Mininet @ Stanford

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Where Mininet is used

• Introduction to Computer Networking
  – CS144
    • In-class exercises
    • Demos
    • Assignment Platform
  – Online MOOC
    • Assignment Platform

• Advanced Topics in Networking (CS244)
  • Assignments

• Graduate Student Research
Introduction to Computer Networking

• In-class exercises
  – Bufferbloat

• Demos
  – DHCP Attack
  – BGP Spoofing

• Assignment Platform (replaced VNS)
  – Static IP Router
  – NAT
  – (Simple OSPF Router)
Assignment Platform

Assignment
• Build a simple router that handles TCP, UDP, & ICMP

Environment
• Mininet topology provided to emulate webservers and tie in students’ code
• Standalone VM for online students
• EC2 for Stanford course
CS244 Spring ’12: Advanced Topics in Networking
Assignment

→ Pick a paper
→ Reproduce a key result, or challenge it (with data)
→ You have:
  $100 EC2 credit,
  3 weeks, and
  must use Mininet
Wide range of projects: transport protocols, data center topologies, and queueing.

CoDel
HULL
MPTCP Wireless
Outcast
Jellyfish
DCTCP
Incast
Flow Completion Time
Hedera
DCell
TCP Initial Congestion Window
Misbehaving TCP Receivers
RED
37 students, 18 projects

Results

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Misbehaving TCP Receivers
RED
37 students, 18 projects
16 replicated

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Results
37 students, 18 projects
16 replicated, 4 with extra results

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37 students, 18 projects
16 replicated, 4 with extra results
2 failed to replicate

Results

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RED
2013

48 students, 24 projects

18 replicated, 3 partially replicated, 3 failed to replicate

Mosh
Jellyfish
TCP Rate Reduction
TCP Initial Window
TCP Fast Open
Video Streaming Rate
Switch Scheduling *
pFabric

Scaling Consistent Updates
TCP Pacing
DCell
Low Rate TCP DoS Attack
DCTCP
MPTCP
Hedera
Alfalfa
2014

31 students, 16 projects

12 replicated, 3 partially replicated, 1 failed to replicate

Sprout
Jellyfish
TCP Fast Open
Mosh
Bro Network
MPTCP

Misbehaving TCP receivers
Flow Completion Time
Video Streaming Rate
MPTCP Wireless
Dcell
TCP Initial Congestion Window
Can network research papers be replicated?

This blog details stories from Stanford CS244 students and researchers anywhere who have been inspired to share their research, largely using the Mininet-HiFi network emulator on EC2 instances.

For more details, check out the Projects gallery, the About page, or Contribute.

Tweet/post/send them to your colleagues, comment at the bottom of each post, or even replicate each blog post using the provided instructions!
Questions?

• **Introduction to Computer Networking**
  – **CS144**
    • *In-class exercises*
    • *Demos*
    • *Assignment Platform*
  – **Online MOOC**
    • *Assignment Platform*

• **Advanced Topics in Networking (CS244)**
  • *Assignments*

• **Graduate Student Research**