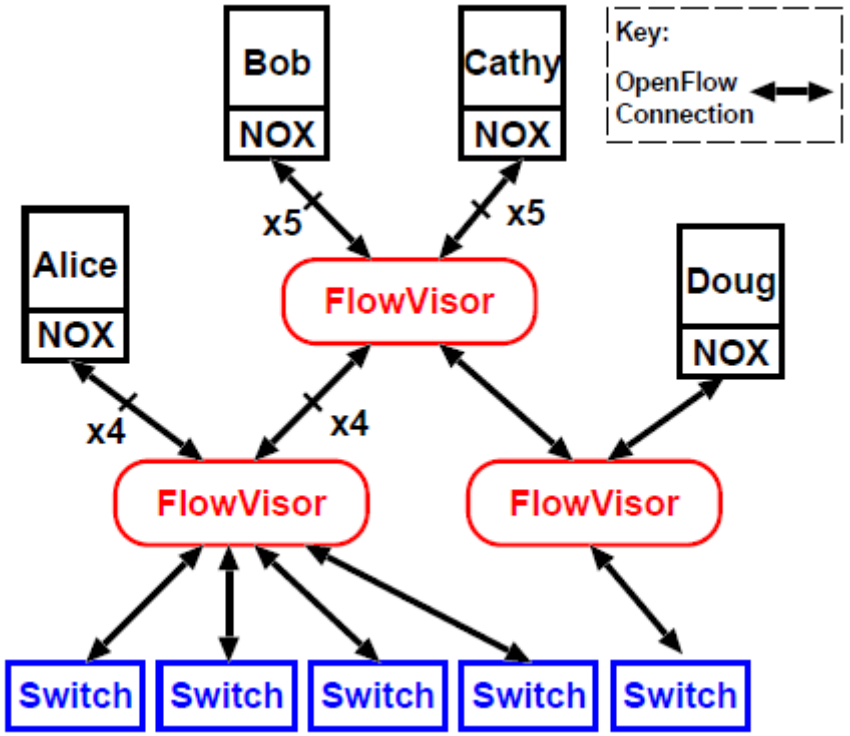
HANDS-ON SDN

Introduction to Software-defined Networking
Block Course – 16-20 March 2015

David Koll

FlowVisor

- FlowVisor: Implemented in JAVA
- Sources at: https://github.com/opennetworkinglab/flowvisor/
- Recall: FlowVisor is an extra layer between controllers and switches



Taken rom: Sherwood, et al. *"Flowvisor: A network virtualization layer." OpenFlow Switch Consortium, Tech. Rep* (2009).

FlowVisor

- Basic procedure:
  - Create and start your network topology with Mininet
  - Connect Flowvisor to switches on standard port
  - Slice network with Flowvisor
  - Connect Controllers to Flowvisor slices

FlowVisor

- Basic procedure:
  - Create and start your network topology with Mininet
  - Connect Flowvisor to switches on standard port
  - Slice network with Flowvisor
  - Connect Controllers to Flowvisor slices

Connecting FlowVisor

- FlowVisor operates outside of Mininet!

```
$ sudo /etc/init.d/flowvisor start
```

(see demo)

- Afterwards: use flowvisor control (command: `fvctl`) to slice

Slicing the Network with FlowVisor

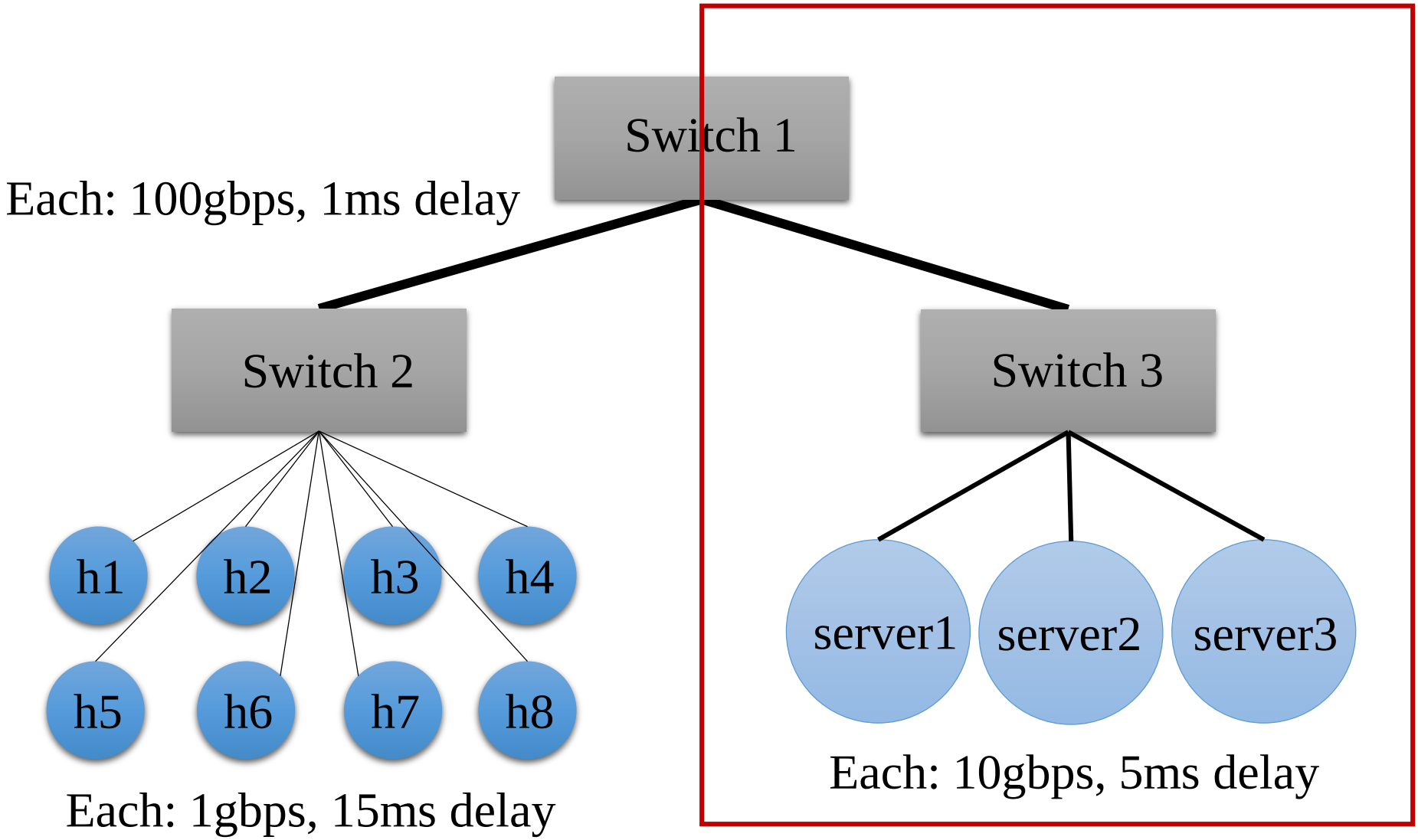
- First: enable topology controller

```
$ fvctl –f /dev/null set-config --enable-topo-ctrl
$ sudo /etc/init.d/flowvisor restart
```

(see demo)

- -f /dev/null option: -f points to pwd file – in our case: empty pw

Let's slice the research lab



Slicing the Network with FlowVisor

- Want to create slice for servers. Have a look at topology:

```
$ fvctl -f /dev/null list-slices

$ fvctl -f /dev/null remove-slice <slice>

$ fvctl -f /dev/null list-flowspace
$ fvctl -f /dev/null list-datapaths
$ fvctl -f /dev/null list-links
```

(see demo)

Slicing the Network with FlowVisor

- Add slices with

```
fvctl add-slice [options] <slicename>
                  <controller-url> <admin-email>
```

```
$ fvctl –f /dev/null add-slice servers
                      tcp:localhost:10001 admin@servers
```

(see demo)

Add Flowspaces

- Add flowspaces with

```
fvctl add-flowspace [options] <flowspace-name> <dpid>
                        <priority> <match> <slice-perm>
```

```
$ fvctl –f /dev/null add-flowspace switch1-port2
                    1 1 in_port=2 servers=7
```

- Permissions: Bitmask
  - `1=DELEGATE, 2=READ, 4=WRITE`

(see demo)

Connect Controllers

- Start controller and connect to FlowVisor

(see demo)

Test Slicing

- Servers should be able to ping each other, but not any hosts

(see demo)

Recap: Hands-On SDN

Reasons for using network emulation

First steps in Mininet

Mininet topologies

Mininet, controllers and OpenFlow

Network Virtualization with FlowVisor

Exercise!

Time for Exercise 8