

MODUL PRAKTIKUM 06

STATIC ROUTING LINUX

TUJUAN

Setelah praktikum dilaksanakan, peserta praktikum diharapkan memiliki kemampuan

1. Melakukan konfigurasi Static Routing dengan text-mode pada Router Linux Ubuntu 8.10
2. Melakukan konfigurasi Static Routing dengan GUI-mode pada Router Linux Ubuntu 8.10
3. Melakukan penelusuran jaringan dengan tracet dan mtr

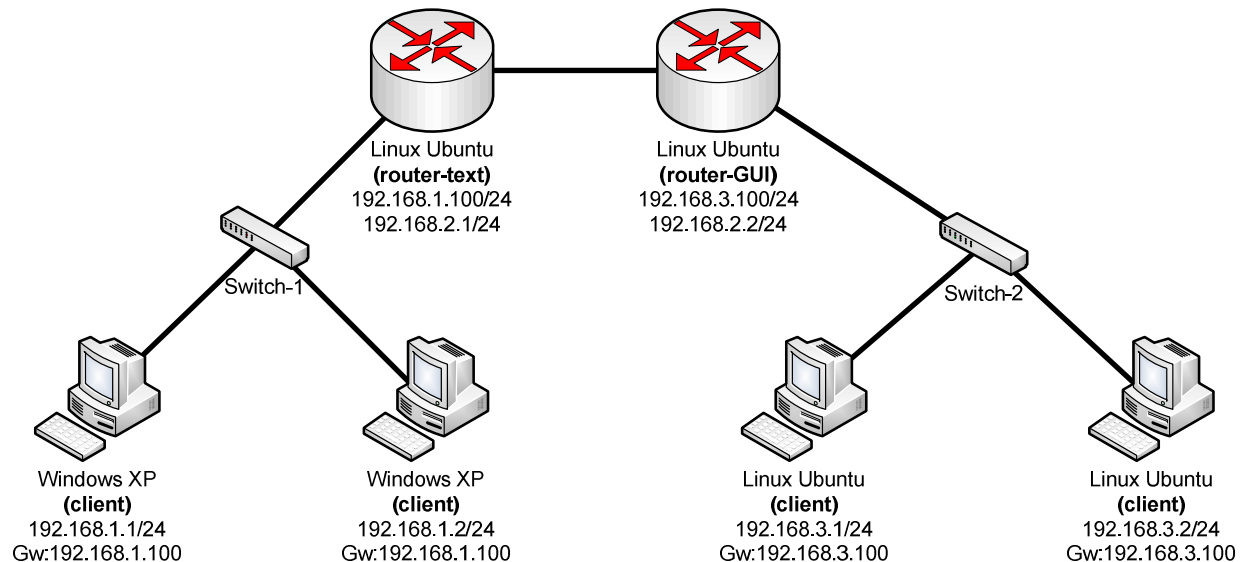
PERANGKAT

Perangkat yang digunakan untuk praktikum adalah sbb :

1. Linux Ubuntu 8.10
2. Windows XP
3. Kabel UTP Straight atau Cross
4. Switch

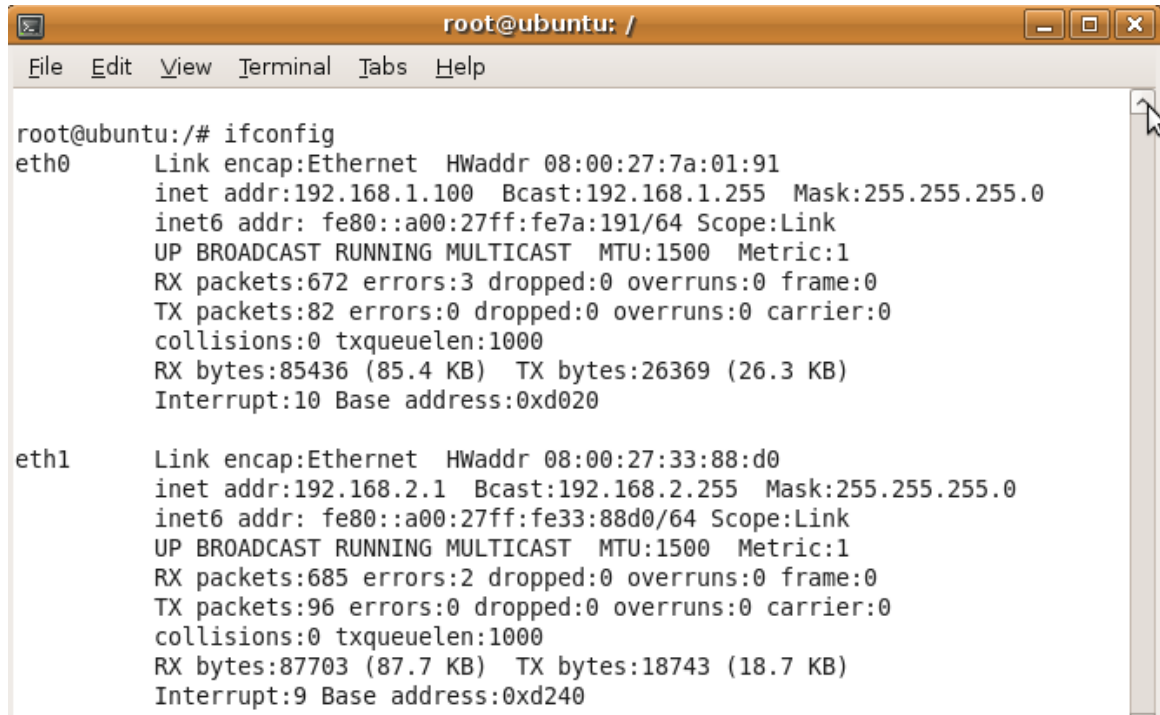
PROSEDUR PRAKTIKUM

Berikut topologi yang akan dijadikan materi praktikum :



1. Melakukan konfigurasi Static Routing dengan text-mode pada Linux Ubuntu 8.10

- a. Tambahkan IP Address pada interface yang sesuai

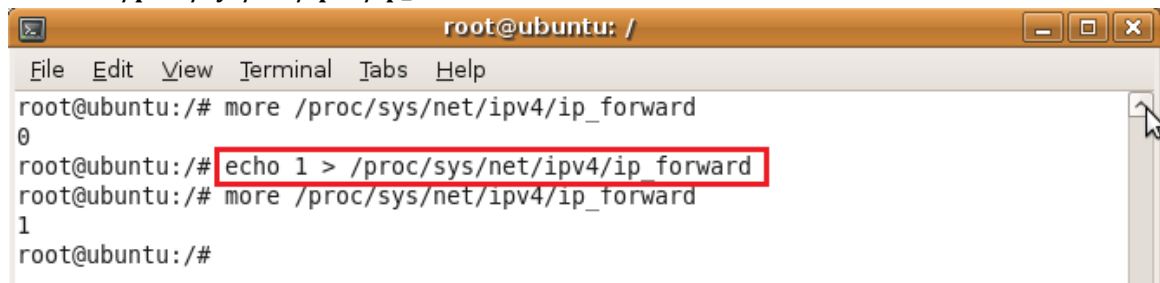


```
root@ubuntu: /
File Edit View Terminal Tabs Help

root@ubuntu:/# ifconfig
eth0      Link encap:Ethernet  HWaddr 08:00:27:7a:01:91
          inet addr:192.168.1.100  Bcast:192.168.1.255  Mask:255.255.255.0
          inet6 addr: fe80::a00:27ff:fe7a:191/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:672 errors:3 dropped:0 overruns:0 frame:0
          TX packets:82 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:85436 (85.4 KB)  TX bytes:26369 (26.3 KB)
          Interrupt:10 Base address:0xd020

eth1      Link encap:Ethernet  HWaddr 08:00:27:33:88:d0
          inet addr:192.168.2.1  Bcast:192.168.2.255  Mask:255.255.255.0
          inet6 addr: fe80::a00:27ff:fe33:88d0/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:685 errors:2 dropped:0 overruns:0 frame:0
          TX packets:96 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:87703 (87.7 KB)  TX bytes:18743 (18.7 KB)
          Interrupt:9 Base address:0xd240
```

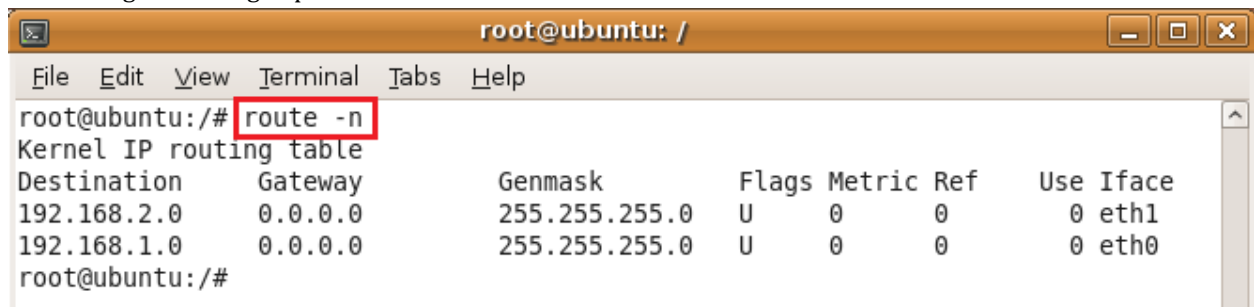
- b. Hidupkan service Routing (ip_forwarding) dengan perintah
“echo 1 > /proc/sys/net/ipv4/ip_forward”



```
root@ubuntu: /
File Edit View Terminal Tabs Help

root@ubuntu:/# more /proc/sys/net/ipv4/ip_forward
0
root@ubuntu:/# echo 1 > /proc/sys/net/ipv4/ip_forward
root@ubuntu:/# more /proc/sys/net/ipv4/ip_forward
1
root@ubuntu:/#
```

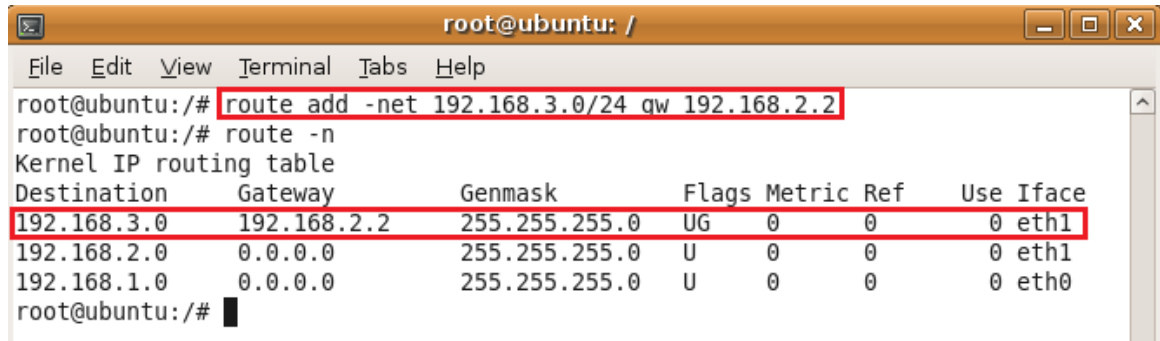
- c. Cek routing table dengan perintah “route -n” atau “netstat -nr”



```
root@ubuntu: /
File Edit View Terminal Tabs Help

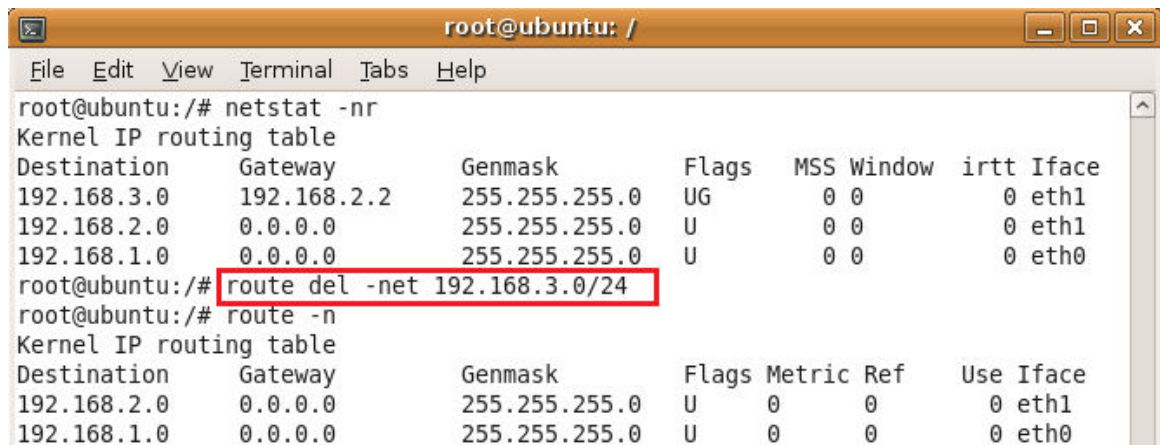
root@ubuntu:/# route -n
Kernel IP routing table
Destination      Gateway          Genmask         Flags Metric Ref    Use Iface
192.168.2.0      0.0.0.0         255.255.255.0  U      0      0      0 eth1
192.168.1.0      0.0.0.0         255.255.255.0  U      0      0      0 eth0
root@ubuntu:/#
```

- d. Tambahkan route ke network yang belum dikenal dengan perintah
“**route add -net <destination-network/prefix> gw <gateway>**”
atau “**route add -net <dest-network> netmask <dest-subnet> gw <gateway>**”



```
root@ubuntu: /
File Edit View Terminal Tabs Help
root@ubuntu:/# route add -net 192.168.3.0/24 gw 192.168.2.2
root@ubuntu:/# route -n
Kernel IP routing table
Destination Gateway Genmask Flags Metric Ref Use Iface
192.168.3.0 192.168.2.2 255.255.255.0 UG 0 0 0 eth1
192.168.2.0 0.0.0.0 255.255.255.0 U 0 0 0 eth1
192.168.1.0 0.0.0.0 255.255.255.0 U 0 0 0 eth0
root@ubuntu:/#
```

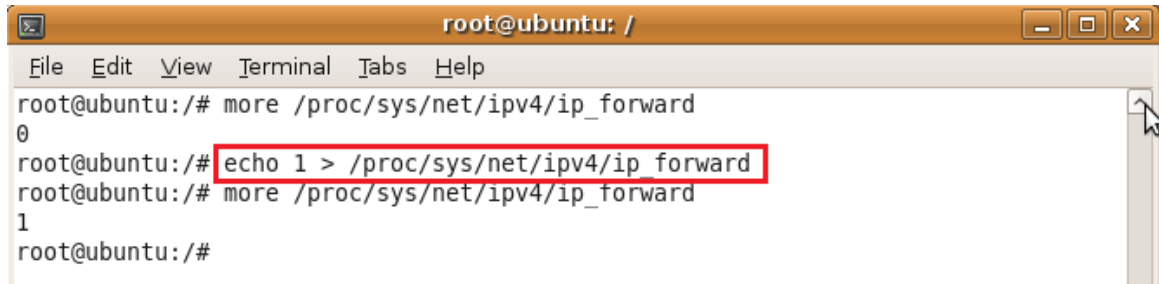
- e. Jika terjadi kesalahan penambahan, dapat dihapus menggunakan perintah
“**route del -net <destination-network/prefix>**”
atau “**route del -net <dest-network> netmask <dest-subnet>**”



```
root@ubuntu: /
File Edit View Terminal Tabs Help
root@ubuntu:/# netstat -nr
Kernel IP routing table
Destination Gateway Genmask Flags MSS Window irtt Iface
192.168.3.0 192.168.2.2 255.255.255.0 UG 0 0 0 eth1
192.168.2.0 0.0.0.0 255.255.255.0 U 0 0 0 eth1
192.168.1.0 0.0.0.0 255.255.255.0 U 0 0 0 eth0
root@ubuntu:/# route del -net 192.168.3.0/24
root@ubuntu:/# route -n
Kernel IP routing table
Destination Gateway Genmask Flags Metric Ref Use Iface
192.168.2.0 0.0.0.0 255.255.255.0 U 0 0 0 eth1
192.168.1.0 0.0.0.0 255.255.255.0 U 0 0 0 eth0
```

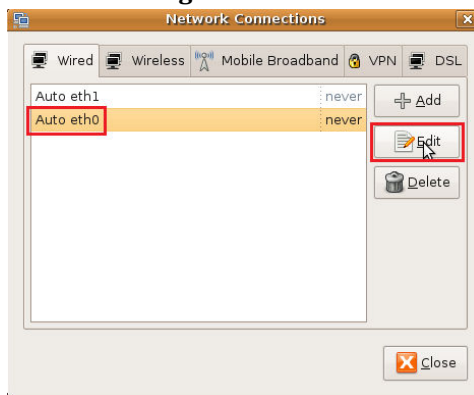
2. Melakukan konfigurasi Static Routing dengan GUI-mode pada Router Linux Ubuntu 8.10

- a. Hidupkan service Routing (ip_forwarding) dengan perintah
"echo 1 > /proc/sys/net/ipv4/ip_forward"

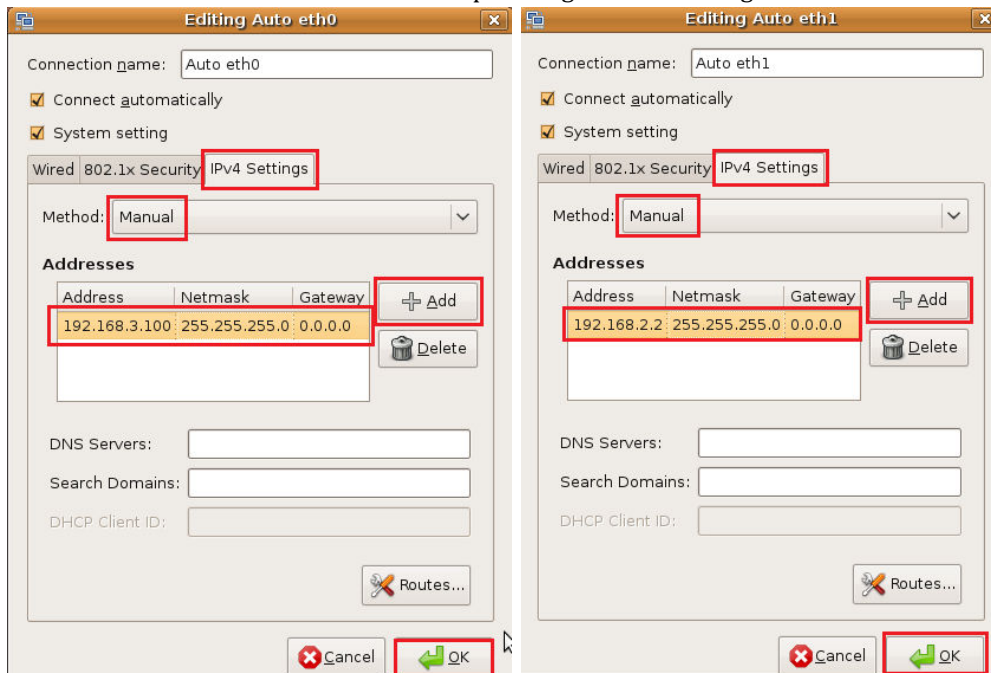


```
root@ubuntu: /
File Edit View Terminal Tabs Help
root@ubuntu:/# more /proc/sys/net/ipv4/ip_forward
0
root@ubuntu:/# echo 1 > /proc/sys/net/ipv4/ip_forward
root@ubuntu:/# more /proc/sys/net/ipv4/ip_forward
1
root@ubuntu:/#
```

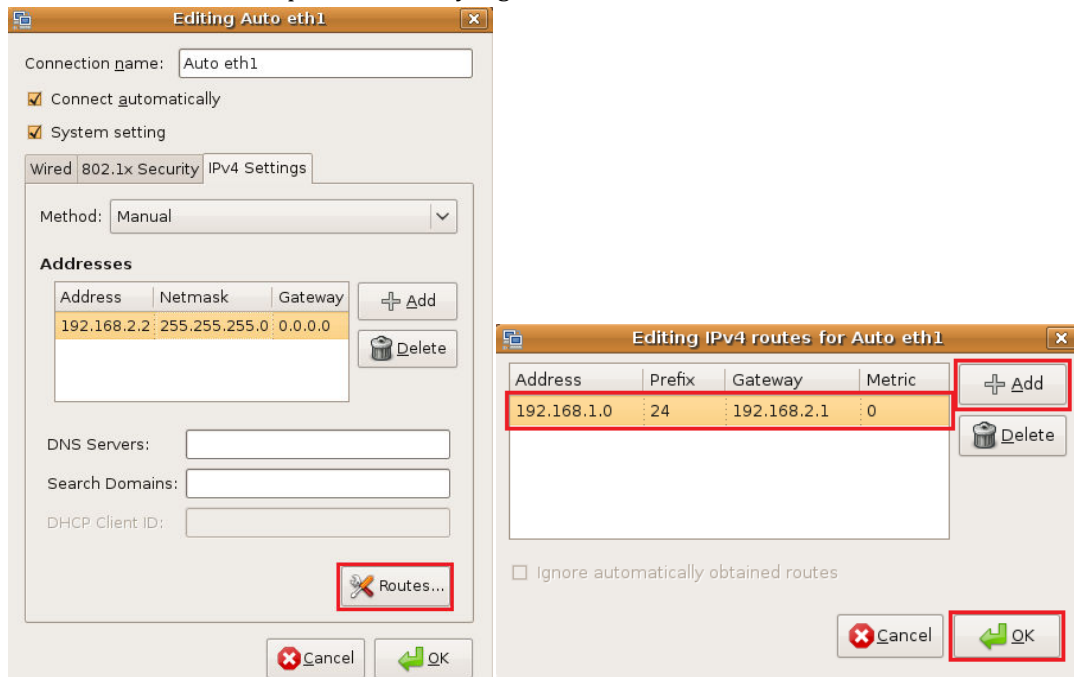
- b. Pasang IP Address menggunakan GUI-mode dengan mengakses menu **System—Preferences—Network Configuration**



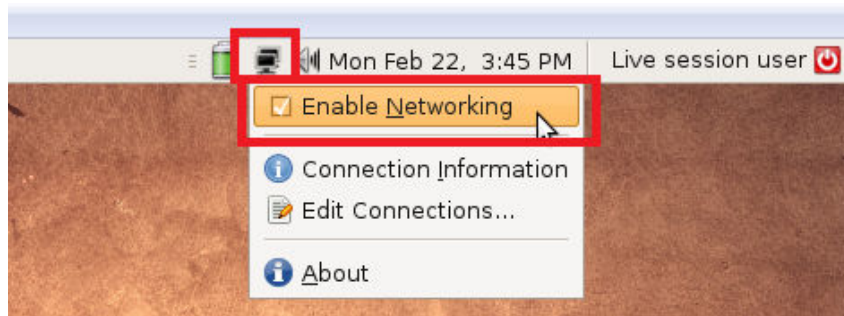
- c. Tambahkan IP Address dan Subnet Mask pada bagian IPv4 Settings



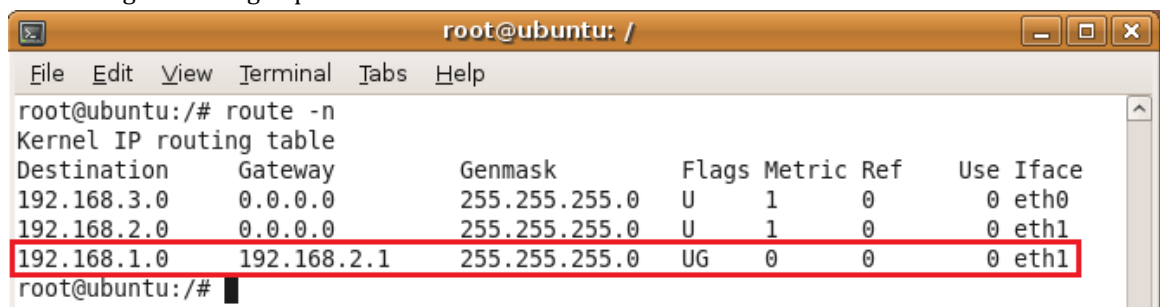
- d. Tambahkan Static Route pada interface yang membutuhkan



- e. Jalankan konfigurasi dengan **Disable/Enable Networking**

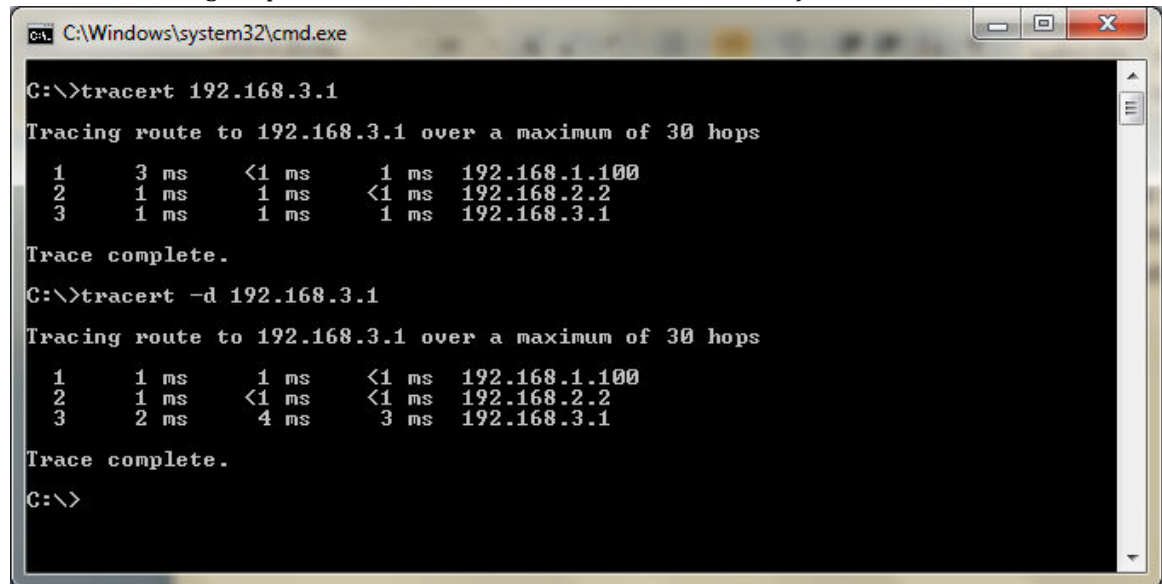


- f. Cek routing table dengan perintah “**route -n**” atau “**netstat -nr**”



3. Melakukan penelusuran jaringan dengan tracert dan mtr

- a. Proses penelusuran jaringan dapat dilakukan dengan perintah tracert pada Windows XP (boleh ditambahkan dengan opsi -d : Do not resolve addresses to hostnames)



```
C:\Windows\system32\cmd.exe

C:\>tracert 192.168.3.1

Tracing route to 192.168.3.1 over a maximum of 30 hops

  1    3 ms    <1 ms    1 ms    192.168.1.100
  2    1 ms    1 ms     <1 ms   192.168.2.2
  3    1 ms    1 ms     1 ms    192.168.3.1

Trace complete.

C:\>tracert -d 192.168.3.1

Tracing route to 192.168.3.1 over a maximum of 30 hops

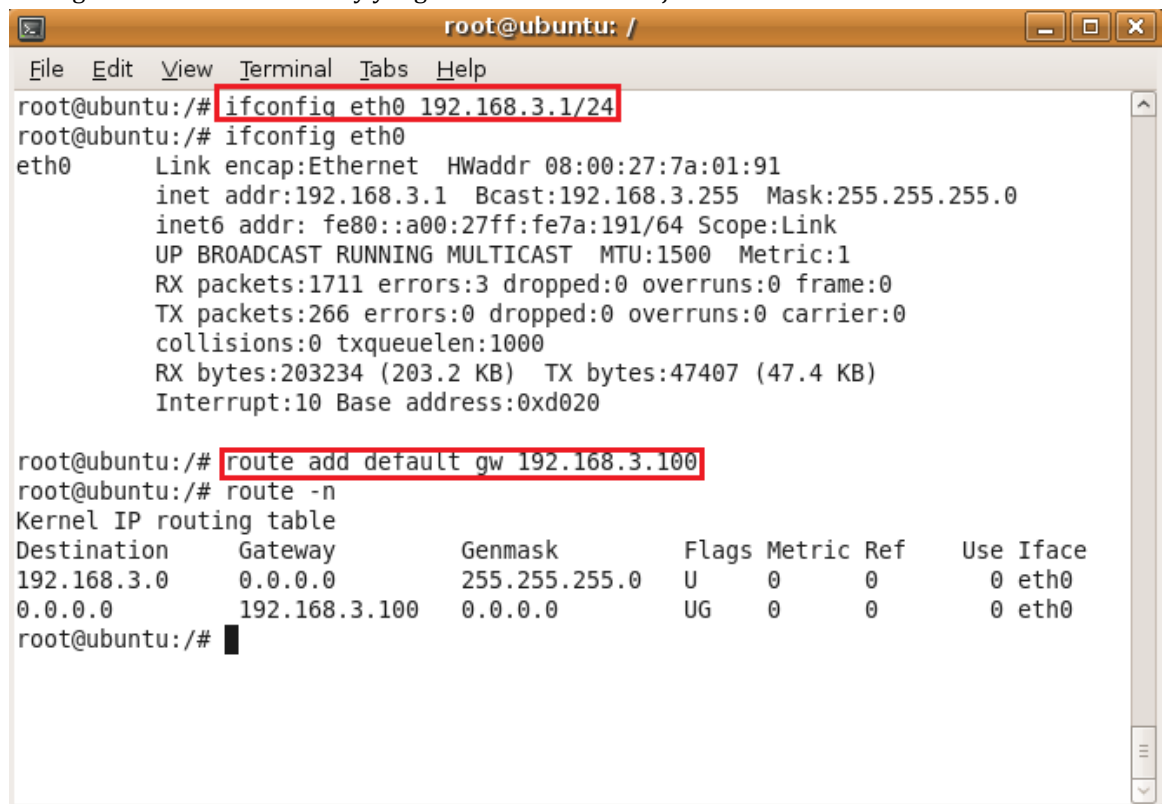
  1    1 ms    1 ms     <1 ms   192.168.1.100
  2    1 ms    <1 ms    <1 ms   192.168.2.2
  3    2 ms    4 ms     3 ms    192.168.3.1

Trace complete.

C:\>
```

- b. Penelusuran jaringan menggunakan mtr pada Linux Ubuntu 8.10

- i. Pasang IP Address dan Gateway yang sesuai sebelum menjalankan mtr



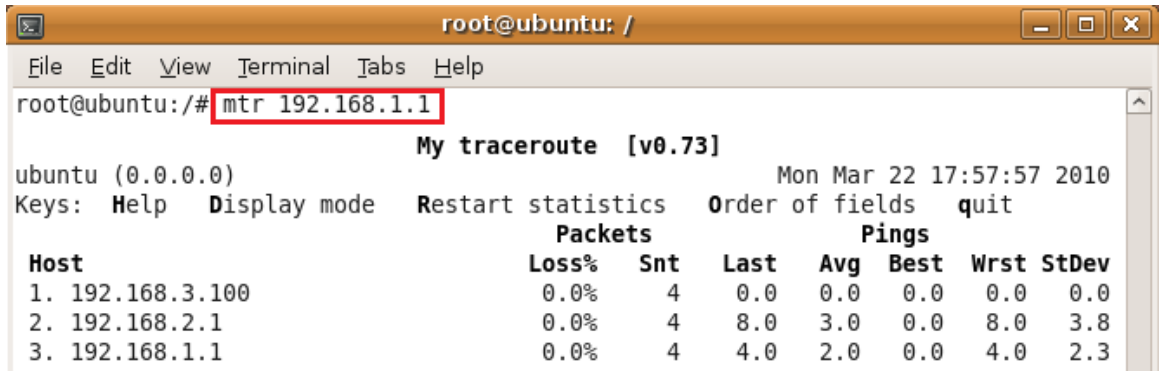
```
root@ubuntu: /

File Edit View Terminal Tabs Help

root@ubuntu:/# ifconfig eth0 192.168.3.1/24
root@ubuntu:/# ifconfig eth0
eth0      Link encap:Ethernet  HWaddr 08:00:27:7a:01:91
          inet addr:192.168.3.1  Bcast:192.168.3.255  Mask:255.255.255.0
          inet6 addr: fe80::a00:27ff:fe7a:191/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:1711 errors:3 dropped:0 overruns:0 frame:0
          TX packets:266 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:203234 (203.2 KB)  TX bytes:47407 (47.4 KB)
          Interrupt:10 Base address:0xd020

root@ubuntu:/# route add default gw 192.168.3.100
root@ubuntu:/# route -n
Kernel IP routing table
Destination Gateway Genmask Flags Metric Ref Use Iface
192.168.3.0 0.0.0.0 255.255.255.0 U 0 0 0 eth0
0.0.0.0 192.168.3.100 0.0.0.0 UG 0 0 0 eth0
root@ubuntu:/#
```

- ii. Jalankan mtr dengan “mtr <destination-ip>” (mtr dapat dihentikan dengan ctrl+c)



The screenshot shows a terminal window titled "root@ubuntu: /". The command "mtr 192.168.1.1" has been entered and is highlighted with a red box. The output of the command is as follows:

```
My traceroute [v0.73]
ubuntu (0.0.0.0) Mon Mar 22 17:57:57 2010
Keys: Help Display mode Restart statistics Order of fields quit

Host                Packets          Pings
Loss%  Snt  Last  Avg  Best  Wrst  StDev
1. 192.168.3.100    0.0%    4    0.0  0.0  0.0  0.0  0.0
2. 192.168.2.1     0.0%    4    8.0  3.0  0.0  8.0  3.8
3. 192.168.1.1     0.0%    4    4.0  2.0  0.0  4.0  2.3
```