Abstract Dataplane

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ELTE Software Lab

What is P4?

- High level language for programming any kind of data planes
 - Protocol and target independent
 - Re-configurable
 - Intuitive abstractions
- Open source project
 - Free membership
 - Strong industrial interest
 - Intensive activity
 - 2 workshop, extended language specification, P4 examples, behavioral compiler, reusable frontend, JSON representation, ...

Results

- Ongoing discussion with P4 developers
- P4 competence built at University
- Compiler architecture
- Core compiler for a subset of P4
- DPDK library
- L2, L3 example
- Prototype for Spider library
- Numa support
- Scalability

Compiler Architecture



P4 pros

- High abstraction level
 - Hardware independent
 - More flexible as OpenFlow
- Applicability
 - Full-featured switch example
- Reference compiler
 - Reusable frontend
- Hardware knowledge is needed only for
 - compiler
 - hardware-dependent library

P4 pros

 Large and dinamically growing
community



P4 cons

- Unstable specification
- Incomplete specification
- Template-based naive behavioral compiler
 - Target specific non-documented elements
- New language
 - P4 knowledge is needed for development

Observations

- Very ineffective behavioral compiler
- Usable official frontend
- Working, specific dpdk examples were needed for correcting compiler misconceptions

Possible plans/Questions

- Complete compiler
- NPU support
- Effective target code
- More example
- More real test (using Ericsson's hardware)
- Joining to P4 consortium (Ericsson/ELTE)?