Georgia Institute of Technology

Software Defined Networking

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In this course, you will learn about software defined networking and how it is changing the way communications networks are managed, maintained, and secured.

School of Computer Science

This Module: Network Virtualization

- Three Lessons
  - What is network virtualization and how is it implemented?
  - Examples of network virtualization and applications
  - **Virtual networking in Mininet**
    - **Mininet: Why and How?**
    - Examples of Using Mininet

What is Mininet?

- A **virtual network environment** that can run on a single PC
- Runs real kernel, switch, and application code on a single machine
  - Command-line, UI, Python interfaces
- Many **OpenFlow features** are built-in
  - Useful: developing, deploying, and sharing

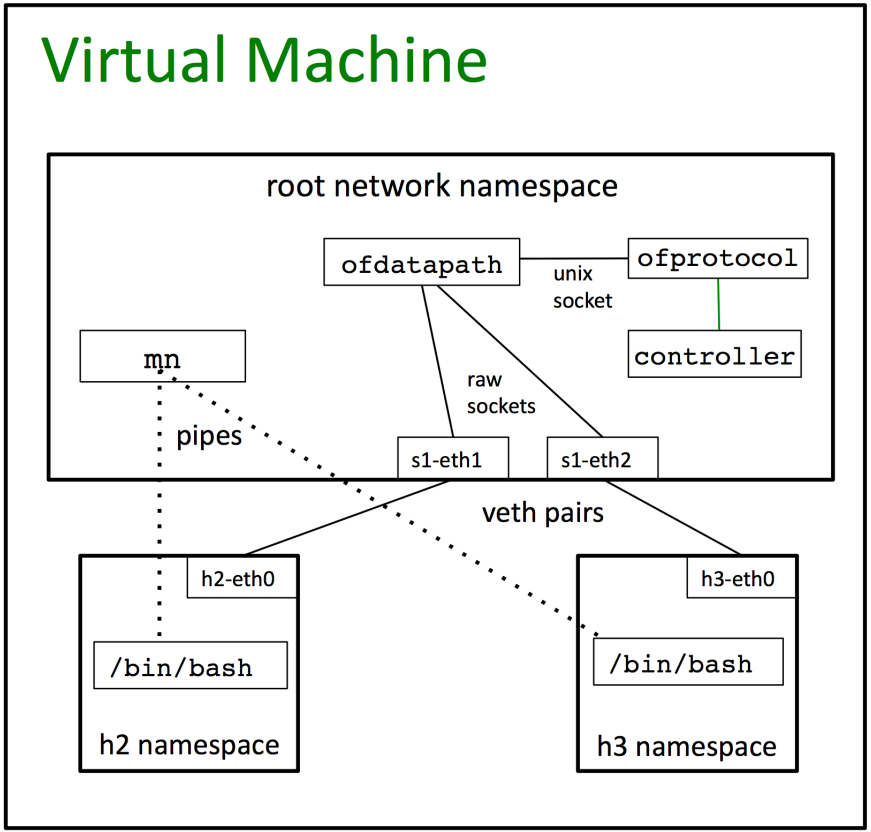
Why Use Mininet?

- Fast
- Possible to create custom topologies
- Can run real programs (anything that can run on Linux can run on a Mininet host)
- Programmable OpenFlow switches
- Easy to use
- Open source

Alternatives

- **Real system:** Pain to configure
- **Networked VMs:** Scalability
- **Simulator:** No path to hardware deployment

The Mininet VM in a Nutshell



- Launch mininet process
- Per host
  - Bash process
  - Network namespace
- Create veth pairs and assign to namespaces
- Create OpenFlow switch to connect hosts
- Create OpenFlow controller

Summary

- Mininet is a network emulator that runs in a Virtual Machine
  - Lightweight OS virtualization to achieve scale
  - Fast, easy, sharable
- Next Part of Lesson: Topology examples
  - mn wrapper, Python
  - Topologies and controllers