On Programmability and Software Defined Networking

- Lots of confusion in the industry over which "programmability" and "software defined networking" actually mean

- So first, what are the programmable entities we're talking about?

- Forwarding Plane v. Control Plane v. "network"
  - So OF/SDN, Netconf, SNMP, CLI, SDKs, OpenStack, SDNP, …

What is Stipulated?

- OF/SDN was originally designed to be a platform for developing control planes

- Programmatic automation of configuration, management, monitoring, data mining, telemetry, … is a requirement in today's networks
  - SDKs, Netconf, Cloud Stacks, SDNP, draft-marques-…

What is my Assertion?

- Enabling programmatic automation of configuration, management, monitoring, data mining, … is largely orthogonal to OF/SDN

- Why?
  - Since this capability will need to be provided on current control planes *and*future control planes, including OF/SDN

What is the Industry Confusion?

- *What is the difference between OF/SDN and the need for network-wide programmatic automation?*
  - OF is a programmatic interface to a single switch's forwarding plane
    - Well, sort of (cf Hybrid Switch Integrated Mode proposal)
  - OF/SDN is about abstractions for building control planes
  - SDNP, OpenStack, … are about programmatic interfaces to the network
  - OF/SDN control planes will also need programmatic interfaces to the network
    - Perhaps the same ones, e.g., IF-MAP (http://www.if-map.org/)

Interesting Quote From Martin (Nicira)

"We need to get beyond, 'OpenFlow is going to solve world peace.' OpenFlow is like USB, it's a protocol, a very simple protocol and it's designed at systems builders." *OpenFlow and beyond: future opportunities in networking*, GigaOM 09/2011

Point here is that OF is assembly language for building control planes rather than an API for programmatic automation of configuration, management, monitoring, ….

Thanks!