

# kathara lab

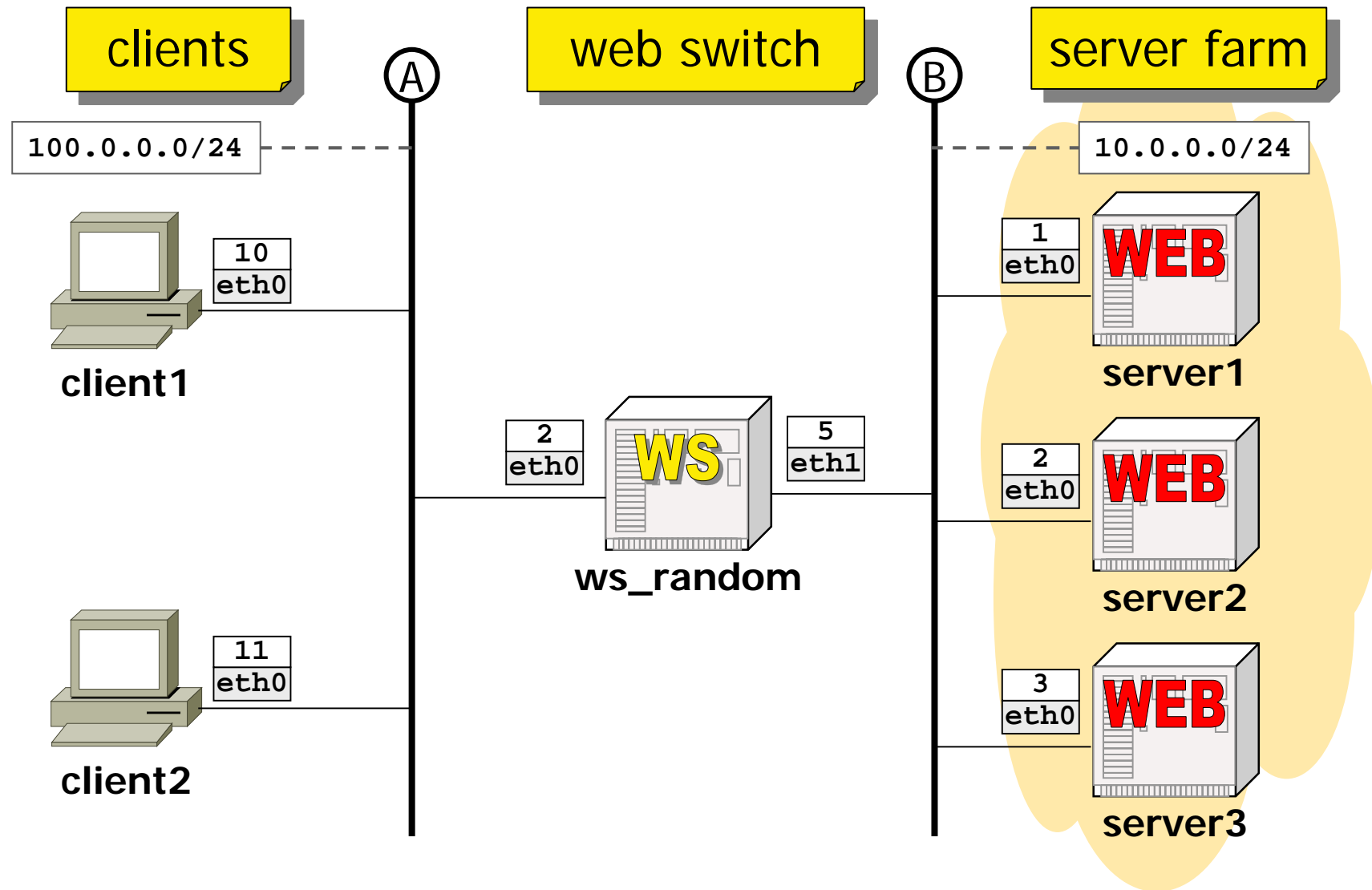
load balancer – web switch – random

<b>Version</b>	1.1
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<b>Description</b>	A lab showing the operation of a web switch based on iptables – kathara version of a netkit lab

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# lab topology



# lab description

- servers
  - offer a simple HTML default page
  - each physical server hosts a different page, so that they can be easily distinguished
- web switch
  - web switch implements a policy for directing requests to the servers
    - **ws\_random**: sends each request to a random server
- clients
  - host a simple web browser (**links**)

## lab description – servers

- each server has a different IP address in the subnet **10.0.0.0/24**
- no special configuration, just a simple HTML default page in **/var/www/index.html**

# lab description – web switch

- each web switch has two interfaces
  - one facing the internal network, with an IP address in the same subnet as the servers
  - one facing the external network, exposing a single **virtual IP address (VIP)** to the clients
- clients only see VIPs of the web switch: they do not know how many servers are in the farm

# lab description – web switch

- web switch is implemented using the Linux firewall iptables
  - random

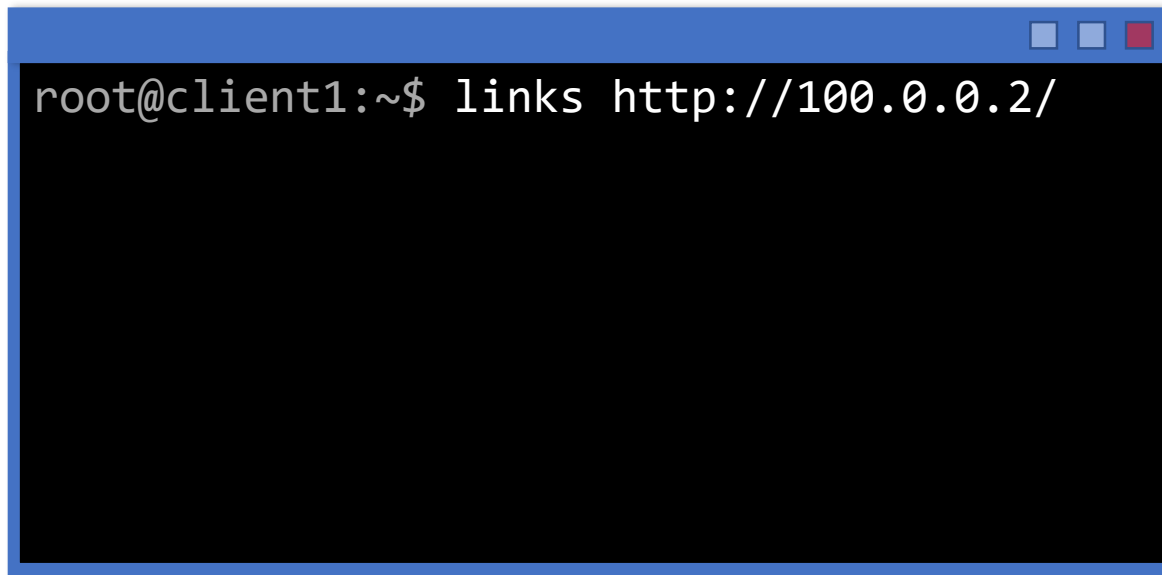
```
iptables --table nat --append PREROUTING --destination 100.0.0.2 -p tcp --dport 80 --match  
statistic --mode random --probability 0.33 --jump DNAT --to-destination 10.0.0.1:80  
iptables --table nat --append PREROUTING --destination 100.0.0.2 -p tcp --dport 80 --match  
statistic --mode random --probability 0.5 --jump DNAT --to-destination 10.0.0.2:80  
iptables --table nat --append PREROUTING --destination 100.0.0.2 -p tcp --dport 80 --jump  
DNAT --to-destination 10.0.0.3:80
```

```
iptables --table nat --append PREROUTING --destination 100.0.0.2  
-p tcp --dport 80 --match statistic --mode random --probability  
0.33 --jump DNAT --to-destination 10.0.0.1:80
```

the rule applies  
with a certain  
probability

# experiments

- to experiment load balancing, pick one of the clients, start **links**, and direct it to the VIP exposed by web switch:

A terminal window with a blue title bar and a black background. The prompt is 'root@client1:~\$' and the command entered is 'links http://100.0.0.2/'.

```
root@client1:~$ links http://100.0.0.2/
```

to experiment random  
balancing



# experiments

- once you have accessed one of the VIPs, you get a page stating which is the physical server that has served it
- load balancing can be checked by reloading the page (**ctrl+R**), but...



# experiments

- once you have accessed one of the VIPs, you get a page stating which is the physical server that has served it
- load balancing can be checked by reloading the page (**ctrl+R**), but...
  - ...by default all HTTP requests use the same connection (HTTP 1.1)!
  - since iptables tracks TCP connections, all HTTP requests within the same connection are directed to the same physical server
  - to really appreciate load balancing you need to close and re-open links