PIF Update

October 9, 2014

Agenda

- Introductory Apple-Pie slides
- Plan for Code Deliverable
- Status
  - Instruction Set discussion
  - Parsing discussion
  - AIR description and prototyping
- PIF rollout plan

Ideal IR

An ideal IR, that supports diversity in both architectures and languages, is something intermediate between an MA and an AM. A notable example today would be LLVM, where typed variables plus basic blocks of static single assignments is the convergence point. So our IR mission would be to find something similar in the domain-specific network processing space, guided by any available MAs and AMs.

-Gordon Brebner

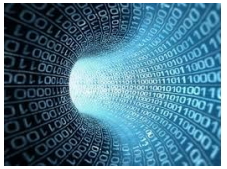
Goals

1. Enable Flexible Forwarding Elements (FFEs)
   - Driven by the implementations to be supported
2. Enable Network Programmers
   - Promote abstractions that:
     - Simplify the development flow
     - Enable distributed development
     - Promote good programming practices
     - Facilitate debugging and visibility

Incremental Progress

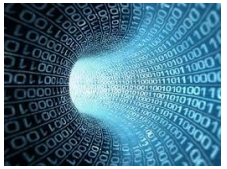
- Identify short term goals that lead to long term success
- Code that will satisfy those goals
- Classify features
  - Needed for short term deliverables
  - Future development; don’t design out

Current Code Schedule



- AIR based IR interpreter in Python
  - Give it an IR instance, it’s a v-switch
  - Version 1 planned for preview week of 10/27
- A second version will follow
  - Will support more features
  - Time table TBD depending on first roll out

Future Code Ideas



- What can we provide/promote that's useful?
  - Graph representations of parser, control flow
  - Coverage tools
  - Network level simulation tools (mininet)
  - Network tracing tools integrated with the above
  - ?
- Integrate parsing (at least) with OVS
- Identification of future feature support
- ?

Parsing Discussion

- Basic idea of naming fields and identifying their location in the packet byte stream
- How to specify parser logic
- How to indicate parsing operation should be done

Basic OF-PI Instruction Set

- Action primitives
- Action specifications as collections of primitives

Next Steps

- PIF related source code management
  - SLC is becoming more active
  - Defining how OS projects will be supported
- How should PIF work be rolled out to ONF?
  - Have initial white paper: Should we review and plan to release?
  - More?