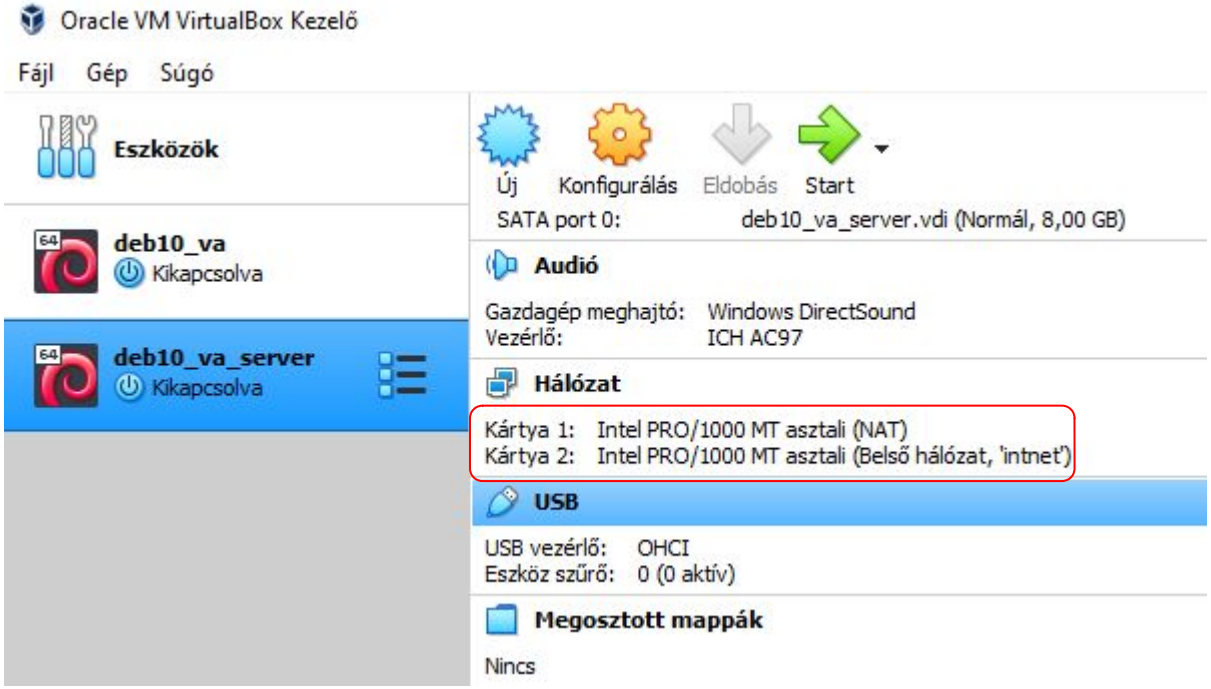
dhcp - gyakorlat

Hálózati környezet

- A szerver két kártyát tartalmaz.
  - 1. kártya NAT-olt. Ezen keresztül érhetőek el más hálózatok.
  - 2. kártya a belső hálózathoz kapcsolódik.



Hálózati környezet

- A szerver két kártyát tartalmaz.
  - 1. kártya (enp0s3) NAT-olt. IP-címét a VirtualBox-tól kapja DHCP-vel.
  - 2. kártya (enp0s8) statikusan kap címet a /etc/network/interfaces beállítása szerint.

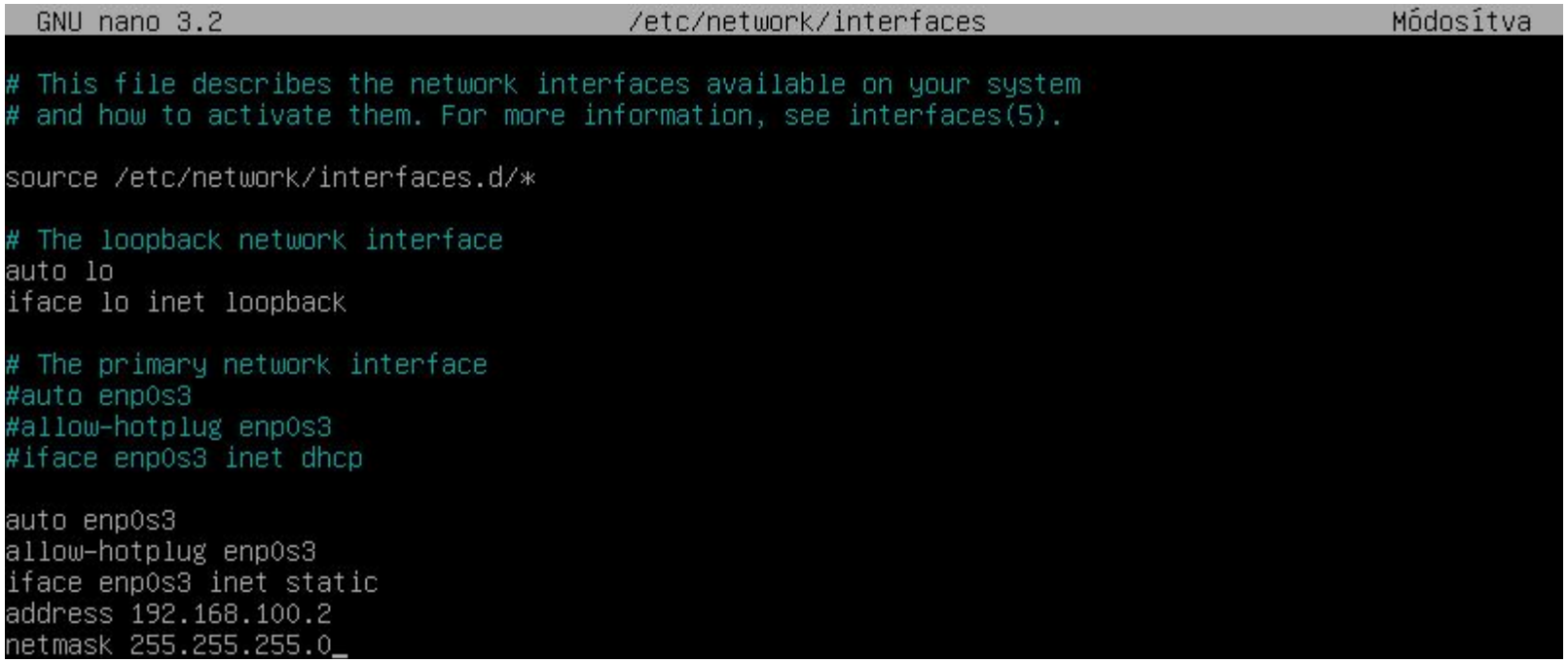
```
auto enp0s3
allow-hotplug enp0s3
iface enp0s3 inet dhcp

auto enp0s8
allow-hotplug enp0s8
iface enp0s8 inet static
address 192.168.100.1
netmask 255.255.255.0
```

```
root@va-server:~# ip a |grep enp0
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1
000
    inet 10.0.2.15/24 brd 10.0.2.255 scope global dynamic enp0s3
3: enp0s8: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1
000
    inet 192.168.100.1/24 brd 192.168.100.255 scope global enp0s8
root@va-server:~#
```

Hálózati környezet

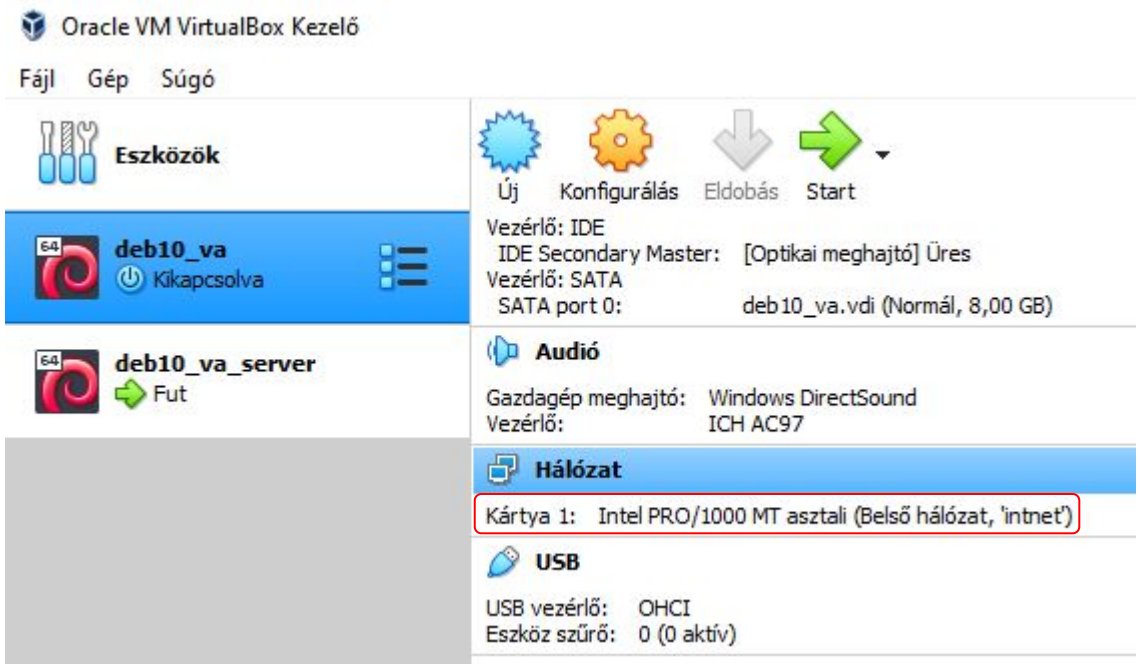
- A **kliens** egy kártyát tartalmaz.
  - Először állítsunk be statikus címet a **kliens**en.



  - Majd kapcsoljuk ki a gépet.

Hálózati környezet

- A **kliens** egy kártyát tartalmaz.
  - Az 1. kártya a belső hálózathoz kapcsolódik.
- A gép csak belső hálózatot ’látja’.



Hálózati környezet

- A **kliens** egy kártyát tartalmaz.
  - Az 1. kártya (enp0s3) statikusan kap címet a /etc/network/interfaces beállítása szerint.

```
root@attila:~# ip a | grep enp
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1
000
    inet 192.168.100.2/24 scope global enp0s3
root@attila:~#
```

  - A szerver a belső hálózaton (intnet) keresztül elérhető.

```
root@attila:~# ping -c4 192.168.100.1
PING 192.168.100.1 (192.168.100.1) 56(84) bytes of data.
64 bytes from 192.168.100.1: icmp_seq=1 ttl=64 time=0.703 ms
64 bytes from 192.168.100.1: icmp_seq=2 ttl=64 time=1.05 ms
64 bytes from 192.168.100.1: icmp_seq=3 ttl=64 time=0.915 ms
64 bytes from 192.168.100.1: icmp_seq=4 ttl=64 time=1.10 ms

--- 192.168.100.1 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 9ms
rtt min/avg/max/mdev = 0.703/0.940/1.097/0.153 ms
```

Telepítés

```
root@va-server:~# apt-get install isc-dhcp-server
Csomaglisták olvasása... Kész
Függőségi fa építése
Állapotinformációk olvasása... Kész
A következő további csomagok lesznek telepítve:
  libirs-export161 libisccfg-export163 policycoreutils selinux-utils
Javasolt csomagok:
  policykit-1 isc-dhcp-server-ldap
Az alábbi ÚJ csomagok lesznek telepítve:
  isc-dhcp-server libirs-export161 libisccfg-export163 policycoreutils selinux-utils
0 frissített, 5 újonnan telepített, 0 eltávolítandó és 0 nem frissített.
Letöltendő adatmennyiség: 1.615 kB.
A művelet után 6.539 kB lemezterület kerül felhasználásra.
Folytatni akarja? [I/n]
```

- állítani.

```
jan 10 09:24:31 va-server dhcpd[905]: before submitting a bug.  These pages explain the proper
jan 10 09:24:31 va-server dhcpd[905]: process and the information we find helpful for debugging.
jan 10 09:24:31 va-server dhcpd[905]:
jan 10 09:24:31 va-server dhcpd[905]: exiting.
jan 10 09:24:33 va-server isc-dhcp-server[892]: Starting ISC DHCPv4 server: dhcpdcheck syslog for di
agnostics. ... failed!
jan 10 09:24:33 va-server isc-dhcp-server[892]:  failed!
jan 10 09:24:33 va-server systemd[1]: isc-dhcp-server.service: Control process exited, code=exited,
status=1/FAILURE
jan 10 09:24:33 va-server systemd[1]: isc-dhcp-server.service: Failed with result 'exit-code'.
jan 10 09:24:33 va-server systemd[1]: Failed to start LSB: DHCP server.
Processing triggers for man-db (2.8.5-2) ...
Processing triggers for libc-bin (2.28-10) ...
Processing triggers for systemd (241-7~deb10u5) ...
root@va-server:~# _
```

journalctl -xe

```
--
-- A start job for unit isc-dhcp-server.service has begun execution.
--
-- The job identifier is 518.
jan 10 09:24:30 va-server isc-dhcp-server[892]: Launching both IPv4 and IPv6 servers (please configu
jan 10 09:24:31 va-server dhcpd[905]: Wrote 0 leases to leases file.
jan 10 09:24:31 va-server dhcpd[905]:
jan 10 09:24:31 va-server dhcpd[905]: No subnet declaration for enp0s8 (192.168.100.1).
jan 10 09:24:31 va-server dhcpd[905]: ** Ignoring requests on enp0s8.  If this is not what
jan 10 09:24:31 va-server dhcpd[905]:    you want, please write a subnet declaration
jan 10 09:24:31 va-server dhcpd[905]:    in your dhcpd.conf file for the network segment
jan 10 09:24:31 va-server dhcpd[905]:    to which interface enp0s8 is attached. **
jan 10 09:24:31 va-server dhcpd[905]:
jan 10 09:24:31 va-server dhcpd[905]:
jan 10 09:24:31 va-server dhcpd[905]: No subnet declaration for enp0s3 (10.0.2.15).
jan 10 09:24:31 va-server dhcpd[905]: ** Ignoring requests on enp0s3.  If this is not what
jan 10 09:24:31 va-server dhcpd[905]:    you want, please write a subnet declaration
jan 10 09:24:31 va-server dhcpd[905]:    in your dhcpd.conf file for the network segment
jan 10 09:24:31 va-server dhcpd[905]:    to which interface enp0s3 is attached. **
jan 10 09:24:31 va-server dhcpd[905]:
jan 10 09:24:31 va-server dhcpd[905]:
jan 10 09:24:31 va-server dhcpd[905]: Not configured to listen on any interfaces!
jan 10 09:24:31 va-server dhcpd[905]:
jan 10 09:24:31 va-server dhcpd[905]: If you think you have received this message due to a bug rathe
jan 10 09:24:31 va-server dhcpd[905]: than a configuration issue please read the section on submitti
jan 10 09:24:31 va-server dhcpd[905]: bugs on either our web page at www.isc.org or in the README fi
jan 10 09:24:31 va-server dhcpd[905]: before submitting a bug.  These pages explain the proper
jan 10 09:24:31 va-server dhcpd[905]: process and the information we find helpful for debugging.
jan 10 09:24:31 va-server dhcpd[905]:
jan 10 09:24:31 va-server dhcpd[905]: exiting.
jan 10 09:24:33 va-server isc-dhcp-server[892]: Starting ISC DHCPv4 server: dhcpdcheck syslog for di
jan 10 09:24:33 va-server isc-dhcp-server[892]:  failed!
jan 10 09:24:33 va-server systemd[1]: isc-dhcp-server.service: Control process exited, code=exited,
-- Subject: Unit process exited
-- Defined-By: systemd
-- Support: https://www.debian.org/support
lines 1316-1351/1370 99%
```

/etc/dhcp/dhcpd.conf

- Fontosak a sorvégi ’;’ és a ’{’ ’}’ szintaktikai elemek. A névszerver a szerver névszervere legyen.

```
root@va-server:~# cat /etc/resolv.conf
domain lan
search lan
nameserver 192.168.1.1
```

```
  GNU nano 3.2                    /etc/dhcp/dhcpd.conf                    Módosítva

# This declaration allows BOOTP clients to get dynamic addresses,
# which we don't really recommend.

#subnet 10.254.239.32 netmask 255.255.255.224 {
#  range dynamic-bootp 10.254.239.40 10.254.239.60;
#  option broadcast-address 10.254.239.31;
#  option routers rtr-239-32-1.example.org;
#}

# A slightly different configuration for an internal subnet.
subnet 192.168.100.0 netmask 255.255.255.0 {
  range 192.168.100.100 192.168.100.200;
  option domain-name-servers 192.168.1.1;
  option domain-name "varga.local";
  option routers 192.168.100.1;
#  option broadcast-address 10.5.5.31;
#  default-lease-time 600;
#  max-lease-time 7200;
}
```

/etc/dafault/isc-dhcp-server

- Meg kell adni azt az interfészt amelyen a szerver szolgáltatást nyújt.

```
  GNU nano 3.2                  /etc/default/isc-dhcp-server                  Módosítva

# Defaults for isc-dhcp-server (sourced by /etc/init.d/isc-dhcp-server)

# Path to dhcpd's config file (default: /etc/dhcp/dhcpd.conf).
#DHCPDv4_CONF=/etc/dhcp/dhcpd.conf
#DHCPDv6_CONF=/etc/dhcp/dhcpd6.conf

# Path to dhcpd's PID file (default: /var/run/dhcpd.pid).
#DHCPDv4_PID=/var/run/dhcpd.pid
#DHCPDv6_PID=/var/run/dhcpd6.pid

# Additional options to start dhcpd with.
#       Don't use options -cf or -pf here; use DHCPD_CONF/ DHCPD_PID instead
#OPTIONS=""

# On what interfaces should the DHCP server (dhcpd) serve DHCP requests?
#       Separate multiple interfaces with spaces, e.g. "eth0 eth1".
INTERFACESv4="enp0s8"
#INTERFACESv6=""
```

/etc/default/isc-dhcp-server

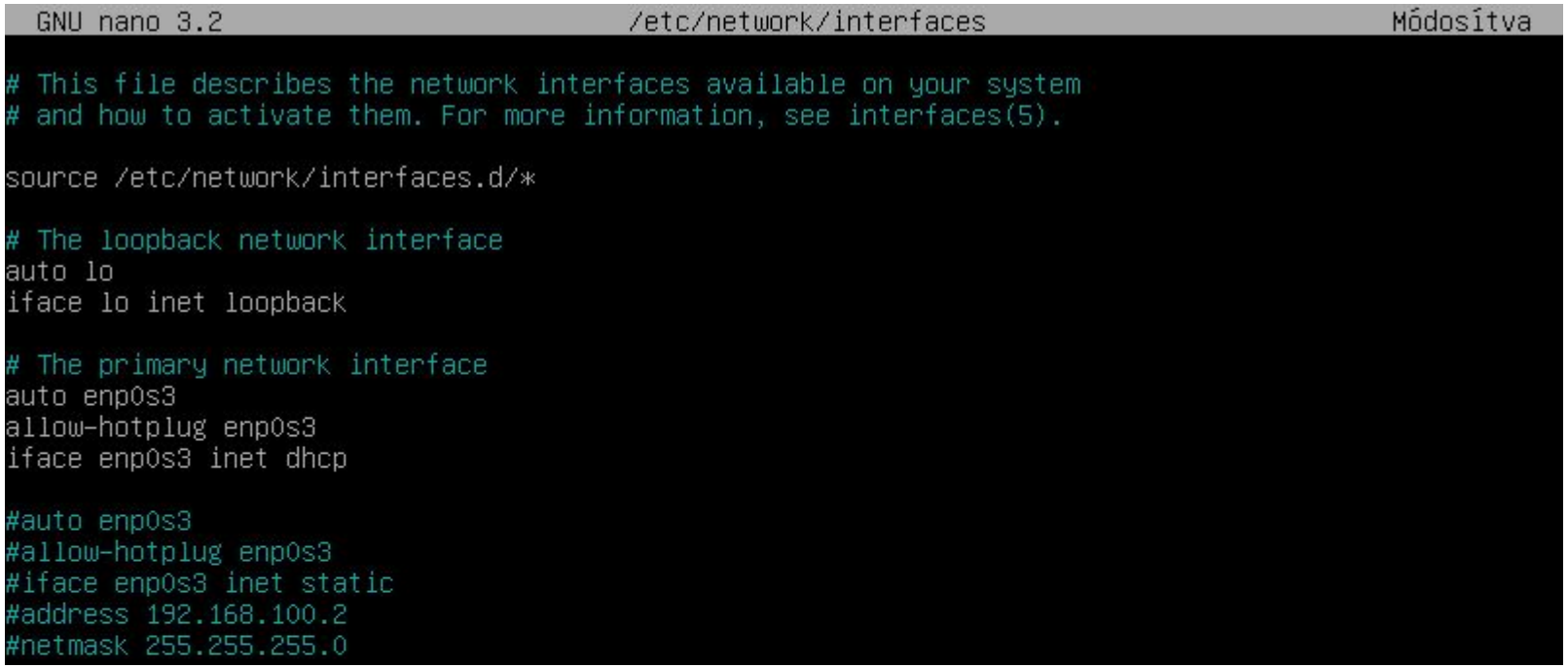
- A szolgáltatás állapota a *systemctl status isc-dhcp-server* paranccsal lekérdezhető.

```
root@va-server:~# systemctl start isc-dhcp-server
root@va-server:~# systemctl status isc-dhcp-server
● isc-dhcp-server.service - LSB: DHCP server
   Loaded: loaded (/etc/init.d/isc-dhcp-server; generated)
   Active: active (running) since Sun 2021-01-10 09:58:17 CET; 20s ago
     Docs: man:systemd-sysv-generator(8)
  Process: 1436 ExecStart=/etc/init.d/isc-dhcp-server start (code=exited, status=0/SUCCESS)
    Tasks: 1 (limit: 1149)
   Memory: 4.5M
   CGroup: /system.slice/isc-dhcp-server.service
           └─1448 /usr/sbin/dhcpd -4 -q -cf /etc/dhcp/dhcpd.conf enp0s8

jan 10 09:58:15 va-server systemd[1]: Starting LSB: DHCP server...
jan 10 09:58:15 va-server isc-dhcp-server[1436]: Launching IPv4 server only.
jan 10 09:58:15 va-server dhcpd[1448]: Wrote 0 leases to leases file.
jan 10 09:58:15 va-server dhcpd[1448]: Server starting service.
jan 10 09:58:17 va-server isc-dhcp-server[1436]: Starting ISC DHCPv4 server: dhcpd.
jan 10 09:58:17 va-server systemd[1]: Started LSB: DHCP server.
root@va-server:~#
```

A kliens beállítása

- Állítsuk az interface-t dinamikusra.



A kliens beállítása

- Újraindítás vagy a *dhclient* parancs kiadása után.

```
root@attila:~# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    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: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1
000
    link/ether 08:00:27:c4:b8:34 brd ff:ff:ff:ff:ff:ff
    inet 192.168.100.100/24 brd 192.168.100.255 scope global dynamic enp0s3
       valid_lft 594sec preferred_lft 594sec
    inet6 fe80::a00:27ff:fec4:b834/64 scope link
       valid_lft forever preferred_lft forever
root@attila:~# _
```

dhcpd.leases

- A szerveren a dhcp-bérletek megtekinthetők.

```
root@va-server:~# cat /var/lib/dhcp/dhcpd.leases
# The format of this file is documented in the dhcpd.leases(5) manual page.
# This lease file was written by isc-dhcp-4.4.1

# authoring-byte-order entry is generated, DO NOT DELETE
authoring-byte-order little-endian;

server-duid "\000\001\000\001'\215|f\010\000'z\3430";

lease 192.168.100.100 {
  starts 0 2021/01/10 09:01:00;
  ends 0 2021/01/10 09:11:00;
  cltt 0 2021/01/10 09:01:00;
  binding state active;
  next binding state free;
  rewind binding state free;
  hardware ethernet 08:00:27:c4:b8:34;
  client-hostname "attila";
}
```

Internetet a kliensnek

- A szerveren a hálózati interface-ek között a csomagtovábbítást engedélyezzük.

```
root@va-server:~# sysctl net.ipv4.ip_forward
net.ipv4.ip_forward = 0
root@va-server:~# cat /proc/sys/net/ipv4/ip_forward
0
root@va-server:~# sysctl -w net.ipv4.ip_forward=1
net.ipv4.ip_forward = 1
root@va-server:~# cat /proc/sys/net/ipv4/ip_forward
1
```

- A beállítást a sysctl.conf állományban is el kell végezni, hogy újraindításkor is beállítsa a

```
  GNU nano 3.2                    /etc/sysctl.conf                    Módosítva

# Uncomment the next line to enable packet forwarding for IPv4
net.ipv4.ip_forward=1

# Uncomment the next line to enable packet forwarding for IPv6
#  Enabling this option disables Stateless Address Autoconfiguration
#  based on Router Advertisements for this host
#net.ipv6.conf.all.forwarding=1
```

Internetet a kliensnek

- Hogy a kliens kérései visszataláljanak, egy NAT-olási tűzfalszabályt állítunk be. Újraindítás után ismét ki kell adni.

```
root@va-server:~# iptables -t nat -A POSTROUTING -o enp0s3 -j MASQUERADE
root@va-server:~#
```

- A kliensről a Google domain-szervere is elérhetővé vált.

```
root@attila:~# ping -c2 dns.google
PING dns.google (8.8.4.4) 56(84) bytes of data.
64 bytes from dns.google (8.8.4.4): icmp_seq=1 ttl=115 time=12.2 ms
64 bytes from dns.google (8.8.4.4): icmp_seq=2 ttl=115 time=14.6 ms

--- dns.google ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 3ms
rtt min/avg/max/mdev = 12.152/13.379/14.606/1.227 ms
```