

Laboratoare Retelistica

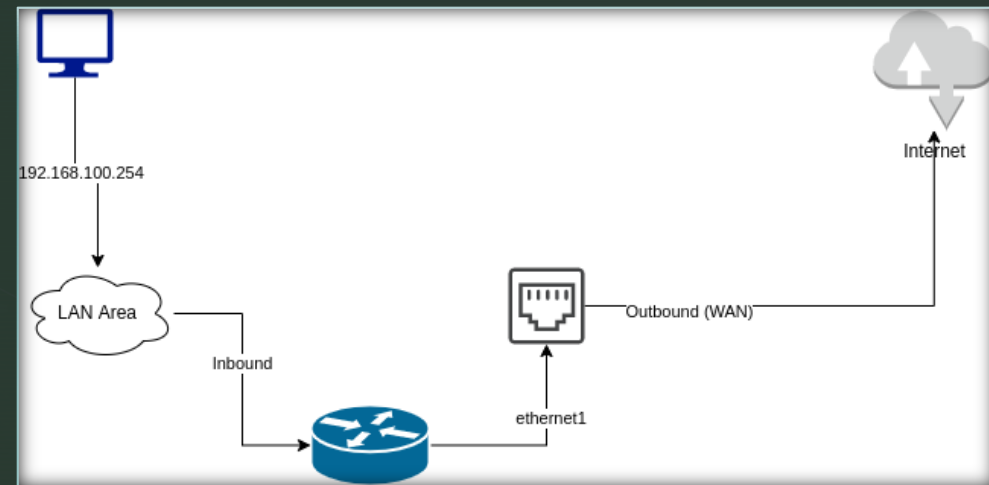
Network Address Translation (NAT)

Network Address Translation (NAT)

- NAT este modul in care un router translateaza o conexiune de la un IP(de obicei privat) la altul (de obicei public).
- Aceasta functie pur si simplu tine cont de conexiuni si translatarea acestora pentru a putea mentine fluxul de date TCP/IP.
- Exista doua tipuri de NAT:
- SRC-NAT (Source NAT)
- DST-NAT (Destination NAT)

SRC-NAT (Source NAT)

- Acest tip de NAT se foloseste pentru a defini ruta prin care retea locala comunica cu exteriorul prin interfata asignatata routerului ca WAN.



SRC-NAT (Source NAT)

- Pentru a vizualiza regula de SRC-NAT trebuie sa accesam meniul IP si submeniul Firewall.
- In tab-ul NAT se poate vedea o singura regula activa.
- Pe chain-ul "srcnat" cu interfata de iesire WAN(ethernet1) si ca actiune avem "masquarade"

```
/ip/firewall/nat/add chain=srcnat action=masquerade out-interface=ether1
```

The image displays two screenshots of the Mikrotik WinBox NAT Rule configuration window. The top screenshot shows the 'General' tab with 'Action' set to 'masquerade'. The bottom screenshot shows the 'General' tab with 'Chain' set to 'srcnat' and 'Out. Interface' set to 'WAN'.

NAT Rule <>

General | Advanced | Extra | Action | Statistics

Action: **masquerade**

☐ Log

Log Prefix:

To Ports:

OK

Cancel

Apply

Disable

Comment

Copy

Remove

Reset Counters

Reset All Counters

NAT Rule <>

General | Advanced | Extra | Action | Statistics

Chain: **srcnat**

Src. Address:

Dst. Address:

Src. Address List:

Dst. Address List:

Protocol:

Src. Port:

Dst. Port:

Any. Port:

In. Interface:

Out. Interface:

In. Interface List:

Out. Interface List: ☐ **WAN**

Packet Mark:

Connection Mark:

Routing Mark:

OK

Cancel

Apply

Disable

Comment

Copy

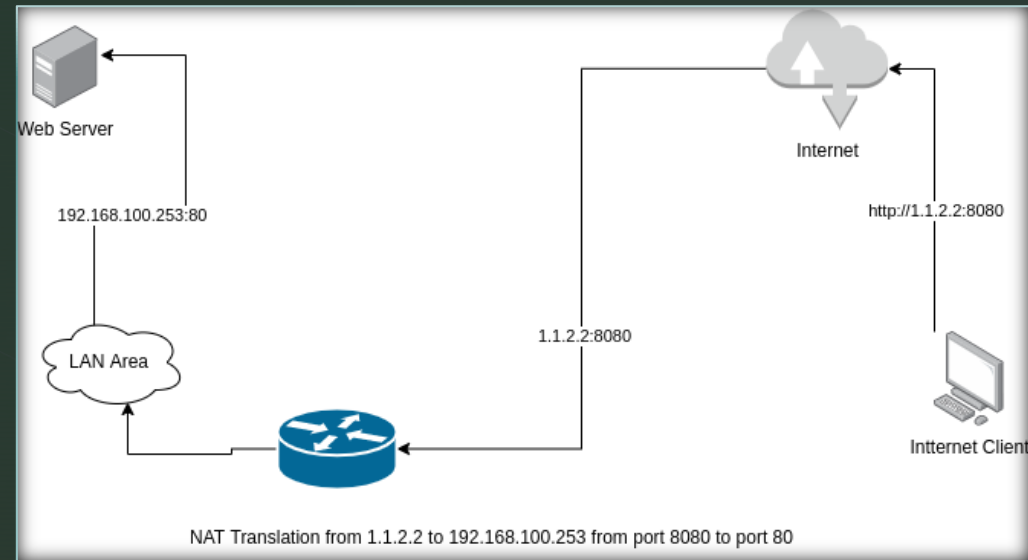
Remove

Reset Counters

Reset All Counters

DST-NAT(Destination NAT)

- Acest tip de NAT mai este numit si port forwarding si este modul in care un client din exterior (WAN) se conecteaza la un serviciu din retea internă(LAN)



DST-NAT(Destination NAT)

- Inainte de a putea incepe configurarea unei reguli de DST-NAT trebuie sa instalam un server web(apache2) in containerul lxc u1



```
apt install apache2
```

```
root@u1:~# apt install apache2
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
Suggested packages:
  apache2-doc apache2-suexec-pristine | apache2-suexec-custom www-browser ufw
The following NEW packages will be installed:
  apache2
0 upgraded, 1 newly installed, 0 to remove and 0 not upgraded.
Need to get 97.8 kB of archives.
After this operation, 546 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu jammy-updates/main amd64 apache2 amd64 2.4.52-1ubuntu4.1 [97.8 kB]
Fetched 97.8 kB in 1s (96.7 kB/s)
Selecting previously unselected package apache2.
(Reading database ... 18881 files and directories currently installed.)
Preparing to unpack .../apache2_2.4.52-1ubuntu4.1_amd64.deb ...
Unpacking apache2 (2.4.52-1ubuntu4.1) ...
Setting up apache2 (2.4.52-1ubuntu4.1) ...
Enabling module mpm_event.
```


DST-NAT(Destination NAT)

- După instalare putem încerca să ne conectăm la serverul web la adresa IP privată folosind curl.
- Putem observa că primim răspunsul HTTP 200 OK însemnând că serverul a răspuns cererii noastre.
- Dacă încercăm de pe mașina gazdă această reprezentând clientul remote în situația noastră putem observa că primim un "no route to host".

```
root@u1:~# curl -I http://192.168.100.254
HTTP/1.1 200 OK
Date: Tue, 30 Aug 2022 10:59:16 GMT
Server: Apache/2.4.52 (Ubuntu)
Last-Modified: Tue, 30 Aug 2022 10:51:06 GMT
ETag: "29af-5e7732842e5a0"
Accept-Ranges: bytes
Content-Length: 10671
Vary: Accept-Encoding
Content-Type: text/html
```

```
abaddon@abaddon in ~/work
λ curl -I http://192.168.100.254
curl: (7) Failed to connect to 192.168.100.254 port 80 after 3073 ms: No route to host
```

DST-NAT(Destination NAT)

- Acum putem face regula de DST-NAT in care specificam chain-ul "dstnat", protocolul "tcp" portul destinatie "8080" in tabul "General"
- In tabul "Action" avem de setat action "dst-nat", adresa serverului "192.168.100.254" si portul serviciului "80".

The screenshot shows the 'NAT Rule <8080>' configuration window with the 'General' tab selected. The 'Chain' is set to 'dstnat'. The 'Protocol' is set to '6 (tcp)'. The 'Dst. Port' is set to '8080'. The 'In. Interface' and 'Out. Interface' are both set to 'any'. The 'Src. Address', 'Dst. Address', 'Src. Address List', and 'Dst. Address List' fields are empty. The 'enabled' checkbox is checked. On the right side, there are buttons for 'OK', 'Cancel', 'Apply', 'Disable', 'Comment', 'Copy', 'Remove', 'Reset Counters', and 'Reset All Counters'.

The screenshot shows the 'NAT Rule <8080>' configuration window with the 'Action' tab selected. The 'Action' is set to 'dst-nat'. The 'Log' checkbox is unchecked. The 'Log Prefix' field is empty. The 'To Addresses' field is set to '192.168.100.254'. The 'To Ports' field is set to '80'. The 'enabled' checkbox is checked. On the right side, there are buttons for 'OK', 'Cancel', 'Apply', 'Disable', 'Comment', 'Copy', 'Remove', 'Reset Counters', and 'Reset All Counters'.

DST-NAT(Destination NAT)

- Accesand ip-ul routerului "192.168.1.22.35" pe portul "8080" in browser putem vedea un raspuns de la serverul web al containerului u1.

```
abaddon@abaddon in ~/work took 4ms  
[●] x curl -I http://192.168.122.35:8080  
HTTP/1.1 200 OK  
Date: Tue, 30 Aug 2022 11:22:57 GMT  
Server: Apache/2.4.52 (Ubuntu)  
Last-Modified: Tue, 30 Aug 2022 10:51:06 GMT  
ETag: "29af-5e7732842e5a0"  
Accept-Ranges: bytes  
Content-Length: 10671  
Vary: Accept-Encoding  
Content-Type: text/html
```

secure | 192.168.122.35:8080



Ubuntu

This is the default welcome page used to
systems. It is based on the equivalent pa
read this page, it means that the Apache
file (located at `/var/www/html/index`
If you are a normal user of this web site
currently unavailable due to maintenanc