Deploying Software Defined Networking

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What do we want out of “SDN”

• Performance (guaranteed?)
• Smarter decision making
• Single network control point
• Visibility
• Profit
What do we want out of “SDN”

What we expect:
What do we want out of “SDN”

What we have:
What have we learned?

IPv6
- incremental deployment failure
- touching deep into applications is a disaster

DNSSEC
- Cool, but not cool enough to care

Interdomain routing (BGP)
- Network policy per Autonomous System
What have we learned?

Interdomain QoS
• I do not actually trust you
• Doing it right (shapers) way too expensive

MPLS
• Smart edge, dumb middle
• Divide & Conquer

Multicast
• Holding state
• Protocol Soup
The State of SDN

OSCARS / DYNES

- OK idea, poor implementation
- Can perform worse than doing nothing
  - Out of order packet delivery
  - Policers can destroy TCP goodput
  - Extremely fragile

Z. Yan, M. Veeraraghavan, C. Tracy, C. Guok, “On how to provision Quality of Service (QoS) for large dataset transfers,” accepted in CTRQ 2013
The State of SDN

• Existing hardware implementations
  – OpenFlow 1.0 + extensions, 1.3
  – Understand optional & other implementation details

• SDN Controllers
  – OpenDaylight
  – Cisco ONE
  – FloodLight
  – NOX, POX, and friends
Open vSwitch is a virtual switch for hypervisors providing network connectivity to virtual machines.
SDN Deployment Models

- Proactive vs Reactive
- “Northbound API” - REST
- Ships in the Night
- Vlan stitching
- Overlay tunnels
- Hybrid (OFPP_NORMAL)
Start playing now

• Try out Open vSwitch
  Included in RHEL 7, (tech preview in rhel 6)
• Grab a controller
• Pester your vendors