	Institut Antoni Ballester Sistemes Microinformàtics i Xarxes. **M7 - Serveis de Xarxa**	Validació DHCP	Curs: 24-25

1. Creació usuari

La màquina virtual disposa de l'usuari **super** amb password **dhcp2425***

Crea un usuari amb el teu nom (sense cognoms) i que **formi part del grup sudo**.

Modifica l'arxiu **.bashrc** del teu usuari per a què es mostri la data i l'hora.

A partir d'ara **totes les captures han** de mostrar el prompt d'Ubuntu amb el teu **nom** (ni root, ni super ni altres). **Si no, la puntuació és 0**.

Fes una captura on es vegi el teu nou usuari fent un ***sudo apt update*** **(0,5 punt)**

```
dj. d'oct. 17 11:42:12 pujolu@valdhcp:~$ sudo apt update
[sudo] password for pujolu:
Obj:1 http://security.ubuntu.com/ubuntu jammy-security InRelease
Obj:2 http://archive.ubuntu.com/ubuntu jammy InRelease
Obj:3 http://archive.ubuntu.com/ubuntu jammy-updates InRelease
Obj:4 http://archive.ubuntu.com/ubuntu jammy-backports InRelease
S'està llegint la llista de paquets… Fet
S'està construint l'arbre de dependències… Fet
S'està llegint la informació de l'estat… Fet
Es poden actualitzar 69 paquets. Executeu «apt list --upgradable» per a veure'ls.
dj. d'oct. 17 11:42:26 pujolu@valdhcp:~$
```

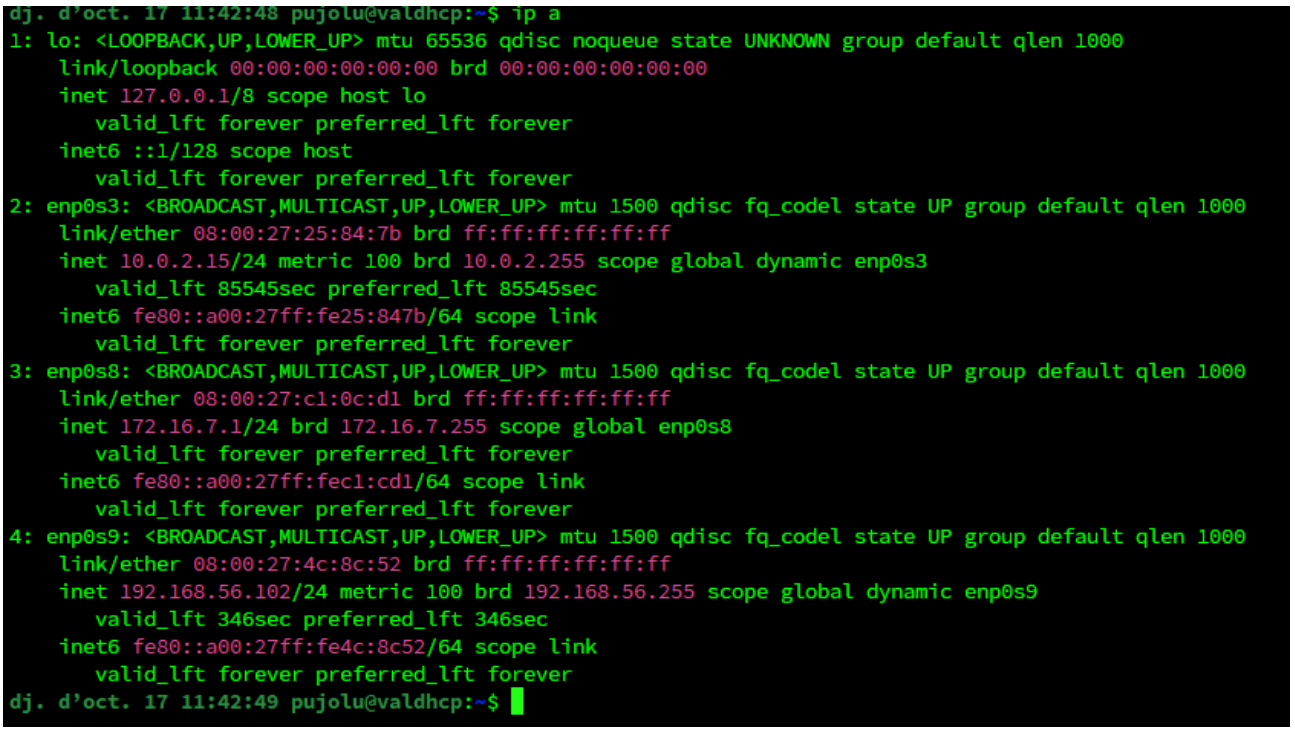
2. Configuració de xarxa.

La màquina virtual que has descarregat disposa de 2 adaptadors de xarxa.

El primer (la NAT) l'has de deixar **configurat per rebre adreces automàticament** i al segon (estàtica) has de posar l'adreça IP que trobaràs a la taula següent segons el teu **COGNOM**.

1ª lletra cognom	@ IP	1ª lletra cognom	@ IP
a-c	172.16.3.1	d-f	172.16.4.1
g-i	172.16.5.1	j-l	172.16.6.1
m-o	172.16.7.1	p-r	172.16.8.1
s-u	172.16.9.1	v-z	172.16.10.1

Executa la comanda ***sudo ip a*** i mostra que tot ha quedat com toca. **(0,5 punt)**



3. Configuració interfície

Configura DHCP per a què escolti per l'adaptador de xarxa interna i mostra el contingut de l'arxiu.

Executa **sudo cat /etc/default/isc-dhcp-server** i que mostri que l'has configurat per a què escolti la interfície interna. **(0,5 punt)**

```
dj. d'oct. 17 11:43:16 pujolu@valdhcp:~$ sudo cat /etc/default/isc-dhcp-server
# 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=""
dj. d'oct. 17 11:43:18 pujolu@valdhcp:~$
```

4. Configuració de la subxarxa

Configura DHCP per a què doni @IP a màquines connectades a la teva xarxa.

L'arxiu de configuració **només haurà de tenir el necessari (esborra comentaris, etc..)**

Configura les següents coses:

- Subxarxa 172.16.x.0, **on x és el número que t'haurà tocat**
- Màscara: /24
- Rang: des de 172.16.x.20 fins a 172.16.x.250
- Nom de domini: «cognom-nom.test», on **cognom i nom són els teus**
- Porta d'enllaç: 172.16.x.1
- Màscara enviada als clients: /24
- Dns 8.8.4.4
- Default-lease-time 7200
- Max-lease-time 10800

Executa **sudo cat /etc/dhcp/dhcpd.conf** i mostra la configuració **(1 punts)**

```
dj. d'oct. 17 11:50:44 pujolu@valdhcp:~$ sudo cat /etc/dhcp/dhcpd.conf
#
option domain-name "example.org";
option domain-name-servers ns1.example.org, ns2.example.org;
#
default-lease-time 600;
max-lease-time 7200;
#
ddns-update-style none;
#
subnet 172.16.7.0 netmask 255.255.255.0 {
  range 172.16.7.20 172.16.7.250;
  option domain-name-servers 8.8.4.4;
  option domain-name "unai-o-pujol.test";
  option subnet-mask 255.255.255.0;
  option routers 172.16.7.1;
  default-lease-time 7200;
  max-lease-time 10800;
}
dj. d'oct. 17 11:50:46 pujolu@valdhcp:~$
```

Reinicia el servidor i realitza les tres següents captures:

1.- sudo systemctl status isc-dhcp-server **(0,5 punt)**

2.- sudo cat /var/log/syslog | grep dhcpd **(0,5 punt)**

3.- sudo cat /var/lib/dhcp/dhcpd.leases **(0,5 punt)**

```
dj. d'oct. 17 11:51:21 pujolu@valdhcp:~$ sudo systemctl status isc-dhcp-server
● isc-dhcp-server.service - ISC DHCP IPv4 server
     Loaded: loaded (/lib/systemd/system/isc-dhcp-server.service; enabled; vendor preset: enabled)
     Active: active (running) since Thu 2024-10-17 11:51:21 UTC; 5s ago
       Docs: man:dhcpd(8)
   Main PID: 2294 (dhcpd)
      Tasks: 4 (limit: 1011)
     Memory: 4.5M
        CPU: 23ms
     CGroup: /system.slice/isc-dhcp-server.service
             └─2294 dhcpd -user dhcpd -group dhcpd -f -4 -pf /run/dhcp-server/dhcpd.pid -cf /etc/dhcp/dhcpd.conf enp

d'oct. 17 11:51:21 valdhcp sh[2294]: PID file: /run/dhcp-server/dhcpd.pid
d'oct. 17 11:51:21 valdhcp dhcpd[2294]: Wrote 0 leases to leases file.
d'oct. 17 11:51:21 valdhcp sh[2294]: Wrote 0 leases to leases file.
d'oct. 17 11:51:21 valdhcp dhcpd[2294]: Listening on LPF/enp0s8/08:00:27:c1:0c:d1/172.16.7.0/24
d'oct. 17 11:51:21 valdhcp sh[2294]: Listening on LPF/enp0s8/08:00:27:c1:0c:d1/172.16.7.0/24
d'oct. 17 11:51:21 valdhcp dhcpd[2294]: Sending on   LPF/enp0s8/08:00:27:c1:0c:d1/172.16.7.0/24
d'oct. 17 11:51:21 valdhcp sh[2294]: Sending on   LPF/enp0s8/08:00:27:c1:0c:d1/172.16.7.0/24
d'oct. 17 11:51:21 valdhcp dhcpd[2294]: Sending on   Socket/fallback/fallback-net
d'oct. 17 11:51:21 valdhcp sh[2294]: Sending on   Socket/fallback/fallback-net
d'oct. 17 11:51:21 valdhcp dhcpd[2294]: Server starting service.
lines 1-21/21 (END)
```

```
Oct 17 11:44:52 valdhcp dhcpd[2259]:
Oct 17 11:44:52 valdhcp dhcpd[2259]: No subnet declaration for enp0s8 (172.16.7.1).
Oct 17 11:44:52 valdhcp sh[2259]: No subnet declaration for enp0s8 (172.16.7.1).
Oct 17 11:44:52 valdhcp dhcpd[2259]: ** Ignoring requests on enp0s8.  If this is not what
Oct 17 11:44:52 valdhcp sh[2259]: ** Ignoring requests on enp0s8.  If this is not what
Oct 17 11:44:52 valdhcp dhcpd[2259]:    you want, please write a subnet declaration
Oct 17 11:44:52 valdhcp sh[2259]:    you want, please write a subnet declaration
Oct 17 11:44:52 valdhcp dhcpd[2259]:    in your dhcpd.conf file for the network segment
Oct 17 11:44:52 valdhcp sh[2259]:    in your dhcpd.conf file for the network segment
Oct 17 11:44:52 valdhcp dhcpd[2259]:    to which interface enp0s8 is attached. **
Oct 17 11:44:52 valdhcp sh[2259]:    to which interface enp0s8 is attached. **
Oct 17 11:44:52 valdhcp dhcpd[2259]:
Oct 17 11:44:52 valdhcp dhcpd[2259]:
Oct 17 11:44:52 valdhcp dhcpd[2259]: Not configured to listen on any interfaces!
Oct 17 11:44:52 valdhcp sh[2259]: Not configured to listen on any interfaces!
Oct 17 11:44:52 valdhcp dhcpd[2259]:
Oct 17 11:44:52 valdhcp dhcpd[2259]: If you think you have received this message due to a bug rather
Oct 17 11:44:52 valdhcp sh[2259]: If you think you have received this message due to a bug rather
Oct 17 11:44:52 valdhcp dhcpd[2259]: than a configuration issue please read the section on submitting
Oct 17 11:44:52 valdhcp sh[2259]: than a configuration issue please read the section on submitting
Oct 17 11:44:52 valdhcp dhcpd[2259]: bugs on either our web page at www.isc.org or in the README file
Oct 17 11:44:52 valdhcp sh[2259]: bugs on either our web page at www.isc.org or in the README file
Oct 17 11:44:52 valdhcp dhcpd[2259]: before submitting a bug.  These pages explain the proper
Oct 17 11:44:52 valdhcp sh[2259]: before submitting a bug.  These pages explain the proper
Oct 17 11:44:52 valdhcp dhcpd[2259]: process and the information we find helpful for debugging.
Oct 17 11:44:52 valdhcp sh[2259]: process and the information we find helpful for debugging.
Oct 17 11:44:52 valdhcp dhcpd[2259]:
Oct 17 11:44:52 valdhcp dhcpd[2259]: exiting.
Oct 17 11:44:52 valdhcp sh[2259]: exiting.
Oct 17 11:44:52 valdhcp systemd[1]: isc-dhcp-server.service: Main process exited, code=exited, status=1/FAILURE
Oct 17 11:44:52 valdhcp systemd[1]: isc-dhcp-server.service: Failed with result 'exit-code'.
Oct 17 11:51:21 valdhcp systemd[1]: Started ISC DHCP IPv4 server.
Oct 17 11:51:21 valdhcp dhcpd[2294]: Internet Systems Consortium DHCP Server 4.4.1
Oct 17 11:51:21 valdhcp sh[2294]: Internet Systems Consortium DHCP Server 4.4.1
Oct 17 11:51:21 valdhcp dhcpd[2294]: Copyright 2004-2018 Internet Systems Consortium.
Oct 17 11:51:21 valdhcp sh[2294]: Copyright 2004-2018 Internet Systems Consortium.
Oct 17 11:51:21 valdhcp dhcpd[2294]: All rights reserved.
Oct 17 11:51:21 valdhcp sh[2294]: All rights reserved.
Oct 17 11:51:21 valdhcp dhcpd[2294]: For info, please visit https://www.isc.org/software/dhcp/
Oct 17 11:51:21 valdhcp sh[2294]: For info, please visit https://www.isc.org/software/dhcp/
Oct 17 11:51:21 valdhcp dhcpd[2294]: Config file: /etc/dhcp/dhcpd.conf
Oct 17 11:51:21 valdhcp sh[2294]: Config file: /etc/dhcp/dhcpd.conf
Oct 17 11:51:21 valdhcp dhcpd[2294]: Database file: /var/lib/dhcp/dhcpd.leases
Oct 17 11:51:21 valdhcp sh[2294]: Database file: /var/lib/dhcp/dhcpd.leases
Oct 17 11:51:21 valdhcp dhcpd[2294]: PID file: /run/dhcp-server/dhcpd.pid
Oct 17 11:51:21 valdhcp sh[2294]: PID file: /run/dhcp-server/dhcpd.pid
Oct 17 11:51:21 valdhcp dhcpd[2294]: Wrote 0 leases to leases file.
Oct 17 11:51:21 valdhcp sh[2294]: Wrote 0 leases to leases file.
Oct 17 11:51:21 valdhcp dhcpd[2294]: Listening on LPF/enp0s8/08:00:27:c1:0c:d1/172.16.7.0/24
Oct 17 11:51:21 valdhcp sh[2294]: Listening on LPF/enp0s8/08:00:27:c1:0c:d1/172.16.7.0/24
Oct 17 11:51:21 valdhcp dhcpd[2294]: Sending on   LPF/enp0s8/08:00:27:c1:0c:d1/172.16.7.0/24
Oct 17 11:51:21 valdhcp sh[2294]: Sending on   LPF/enp0s8/08:00:27:c1:0c:d1/172.16.7.0/24
Oct 17 11:51:21 valdhcp dhcpd[2294]: Sending on   Socket/fallback/fallback-net
Oct 17 11:51:21 valdhcp sh[2294]: Sending on   Socket/fallback/fallback-net
Oct 17 11:51:21 valdhcp dhcpd[2294]: Server starting service.
dj. d'oct. 17 11:51:57 pujolu@valdhcp:~$
```

```
dj. d'oct. 17 11:53:41 pujolu@valdhcp:~$  sudo 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.\243\266\271\010\000'\301\014\321";

dj. d'oct. 17 11:53:43 pujolu@valdhcp:~$
```

Ara conecta PC1 (el client utilitzat a pràctiques) a la xarxa interna del servidor (assegura't que està configurat per rebre adreces de manera automàtica)

I que el servidor li ofereixi una adreça IP. Si cal, força-ho amb sudo dhclient -4

Executa la comanda ***sudo cat /etc/netplan/00-installer-config.yaml*** **al client** i mostra com has configurat el client per rebre la IP des del servidor. **(0,5 punt)**

```
Thu Oct 17 12:05:04 pujolu@PC1:~$ sudo cat /etc/netplan/50-cloud-init.yaml
# This file is generated from information provided by the datasource.  Changes
# to it will not persist across an instance reboot.  To disable cloud-init's
# network configuration capabilities, write a file
# /etc/cloud/cloud.cfg.d/99-disable-network-config.cfg with the following:
# network: {config: disabled}
network:
    ethernets:
        enp0s3:
            dhcp4: true
        enp0s9:
            dhcp4: true
    version: 2
Thu Oct 17 12:05:44 pujolu@PC1:~$
```

Executa la comanda ***sudo ip a*** **al client** i mostra que ha rebut la IP del nostre servidor DHCP. **(1 punt)**

```
Thu Oct 17 12:07:01 pujolu@PC1:~$ sudo 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 fq_codel state UP group default qlen 1000
    link/ether 08:00:27:e3:78:6a brd ff:ff:ff:ff:ff:ff
    inet 172.16.7.20/24 metric 100 brd 172.16.7.255 scope global dynamic enp0s3
       valid_lft 6923sec preferred_lft 6923sec
    inet6 fe80::a00:27ff:fee3:786a/64 scope link
       valid_lft forever preferred_lft forever
3: enp0s9: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:88:95:53 brd ff:ff:ff:ff:ff:ff
    inet 192.168.56.101/24 metric 100 brd 192.168.56.255 scope global dynamic enp0s9
       valid_lft 319sec preferred_lft 319sec
    inet6 fe80::a00:27ff:fe88:9553/64 scope link
       valid_lft forever preferred_lft forever
Thu Oct 17 12:07:16 pujolu@PC1:~$
```

5. Configuració del bloc host

Configura el servidor amb l'adreça MAC del teu client per a què li envii l'adreça IP 172.16.x.4

Executa **sudo cat /etc/dhcp/dhcpd.conf** i mostra els canvis realitzats a la configuració **(1 punts)**

```
dj. d'oct. 17 12:12:45 pujolu@valdhcp:~$ sudo cat /etc/dhcp/dhcpd.conf
#
option domain-name "example.org";
option domain-name-servers ns1.example.org, ns2.example.org;
#
default-lease-time 600;
max-lease-time 7200;
#
ddns-update-style none;
#
subnet 172.16.7.0 netmask 255.255.255.0 {
  range 172.16.7.20 172.16.7.250;
  option domain-name-servers 8.8.4.4;
  option domain-name "unai-o-pujol.test";
  option subnet-mask 255.255.255.0;
  option routers 172.16.7.1;
  default-lease-time 7200;
  max-lease-time 10800;
}

host PC1 {
  hardware ethernet 08:00:27:e3:78:6a;
  fixed-address 172.16.7.4;
}
dj. d'oct. 17 12:12:55 pujolu@valdhcp:~$
```

Fes que el client torni a demanar una nova adreça IP.

Executa la comanda ***sudo ip a*** al client (PC1) i mostra que ha rebut la nova IP del nostre servidor DHCP. **(1 punt)**

```
Thu Oct 17 12:16:31 pujolu@PC1:~$ 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 fq_codel state UP group default qlen 1000
    link/ether 08:00:27:e3:78:6a brd ff:ff:ff:ff:ff:ff
    inet 172.16.7.4/24 brd 172.16.7.255 scope global dynamic enp0s3
       valid_lft 7035sec preferred_lft 7035sec
    inet6 fe80::a00:27ff:fee3:786a/64 scope link
       valid_lft forever preferred_lft forever
3: enp0s9: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:88:95:53 brd ff:ff:ff:ff:ff:ff
    inet 192.168.56.103/24 brd 192.168.56.255 scope global dynamic enp0s9
       valid_lft 435sec preferred_lft 435sec
    inet6 fe80::a00:27ff:fe88:9553/64 scope link
       valid_lft forever preferred_lft forever
Thu Oct 17 12:16:33 pujolu@PC1:~$
```

6. Configuració del bloc pool

Configura el servidor amb dos pools d'adreces, un per a màquines registrades i l'altre per màquines desconegudes.

- El rang de les màquines registrades serà 172.16.x.20 fins a 172.16.x.100
- El rang de les màquines no registrades serà 172.16.x.101 fins a 172.16.x.254
- El client (PC1) ha d'estar registrat i rebrà adreça del primer pool.

Executa **sudo cat /etc/dhcp/dhcpd.conf** i mostra els canvis realitzats ***(1 punts)***

```
dj. d'oct. 17 12:24:16 pujolu@valdhcp:~$ sudo cat /etc/dhcp/dhcpd.conf
#
option domain-name "example.org";
option domain-name-servers ns1.example.org, ns2.example.org;
#
default-lease-time 600;
max-lease-time 7200;
#
ddns-update-style none;
#
subnet 172.16.7.0 netmask 255.255.255.0 {
  #range 172.16.7.20 172.16.7.250;
  option domain-name-servers 8.8.4.4;
  option domain-name "unai-o-pujol.test";
  option subnet-mask 255.255.255.0;
  option routers 172.16.7.1;
  default-lease-time 7200;
  max-lease-time 10800;

pool {
  range 172.16.7.20 172.16.7.100;
  deny unknown-clients;
}
#
pool {
  range 172.16.7.101 172.16.7.254;
  allow unknown-clients ;
}
#
}

host PC1 {
  hardware ethernet 08:00:27:e3:78:6a;
  #fixed-address 172.16.7.4;
}
dj. d'oct. 17 12:24:18 pujolu@valdhcp:~$
```

Executa al client **sudo ip a** i mostra com la seva IP s'ha actualitzat segons la nova configuració ***(1 punts)***

```
Thu Oct 17 12:23:58 pujolu@PC1:~$ 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 fq_codel state UP group default qlen 1000
    link/ether 08:00:27:e3:78:6a brd ff:ff:ff:ff:ff:ff
    inet 172.16.7.21/24 brd 172.16.7.255 scope global dynamic enp0s3
       valid_lft 7145sec preferred_lft 7145sec
    inet6 fe80::a00:27ff:fee3:786a/64 scope link
       valid_lft forever preferred_lft forever
3: enp0s9: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether 08:00:27:88:95:53 brd ff:ff:ff:ff:ff:ff
    inet 192.168.56.103/24 brd 192.168.56.255 scope global dynamic enp0s9
       valid_lft 408sec preferred_lft 408sec
    inet 192.168.56.101/24 metric 100 brd 192.168.56.255 scope global secondary dynamic enp0s9
       valid_lft 370sec preferred_lft 370sec
    inet6 fe80::a00:27ff:fe88:9553/64 scope link
       valid_lft forever preferred_lft forever
Thu Oct 17 12:25:10 pujolu@PC1:~$
```

Finalment executa al servidor **sudo cat /var/lib/dhcp/dhcpd.leases** i explica quina informació es mostra ***(0,5 punts)***

```
dj. d'oct. 17 12:25:44 pujolu@valdhcp:~$ sudo 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;

lease 172.16.7.20 {
  starts 4 2024/10/17 12:02:41;
  ends 4 2024/10/17 14:02:41;
  tstp 4 2024/10/17 14:02:41;
  cltt 4 2024/10/17 12:02:41;
  binding state active;
  next binding state free;
  rewind binding state free;
  hardware ethernet 08:00:27:e3:78:6a;
  uid "\377\3424?>\000\002\000\000\253\021\015\304\264\276\246\014b\230";
  client-hostname "PC1";
}
lease 172.16.7.21 {
  starts 4 2024/10/17 12:24:17;
  ends 4 2024/10/17 14:24:17;
  tstp 4 2024/10/17 14:24:17;
  cltt 4 2024/10/17 12:24:17;
  binding state active;
  next binding state free;
  rewind binding state free;
  hardware ethernet 08:00:27:e3:78:6a;
  client-hostname "PC1";
}
server-duid "\000\001\000\001.\243\266\271\010\000'\301\014\321";

dj. d'oct. 17 12:25:46 pujolu@valdhcp:~$
```

Mostra les IP que ha assignat al PC1, la primera es la primera que s'ha donat al PC1 i la segona es la tercera que se l'hi ha donat al PC1. No mostra la segona que se l'hi ha donat al PC1 perque la hem assignat manualment.