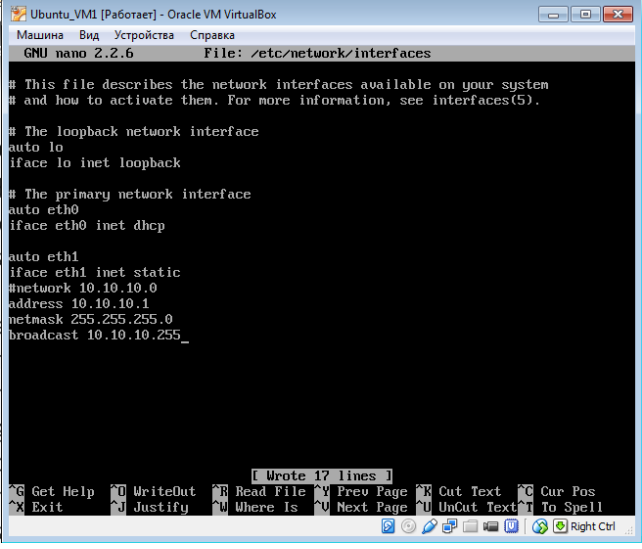


Configure the network by editing /etc/interfaces file



The screenshot shows a VirtualBox window titled 'Ubuntu\_VMI [Работает] - Oracle VM VirtualBox'. Inside, the 'nano 2.2.6' text editor is open, editing the file '/etc/network/interfaces'. The file contains configuration for three network interfaces: 'lo' (loopback), 'eth0' (primary interface with DHCP), and 'eth1' (static IP 10.10.10.1). The status bar at the bottom indicates '[ Wrote 17 lines ]'.

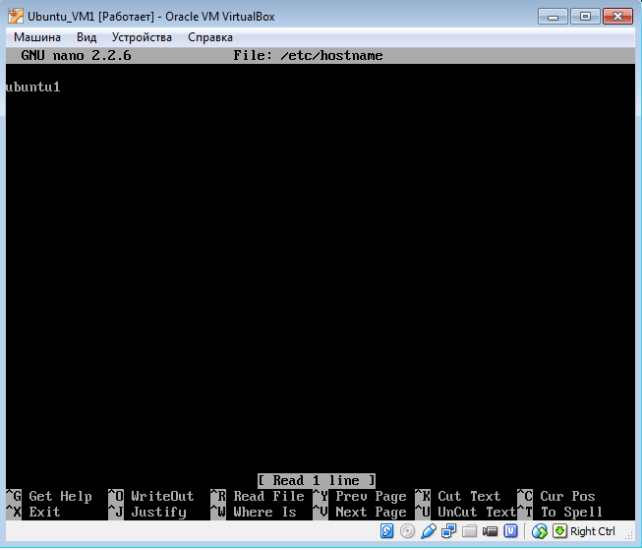
```
# This file describes the network interfaces available on your system
# and how to activate them. For more information, see interfaces(5).

# The loopback network interface
auto lo
iface lo inet loopback

# The primary network interface
auto eth0
iface eth0 inet dhcp

auto eth1
iface eth1 inet static
#network 10.10.10.0
address 10.10.10.1
netmask 255.255.255.0
broadcast 10.10.10.255_
```

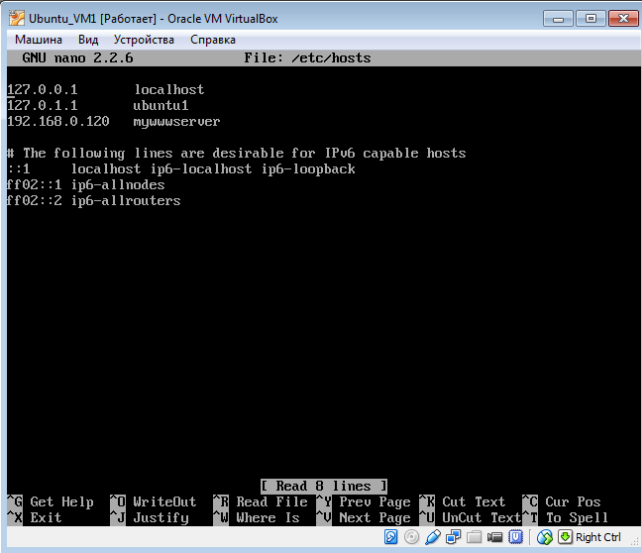
Change /etc/hostname file



The screenshot shows the 'nano 2.2.6' text editor editing the file '/etc/hostname'. The file contains the text 'ubuntu1'. The status bar at the bottom indicates '[ Read 1 line ]'.

```
ubuntu1
```

Also change /etc/hosts file



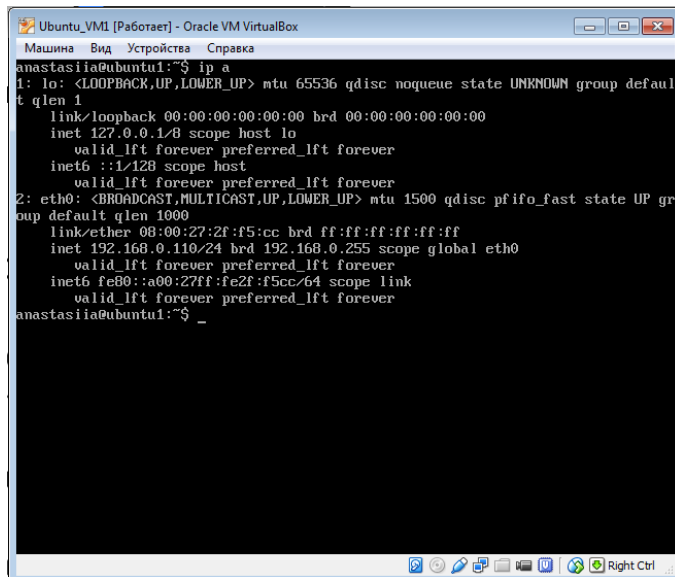
The screenshot shows the 'nano 2.2.6' text editor editing the file '/etc/hosts'. The file contains mappings for IP addresses 127.0.0.1, 127.0.1.1, and 192.168.0.120 to 'localhost', 'ubuntu1', and 'mywwwserver' respectively. It also includes IPv6 configuration lines. The status bar at the bottom indicates '[ Read 8 lines ]'.

```
127.0.0.1 localhost
127.0.1.1 ubuntu1
192.168.0.120 mywwwserver

# The following lines are desirable for IPv6 capable hosts
::1 localhost ip6-localhost ip6-loopback
ff02::1 ip6-allnodes
ff02::2 ip6-allrouters
```

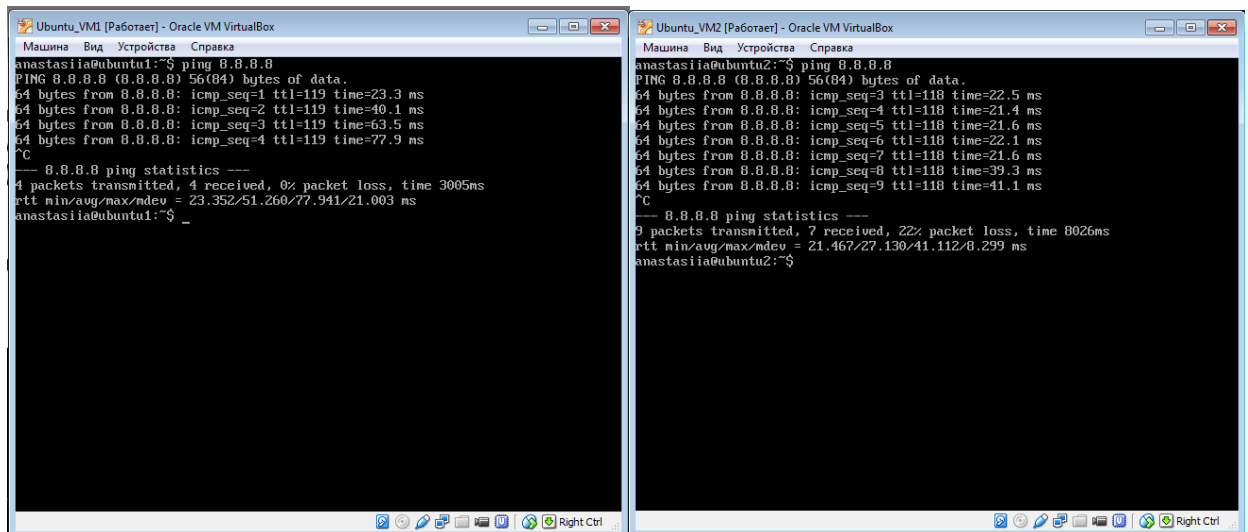
To enable or disable specific Interface, use command as follows:

```
>sudo ifup eth0
>sudo ifdown eth0
```



```
anastasiia@ubuntu1:~$ ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 08:00:27:f5:cc:ff brd ff:ff:ff:ff:ff:ff
    inet 192.168.0.110/24 brd 192.168.0.255 scope global eth0
        valid_lft forever preferred_lft forever
    inet6 fe80::a00:27ff:fe2f:f5cc/64 scope link
        valid_lft forever preferred_lft forever
anastasiia@ubuntu1:~$ _
```

Ping host name of IP address using below command



```
anastasiia@ubuntu1:~$ ping 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data:
64 bytes from 8.8.8.8: icmp_seq=1 ttl=119 time=23.3 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=119 time=40.1 ms
64 bytes from 8.8.8.8: icmp_seq=3 ttl=119 time=63.5 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=119 time=77.9 ms
^C
--- 8.8.8.8 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3005ms
rtt min/avg/max/mdev = 23.352/51.260/77.941/21.003 ms
anastasiia@ubuntu1:~$ _

anastasiia@ubuntu2:~$ ping 8.8.8.8
PING 8.8.8.8 (8.8.8.8) 56(84) bytes of data:
64 bytes from 8.8.8.8: icmp_seq=3 ttl=118 time=22.5 ms
64 bytes from 8.8.8.8: icmp_seq=4 ttl=118 time=21.4 ms
64 bytes from 8.8.8.8: icmp_seq=5 ttl=118 time=21.6 ms
64 bytes from 8.8.8.8: icmp_seq=6 ttl=118 time=22.1 ms
64 bytes from 8.8.8.8: icmp_seq=7 ttl=118 time=21.6 ms
64 bytes from 8.8.8.8: icmp_seq=8 ttl=118 time=39.3 ms
64 bytes from 8.8.8.8: icmp_seq=9 ttl=118 time=41.1 ms
^C
--- 8.8.8.8 ping statistics ---
9 packets transmitted, 7 received, 22% packet loss, time 8026ms
rtt min/avg/max/mdev = 21.467/27.130/41.112/8.299 ms
anastasiia@ubuntu2:~$
```

```
Ubuntu_VM1 [Работаer] - Oracle VM VirtualBox
Машина Вид Устройства Справка
anastasiia@ubuntu1:~$ ping 10.10.10.2
PING 10.10.10.2 (10.10.10.2) 56(84) bytes of data:
64 bytes from 10.10.10.2: icmp_seq=1 ttl=64 time=0.903 ms
64 bytes from 10.10.10.2: icmp_seq=2 ttl=64 time=0.912 ms
64 bytes from 10.10.10.2: icmp_seq=3 ttl=64 time=0.473 ms
64 bytes from 10.10.10.2: icmp_seq=4 ttl=64 time=0.886 ms
^C
--- 10.10.10.2 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3002ms
rtt min/avg/max/mdev = 0.473/0.793/0.912/0.187 ms
anastasiia@ubuntu1:~$
```

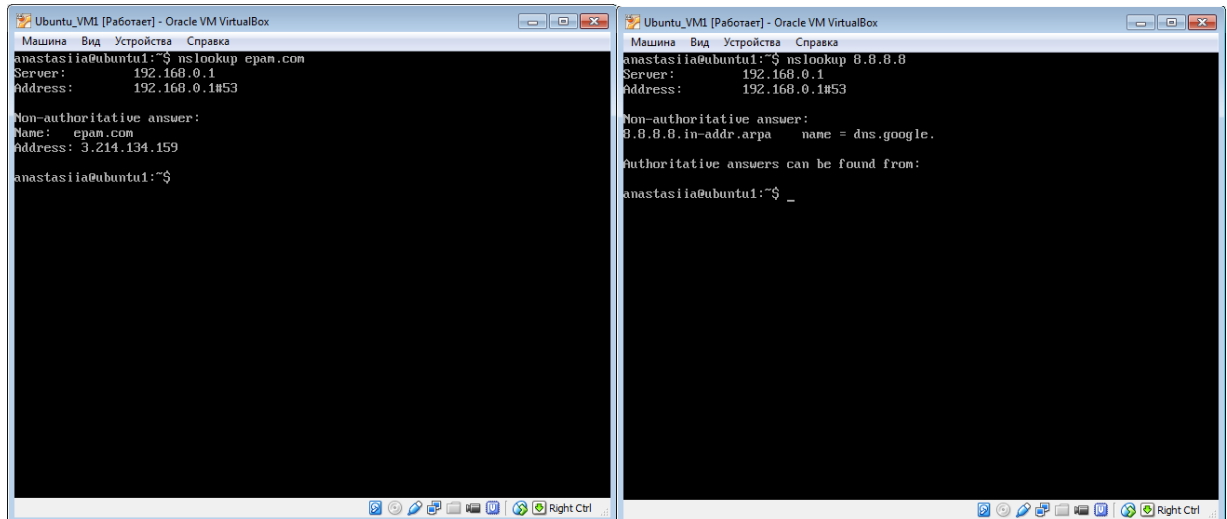
traceroute is a network troubleshooting utility which shows number of hops taken to reach destination also determine packets traveling path

```
Ubuntu_VM1 [Работаer] - Oracle VM VirtualBox
Машина Вид Устройства Справка
anastasiia@ubuntu1:~$ sudo traceroute -M icmp 8.8.8.8
traceroute to 8.8.8.8 (8.8.8.8), 30 hops max, 60 byte packets
 1  10.0.2.2 (10.0.2.2)  0.214 ms  0.273 ms  0.243 ms
 2  * * * *
 3  * * * *
 4  * * * *
 5  * * * *
 6  * * * *
 7  * * * *
 8  * * * *
 9  * * * *
10  * * * *
11  * * * *
12 * dns.google (8.8.8.8) 24.041 ms 0.517 ms
anastasiia@ubuntu1:~$
```

Netstat (Network Statistic) command display connection info, routing table information etc. To displays routing table information use option as -r

```
Ubuntu_VM1 [Работаer] - Oracle VM VirtualBox
Машина Вид Устройства Справка
anastasiia@ubuntu1:~$ netstat -r
Kernel IP routing table
Destination Gateway Genmask Flags MSS Window irtt Iface
default 10.0.2.2 0.0.0.0 UG 0 0 0 eth0
10.0.2.0 * 255.255.255.0 U 0 0 0 eth0
10.10.10.0 * 255.255.255.0 U 0 0 0 eth1
anastasiia@ubuntu1:~$ _
```

nslookup command also use to find out DNS related query



The image shows two terminal windows from an Oracle VM VirtualBox. The left window shows the command `nslookup epan.com` being executed, resulting in a non-authoritative answer for `epan.com` with IP `3.214.134.159`. The right window shows the command `nslookup 8.8.8.8` being executed, resulting in a non-authoritative answer for `8.8.8.8.in-addr.arpa` with the name `dns.google`.

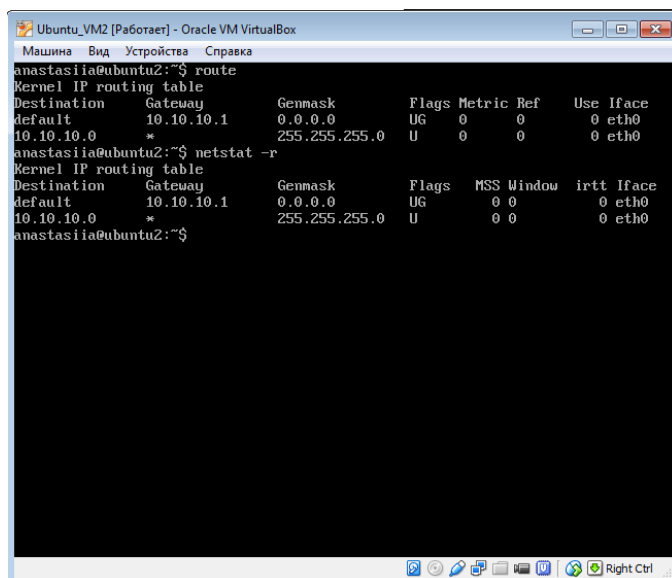
```
anastasiia@ubuntu1:~$ nslookup epan.com
Server:      192.168.0.1
Address:     192.168.0.1#53

Non-authoritative answer:
Name:   epan.com
Address: 3.214.134.159
anastasiia@ubuntu1:~$
```

```
anastasiia@ubuntu1:~$ nslookup 8.8.8.8
Server:      192.168.0.1
Address:     192.168.0.1#53

Non-authoritative answer:
8.8.8.8.in-addr.arpa  name = dns.google.
Authoritative answers can be found from:
anastasiia@ubuntu1:~$
```

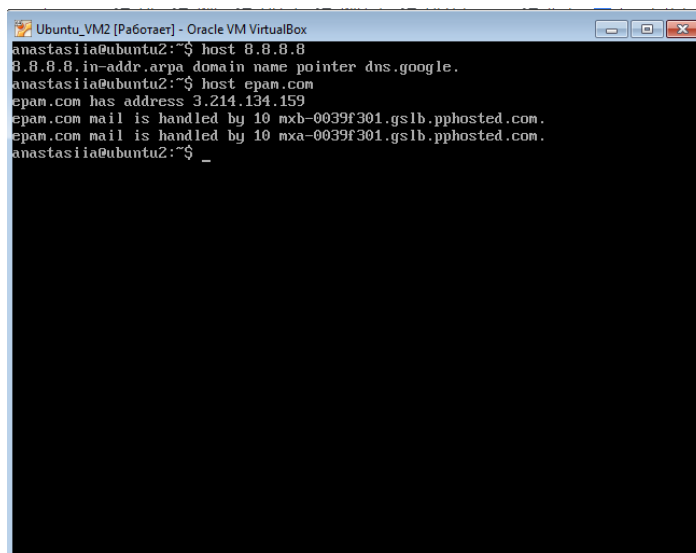
route command also shows and manipulate ip routing table



The image shows a terminal window with the `route` and `netstat -r` commands. Both commands display the kernel IP routing table, showing destinations, gateways, flags, metrics, and interfaces.

```
anastasiia@ubuntu2:~$ route
Kernel IP routing table
Destination Gateway Genmask Flags Metric Ref Use Iface
default 10.10.10.1 0.0.0.0 UG 0 0 0 eth0
10.10.10.0 * 255.255.255.0 U 0 0 0 eth0
anastasiia@ubuntu2:~$ netstat -r
Kernel IP routing table
Destination Gateway Genmask Flags MSS Window irtt Iface
default 10.10.10.1 0.0.0.0 UG 0 0 0 eth0
10.10.10.0 * 255.255.255.0 U 0 0 0 eth0
anastasiia@ubuntu2:~$
```

host command to find name to IP or IP to name in IPv4 or IPv6 and also query DNS records



The image shows a terminal window with the `host` command being used to query DNS records for `8.8.8.8`, `epan.com`, and `mxh-0039f301.gslb.pphosted.com`. The output shows the domain name pointer for `8.8.8.8` and the IP address for `epan.com`.

```
anastasiia@ubuntu2:~$ host 8.8.8.8
8.8.8.8.in-addr.arpa domain name pointer dns.google.
anastasiia@ubuntu2:~$ host epan.com
epan.com has address 3.214.134.159
epan.com mail is handled by 10 mxh-0039f301.gslb.pphosted.com.
epan.com mail is handled by 10 mxa-0039f301.gslb.pphosted.com.
anastasiia@ubuntu2:~$
```