Laboratoare Retelistica

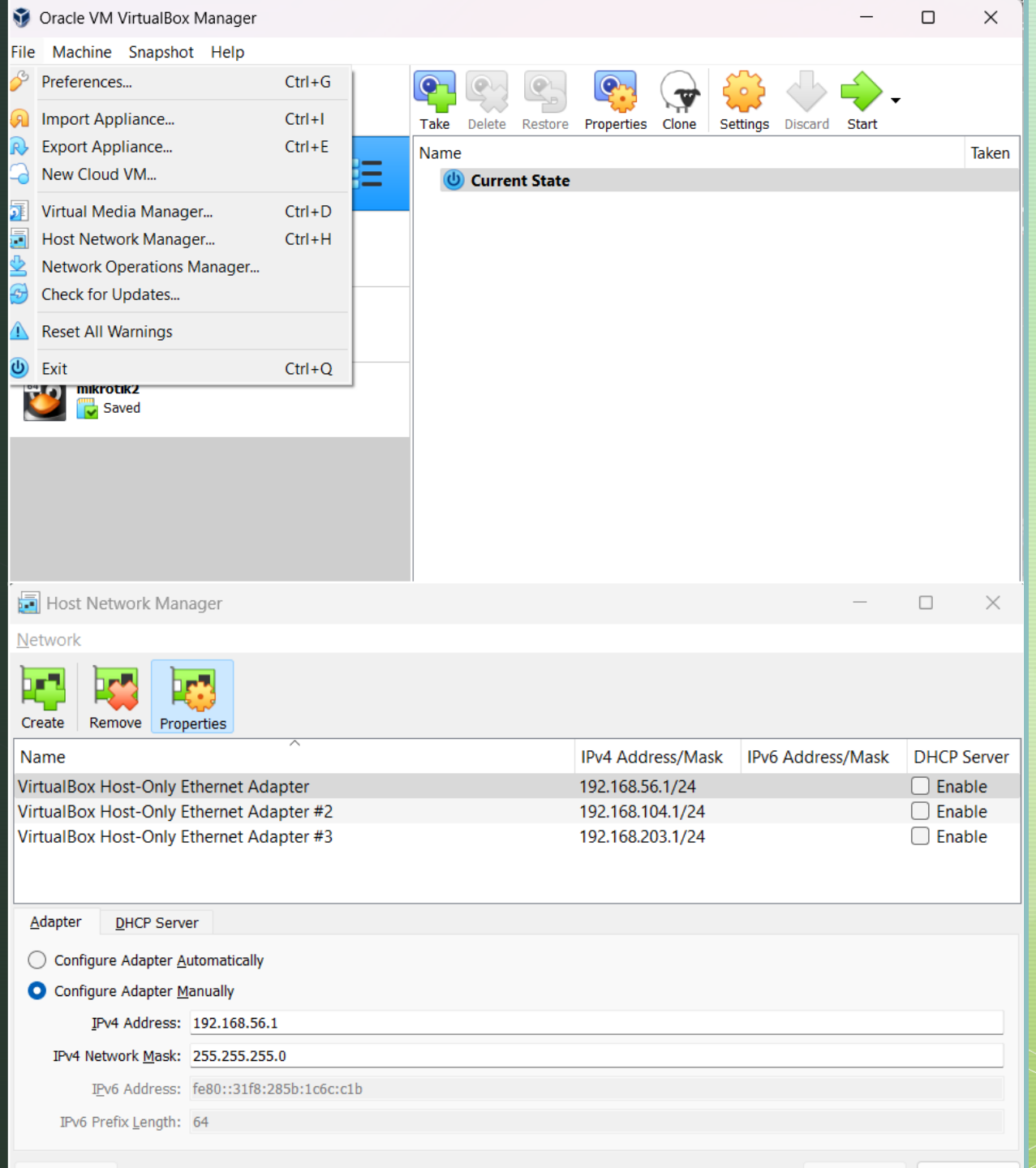
Setup VirtualBox Windows

Setare Adaptoare Virtuale

Mergem in meniul File si Selectam Host Network Manager

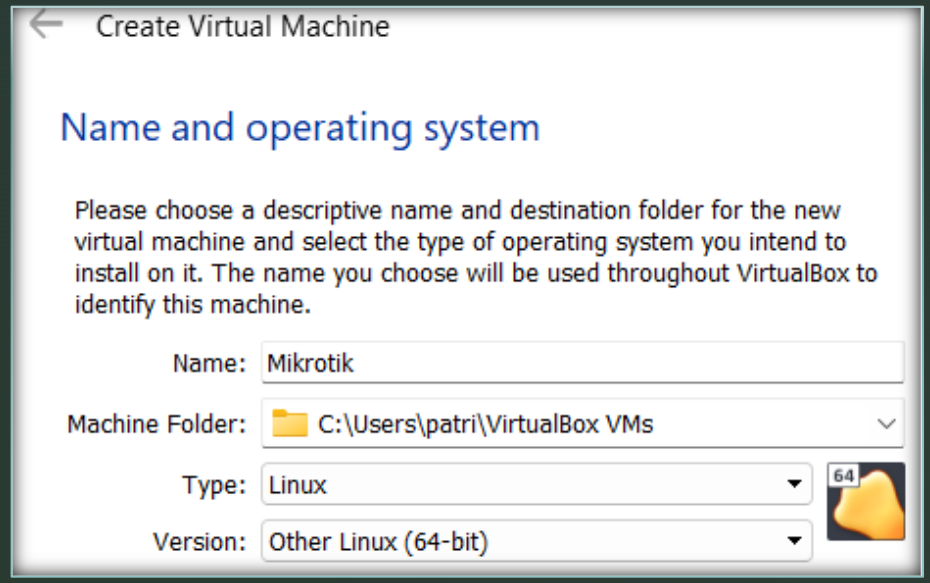
Aici facem Adaptoare prin apasarea butonului Create si debifam setarile de DHCP

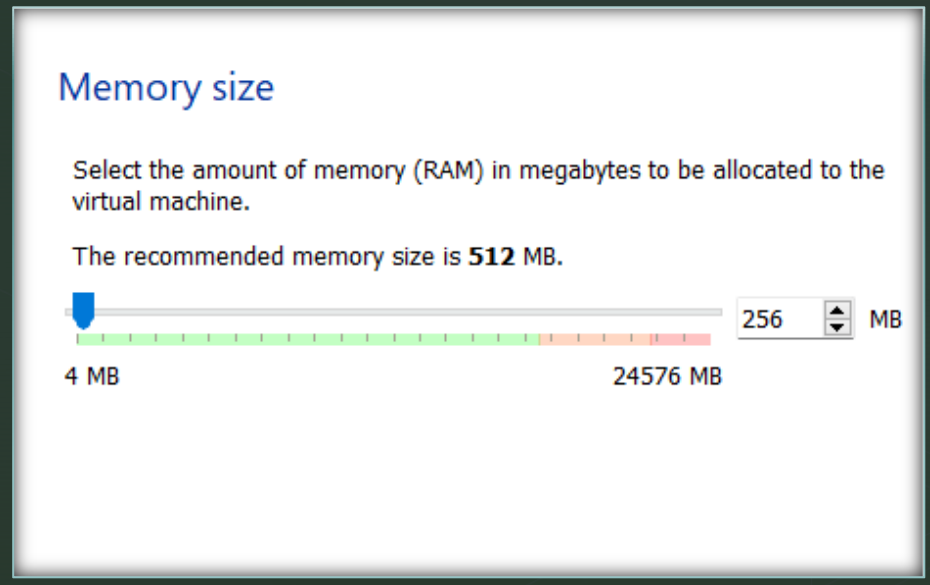
Dupa ce am facut cateva adaptoare putem trece la crearea masini virtuale cu RouterOS



RouterOS VM Setup

- In Interfata principala VirtualBox apasam butonul New si ii dam un nume masinii (ex: MikroTik1) dupa care selectam sistemul de operare linux X64.
- In urmatoarea fereastra setam memoria alocata la 256 MB



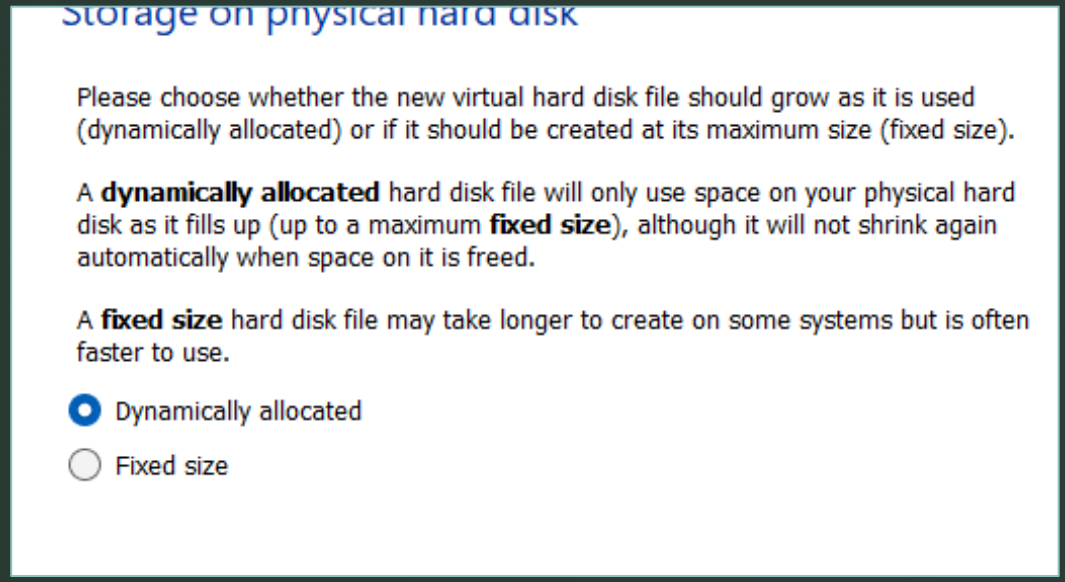


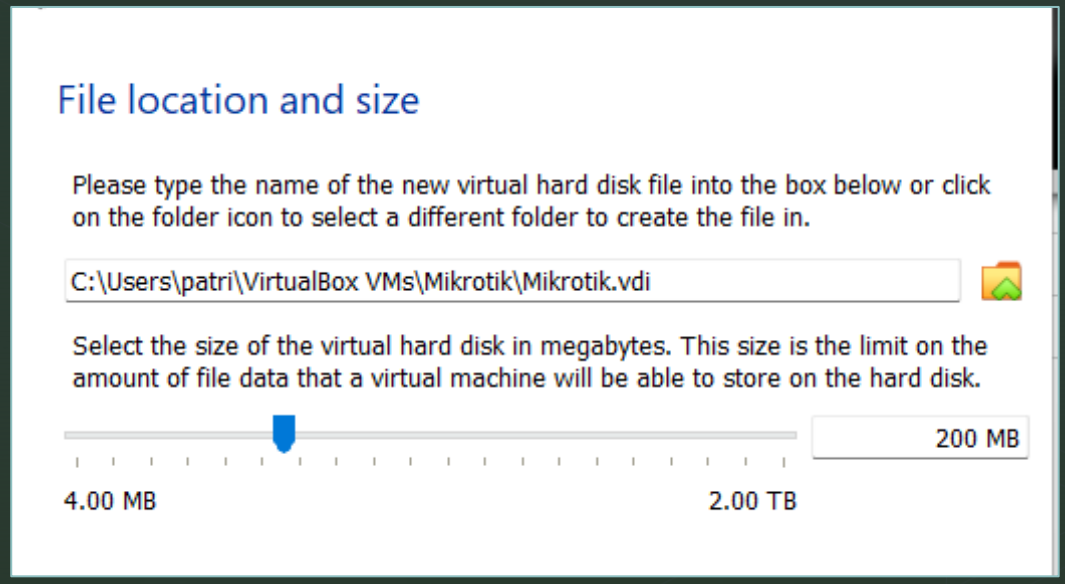
RouterOS VM Setup

In urmatorul ecran putem face un disk de 200 MB

Cu alocare dinamica pentru a nu ocupa mai mult spatiu decat sunt date actuale.

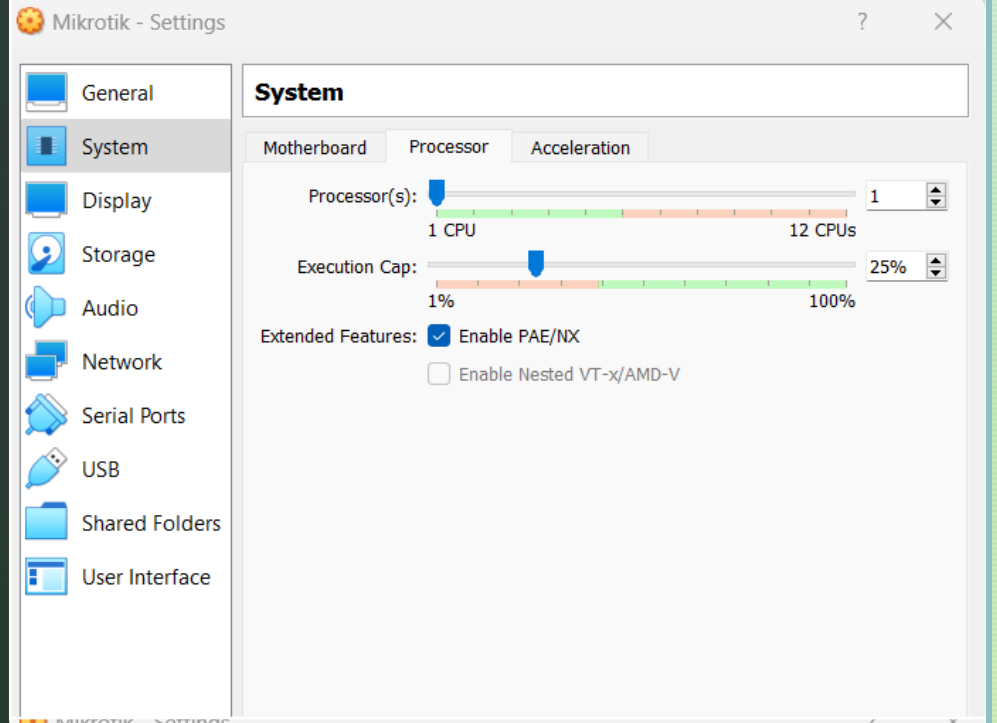
RouterOS VM Setup

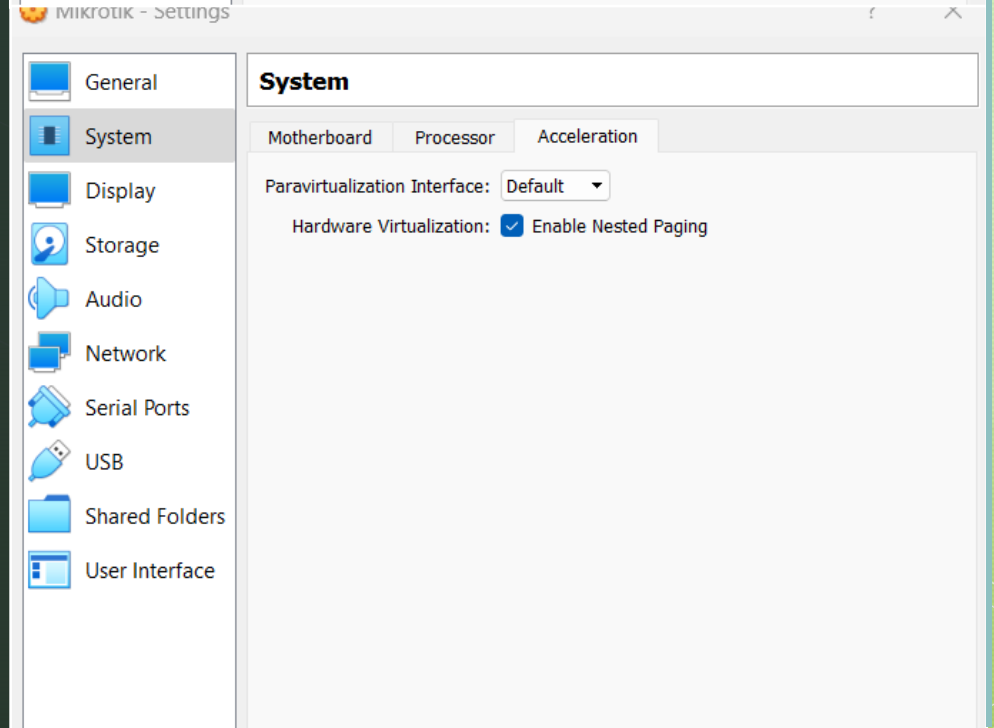




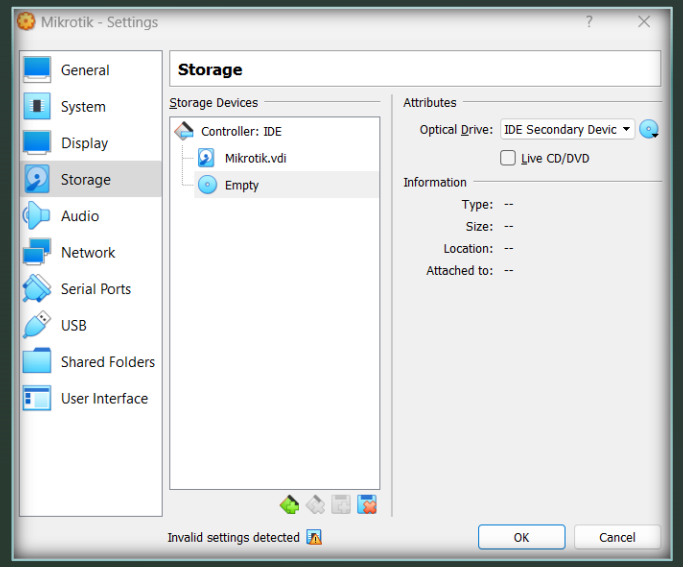
RouterOS VM Setup

- Dupa ce am facut configuratia de baza selectam setari fie prin click dreapta pe masina virtuala fie din meniul principal
- In System -> Processor putem sa mai limitam utilizarea procesorului la un procent mai mic pentru a conserva cat mai multe resurse.
- System -> Acceleartion puteam sa folosim diferite tehnologi de virtualizare in cazul in care VM-ul se misca greu.

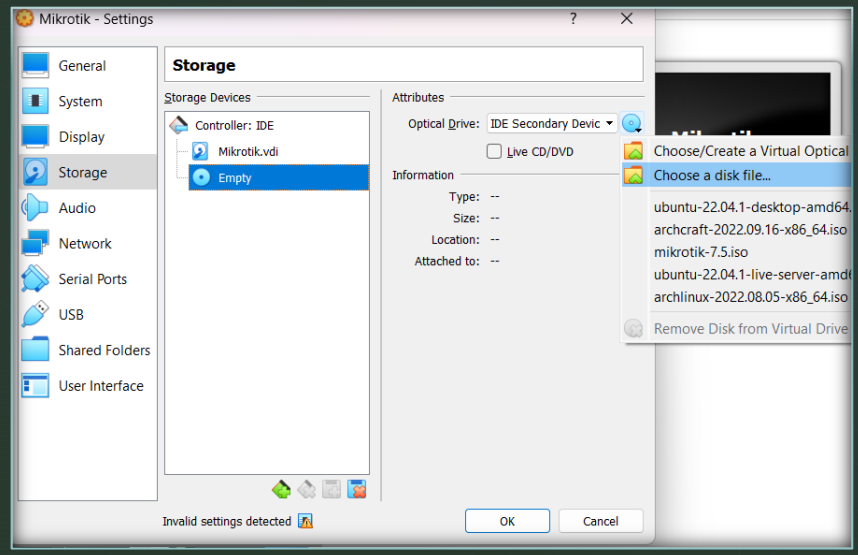




RouterOS VM Setup

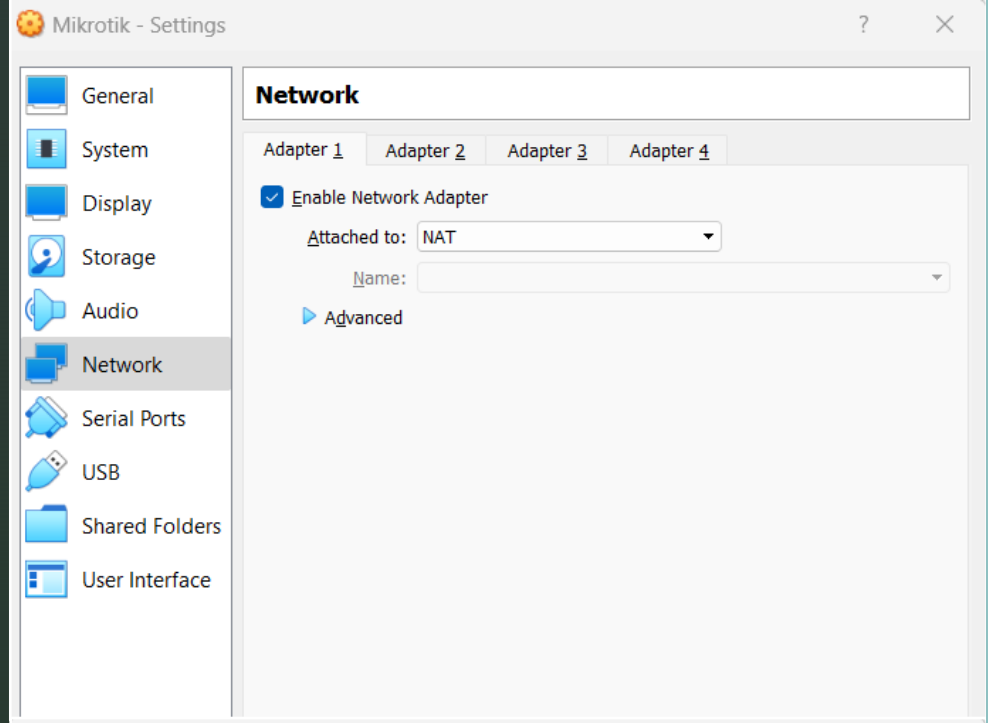


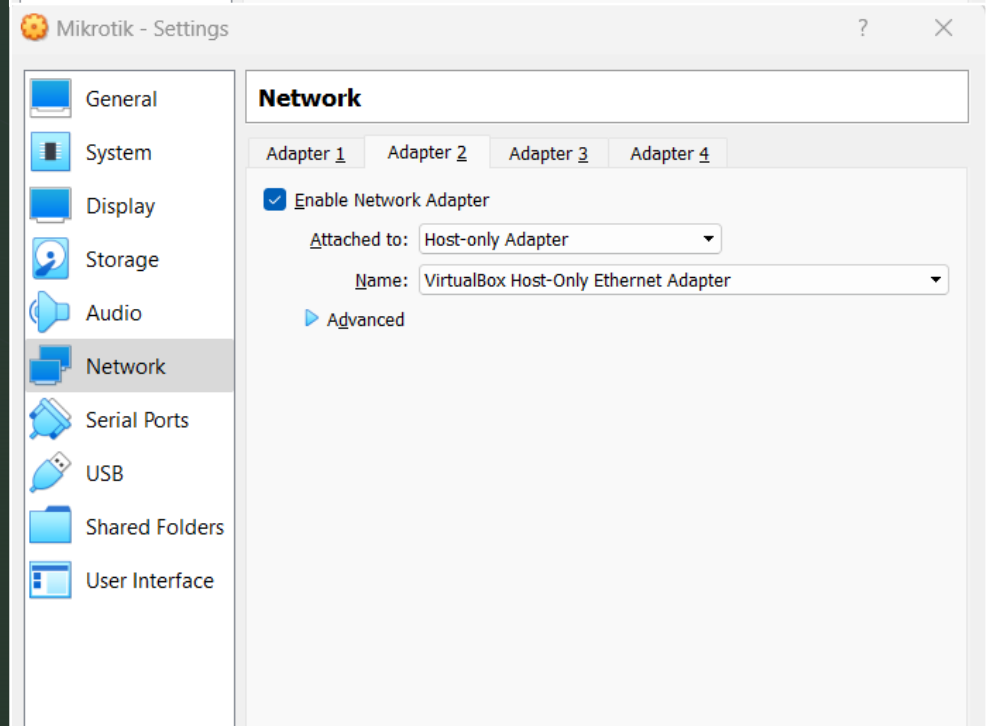
- In meniul Storage incaram ISO-ul cu RouterOS



RouterOS VM Setup

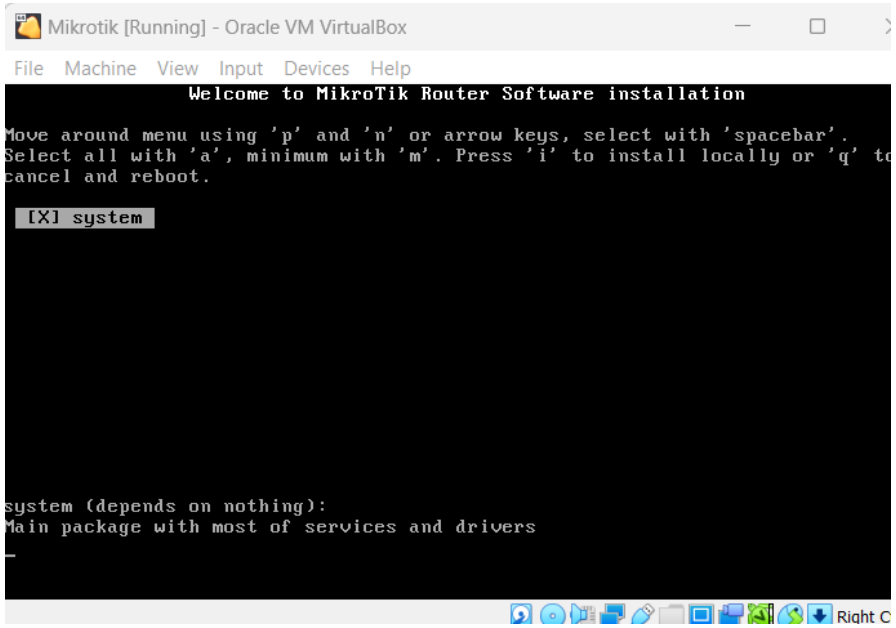
- In Network setam primul adaptor fie in bridge sau in NAT (bridge cu adaptorul Wi-Fi sau ethernet va avea acces direct in reteaua locala, in cazul NAT va avea acces prin laptop)
- Al doilea adaptor il pune in Host-only Adapter si selectam adaptorul facut mai devreme
- Aceste adaptor face o retea interna izolata intre masinile virtuale.
- Dupa care putem sava setarile si porni masina virtuala.

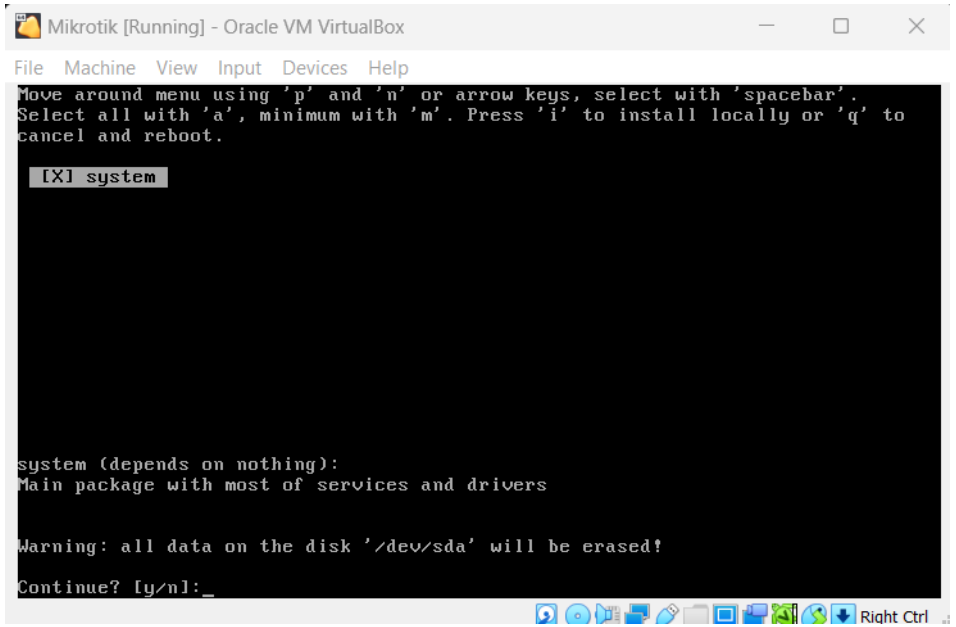




RouterOS VM Setup

- Dupa ce pornim VM-ul va incepe porcesul de instalare, apasand “a” si apoi “i”
- Ne va informa ca tot disk-ul virtual va fi sters si instalat sistemul si noi putem accepta apasand “y”



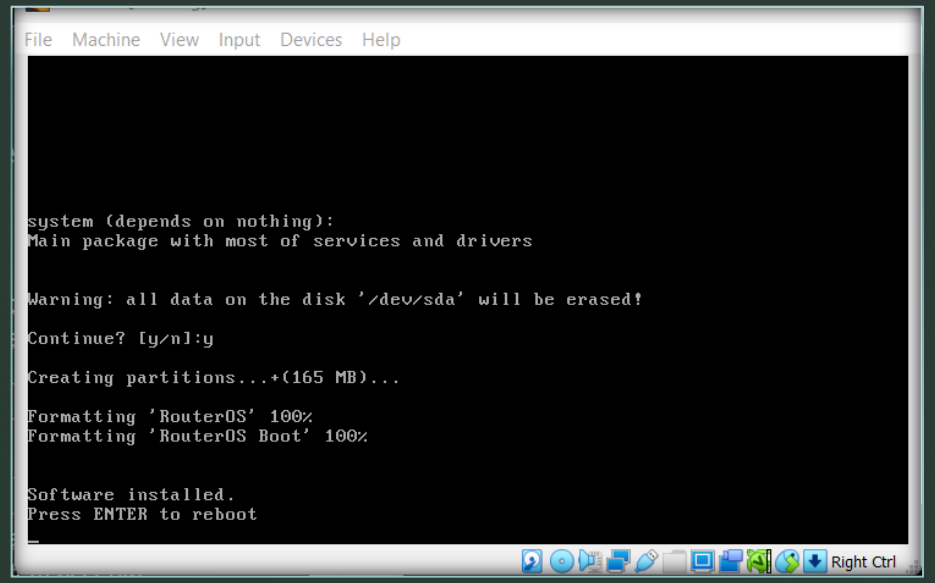


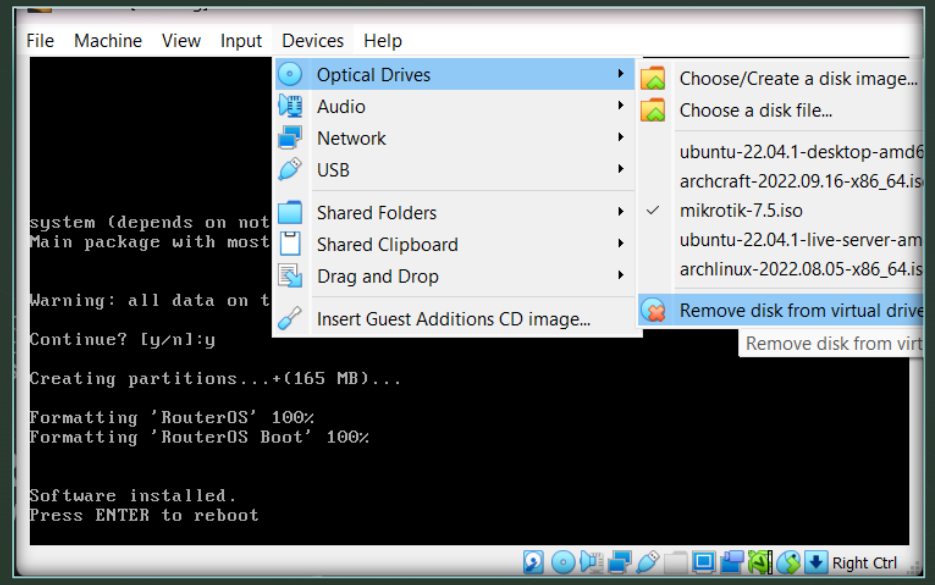
RouterOS VM Setup

Dupa instalare inainte de a da reboot trebuie sa scoatem ISO-ul mapat din VM.

Selectam Devices -> Optical Drives -> Remove disk from virtual drive.

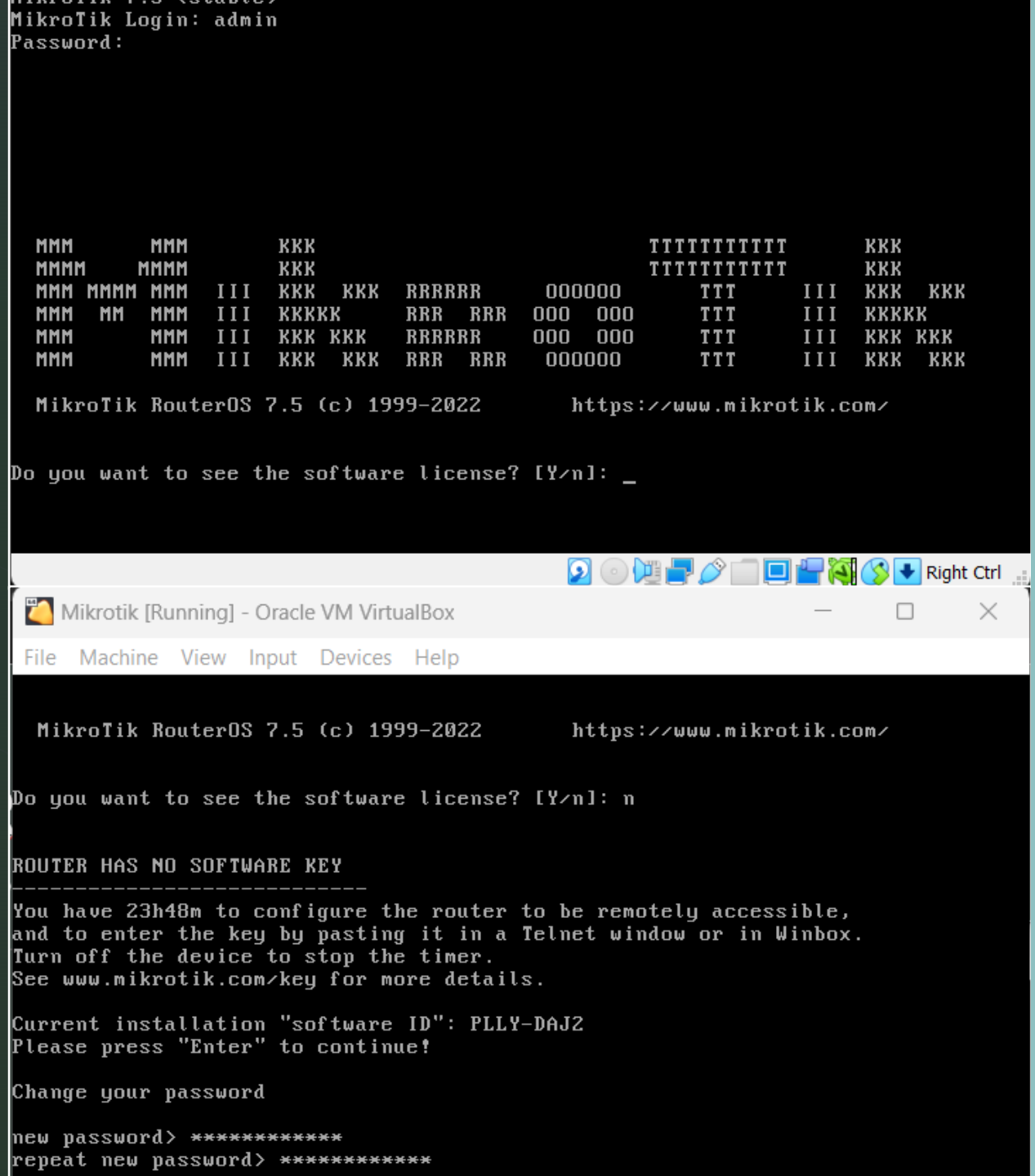
Si puteam apasa ENTER pentru a reporni sistemul.





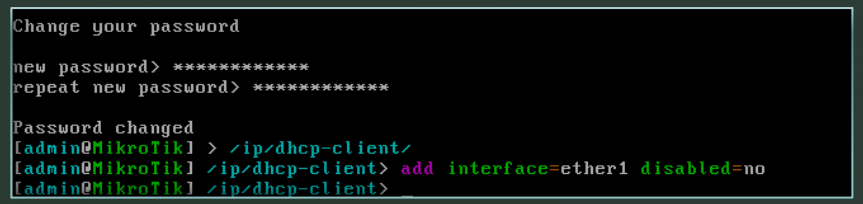
RouterOS VM Setup

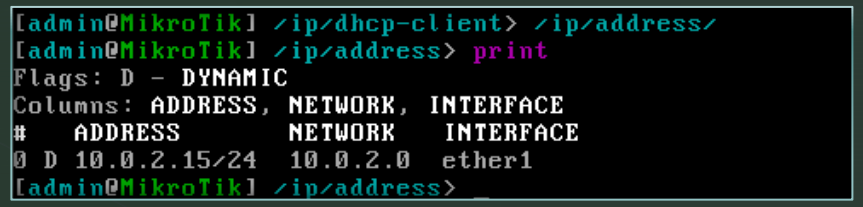
- Dupa reboot suntem prezentati cu interfata de login in care initial vom folosi username: “admin” si fara parola.
- Apoi introducem nua parola.



RouterOS VM Setup

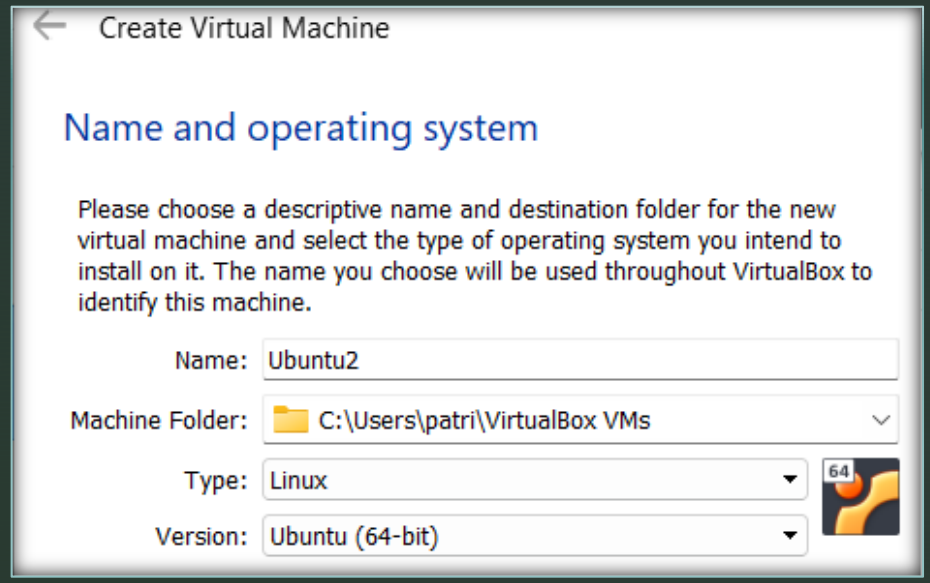
- Acum trebuie sa luam setari dhcp pe prima interfarta (WAN) folosind comanda “/ip/dhcp-client/add interface=ether1 disabled=no”
- Dupa care verificam cu comanda “/ip/address/print” si vedeam alocarea unui IP pe interfata ether1

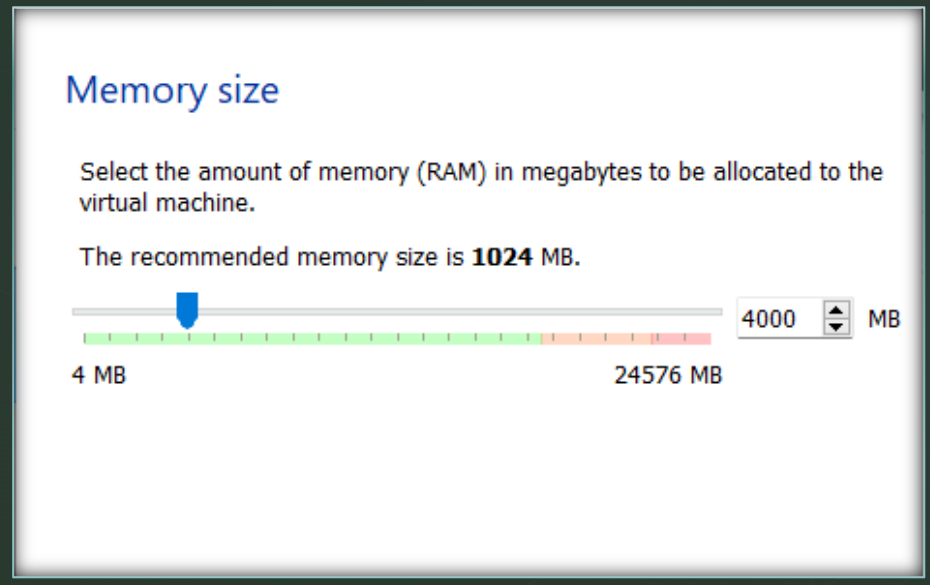




Linux VM Setup

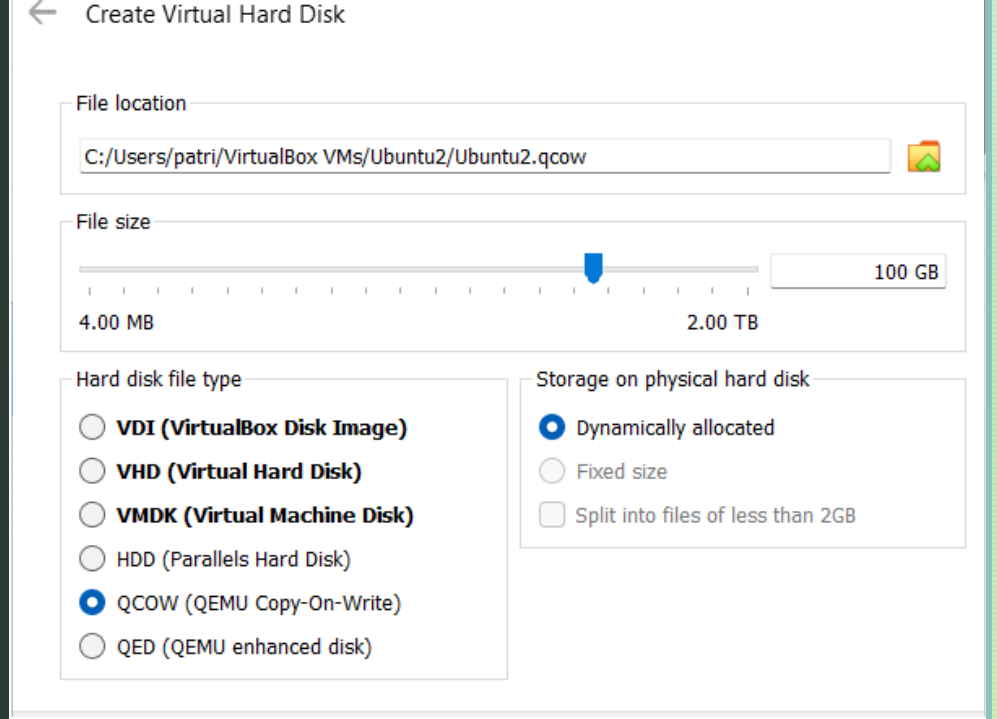
- Pentru celalat VM am ales o distributie mai populara de linux numita Ubuntu care poate fi desktop sau server.
- Ca in cazul primului VM facem un nou setup si alocam resurse

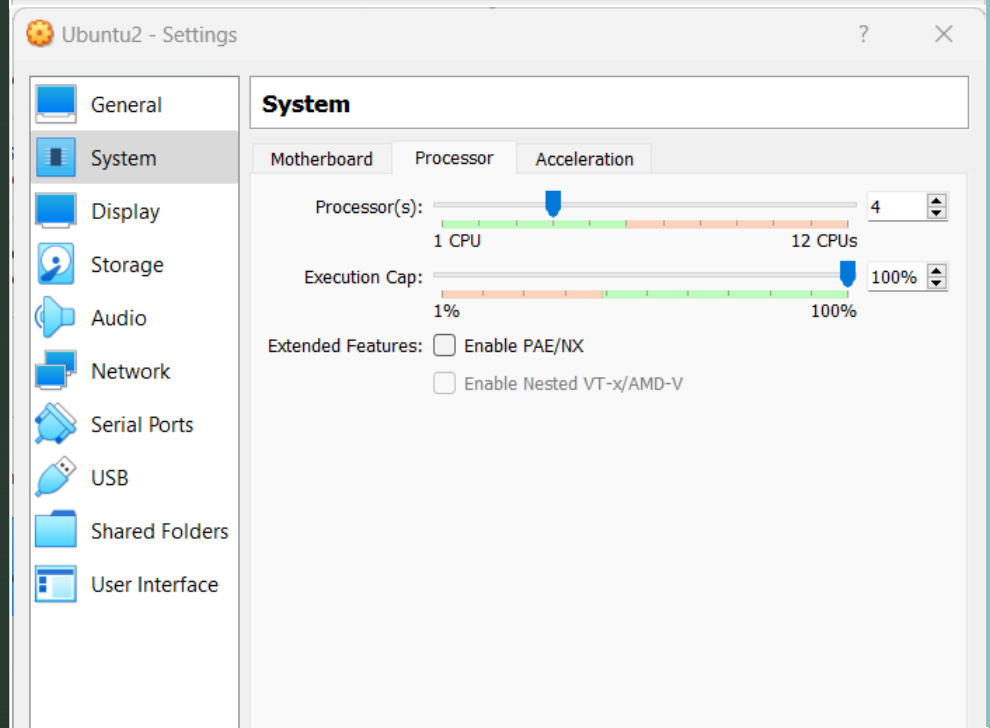




Linux VM Setup

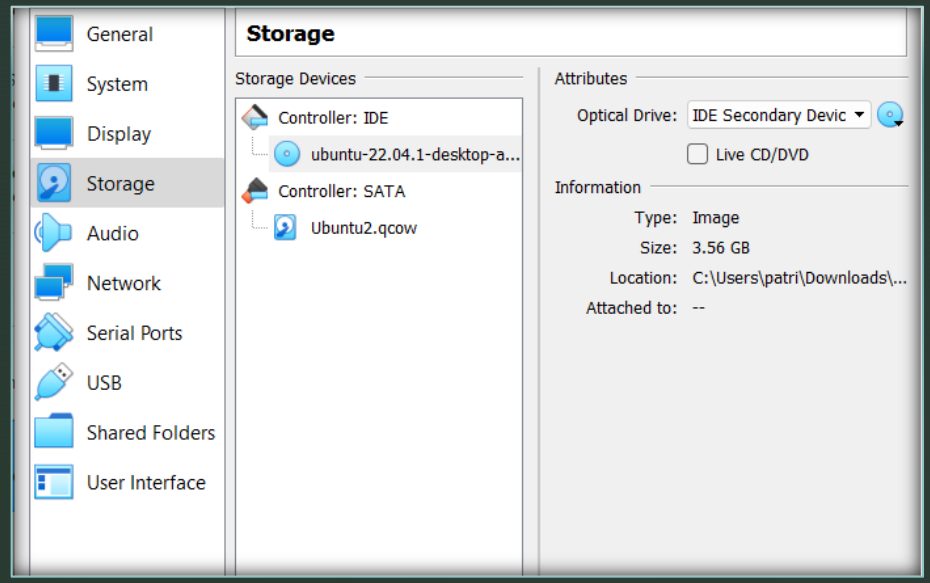
- Facem un disk de ~100GB (este optional pasul de aici in forma avansata folosind imagine QCOW se poate face la fel ca in setup-ul de RouterOS)
- Dupa ce se face VM-ul intram in seatrile acestuia si editam urmatoarele configuratii:
- - System -> Processor si alocam minim doua procesoare

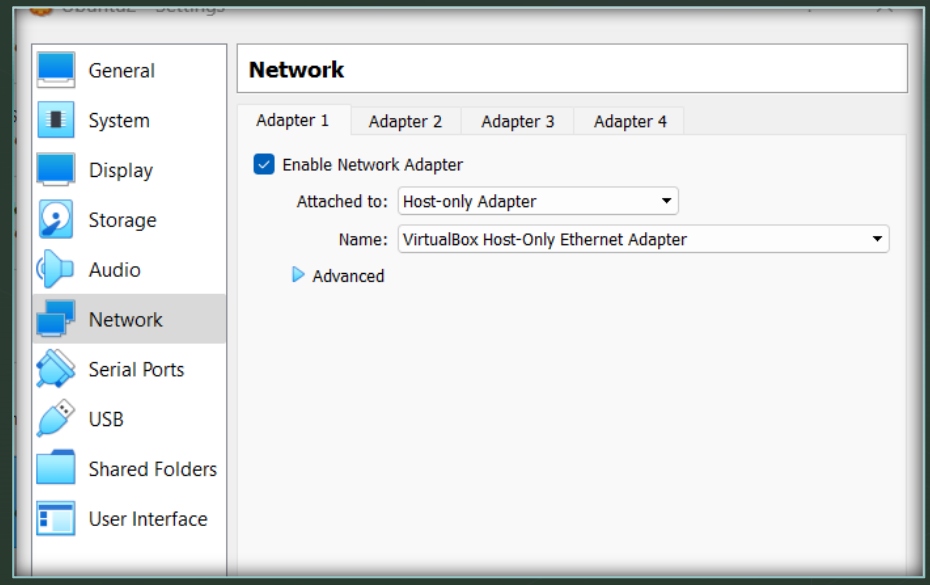




Linux VM Setup

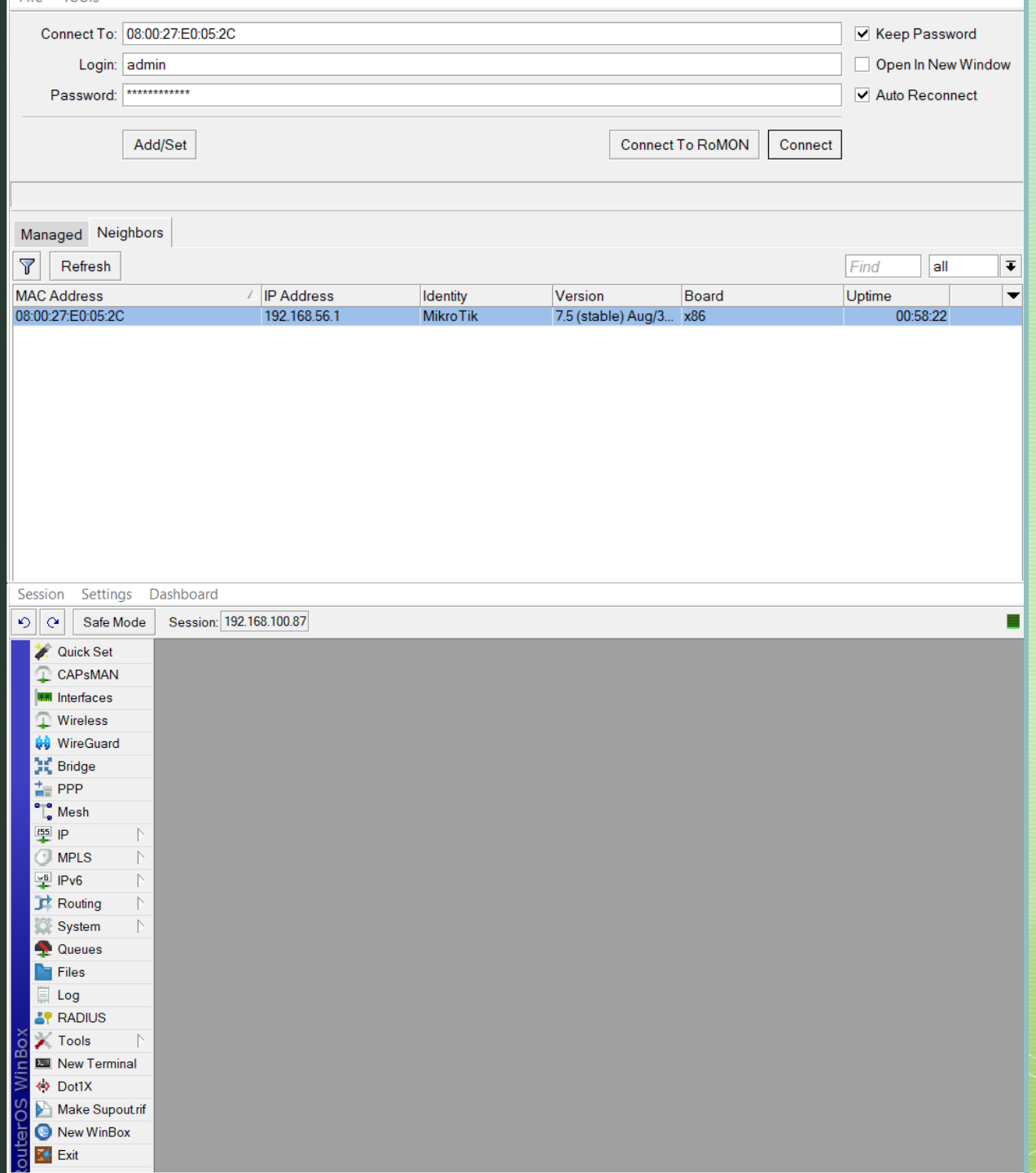
- La storage selectam ISO-ul de Ubuntu descarcat.
- Iar in Netowrk setam primul adaptor in Host-only Adapter si alegem interfata facuta la inceput.
- Dupa care putem porni VM-ul si incepe instalarea.





LAN Setup

- Dupa instalarea standard al distributiei putem sa deschidem winbox pe care il descarcam de pe site-ul MikroTik.
- Si putem vedea routerul si loga in acesta folosind userul admin si parola stabilita.
- In cazul in care nu ne putem conecta prin NAT putem sa trecem intefata in modul bridge.



LAN Setup

Intrand in Quick Set vom face setup-ul pentru reteaua locala (LAN)

Unde setam adresa ip a interfetei (192.168.30.1)

Netmask (/24)

Activam DHCP Server

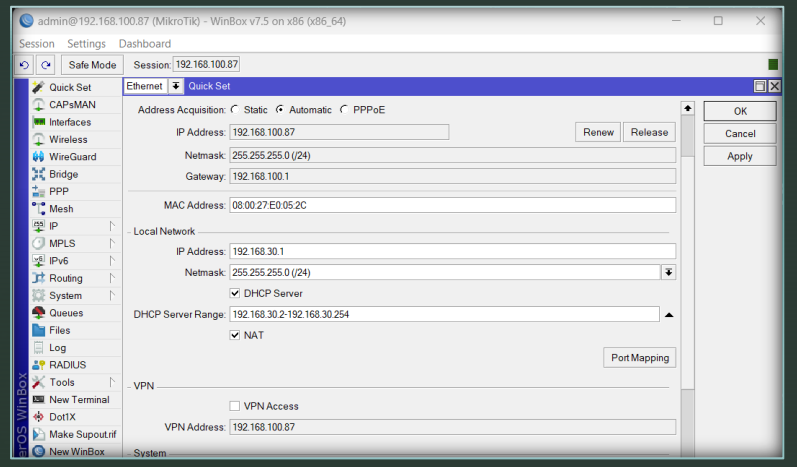
Setam DHCP Server Range (192.168.30.2-192.168.30.254)

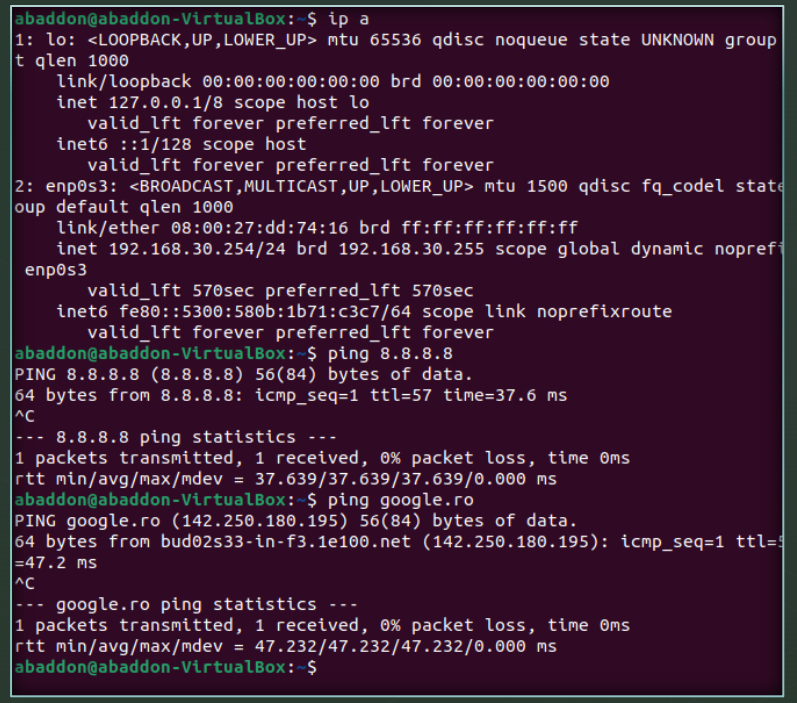
Si activam optiunea de NAT

Dupa care puteam da Apply

In masina de Ubuntu putem rula comanda “ip a” pentru a vedea daca avem asignata o adresa ip.

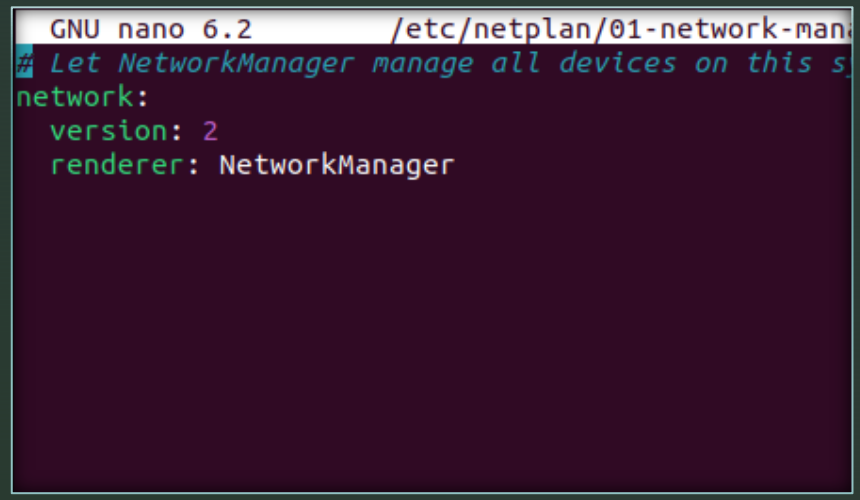
Comanda “ping 8.8.8.8” si “ping google.ro” pentru a vedea ca avem access la internet.

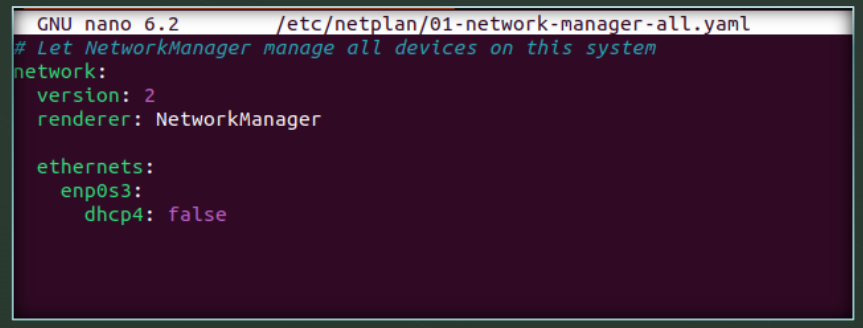




Crearea bridge-ului in Ubuntu

- Intram in terminal si trecem ca utilizator root folosind comanda “sudo su”
- Dupa care editam fisierul cu comanda “nano /home/abaddon# nano /etc/netplan/01-network-manager-all.yaml”
- Atentie! Fisierul de tip yam trebuie formatat cu identari corect.
- Primul pas fiind sa trecem interfata fara dhcp pentru ca aceasta functie va fi luata de bridge-ul pe care il vom face.





Crearea bridge-ului in Ubuntu

- Putem testa dupa salvarea fisierului configul cu comanda “netplan try” si verificam ca intrefata nu mai are asignat un ip cu comanda “ip addr show <interface>”
- Dupa care adaugam interfata de bridge cu slave enp0s3 in cazul meu si cu dhcp activat.
- Testam cu comenzile “ping” si “ip” cum am facut mai devreme sa verificam conectivitatea.

```
abaddon@abaddon-VirtualBox:~$ ip addr show enp0s3
2: enp0s3: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP g
roup default qlen 1000
    link/ether 08:00:27:dd:74:16 brd ff:ff:ff:ff:ff:ff
    inet 169.254.1.60/16 brd 169.254.255.255 scope link noprefixroute enp0s3
       valid_lft forever preferred_lft forever
    inet6 fe80::a00:27ff:fedd:7416/64 scope link
       valid_lft forever preferred_lft forever
```

```
  GNU nano 6.2
# Let NetworkManager manage all devices on this system
network:
  version: 2
  renderer: NetworkManager
# adaugam interfata in netplan pentru a modifica setarile acesteia
  ethernets:
    enp0s3:
      dhcp4: no
# facem o interfata de tip bridge si asignam ca slave enp0s3
  bridges:
    br0:
      dhcp4: yes
      interfaces:
        - enp0s3
```

```
root@abaddon-VirtualBox:/home/abaddon# 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=114 time=72.1 ms
64 bytes from 8.8.8.8: icmp_seq=2 ttl=114 time=75.7 ms
^C
--- 8.8.8.8 ping statistics ---
2 packets transmitted, 2 received, 0% packet loss, time 1009ms
rtt min/avg/max/mdev = 72.087/73.912/75.737/1.825 ms
root@abaddon-VirtualBox:/home/abaddon#
```

Instalare LXC/LXD

- Instalarea in ubuntu verisunile noi care foloses snap se va insatala lxd din snap cu comanda “snap install lxd”
- Dupa care trebuie sa facem initializarea lxd-ului cu comanda “lxd init” cu setarile din imaginea alaturata singura modificare din setup-ul default este acea de create bridge no on loc de yes si sa foloseasca un bridge existent yes in loc de no, apoi setarea br0 la host interface

```
root@abaddon-VirtualBox:/home/abaddon# snap install lxd
lxd 5.6-794016a from Canonical✓ installed
```

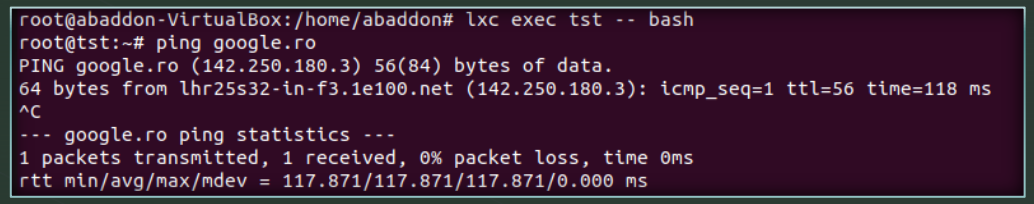
```
root@abaddon-VirtualBox:/home/abaddon# lxd init
Would you like to use LXD clustering? (yes/no) [default=no]: no
Do you want to configure a new storage pool? (yes/no) [default=yes]: yes
Name of the new storage pool [default=default]: default
Name of the storage backend to use (lvm, zfs, btrfs, ceph, cephobject, dir) [default=zfs]: zfs
Would you like to create a new zfs dataset under rpool/lxd? (yes/no) [default=yes]: yes
Would you like to connect to a MAAS server? (yes/no) [default=no]: no
Would you like to create a new local network bridge? (yes/no) [default=yes]: no
Would you like to configure LXD to use an existing bridge or host interface? (yes/no) [default=no]: yes
Name of the existing bridge or host interface: br0
Would you like the LXD server to be available over the network? (yes/no) [default=no]: no
Would you like stale cached images to be updated automatically? (yes/no) [default=yes]:
Would you like a YAML "lxd init" preseed to be printed? (yes/no) [default=no]: no
```

Instalare LXC/LXD

- Pentru a putea access un container folosim comanda

“lxc exec <container_name> -- bash”

- si verificam conectivitatea in interiorul acestuia.



Instalare LXC/LXD

- Pornim un container de test cu comanda “lxc launch ubuntu test”
- Dupa care putem verifica cu comadna “lxc list” ca ruleaza containerul si are asignata o adresa ip de la router.

```
root@abaddon-VirtualBox:/home/abaddon# lxc launch ubuntu tst
Creating tst
The local image 'ubuntu' couldn't be found, trying 'ubuntu:' instead.
Retrieving image: rootfs: 12% (334.86kB/s)
Retrieving image: rootfs: 31% (288.18kB/s)
Starting tst
root@abaddon-VirtualBox:/home/abaddon#
```

```
root@abaddon-VirtualBox:/home/abaddon# lxc list
+------+---------+----------------------+------+-----------+-----------+
| NAME |  STATE  |         IPV4         | IPV6 |   TYPE    | SNAPSHOTS |
+------+---------+----------------------+------+-----------+-----------+
| tst  | RUNNING | 192.168.88.253 (eth0) |      | CONTAINER | 0         |
+------+---------+----------------------+------+-----------+-----------+
```