

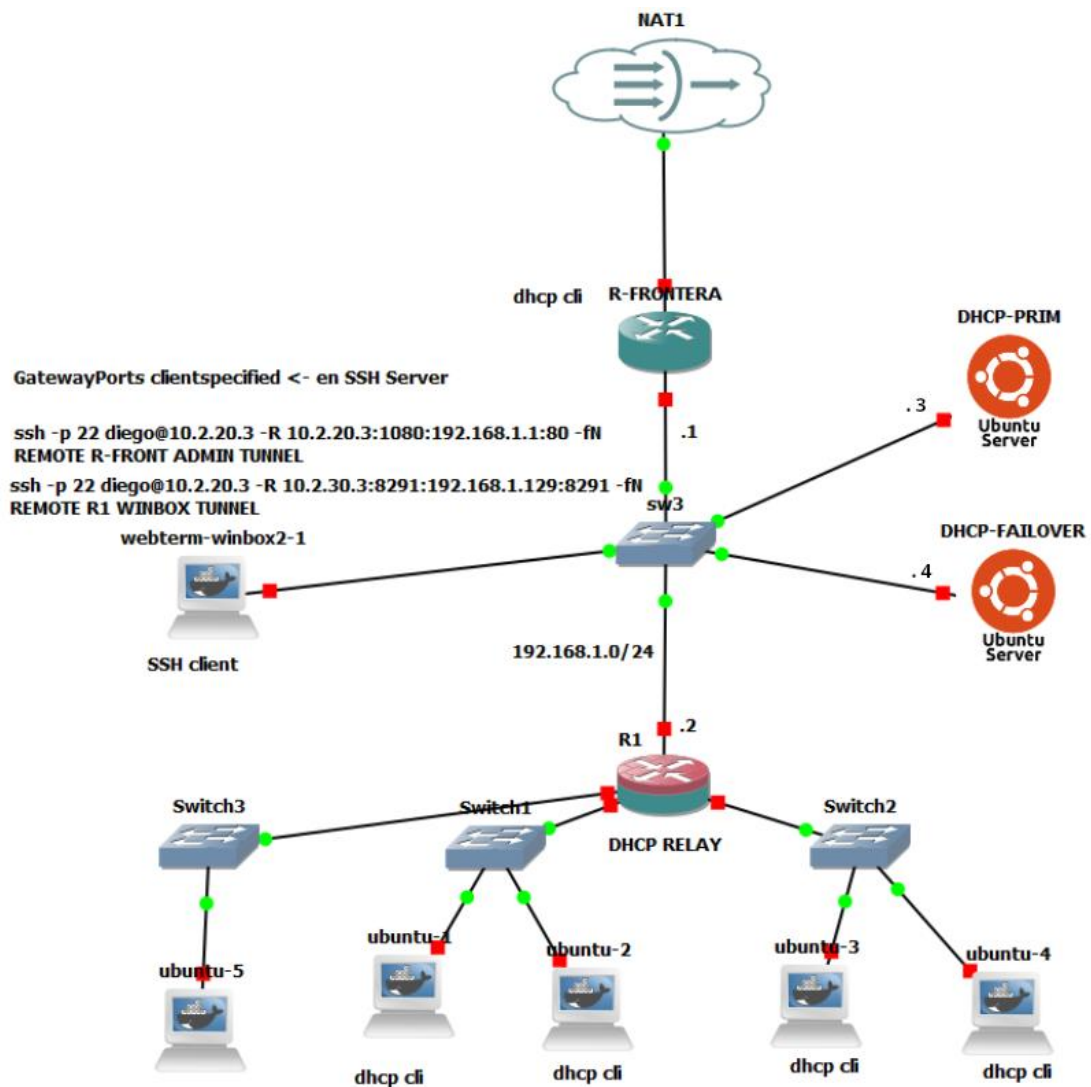
	SERVICIOS DE RED E INTERNET 2º ASIR	
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1.Nombre: **Cristóbal Suárez Abad**..... Fecha:

SERVICIO DHCP

NOMBRE DEL PROYECTO EN GNS3:
SRI_Recuperacion_DHCP_Cristobal_Suarez

Crea el siguiente diagrama en GNS3:



El direccionamiento de las LANs será:

- LAN Switch1 10.10.X*2.0/23
- LAN Switch2 10.12.X.32/27
- LAN Switch3 10.8.X.96/28

donde X es vuestro número de lista.

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1. (0.5 pts.) Establece la configuración de red necesaria en los servidores DHCP y las rutas estáticas necesarias para conectar con las redes bajo R1.

MODIFICAMOS EL ARCHIVO: nano /etc/netplan/50-cloud-init.yaml

Servidor DHCP 1:

network:

version: 2

ethernets:

ens3:

match:

macaddress: 0c:3a:40:aa:00:00

set-name: ens3

dhcp4: false

addresses:

- 192.168.1.3/24

routes:

- to: 0.0.0.0/0

via: 192.168.1.1

- to: 10.10.14.0/23

via: 192.168.1.2

- to: 10.12.7.32/27

via: 192.168.1.2

- to: 10.8.7.96/28

via: 192.168.1.2

nameservers:

addresses:

- 172.16.200.1

- 8.8.8.8

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```

root@ubuntu-cloud:/home/ubuntu# cat /etc/netplan/50-cloud-init.yaml
network:
  version: 2
  ethernet:
    ens3:
      # match:
      #   macaddress: 0c:3a:40:aa:00:00
      #   set-name: ens3
      #   dhcp4: false
      addresses:
        - 192.168.1.3/24
      routes:
        - to: 0.0.0.0/0
          via: 192.168.1.1
        - to: 10.10.14.0/23
          via: 192.168.1.2
        - to: 10.12.7.32/27
          via: 192.168.1.2
        - to: 10.8.7.96/28
          via: 192.168.1.2
      nameservers:
        addresses:
          - 172.16.200.1
          - 8.8.8.8
root@ubuntu-cloud:/home/ubuntu# █

```

SERVIDOR DHCP 2:

```

network:
  version: 2
  ethernet:
    ens3:
      # match:
      #   macaddress: 0c:3a:40:aa:00:00
      #   set-name: ens3
      #   dhcp4: false
      addresses:
        - 192.168.1.4/24
      routes:
        - to: 0.0.0.0/0
          via: 192.168.1.1
        - to: 10.10.14.0/23
          via: 192.168.1.2
        - to: 10.12.7.32/27
          via: 192.168.1.2

```

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- to: 10.8.7.96/28

via: 192.168.1.2

nameservers:

addresses:

- 172.16.200.1

- 8.8.8.8

```
network:
  version: 2
  ethernet:
    ens3:
      # match:
      #   macaddress: 0c:3a:40:aa:00:00
      # set-name: ens3
      # dhcp4: false
      addresses:
        - 192.168.1.4/24
      routes:
        - to: 0.0.0.0/0
          via: 192.168.1.1
        - to: 10.10.14.0/23
          via: 192.168.1.2
        - to: 10.12.7.32/27
          via: 192.168.1.2
        - to: 10.8.7.96/28
          via: 192.168.1.2
      nameservers:
        addresses:
          - 172.16.200.1
          - 8.8.8.8
root@ubuntu-cloud:/home/ubuntu#
```

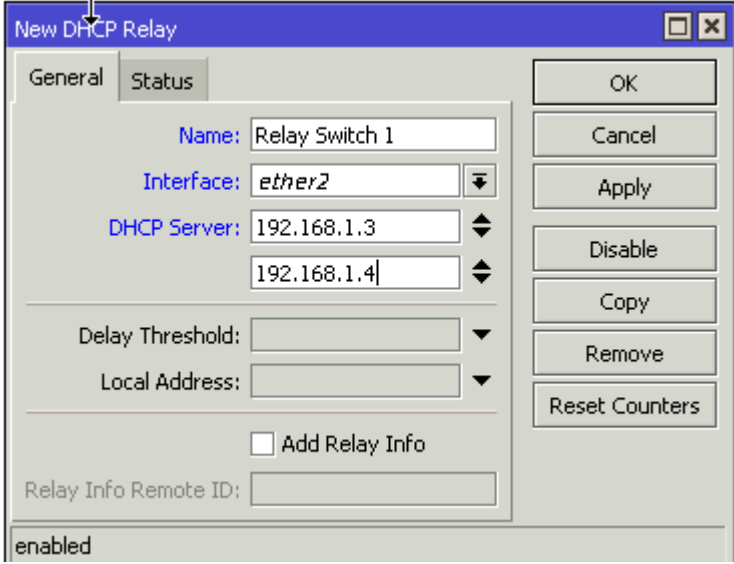
Una vez terminada la configuración:

netplan apply

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2. (1 pts) Realiza la configuración de red necesaria en R1 para que las peticiones DHCP de las LAN de SW1 y SW2 alcancen el servidor DHCP.

Establecemos el servicio de DHCP Relay en el Router R1 (Mikrotik).



New DHCP Relay

General Status

Name: Relay Switch 1

Interface: ether2

DHCP Server: 192.168.1.3
192.168.1.4

Delay Threshold:

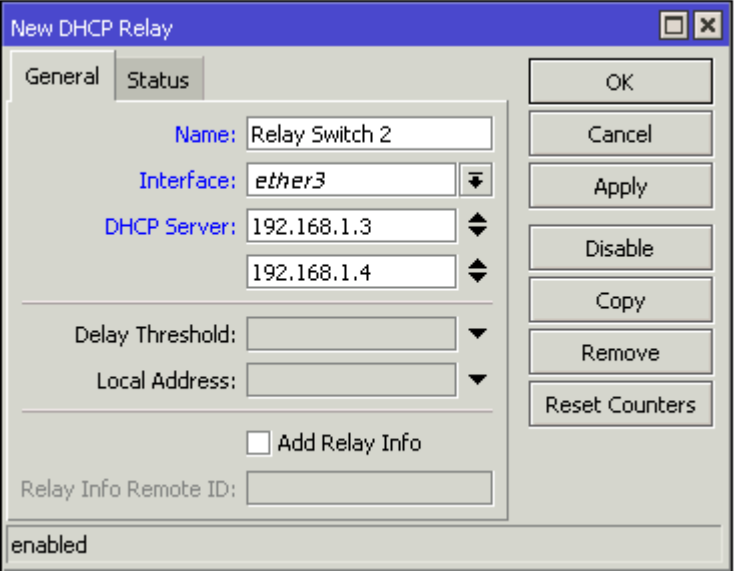
Local Address:

☐ Add Relay Info

Relay Info Remote ID:

OK Cancel Apply Disable Copy Remove Reset Counters

enabled



New DHCP Relay

General Status

Name: Relay Switch 2

Interface: ether3

DHCP Server: 192.168.1.3
192.168.1.4

Delay Threshold:

Local Address:

☐ Add Relay Info

Relay Info Remote ID:

OK Cancel Apply Disable Copy Remove Reset Counters

enabled

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3. (3 pts.) Instala el servicio DHCP en los servidores DHCP y configura lo necesario para que se reparta entre ambos (50%/50%) la configuración de red a los equipos de las LAN SW1 y SW2, con las siguientes especificaciones:

- i. Asignar un rango que deje 4 ips para uso como estáticas o reservas.
- ii. Duración de la concesión: 18 horas
- iii. Servidores DNS: 9.9.9.9 y 7.7.5.5
- iv. Asigna una puerta de enlace lógica válida
- v. Dominio "make.it"
- vi. Ambos servidores serán autoritarios.

Ya hemos instalado isc-dhcp-server en ambos servidores:

Modificamos en **ambos** para poner el nombre de la interfaz donde pondremos el servicio:

Servidor DHCP 1:

 US24.04LTS-1 - PuTTY

```

nameservers:
  addresses:
    - 172.16.200.1
    - 8.8.8.8
root@ubuntu-cloud:/home/ubuntu# 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="ens3"
INTERFACESv6=""
root@ubuntu-cloud:/home/ubuntu#

```

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Servidor DHCP 2:

US24.04LTS-2 - PuTTY

```
root@ubuntu-cloud:/home/ubuntu# systemctl restart isc-dhcp-server
root@ubuntu-cloud:/home/ubuntu# 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="ens3"
INTERFACESv6=""
root@ubuntu-cloud:/home/ubuntu#
```

Ahora modificamos: **/etc/dhcp/dhcpd.conf**

Debemos descomentar:

authoritative;

ddns-update-style none;

DHCP 1 y 2:

```
# have support for DDNS.)
ddns-update-style none;

# If this DHCP server is the official
# network, the authoritative directive
authoritative;
```

Ahora hay una parte que es individual para cada uno:

DHCP Server 1:

#CONFIGURACIÓN DE ((DHCP-PRIM))

```
failover peer "FAILOVER" {
    primary;
    address 192.168.1.3;
    port 647;
    peer address 192.168.1.4;
```

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```
peer port 647;
max-unacked-updates 10;
max-response-delay 30;
load balance max seconds 3;
mclt 1800;
split 128;
}
```

```
#CONFIGURACIÓN DE ((DHCP-PRIM))

failover peer "FAILOVER" {
    primary;
    address 192.168.1.3;
    port 647;
    peer address 192.168.1.4;
    peer port 647;
    max-unacked-updates 10;
    max-response-delay 30;
    load balance max seconds 3;
    mclt 1800;
    split 128;
}
```

SERVIDOR DHCP 2:

#CONFIGURACIÓN DE ((DHCP-SECOND))

```
failover peer "FAILOVER" {
    secondary;
    address 192.168.1.4;
    port 647;
    peer address 192.168.1.3;
    peer port 647;
    max-unacked-updates 10;
    max-response-delay 30;
    load balance max seconds 3;
}
```


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```
#CONFIGURACIÓN DE ((DHCP-SECOND))

failover peer "FAILOVER" {
    secondary;
    address 192.168.1.4;
    port 647;
    peer address 192.168.1.3;
    peer port 647;
    max-unacked-updates 10;
    max-response-delay 30;
    load balance max seconds 3;
}
```

Y una parte que es común para ambos servidores:

##Configuración común

```
subnet 192.168.1.0 netmask 255.255.255.0 {
    not authoritative;
}
```

```
#LAN Switch1 10.10.14.0/23
#LAN Switch2 10.12.7.32/27
```

```
# SubNet 10.10.14.0/23
subnet 10.10.14.0 netmask 255.255.254.0 {
    option domain-name-servers 9.9.9.9, 7.7.5.5;
    option domain-name "make.it";
    option routers 10.10.14.1;
    pool {
        failover peer "FAILOVER";
        range 10.10.14.5 10.10.15.254;
        default-lease-time 64800;
        max-lease-time 86000;
        host megalol-01 {
            hardware ethernet 02:42:d2:70:03:00;
            fixed-address 10.10.14.4;
        }
    }
}
```

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}

SubNet 10.12.7.32/27

```
subnet 10.12.7.32 netmask 255.255.255.224 {
  option domain-name-servers 9.9.9.9, 7.7.5.5;
  option domain-name "make.it";
  option routers 10.12.7.33;
  pool {
    failover peer "FAILOVER";
    range 10.12.7.39 10.12.7.62;
    default-lease-time 64800;
    max-lease-time 86000;
    host megalol-02 {
      hardware ethernet 02:42:97:2b:f7:00;
      fixed-address 10.12.7.40;
    }
  }
}
```

```
##Configuración común
```

```
subnet 192.168.1.0 netmask 255.255.255.0 {
  not authoritative;
}
```

```
# SubNet 10.10.14.0/23
subnet 10.10.14.0 netmask 255.255.254.0 {
  option domain-name-servers 9.9.9.9, 7.7.5.5;
  option domain-name "make.it";
  option routers 10.10.14.1;
  pool {
    failover peer "FAILOVER";
    range 10.10.14.5 10.10.15.254;
    default-lease-time 64800;
    max-lease-time 86000;
    host megalol-01 {
      hardware ethernet 02:42:d2:70:03:00;
      fixed-address 10.10.14.4;
    }
  }
}
```

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```
# SubNet 10.12.7.32/27
subnet 10.12.7.32 netmask 255.255.255.224 {
    option domain-name-servers 9.9.9.9, 7.7.5.5;
    option domain-name "make.it";
    option routers 10.12.7.33;
    pool {
        failover peer "FAILOVER";
        range 10.12.7.39 10.12.7.62;
        default-lease-time 64800;
        max-lease-time 86000;
        host megalol-02 {
            hardware ethernet 02:42:97:2b:f7:00;
            fixed-address 10.12.7.40;
        }
    }
}
```

Una vez terminada la configuración:

systemctl restart isc-dhcp-server

systemctl status isc-dhcp-server

```
root@ubuntu-cloud:/home/ubuntu# systemctl status isc-dhcp-server
● isc-dhcp-server.service - ISC DHCP IPv4 server
   Loaded: loaded (/usr/lib/systemd/system/isc-dhcp-server.service; enabled; >
   Active: active (running) since Wed 2025-11-19 19:08:13 UTC; 3min 26s ago
     Docs: man:dhcpd(8)
    Main PID: 2238 (dhcpd)
      Tasks: 1 (limit: 1112)
     Memory: 4.3M (peak: 4.8M)
        CPU: 184ms
    CGroup: /system.slice/isc-dhcp-server.service
            └─2238 dhcpd -user dhcpd -group dhcpd -f -4 -pf /run/dhcp-server/d>

Nov 19 19:08:13 ubuntu-cloud dhcpd[2238]: failover peer FAILOVER: Both servers >
Nov 19 19:08:15 ubuntu-cloud dhcpd[2238]: peer FAILOVER: disconnected
Nov 19 19:08:15 ubuntu-cloud dhcpd[2238]: failover peer FAILOVER: I move from n>
Nov 19 19:08:15 ubuntu-cloud dhcpd[2238]: failover peer FAILOVER: peer moves fr>
Nov 19 19:08:15 ubuntu-cloud dhcpd[2238]: failover peer FAILOVER: I move from c>
Nov 19 19:08:15 ubuntu-cloud dhcpd[2238]: failover peer FAILOVER: Both servers >
Nov 19 19:08:15 ubuntu-cloud dhcpd[2238]: balancing pool 5dd08ebe65a0 10.12.7.3>
Nov 19 19:08:15 ubuntu-cloud dhcpd[2238]: balanced pool 5dd08ebe65a0 10.12.7.32>
Nov 19 19:08:15 ubuntu-cloud dhcpd[2238]: balancing pool 5dd08ebelc10 10.10.14.>
Nov 19 19:08:15 ubuntu-cloud dhcpd[2238]: balanced pool 5dd08ebelc10 10.10.14.0>
lines 1-21/21 (END)
```



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En el Router Relay Mikrotik establecemos una regla NAT:

The image displays two screenshots of the Mikrotik WinBox interface, showing the configuration of a NAT rule.

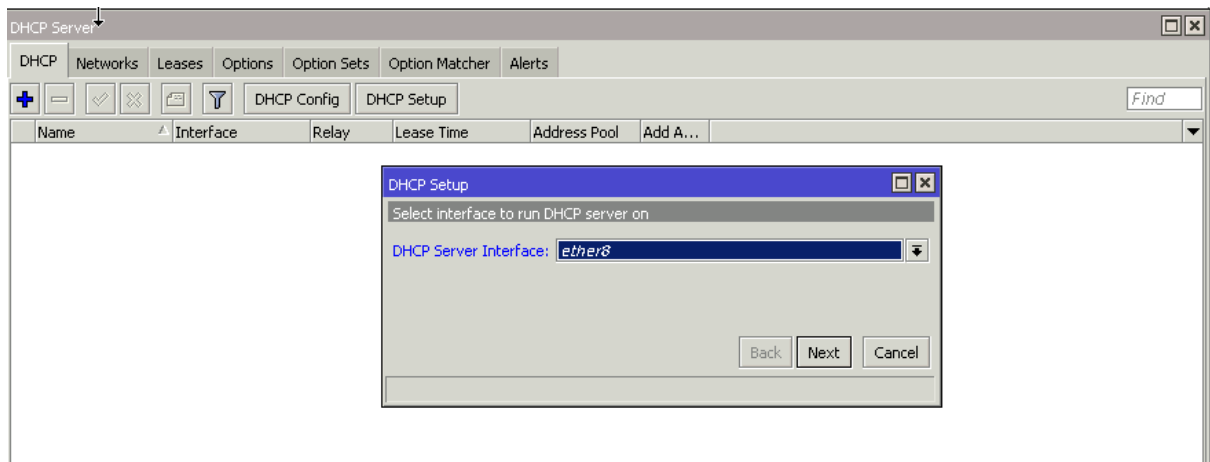
The top screenshot shows the "New NAT Rule" dialog box. The "General" tab is selected. The "Chain" is set to "srcnat". The "Out. Interface" is set to "ether1". The "Action" is set to "masquerade". The "Log" checkbox is checked. The "Log Prefix" is set to "NAT Rule <>". The "To Ports" field is empty. The "In. Interface List" field is empty. The "OK" button is highlighted.

The bottom screenshot shows the "NAT Rule <>" dialog box. The "Advanced" tab is selected. The "Action" is set to "masquerade". The "Log" checkbox is checked. The "Log Prefix" is set to "NAT Rule <>". The "To Ports" field is empty. The "OK" button is highlighted.

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4. (2 pts.) Configura lo necesario para que R1 sea el servidor DHCP de la LAN del SW3.

- i. Asignar un rango que deje 3 ips para uso como estáticas o reservas.
- ii. Duración de la concesión: 9 horas
- iii. Servidores DNS: 9.9.9.9 y 2.2.2.2
- iv. Asigna una puerta de enlace lógica válida
- v. Dominio “agar.io”





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DHCP Setup

Select network for DHCP addresses

DHCP Address Space: 10.8.7.96/28

Back Next Cancel

DHCP Setup

Select gateway for given network

Gateway for DHCP Network: 10.8.7.97


Back Next Cancel

DHCP Setup

Select pool of ip addresses given out by DHCP server

Addresses to Give Out: 10.8.7.100-10.8.7.110

Back Next Cancel




DHCP Setup

Select DNS servers

DNS Servers: 9.9.9.9

2.2.2.2

Back Next Cancel



DHCP Setup

Select lease time

Lease Time: 09:00:00

Back Next Cancel

CREADO:

Relay Switch 1	ether2	192.168.1.3, 19...
Relay Switch 2	ether3	192.168.1.3, 19...

The screenshot shows the Mikrotik WinBox interface. On the left, the 'DHCP Server' tab is active, displaying a table with one entry:

Name	Interface	Relay
dhcp1	ether8	

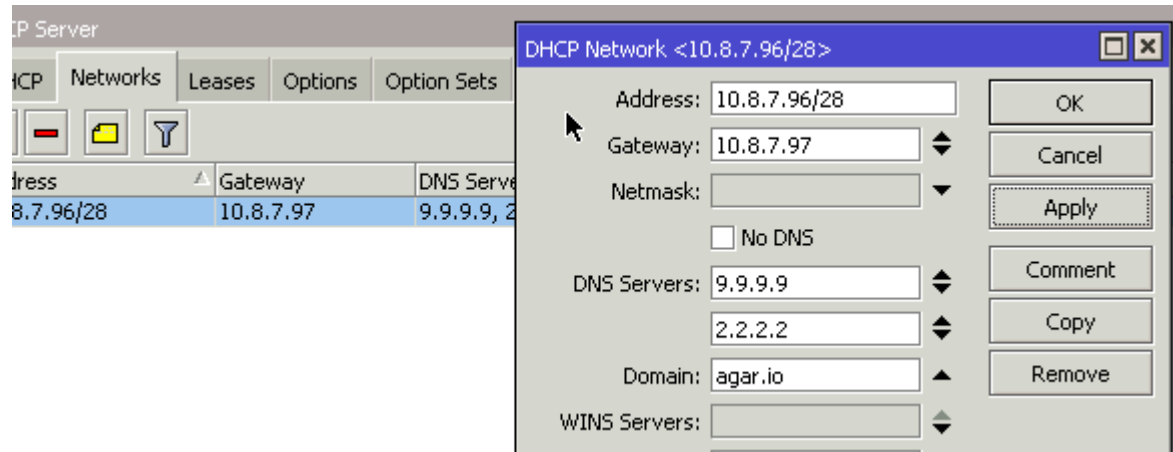
On the right, the 'Script' tab of the configuration window is open, showing the following settings:

- Name: dhcp1
- Interface: ether8
- Relay: (empty)
- Lease Time: 09:00:00
- Bootp Lease Time: forever
- Address Pool: dhcp_pool0
- DHCP Option Set: (empty)
- Server Address: (empty)
- Delay Threshold: (empty)
- Authoritative: yes
- Bootp Support: static
- Client MAC Limit: (empty)
- Use RADIUS: no

Buttons on the right include OK, Cancel, Apply, Disable, Comment, Copy, and Remove.

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Esto se hace una vez se ha terminado el asistente: **poner el nombre del dominio.**



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5. (1 pts.) Enciende los clientes y verifica en los servidores qué direcciones están asignadas dinámicamente en este instante. Usa busybox y muestra la configuración de red incluidos dns y sufijo de búsqueda. Comprueba que hay conectividad con los servidores DHCP.

SERVIDOR DHCP 1:

Usamos: `dhcp-lease-list --parsable`

```
root@ubuntu-cloud:/home/ubuntu# dhcp-lease-list --parsable
To get manufacturer names please download http://standards-oui.ieee.org/oui.txt to /usr/local/etc/oui.txt
MAC 02:42:49:f2:e6:00 IP 10.10.15.1 HOSTNAME UbuntuDockerGuest-1 BEGIN 2025-11-19 18:32:02 END 2025-11-20 12:32:02 MANUFACTURER -NA-
MAC 02:42:4b:ef:05:00 IP 10.12.7.51 HOSTNAME UbuntuDockerGuest-2 BEGIN 2025-11-19 18:32:13 END 2025-11-20 06:32:13 MANUFACTURER -NA-
root@ubuntu-cloud:/home/ubuntu#
```

SERVIDOR DHCP 2:

```
root@ubuntu-cloud:/home/ubuntu# dhcp-lease-list --parsable
To get manufacturer names please download http://standards-oui.ieee.org/oui.txt to /usr/local/etc/oui.txt
MAC 02:42:49:f2:e6:00 IP 10.10.15.1 HOSTNAME UbuntuDockerGuest-1 BEGIN 2025-11-19 18:32:02 END 2025-11-20 12:32:02 MANUFACTURER -NA-
MAC 02:42:4b:ef:05:00 IP 10.12.7.51 HOSTNAME UbuntuDockerGuest-2 BEGIN 2025-11-19 18:32:13 END 2025-11-20 06:32:13 MANUFACTURER -NA-
root@ubuntu-cloud:/home/ubuntu#
```

Cliente Switch 1:

Al iniciar ya nos avisa que se nos concede una IP y el tiempo.

```
root@UbuntuDockerGuest-1: ~
UbuntuDockerGuest-1 console is now available... Press RETURN to get started.
udhcpd: started, v1.30.1
udhcpd: sending discover
udhcpd: sending select for 10.10.15.1
udhcpd: lease of 10.10.15.1 obtained, lease time 64232
root@UbuntuDockerGuest-1:~#
```

Resultado de "ip a".

```
root@UbuntuDockerGuest-1:~# hostname
UbuntuDockerGuest-1
root@UbuntuDockerGuest-1:~# b ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue 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
1661: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel qlen 1000
    link/ether 02:42:49:f2:e6:00 brd ff:ff:ff:ff:ff:ff
    inet 10.10.15.1/23 scope global eth0
        valid_lft forever preferred_lft forever
root@UbuntuDockerGuest-1:~#
```

El gateway:



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```
valid_itt forever preferred_itt forever
root@UbuntuDockerGuest-1:~# b ip route
default via 10.10.14.1 dev eth0 metric 1861
10.10.14.0/23 dev eth0 scope link src 10.10.15.1
root@UbuntuDockerGuest-1:~#
```

Servidor DNS:

```
10.10.14.0/23 dev eth0 scope link src 10.10.15.1
root@UbuntuDockerGuest-1:~# cat /etc/resolv.conf
search make.it
nameserver 9.9.9.9
nameserver 7.7.5.5
root@UbuntuDockerGuest-1:~#
```

¿Tenemos Internet? Claro que si.


```
root@UbuntuDockerGuest-1:~# ping x.uk
PING x.uk (185.249.71.213) 56(84) bytes of data.
64 bytes from 185.249.71.213 (185.249.71.213): icmp_seq=1 ttl=45 time=39.2 ms
64 bytes from 185.249.71.213 (185.249.71.213): icmp_seq=2 ttl=45 time=38.7 ms
64 bytes from 185.249.71.213 (185.249.71.213): icmp_seq=3 ttl=45 time=38.8 ms
64 bytes from 185.249.71.213 (185.249.71.213): icmp_seq=4 ttl=45 time=38.8 ms
^C
--- x.uk ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3004ms
rtt min/avg/max/mdev = 38.696/38.876/39.222/0.205 ms
root@UbuntuDockerGuest-1:~#
```

Conectividad con los servidores DHCP:

```
root@UbuntuDockerGuest-1:~# ping 192.168.1.3
PING 192.168.1.3 (192.168.1.3) 56(84) bytes of data.
64 bytes from 192.168.1.3: icmp_seq=1 ttl=63 time=5.63 ms
64 bytes from 192.168.1.3: icmp_seq=2 ttl=63 time=4.66 ms
^C
--- 192.168.1.3 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1002ms
rtt min/avg/max/mdev = 4.656/5.141/5.627/0.485 ms
root@UbuntuDockerGuest-1:~# ping 192.168.1.4
PING 192.168.1.4 (192.168.1.4) 56(84) bytes of data.
64 bytes from 192.168.1.4: icmp_seq=1 ttl=63 time=4.96 ms
64 bytes from 192.168.1.4: icmp_seq=2 ttl=63 time=4.20 ms
^C
--- 192.168.1.4 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1001ms
rtt min/avg/max/mdev = 4.201/4.579/4.958/0.378 ms
root@UbuntuDockerGuest-1:~#
```

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Cliente Switch 2:

 root@UbuntuDockerGuest-2: ~

```
UbuntuDockerGuest-2 console is now available... Press RETURN to get started.
udhcpd: started, v1.30.1
udhcpd: sending discover
udhcpd: sending select for 10.12.7.51
udhcpd: lease of 10.12.7.51 obtained, lease time 42637
root@UbuntuDockerGuest-2:~#
```

```
root@UbuntuDockerGuest-2:~# b ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue 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
1662: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel qlen 1000
    link/ether 02:42:4b:ef:05:00 brd ff:ff:ff:ff:ff:ff
    inet 10.12.7.51/27 scope global eth0
        valid_lft forever preferred_lft forever
root@UbuntuDockerGuest-2:~#
```

```
root@UbuntuDockerGuest-2:~# b ip route
default via 10.12.7.33 dev eth0 metric 1862
10.12.7.32/27 dev eth0 scope link src 10.12.7.51
root@UbuntuDockerGuest-2:~#
```

```
root@UbuntuDockerGuest-2:~# cat /etc/resolv.conf
search make.it
nameserver 9.9.9.9
nameserver 7.7.5.5
root@UbuntuDockerGuest-2:~#
```

```
root@UbuntuDockerGuest-2:~# ping x.uk
PING x.uk (185.249.71.213) 56(84) bytes of data.
64 bytes from 185.249.71.213 (185.249.71.213): icmp_seq=1 ttl=45 time=38.6 ms
64 bytes from 185.249.71.213 (185.249.71.213): icmp_seq=2 ttl=45 time=37.9 ms
64 bytes from 185.249.71.213 (185.249.71.213): icmp_seq=3 ttl=45 time=38.4 ms
^C
--- x.uk ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2003ms
rtt min/avg/max/mdev = 37.871/38.291/38.636/0.316 ms
root@UbuntuDockerGuest-2:~#
```

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```

root@UbuntuDockerGuest-2: ~
root@UbuntuDockerGuest-2:~# ping 192.168.1.3
PING 192.168.1.3 (192.168.1.3) 56(84) bytes of data.
64 bytes from 192.168.1.3: icmp_seq=1 ttl=63 time=5.56 ms
^C
--- 192.168.1.3 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 5.555/5.555/5.555/0.000 ms
root@UbuntuDockerGuest-2:~# ping 192.168.1.4
PING 192.168.1.4 (192.168.1.4) 56(84) bytes of data.
64 bytes from 192.168.1.4: icmp_seq=1 ttl=63 time=5.41 ms
^C
--- 192.168.1.4 ping statistics ---
1 packets transmitted, 1 received, 0% packet loss, time 0ms
rtt min/avg/max/mdev = 5.414/5.414/5.414/0.000 ms
root@UbuntuDockerGuest-2:~# █

```

Cliente Switch 3:

```

root@UbuntuDockerGuest-3: ~
UbuntuDockerGuest-3 console is now available... Press RETURN to get started.
udhcpd: started, v1.30.1
udhcpd: sending discover
udhcpd: sending select for 10.8.7.110
udhcpd: lease of 10.8.7.110 obtained, lease time 32400
root@UbuntuDockerGuest-3:~# █

root@UbuntuDockerGuest-3:~# b ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue 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
1666: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel qlen 1000
    link/ether 02:42:76:60:eb:00 brd ff:ff:ff:ff:ff:ff
    inet 10.8.7.110/28 scope global eth0
        valid_lft forever preferred_lft forever
root@UbuntuDockerGuest-3:~# █

```



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```
root@UbuntuDockerGuest-3:~# b ip route
default via 10.8.7.97 dev eth0 metric 1866
10.8.7.96/28 dev eth0 scope link src 10.8.7.110
root@UbuntuDockerGuest-3:~#
```

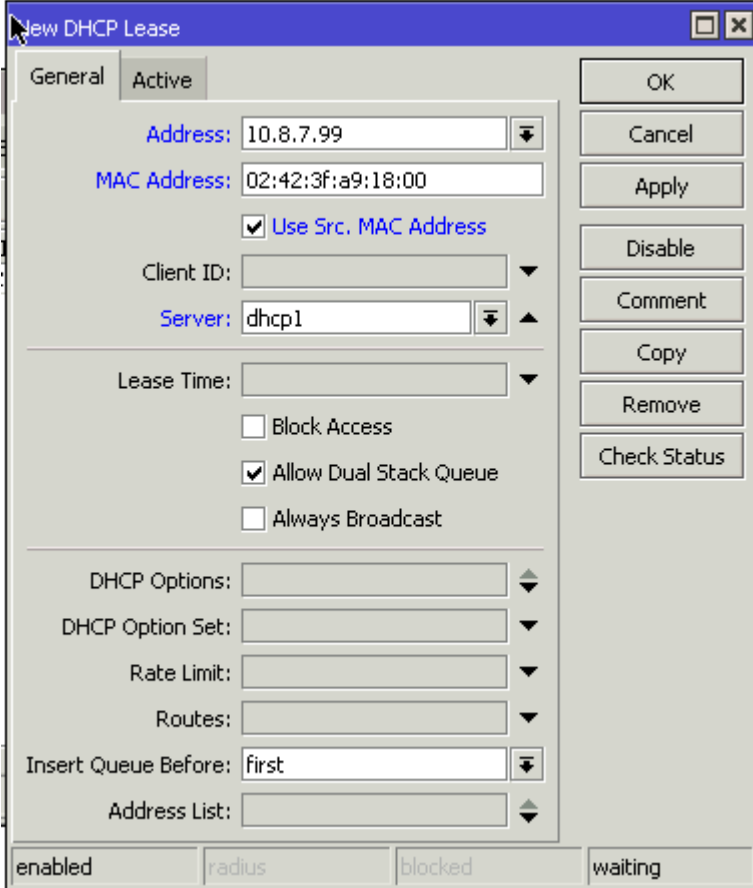
```
root@UbuntuDockerGuest-3:~# cat /etc/resolv.conf
search agar.io
nameserver 9.9.9.9
nameserver 2.2.2.2
root@UbuntuDockerGuest-3:~#
```

```
root@UbuntuDockerGuest-3:~# ping x.uk
PING x.uk (185.249.71.213) 56(84) bytes of data.
64 bytes from 185.249.71.213 (185.249.71.213): icmp_seq=1 ttl=45 time=37.9 ms
64 bytes from 185.249.71.213 (185.249.71.213): icmp_seq=2 ttl=45 time=38.1 ms
^C
--- x.uk ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1002ms
rtt min/avg/max/mdev = 37.926/37.994/38.062/0.068 ms
root@UbuntuDockerGuest-3:~#
```

```
root@UbuntuDockerGuest-3:~# ping 192.168.1.3
PING 192.168.1.3 (192.168.1.3) 56(84) bytes of data.
64 bytes from 192.168.1.3: icmp_seq=1 ttl=63 time=4.37 ms
64 bytes from 192.168.1.3: icmp_seq=2 ttl=63 time=3.83 ms
^C
--- 192.168.1.3 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1001ms
rtt min/avg/max/mdev = 3.833/4.102/4.372/0.269 ms
root@UbuntuDockerGuest-3:~# ping 192.168.1.4
PING 192.168.1.4 (192.168.1.4) 56(84) bytes of data.
64 bytes from 192.168.1.4: icmp_seq=1 ttl=63 time=6.46 ms
64 bytes from 192.168.1.4: icmp_seq=2 ttl=63 time=4.65 ms
64 bytes from 192.168.1.4: icmp_seq=3 ttl=63 time=4.37 ms
^C
--- 192.168.1.4 ping statistics ---
3 packets transmitted, 3 received, 0% packet loss, time 2004ms
rtt min/avg/max/mdev = 4.374/5.162/6.461/0.925 ms
root@UbuntuDockerGuest-3:~#
```

6. (1 pts.) Realiza una reserva para cada LAN bajo R1 y demuestra que los clientes las obtienen.

RESERVA EN LAN SWITCH 3:



```

root@UbuntuDockerGuest-4: ~
UbuntuDockerGuest-4 console is now available... Press RETURN to get started.
udhcpd: started, v1.30.1
udhcpd: sending discover
udhcpd: sending select for 10.8.7.99
udhcpd: lease of 10.8.7.99 obtained, lease time 32400
root@UbuntuDockerGuest-4:~#
  
```

Un equipo con Reserva y el otro por DHCP:

DHCP Server									
DHCP		Networks	Leases	Options	Option Sets	Option Matcher	Alerts		
<div> + - ✓ ✗ 🔍 Check Status Find </div>									
Address	MAC Address	Client ID	Server	Active Address	Active MAC Addr...	Active Ho...	Bridge Port	Expires After	Status
10.8.7.99	02:42:3f:a9:18:00		dhcp1	10.8.7.99	02:42:3f:a9:18:00	UbuntuDo...		08:59:40	bound
10.8.7.110	02:42:76:60:EB:00	1:2:42:76:60:eb:0	dhcp1	10.8.7.110	02:42:76:60:EB:00	UbuntuDo...		08:51:09	bound

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Reserva Switch 1:

Hostname: megalol-01

Mac: 02:42:d2:70:03:00

```

root@megalol-01: ~
megalol-01 console is now available... Press RETURN to get started.
udhcpd: started, v1.30.1
udhcpd: sending discover
udhcpd: sending select for 10.10.14.4
udhcpd: lease of 10.10.14.4 obtained, lease time 64800
root@megalol-01:~# alias b=/gns3/bin/busybox
root@megalol-01:~# b ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue 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
1668: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel qlen 1000
    link/ether 02:42:d2:70:03:00 brd ff:ff:ff:ff:ff:ff
    inet 10.10.14.4/23 scope global eth0
        valid_lft forever preferred_lft forever
root@megalol-01:~# █

```


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Reserva Switch 2:

Hostname: megalol-02

Mac: 02:42:97:2b:f7:00

```

root@megalol-02: ~
megalol-02 console is now available... Press RETURN to get started.
udhcpd: started, v1.30.1
udhcpd: sending discover
udhcpd: sending select for 10.12.7.40
udhcpd: lease of 10.12.7.40 obtained, lease time 64800
root@megalol-02:~# alias b=/gns3/bin/busybox
root@megalol-02:~# b ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue 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
1669: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel qlen 1000
    link/ether 02:42:97:2b:f7:00 brd ff:ff:ff:ff:ff:ff
    inet 10.12.7.40/27 scope global eth0
        valid_lft forever preferred_lft forever
root@megalol-02:~# █

```