Motivation
Network engineers on campuses: troubleshoot SDN devices and find paths for specific “flows”

FLOW: can be defined with L2-L7

Inspired by the requirements listed at I2 TechExchange meeting:
https://spaces.internet2.edu/display/sdn/2014-10-28+-+BoF+notes+-+SDNTrace

Find multiple paths based on flow rules in switches

Experiment setup
RYU Controller
SDNTrace NB app (modified simple_switch)
Scapy to generate probe at originator
VTS: create topology on GENI
VTS features port UP/DOWN: manually create a directed acyclic graph to remove loops
Ping to discover the switches and attachment points
VTS feature dumpFlows: verify flows on datapath
RUN SDNTrace to send a probe packet from source to destination with the “to-be-traced” flow packet

SDNTrace Protocol Message Types

TraceRequest – probe packet with an embedded “to-be-traced” packet for flow definition
TraceReply – reply packet carrying all node information on the path of “to-be-traced” flow

Traditional Traceroute
Based on ICMP/TTL_EXCEEDED messages
Tests L3 connectivity

New approach – SDNTrace Protocol
Implemented as a NB application
Carries all path information in a reply message
Uses existing datapath state