesis.

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