OpenPipes: Prototyping High-Speed Networking Systems

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OpenPipes: OpenFlow-based module pipelines

OpenPipes is a prototyping platform that uses OpenFlow to interconnect a series of processing modules in a pipeline.

Features
- **Easy repartitioning**: modules can be moved between physical systems while the system is running
- **Reduce testing complexity**: design and test modules in software and later migrate to hardware while the system is running

Approach
OpenPipes works as follows:
- System is comprised of modules
- Connect modules via a network
- Use OpenFlow as the interconnect

The OpenFlow network provides the ability to move modules around in the network, from one subsystem to another, while the system is running.

Dynamic Repartitioning
- Modules attach metadata to output data to indicate a “decision” (e.g., are all fields valid or not?)
- Modules have no concept of addresses
- Source module and decision metadata used to route data
- OpenFlow controller can reconfigure routing based on source module/decision metadata at any time

OpenPipes uses OpenFlow

OpenFlow Basics
- Separation of **Control** from **Datapath**
- **Control**: External controller with complete control over traffic flow
- **Datapath**: Simple flow-based switches

http://OpenFlowSwitch.org

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