

1. Remember to check your network configuration!

* Check it with:

```
# ifconfig em0 inet
```

-> Do you see an IP address on your network card ?

It should look like this:

```
em0: flags=8843<UP,BROADCAST,RUNNING,SIMPLEX,MULTICAST> metric 0 mtu 1500
      options=8<VLAN_MTU>
      inet 41.215.76.x netmask 0xffffffff broadcast 41.215.76.255
```

... where 'x' is your IP

* If you em0 netcard does not have a 41.215.76.x IP, then configure it:

```
# ifconfig em0 41.215.76.x/24
# route add default 41.215.76.254
```

* Remember to add your IPv6 address:

```
# ifconfig em0 inet6 2001:470:933d::X
# route add -inet6 default 2001:470:933d::254
```

* Check the network configuration again with ifconfig

```
em0: flags=8843<UP,BROADCAST,RUNNING,SIMPLEX,MULTICAST> metric 0 mtu 1500
      options=19b<RXCSUM, TXCSUM, VLAN_MTU, VLAN_HWTAGGING, VLAN_HWCSUM, TSO4>
      ether 00:1e:0b:b5:a3:c9
      inet 41.215.76.X netmask 0xffffffff broadcast 41.215.76.255
      inet6 2001:470:933d::X prefixlen 64
      media: Ethernet autoselect (10baseT/UTP <full-duplex>)
      status: active
```

* Additionally, configure your /etc/resolv.conf by editing it and adding:

```
nameserver 196.200.223.1
```

(you can also try 2001:470:933d::253 - it should work!)

2. NETSTAT

* Look at your routing table:

```
# netstat -rn
```

and

```
# netstat -rn -f inet6
```

(Stop it with CTRL+C)

Try again with 2001:470:933d::254

* Let's ping something outside, on the Internet. For example,
www.afrinic.net

```
# ping www.afrinic.net
```

-> Do you get an answer ?

What about IPv6 ?

```
# ping6 2001:42d0::200:80:1
```

```
# ping6 www.afrinic.net
```

If not, check:

- that you have a gateway in IPv4 **AND** IPv6
- that you have an /etc/resolv.conf that contains a nameserver! (see 1.)

-> What do you notice about the response time (time=.. ms) ?

* Remove your default gateway:

```
# route delete default
```

```
# route delete -inet6 default
```

* Control that the default gateway is gone using the netstat -r, and netstat -r -f inet6, commands.

-> How can you be sure that the default gateway is no longer configured ?

* Now, try to ping:

- the local NOC machine:

```
# ping 41.215.76.253
```

```
# ping6 2001:470:933d::253
```

- www.afrinic.net:

```
# ping www.afrinic.net
```

```
# ping6 www.afrinic.net
```

- The IP address of www.afrinic.net

```
# ping 196.216.2.1
```

```
# ping www.afrinic.net
# ping6 www.afrinic.net
```

4. TRACEROUTE

* Traceroute to www.afrinic.net

```
# traceroute www.afrinic.net
# traceroute6 www.afrinic.net
```

* Try again, this time with the -n option:

```
# traceroute -n www.afrinic.net
# traceroute6 -n www.afrinic.net
```

-> Observe the difference with and without the '-n' option

5. ROUTE (IPv4 Example DO NOT DO THIS)

* Remove your default routes

```
# route delete default
```

* Add a route to the AfNOG backbone network through the gateway:

```
# route add 196.200.223.0/24 41.215.76.254
```

* Try to ping the backbone NOC:

```
# ping 196.200.223.1
```

* Try to ping www.afrinic.net:

```
# ping www.afrinic.net
```

* Try to ping 196.216.2.1:

```
# ping 196.216.2.1
```

-> What do you notice ?

-> What do you conclude ?

* Restore the default route:

```
# route add default 41.215.76.254
```

* Look at the routing table with the netstat -rn command:

```
# netstat -rn
```

6. TCPDUMP (IPv4 only)

* Run tcpdump on your system:

```
# tcpdump -n -i em0 icmp
```

(Note the use of the icmp keyword to limit viewing ICMP traffic)

* Ask someone else in the room to ping your machine, and look at your screen

* Delete the default route on your system:

```
# route delete default
```

* Repeat the ping

-> What do you notice ?