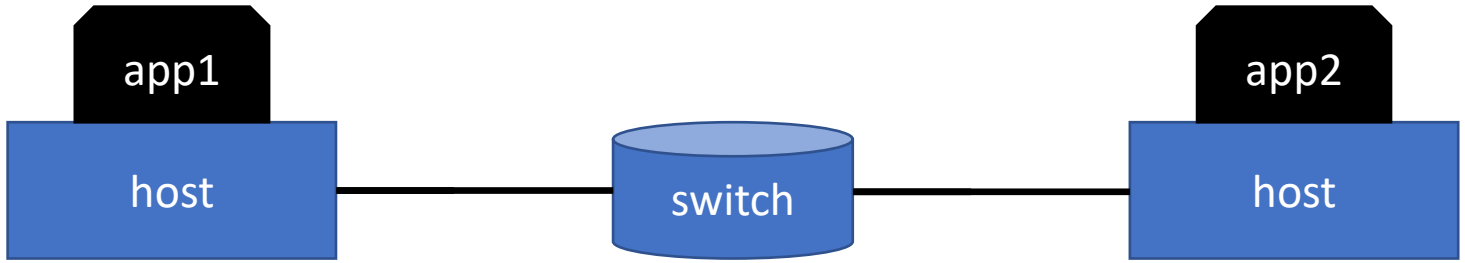
GINA CODY
SCHOOL OF ENGINEERING
AND COMPUTER SCIENCE

Introduction to Mininet

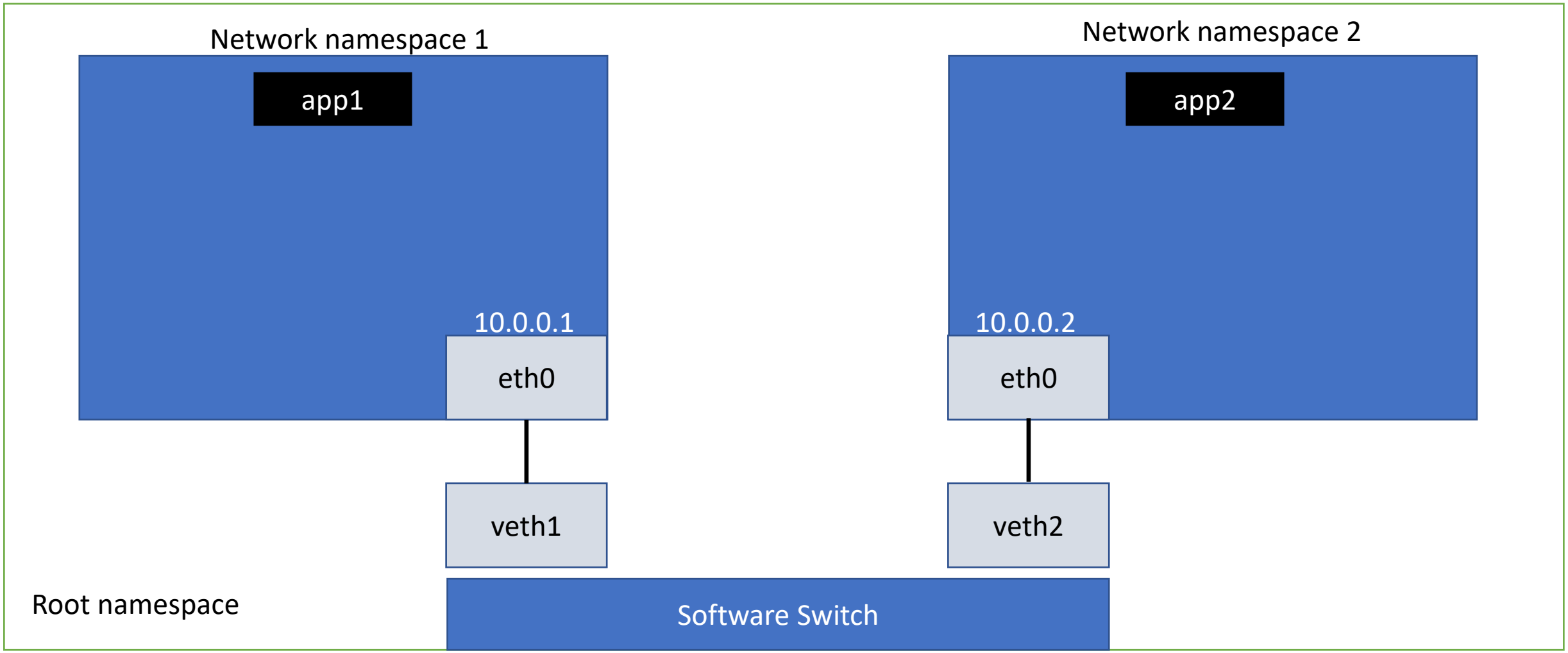
COEN 366

Instructor: Prof. Chadi Assi

Simple topology



Network Namespaces and Virtual Ethernet Pairs



Create this simple topology using Linux

1. Create host namespaces

```
ip netns add h1
ip netns add h2
```

2. Create switches

```
ovs-vsctl add-br s1
```

3. Create links

```
ip link add h1-eth0 type veth peer name s1-eth1
ip link add h2-eth0 type veth peer name s1-eth2
ip link show
```

4. Move hosts ports into namespaces

```
ip link set h1-eth0 netns h1
ip link set h2-eth0 netns h2
ip netns exec h1 ip link show
ip netns exec h2 ip link show
```

Create this simple topology using Linux

5. Connect switch ports to OVS

```
ovs-vsctl add-port s1 s1-eth1
ovs-vsctl add-port s1 s1-eth2
ovs-vsctl show
```

6. Set up openFlow controller

```
ovs-vsctl set-controller s1 tcp:127.0.0.1
ovs-testcontroller ptcp: &
ovs-vsctl show
```

7. Configure network

```
ip netns exec h1 ifconfig h1-eth0 10.1
ip netns exec h1 ifconfig lo up
ip netns exec h2 ifconfig h2-eth0 10.2
ip netns exec h1 ifconfig lo up
ifconfig s1-eth1 up
ifconfig s1-eth2 up
```

8. Test network

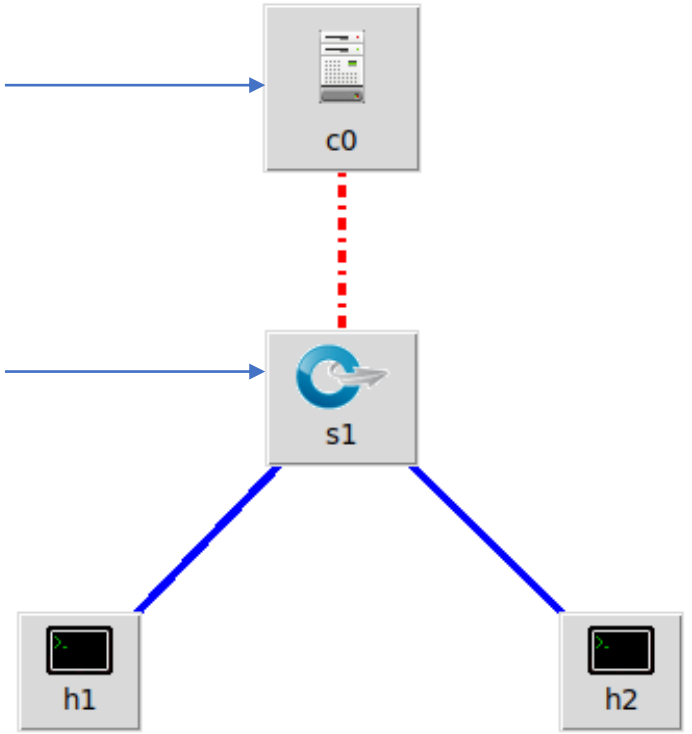
```
ip netns exec h1 ping -c1 10.2
```

What is Mininet ?

- Mininet is a network emulator that allows you to mimic a real network topology by creating virtual hosts, switches, routers, and controllers.
- Supports OpenFlow for highly flexible routing and SDN.

Set policies, and prioritize traffic

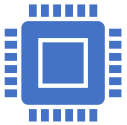
OpenFlow switch



Python APIs

Python is used for orchestration, but emulation is performed by compiled C code.

It is a command-line tool or API to create topologies up to hundreds of nodes (containers, network namespaces).



It has a GUI (MiniEdit)

Using simple command in Mininet you can create a topology and test it.

It allows to create custom topologies by writing python scripts.

It supports wireshark.

Mininet vs. Testbeds

- Inexpensive
- flexible real code
- reasonably accurate
- easy to download fast/interactive usage
- Shareabale

- expensive
- hard to reconfigure
- hard to change
- hard to download

Mininet Installation

1. Download Mininet VM and set up the environment (Ubuntu VM image containing Mininet)

2. Native installation from source files (e.g., git clone download link)

3. Installation through packages (e.g., **apt-get install**)

More details:

https://programmerall.com/article/4801208015/