

OpenFlow at GEC10

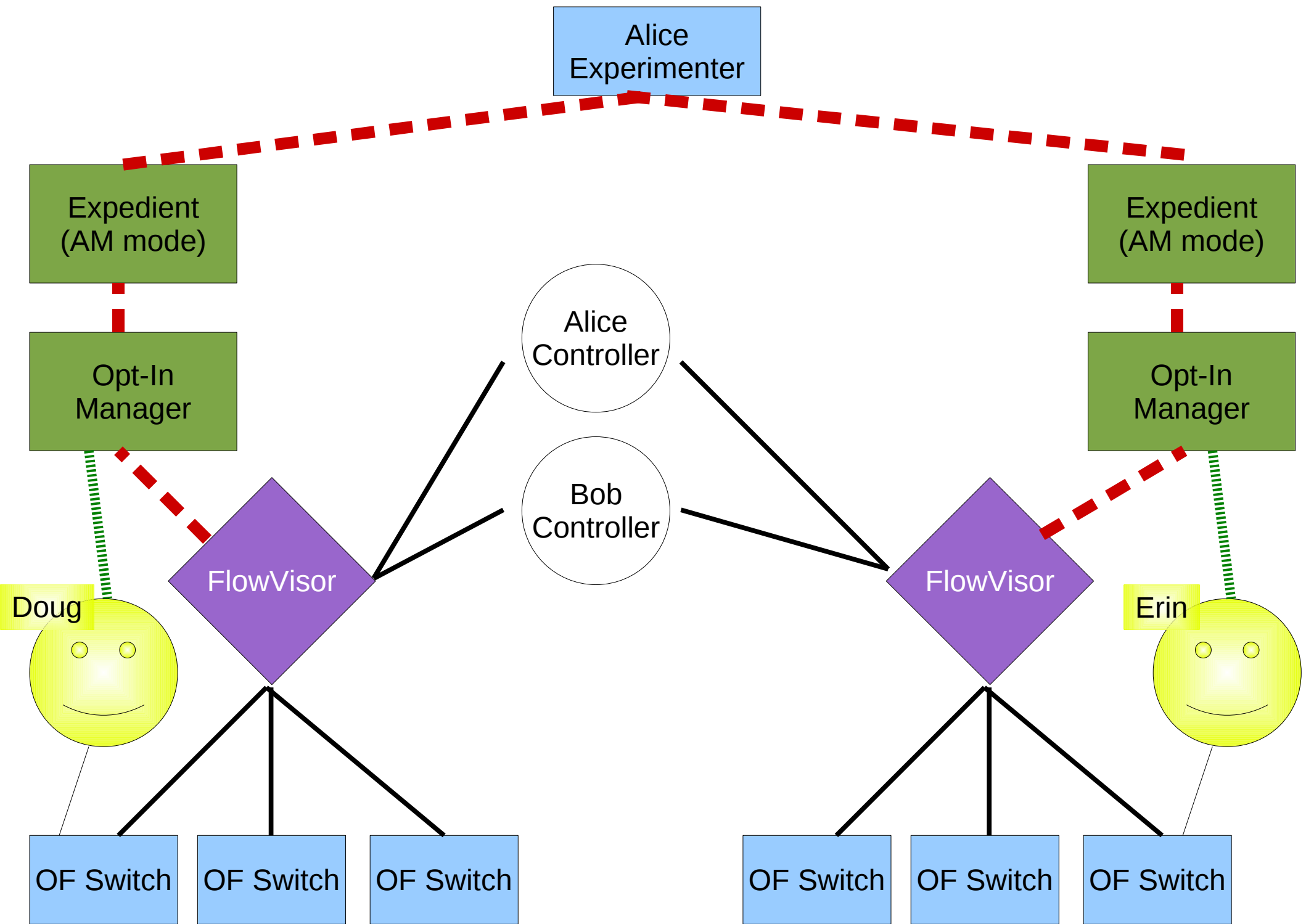
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March 16, 2011

Outline

- Overview of OpenFlow on GENI
 - FlowVisor, Opt-In Manager, Expedient
- OpenFlow and Rspecs
 - Current
 - Moving towards ProtoGENI v2 Rspecs
- OpenFlow and Stitching (next talk)
 - Current
 - Comments on proposals

OpenFlow on GENI



Rspecs

OpenFlow Resources

- Switches are nodes
 - 8 byte DPID as unique ID
 - Ports: decimal integers 1-65535
- Links are unidirectional dpid:port pairs
 - $sDPID:sPort \rightarrow dDPID:dPort$
- Each link has an allowed “FlowSpace” with ranges
 - $dl_vlan=1235-3000, ip_saddr=128.8.128.0/24, tp_dport=80-80$
- Other info:
 - Controller URL: `tcp://alice.controller.org:6633`
 - User account/passwd for FlowVisor API

Current OpenFlow Rspec

- Advertise
 - No flowspace – Opt-In manager trick
 - Mostly just topology information
 - No bandwidth information
- Request
 - Subset topology (“bound request”)
 - FlowSpace per link: lots of duplication
 - No bandwidth reservations
- Translates to omni_spec (by hand)

Thoughts on ProtoGENI v2 Rspec

- Stick with “bound” requests for now
 - No need for ticket, manifest rspecs?
- Create a FlowSpace extension
 - 12+ OpenFlow tuples: ranges?
 - For links, switches, slices?
- Create a bandwidth reservation extension
- Bottom line:
 - “have rough consensus; now need running code”

Slice Stitching

Current Stitching

- Hard code touch points
 - PlanetLab, ProtoGENI, other OpenFlow aggregates
 - Advertised in Expedient (in Clearing House mode)
- Experimenter “hand” stitches
 - Via rspec, etc.
- Problems
 - Doesn't scale
 - Error prone
 - PITA

OpenFlow and Proposal

- Agree at high-level
- Two level discovery hierarchy
 - Global, inter-AM view
 - Static information: touch points
 - Local, intra-AM view
 - Dynamic information: link status, bandwidth availability
- Likely need to add OpenFlow linktype
 - Assumes VLAN = Bandwidth reservation
 - Describe virtual-wire-like functionality

Conclusions

- Both proposals seem like they should work
 - read: “have rough consensus”
- Proof is in pudding
 - read: “need running code”
- Flexibility of extension mechanisms critical