GREE Winter Camp 2014 Presentation: OpenFlow Firewall

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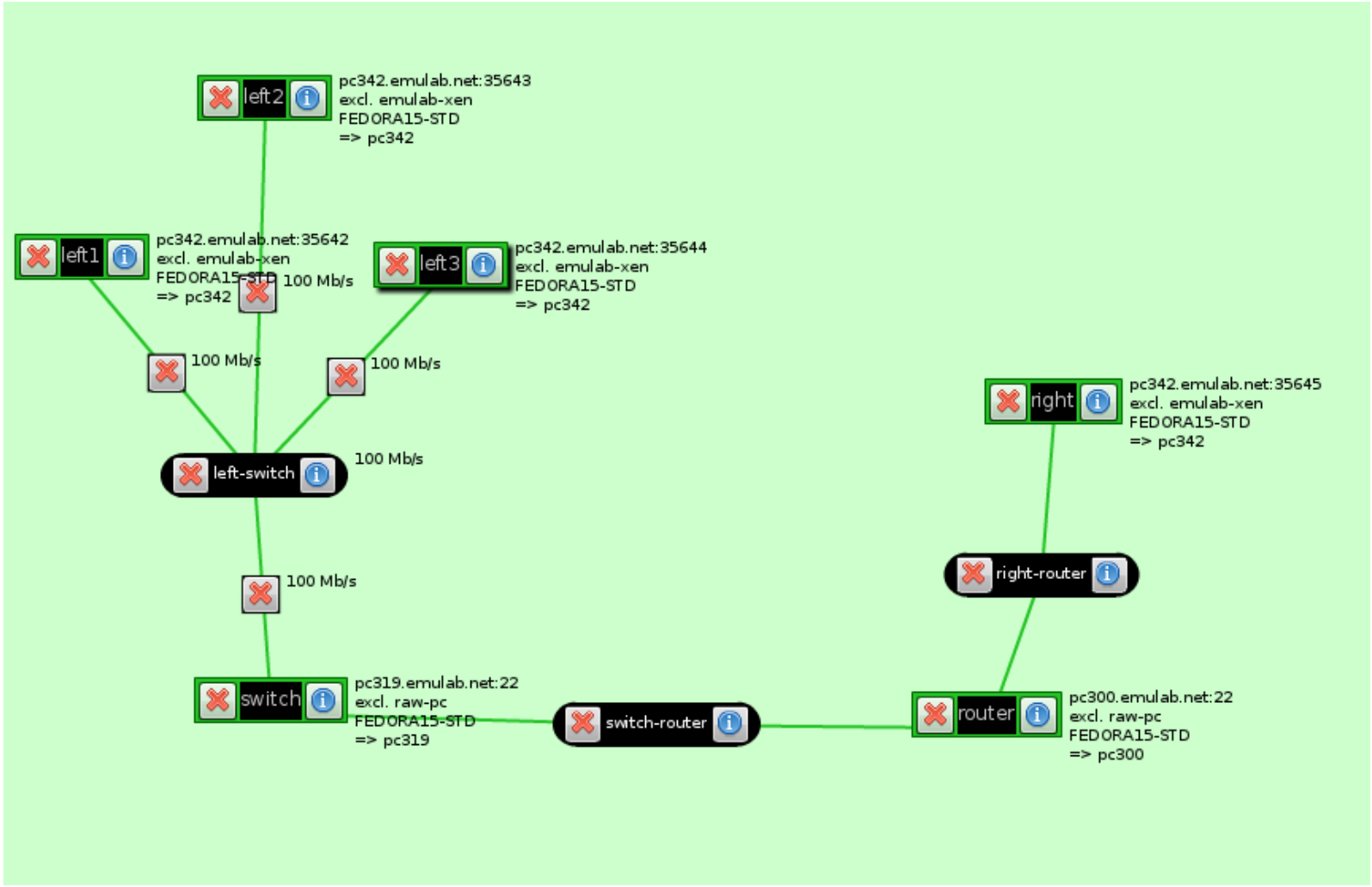
Problem

- Preventing unauthorised access to servers
- Firewall using OpenFlow
- Stateful firewall

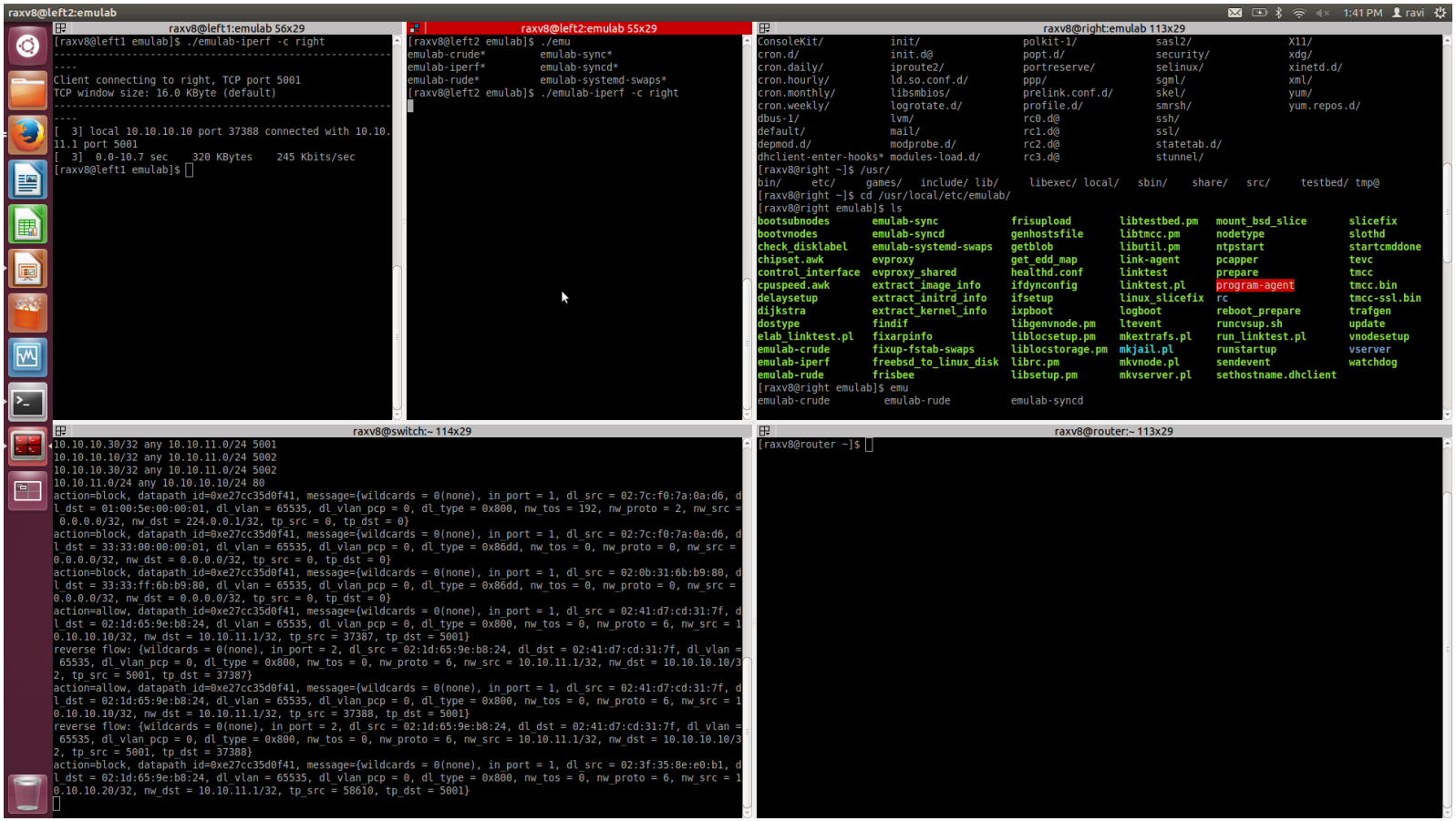
Experiment setup

- Based on
  `http://groups.geni.net/geni/wiki/GENIEducation/SampleAssignments/OpenFlowFirewallAssignment`
- Extension for multiple hosts
- OpenFlow controller using Trema
  (`http://trema.github.io/`)

Topology


left2
pc342.emulab.net:35643
excl. emulab-xen
FEDORA15-STD
=> pc342
left1
pc342.emulab.net:35642
excl. emulab-xen
FEDORA15-STD
=> pc342
100 Mb/s
left3
pc342.emulab.net:35644
excl. emulab-xen
FEDORA15-STD
=> pc342
100 Mb/s
100 Mb/s
left-switch
100 Mb/s
100 Mb/s
switch
pc319.emulab.net:22
excl. raw-pc
FEDORA15-STD
=> pc319
switch-router
router
pc300.emulab.net:22
excl. raw-pc
FEDORA15-STD
=> pc300
right-router
right
pc342.emulab.net:35645
excl. emulab-xen
FEDORA15-STD
=> pc342

Demonstration



DoS attack detection

- We attempted to implement DoS attack detection by SYN floods
- Lack of time to debug

Future work

- DoS attack detection (TCP SYN floods)
- Load balancing or redundancy by multiple paths
- Repeatable test cases by LabWiki / GIMI

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