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Lab Random Loadbalancer

load balancer – web switch – random

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

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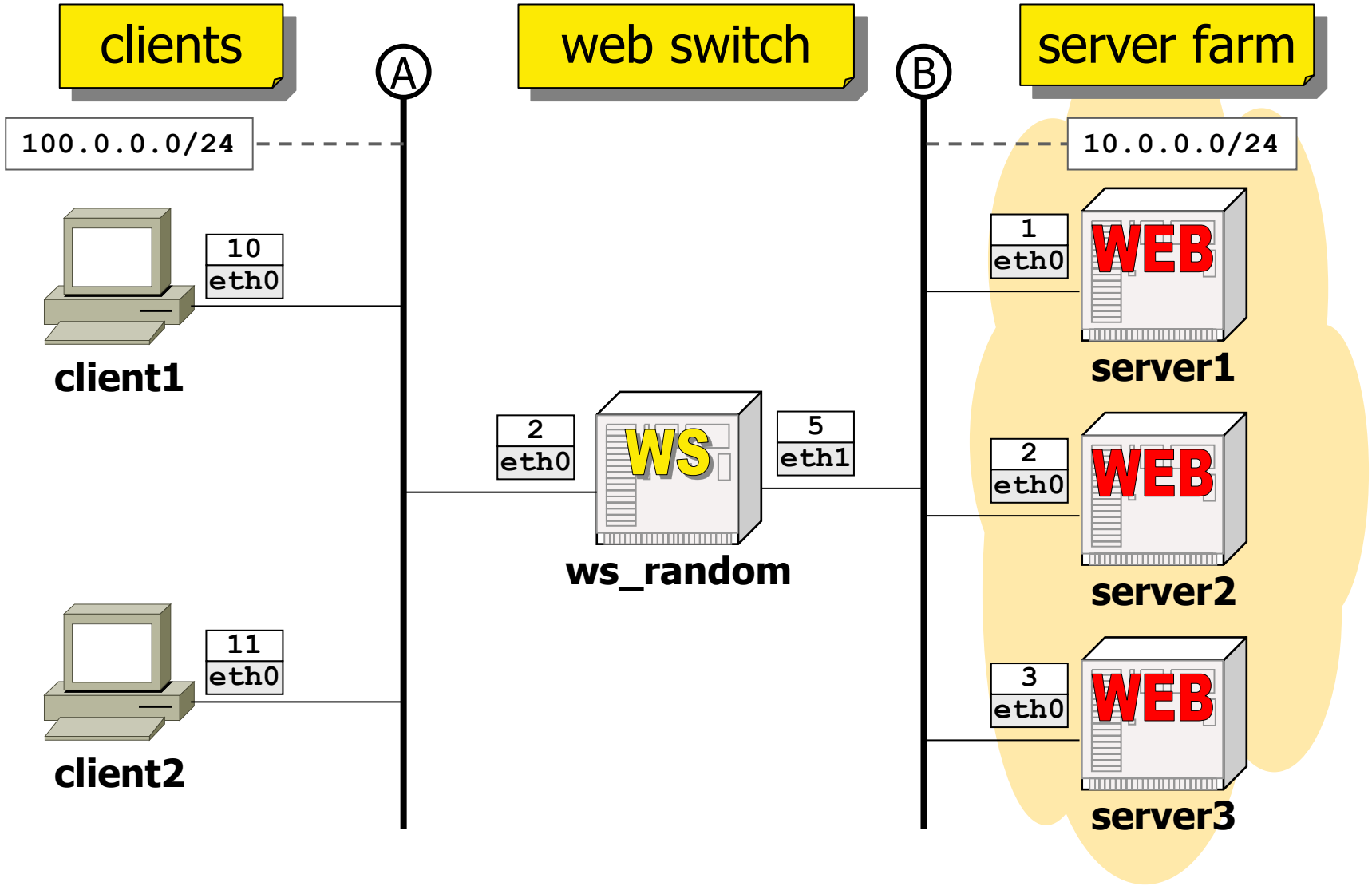
lab topology



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

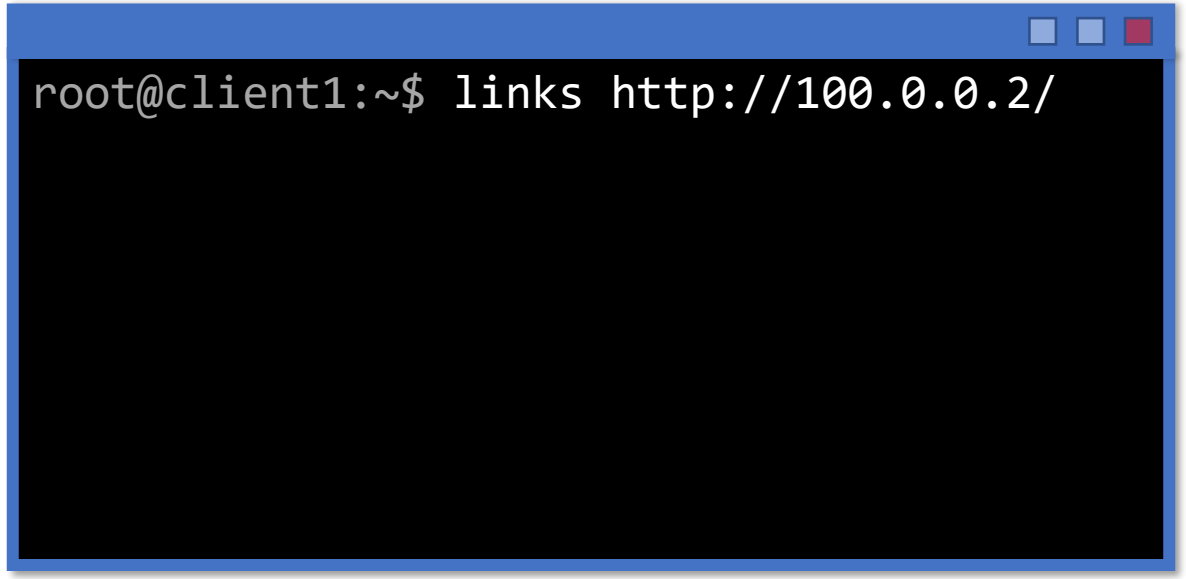
```
iptables --table nat --append PREROUTING --destination 100.0.0.2 -p tcp --dport 80 --match
statistic --mode random --probability 0.33 --jump DNAT --to-destination 10.0.0.1:80
iptables --table nat --append PREROUTING --destination 100.0.0.2 -p tcp --dport 80 --match
statistic --mode random --probability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



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