Compiling P4 to Lua

P4 is a new language to program packet processing devices in a protocol-independent manner, see p4.org\(^a\) 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\(^b\) packet networking toolkit or in libmoon framework\(^c\). The language is well-suited as a target for compilers, for example, the plua\(^d\) project compiles libpcap filters to Lua, the resulting code then outperforms other implementations when run in LuaJIT.

\(^a\)http://p4.org
\(^b\)https://github.com/snabbco/snabb
\(^c\)https://github.com/libmoon/libmoon
\(^d\)https://github.com/Igalia/plua

Implement a compiler that translates P4 to Lua.

Previous experiences with compilers are very helpful for this thesis.

Paul Emmerich  emmericp@net.in.tum.de
Dominik Scholz  scholzd@net.in.tum.de