

## Exercises lb

# Exercise: Load balancers

- Setup will be as shown in Figure [\[1\]](#)

### (40P) Pre-defined servers

- 
- AIM: Http requests from different clients will be directed to different pre-defined servers

```
$ sudo mn --topo single,6 --mac --arp --controller remote
$. /pox/pox.py log.level --DEBUG misc.ip_loadbalancer --ip=10.0.1.1
--servers=10.0.0.1,10.0.0.2
```

Build the network:

```
mininet@mininet-vm:~$ sudo mn --topo single,6 --mac --arp --controller remote
*** Creating network
*** Adding controller
Unable to contact the remote controller at 127.0.0.1:6633
*** Adding hosts:
h1 h2 h3 h4 h5 h6
*** Adding switches:
s1
*** Adding links:
(h1, s1) (h2, s1) (h3, s1) (h4, s1) (h5, s1) (h6, s1)
*** Configuring hosts
h1 h2 h3 h4 h5 h6
*** Starting controller
c0
*** Starting 1 switches
s1
*** Starting CLI:
mininet> xterm h1 h2 h3
mininet>
```

Start HTTP servers on h1, h2

```
mininet> xterm h1
mininet> xterm h2

h1$ python -m SimpleHTTPServer 80
h2$ python -m SimpleHTTPServer 80
```

run two http servers:

```

"Node: h2"
root@mininet-vm:~# python -m SimpleHTTPServer 80
Serving HTTP on 0.0.0.0 port 80 ...
10.0.0.3 - - [28/Feb/2017 04:35:27] "GET / HTTP/1.1" 200 -
10.0.0.3 - - [28/Feb/2017 04:35:39] "GET / HTTP/1.1" 200 -
10.0.0.3 - - [28/Feb/2017 04:35:52] "GET / HTTP/1.1" 200 -

"Node: h1"
root@mininet-vm:~# python -m SimpleHTTPServer 80
Serving HTTP on 0.0.0.0 port 80 ...
10.0.0.3 - - [28/Feb/2017 04:35:49] "GET / HTTP/1.1" 200 -
10.0.0.3 - - [28/Feb/2017 04:35:50] "GET / HTTP/1.1" 200 -

```

- Get webpage from clients (h3)

```

mininet> xterm h3
h3$ curl 10.0.1.1

```

```

mininet@mininet-vm:~$ ./pox/pox.py log.level --DEBUG misc.ip_loadbalancer --ip=1
0.0.1.1 --servers=10.0.0.1,10.0.0.2
POX 0.2.0 (carp) / Copyright 2011-2013 James McCauley, et al.
DEBUG:core:POX 0.2.0 (carp) going up...
DEBUG:core:Running on CPython (2.7.6/Mar 22 2014 22:59:38)
DEBUG:core:Platform is Linux-3.13.0-24-generic-i686-with-Ubuntu-14.04-trusty
INFO:core:POX 0.2.0 (carp) is up.
DEBUG:openflow.of_01:Listening on 0.0.0.0:6633
INFO:openflow.of_01:[00-00-00-00-00-01 1] connected
INFO:iplb:IP Load Balancer Ready.
INFO:iplb:Load Balancing on [00-00-00-00-00-01 1]
INFO:iplb.00-00-00-00-00-01:Server 10.0.0.1 up
INFO:iplb.00-00-00-00-00-01:Server 10.0.0.2 up
DEBUG:iplb.00-00-00-00-00-01:Directing traffic to 10.0.0.2
DEBUG:iplb.00-00-00-00-00-01:Directing traffic to 10.0.0.2
DEBUG:iplb.00-00-00-00-00-01:Directing traffic to 10.0.0.1
DEBUG:iplb.00-00-00-00-00-01:Directing traffic to 10.0.0.1
DEBUG:iplb.00-00-00-00-00-01:Directing traffic to 10.0.0.2

```

The servers are not equally shared.

## (60P) Modified Load\_balancer

- Now modify pox/pox/misc/ip\_loadbalancer.py to select server in a round robin fashion

The code is in the attachment

Only four lines code added and one line changed

Acclaim a global variable count:

```
count=0
```

In def \_pick\_server:

```
global count
```

```
x=count%2
```

```
count++
```

```
Return list(self.live_servers.leys())[x]
```

This is round robin fashion result:

```
mininet@mininet-vm:~$ ./pox/pox.py log.level --DEBUG misc.ip_loadbalancer --ip=10.0.1.1 --servers=10.0.0.1,10.0.0.2
POX 0.2.0 (carp) / Copyright 2011-2013 James McCauley, et al.
DEBUG:core:POX 0.2.0 (carp) going up...
DEBUG:core:Running on CPython (2.7.6/Mar 22 2014 22:59:38)
DEBUG:core:Platform is Linux-3.13.0-24-generic-i686-with-Ubuntu-14.04-trusty
INFO:core:POX 0.2.0 (carp) is up.
DEBUG:openflow.of_01:Listening on 0.0.0.0:6633
INFO:openflow.of_01:[00-00-00-00-00-01 1] connected
INFO:iplb:IP Load Balancer Ready.
INFO:iplb:Load Balancing on [00-00-00-00-00-01 1]
INFO:iplb.00-00-00-00-00-01:Server 10.0.0.1 up
INFO:iplb.00-00-00-00-00-01:Server 10.0.0.2 up
DEBUG:iplb.00-00-00-00-00-01:Directing traffic to 10.0.0.1
DEBUG:iplb.00-00-00-00-00-01:Directing traffic to 10.0.0.2
DEBUG:iplb.00-00-00-00-00-01:Directing traffic to 10.0.0.1
DEBUG:iplb.00-00-00-00-00-01:Directing traffic to 10.0.0.2
DEBUG:iplb.00-00-00-00-00-01:Directing traffic to 10.0.0.1
DEBUG:iplb.00-00-00-00-00-01:Directing traffic to 10.0.0.2
DEBUG:iplb.00-00-00-00-00-01:Directing traffic to 10.0.0.1
DEBUG:iplb.00-00-00-00-00-01:Directing traffic to 10.0.0.2
DEBUG:iplb.00-00-00-00-00-01:Directing traffic to 10.0.0.1
DEBUG:iplb.00-00-00-00-00-01:Directing traffic to 10.0.0.2
```