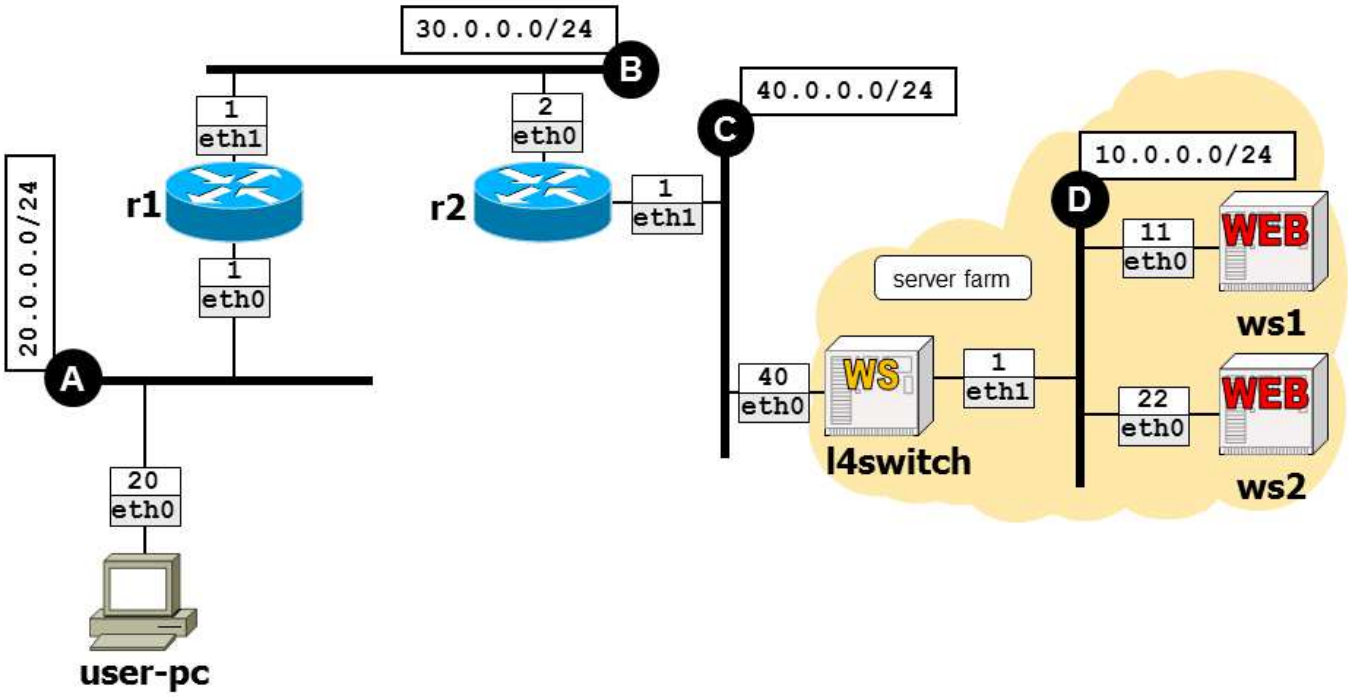
ICN – Examination date: 25-11-2016 – "Violin" 

Available time: 75 minutes.



Using Netkit, implement the network depicted in the figure and described below (you can use the following as a checklist).

- ☐ Routing is implemented by using statically configured routes.
  - ☐ Remember to set a default route on all network nodes that do *not* act as routers, including `l4switch`.
- ☐ `ws1` and `ws2` are web servers running apache2; they serve a single default page, which is different for each server. In particular, `ws1` serves a page containing "ws1" whereas `ws2` serves a page containing "ws2".
- ☐ `l4switch` is a layer 4 web switch that implements a round robin load balancing policy. Use the following commands to properly set it up:

On a single line!

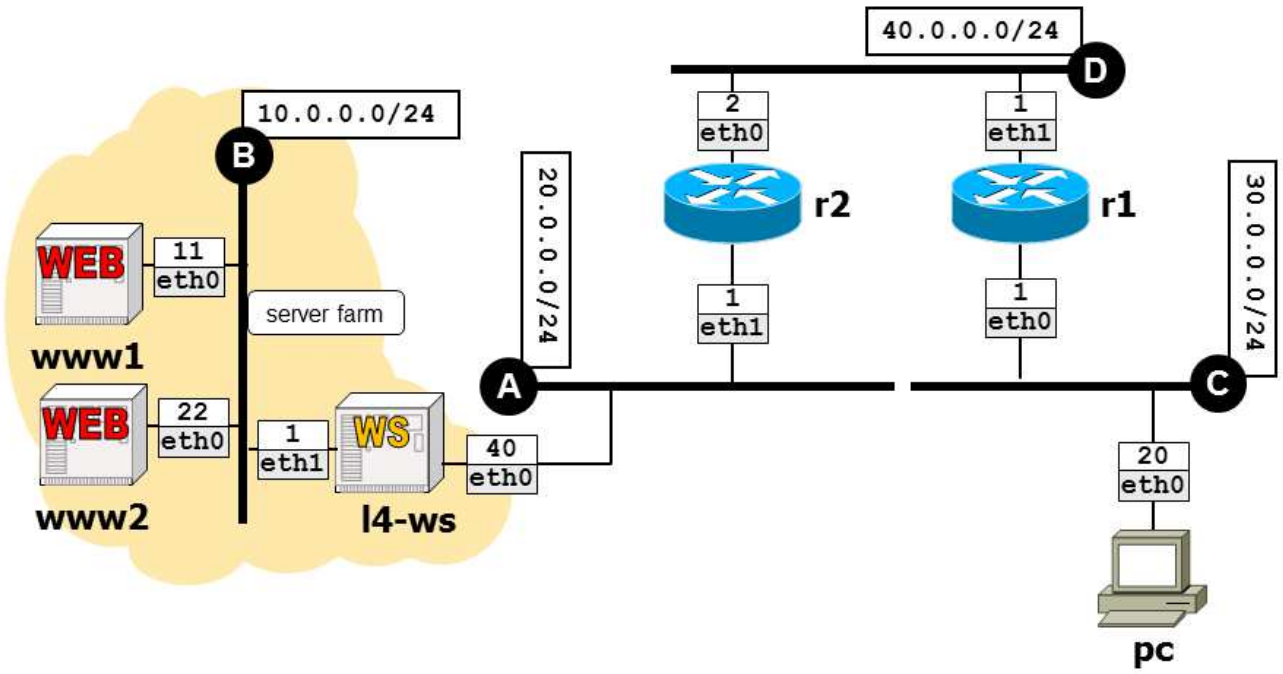
```
iptables -t nat -A PREROUTING -d 40.0.0.40 -m statistic --mode nth --every 2 -j
DNAT --to-destination 10.0.0.11
iptables -t nat -A PREROUTING -d 40.0.0.40 -j DNAT --to-destination 10.0.0.22
```

Goals:

- `user-pc` must be able to access web page `http://40.0.0.40/` using the `links` web browser.
- The load balancing mechanisms implemented by the web switch must be observable (using `links`).

ICN – Examination date: 25-11-2016 – "Harp"

Available time: 75 minutes.



Using Netkit, implement the network depicted in the figure and described below (you can use the following as a checklist).

- ☐ Routing is implemented by using statically configured routes.
  - ☐ Remember to set a default route on all network nodes that do *not* act as routers, including `l4-ws`.
- ☐ `www1` and `www2` are web servers running apache2; they serve a single default page, which is different for each server. In particular, `www1` serves a page containing "www1" whereas `www2` serves a page containing "www2".
- ☐ `l4-ws` is a layer 4 web switch that implements a round robin load balancing policy. Use the following commands to properly set it up:

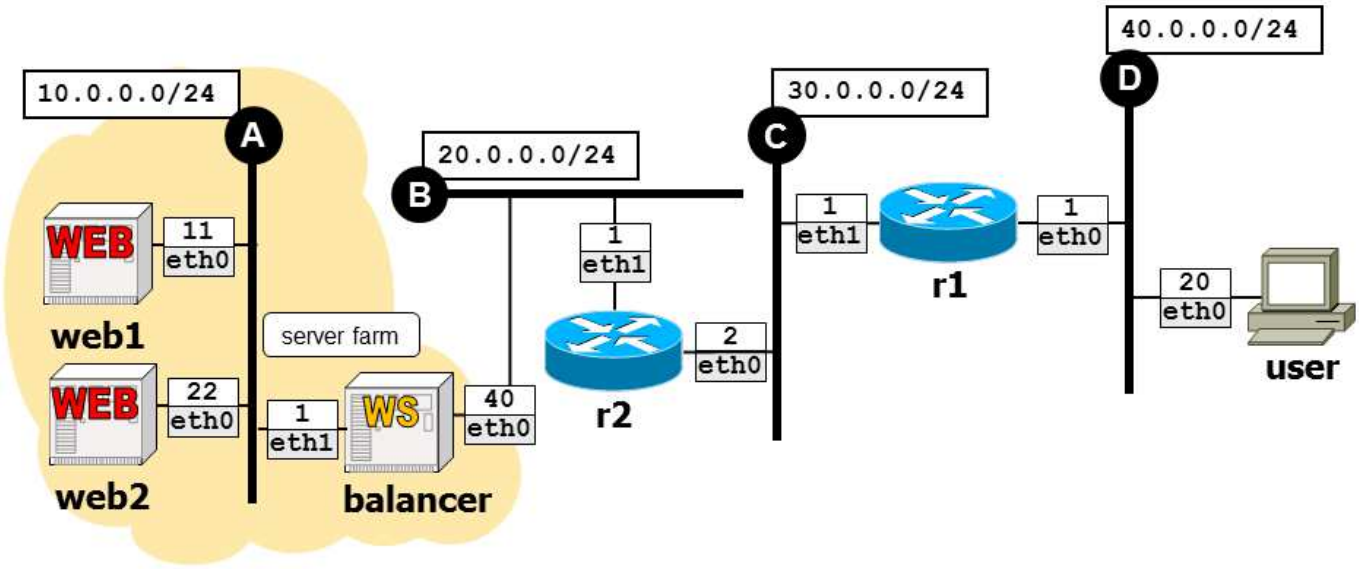
On a single line!
```
iptables -t nat -A PREROUTING -d 20.0.0.40 -m statistic --mode nth --every 2 -j
DNAT --to-destination 10.0.0.11
iptables -t nat -A PREROUTING -d 20.0.0.40 -j DNAT --to-destination 10.0.0.22
```

Goals:

- `pc` must be able to access web page `http://20.0.0.40/` using the `links` web browser.
- The load balancing mechanisms implemented by the web switch must be observable (using `links`).

ICN – Examination date: 25-11-2016 – "Lute"

Available time: 75 minutes.



Using Netkit, implement the network depicted in the figure and described below (you can use the following as a checklist).

- ☐ Routing is implemented by using statically configured routes.
  - ☐ Remember to set a default route on all network nodes that do *not* act as routers, including `balancer`.
- ☐ `web1` and `web2` are web servers running apache2; they serve a single default page, which is different for each server. In particular, `web1` serves a page containing "web1" whereas `web2` serves a page containing "web2".
- ☐ `balancer` is a layer 4 web switch that implements a round robin load balancing policy. Use the following commands to properly set it up:

On a single line!

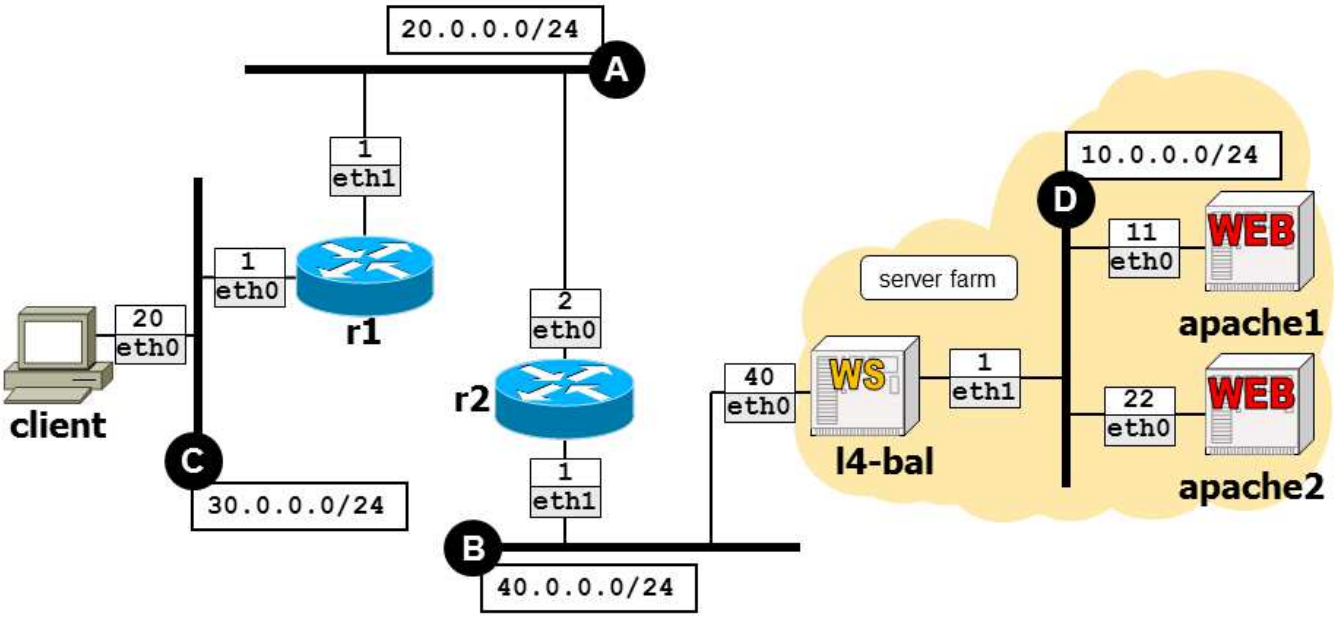
```
iptables -t nat -A PREROUTING -d 20.0.0.40 -m statistic --mode nth --every 2 -j
DNAT --to-destination 10.0.0.11
iptables -t nat -A PREROUTING -d 20.0.0.40 -j DNAT --to-destination 10.0.0.22
```

Obiettivi:

- `user` must be able to access web page `http://20.0.0.40/` using the `links` web browser.
- The load balancing mechanisms implemented by the web switch must be observable (using `links`).

ICN – Examination date: 25-11-2016 – "Double Bass" 

Available time: 75 minutes.



Using Netkit, implement the network depicted in the figure and described below (you can use the following as a checklist).

- ☐ Routing is implemented by using statically configured routes.
  - ☐ Remember to set a default route on all network nodes that do *not* act as routers, including `l4-bal`.
- ☐ `apache1` and `apache2` are web servers running apache2; they serve a single default page, which is different for each server. In particular, `apache1` serves a page containing "apache1" whereas `apache2` serves a page containing "apache2".
- ☐ `l4-bal` is a layer 4 web switch that implements a round robin load balancing policy. Use the following commands to properly set it up:

On a single line!

```
iptables -t nat -A PREROUTING -d 40.0.0.40 -m statistic --mode nth --every 2 -j
DNAT --to-destination 10.0.0.11
iptables -t nat -A PREROUTING -d 40.0.0.40 -j DNAT --to-destination 10.0.0.22
```

Obiettivi:

- `client` must be able to access web page `http://40.0.0.40/` using the `links` web browser.
- The load balancing mechanisms implemented by the web switch must be observable (using `links`).