Nama : Teddy Adi Kusuma

Nim : 20210801149

Teknik Informatika

IP Address Kelas A- D

IP address adalah alamat unik yang digunakan untuk mengidentifikasi perangkat dalam jaringan. Berdasarkan standar IPv4, IP address dibagi ke dalam beberapa **kelas** untuk mendukung berbagai ukuran jaringan dan kebutuhan pengguna.

---

1. Kelas A

- **Range IP**: 1.0.0.0 hingga 126.255.255.255
- **Subnet Mask Default**: 255.0.0.0 (/8)
- **Jumlah Jaringan**: 128 (1 hingga 126, karena 0 dan 127 memiliki penggunaan khusus)
- **Jumlah Host Per Jaringan**: 224−2=16.777.214 (mengurangi 2 untuk alamat network dan broadcast)

  $$224 - 2 = 16.777.2142^{24} - 2 = 16.777.214$$

- **Tujuan**: Digunakan untuk jaringan besar dengan banyak perangkat, seperti perusahaan besar, organisasi pemerintah, dan ISP.

Karakteristik:

- Bit pertama dari oktet pertama selalu **0** (0xxxxxxx dalam biner).
- Contoh IP Address: 10.0.0.1 (network 10.0.0.0).

Penggunaan:

- **10.0.0.0/8** adalah alamat **private** untuk penggunaan internal jaringan.

---

2. Kelas B

- **Range IP**: 128.0.0.0 hingga 191.255.255.255
- **Subnet Mask Default**: 255.255.0.0 (/16)
- **Jumlah Jaringan**: 214=16.384

  $$214 = 16.3842^{14} = 16.384$$

- **Jumlah Host Per Jaringan**: 216−2=65.534

  $$216 - 2 = 65.5342^{16} - 2 = 65.534$$

- **Tujuan**: Dirancang untuk jaringan menengah hingga besar, seperti universitas, organisasi skala menengah, dan perusahaan.

Karakteristik:

- Dua bit pertama dari oktet pertama selalu **10** (10xxxxxx dalam biner).
- Contoh IP Address: 172.16.0.1 (network 172.16.0.0).

Penggunaan:

- **172.16.0.0/12** adalah alamat **private** untuk penggunaan internal jaringan.

---

3. Kelas C

- **Range IP**: 192.0.0.0 hingga 223.255.255.255
- **Subnet Mask Default**: 255.255.255.0 (/24)
- **Jumlah Jaringan**: 221=2.097.152

$$221 = 2.097.1522^{21} = 2.097.152$$

- **Jumlah Host Per Jaringan**: 28−2=254

$$28 - 2 = 2542^{8} - 2 = 254$$

- **Tujuan**: Digunakan untuk jaringan kecil seperti kantor, sekolah, atau jaringan rumah.

Karakteristik:

- Tiga bit pertama dari oktet pertama selalu **110** (110xxxxx dalam biner).
- Contoh IP Address: 192.168.0.1 (network 192.168.0.0).

Penggunaan:

- **192.168.0.0/16** adalah alamat **private** untuk penggunaan internal jaringan.

---

4. Kelas D

- **Range IP**: 224.0.0.0 hingga 239.255.255.255
- **Subnet Mask Default**: Tidak ada (tidak digunakan untuk subnetting).
- **Jumlah Jaringan dan Host**: Tidak relevan.
- **Tujuan**: Digunakan untuk **multicasting**, pengiriman data ke grup perangkat tertentu dalam jaringan.

Subnet Mask

/24 (255.255.255.0):

- Paling umum digunakan dalam jaringan lokal (LAN).
- Mendukung 254 host per jaringan.
- cocok untuk jaringan lokal.

	Hosts	Netmask	Amount of a Class C
/30	4	255.255.255.252	1/64
/29	8	255.255.255.248	1/32
/28	16	255.255.255.240	1/16
/27	32	255.255.255.224	1/8
/26	64	255.255.255.192	1/4
/25	128	255.255.255.128	1/2
/24	256	255.255.255.0	1
/23	512	255.255.254.0	2
/22	1024	255.255.252.0	4
/21	2048	255.255.248.0	8
/20	4096	255.255.240.0	16
/19	8192	255.255.224.0	32
/18	16384	255.255.192.0	64
/17	32768	255.255.128.0	128
/16	65536	255.255.0.0	256

Topologi

topologi jaringan adalah konfigurasi fisik atau logis dari perangkat jaringan yang saling terhubung. Topologi mempengaruhi efisiensi, skalabilitas, dan kinerja jaringan. Berikut adalah topologi yang digunakan dalam jaringan komputer, termasuk konfigurasi fisik dan logis:

Topologi Fisik

Topologi fisik menggambarkan cara perangkat (node) dalam jaringan dihubungkan secara fisik.

Topologi Bus

- **Deskripsi**:
    - Semua perangkat terhubung ke satu kabel utama (bus) sebagai saluran komunikasi.
- **Kelebihan**:
    - Mudah diimplementasikan dan hemat kabel.
    - Biaya murah untuk jaringan kecil.
- **Kekurangan**:
    - Jika kabel utama rusak, seluruh jaringan gagal.
    - Tidak cocok untuk jaringan besar karena rentan terhadap tabrakan data.
- **Penggunaan**:
    - Jaringan kecil seperti laboratorium komputer.

Port

1. **Port Keamanan**:
    - **22 (SSH)**: Untuk akses aman ke server atau perangkat jarak jauh.
    - **443 (HTTPS)**: Untuk komunikasi web yang aman menggunakan enkripsi SSL/TLS.
    - **636 (LDAPS)**: Untuk akses aman ke layanan direktori seperti Active Directory.
2. **Port Jaringan dan Infrastruktur**:
    - **53 (DNS)**: Resolusi nama domain untuk akses web.
    - **67/68 (DHCP)**: Alokasi alamat IP dinamis untuk perangkat di jaringan.
    - **161/162 (SNMP)**: Monitoring perangkat jaringan.
3. **Port untuk Transfer File**:
    - **20/21 (FTP)**: Transfer file antar perangkat (tidak aman).
    - **22 (SCP/SFTP)**: Transfer file aman melalui SSH.
    - **69 (TFTP)**: Transfer file sederhana tanpa otentikasi.
4. **Port untuk Aplikasi dan Database**:
    - **3306 (MySQL)**: Koneksi ke database MySQL.
    - **5432 (PostgreSQL)**: Koneksi ke database PostgreSQL.
    - **27017 (MongoDB)**: Koneksi ke database MongoDB.
5. **Port untuk Remote Access**:

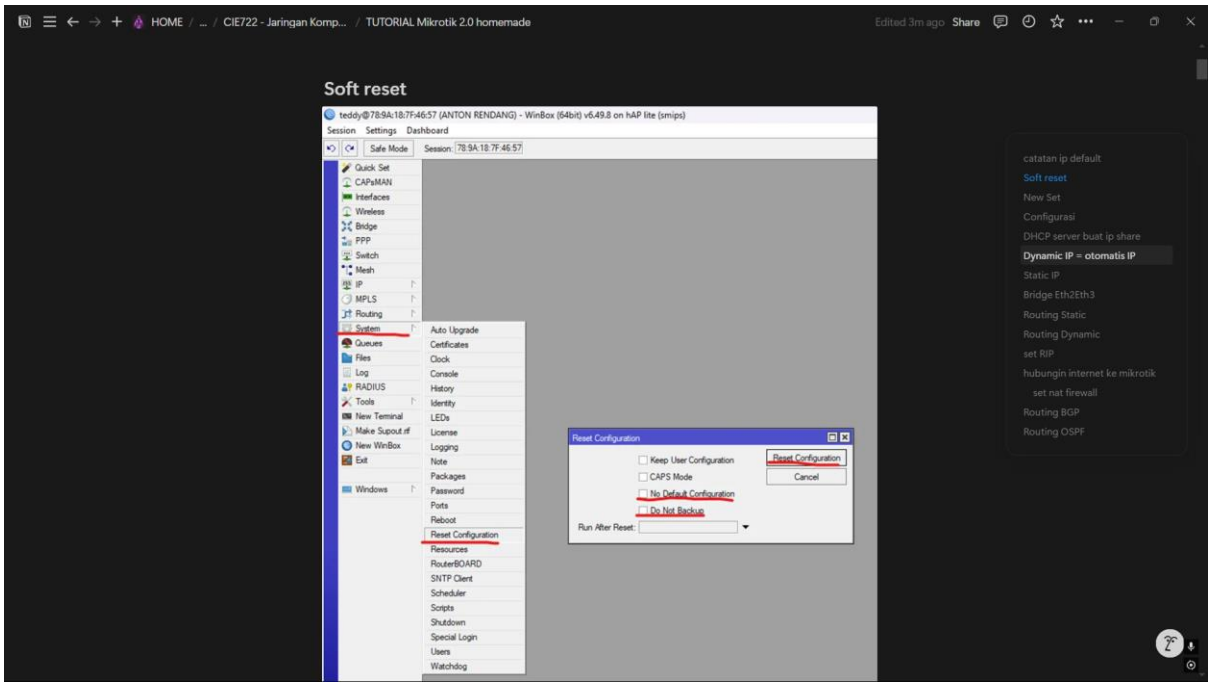
- **23 (Telnet)**: Akses jarak jauh (tidak aman).
- **3389 (RDP)**: Remote desktop untuk Windows.
- **22 (SSH)**: Remote shell yang aman.

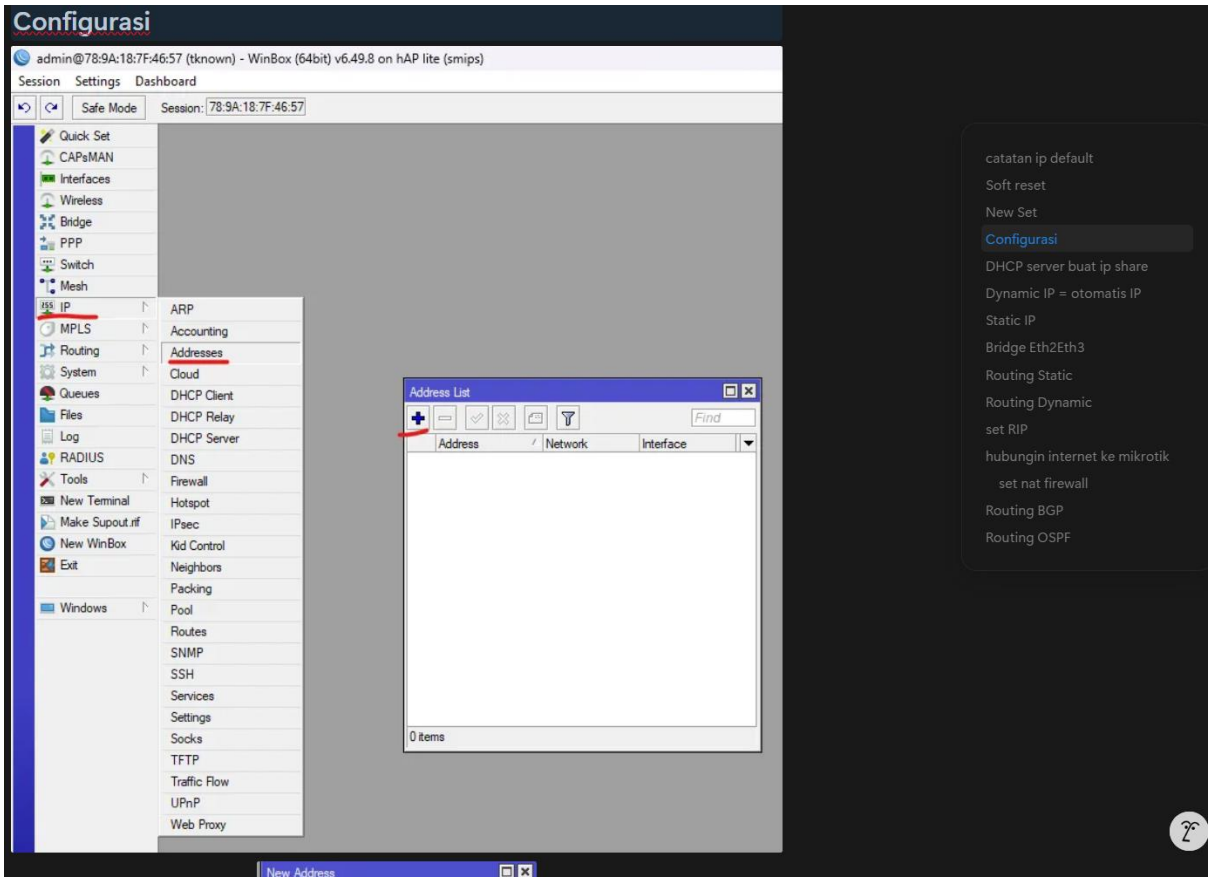
Praktek

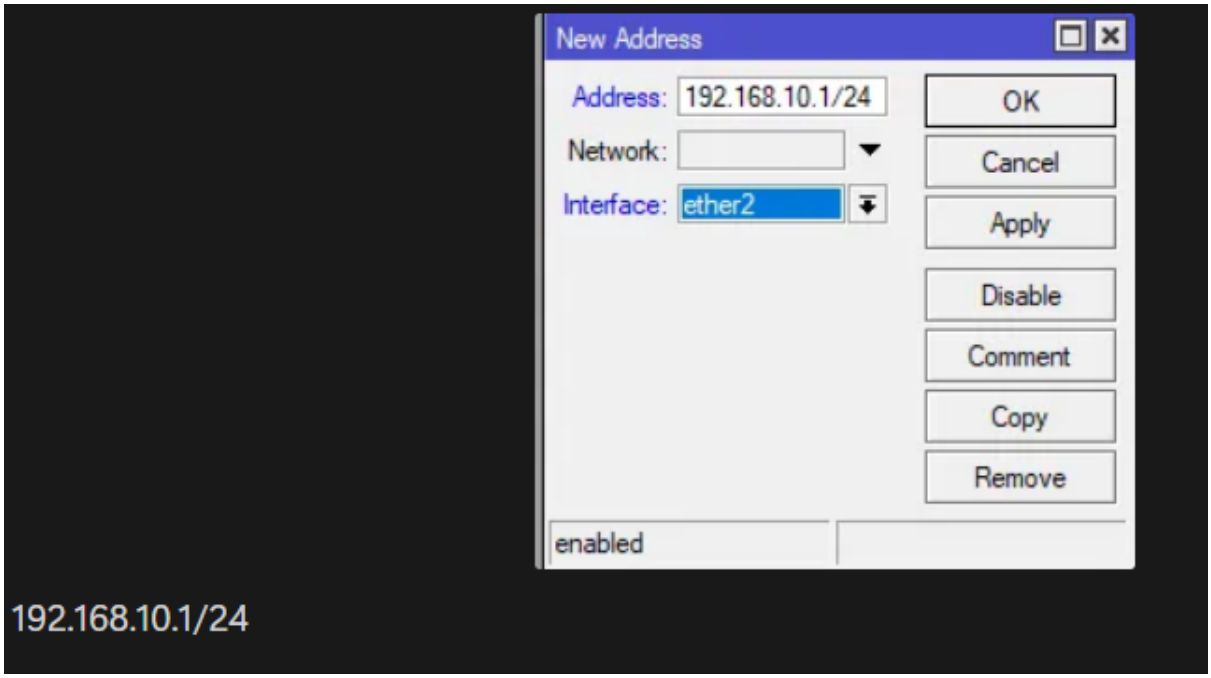
Set soft reset sampai OSFP

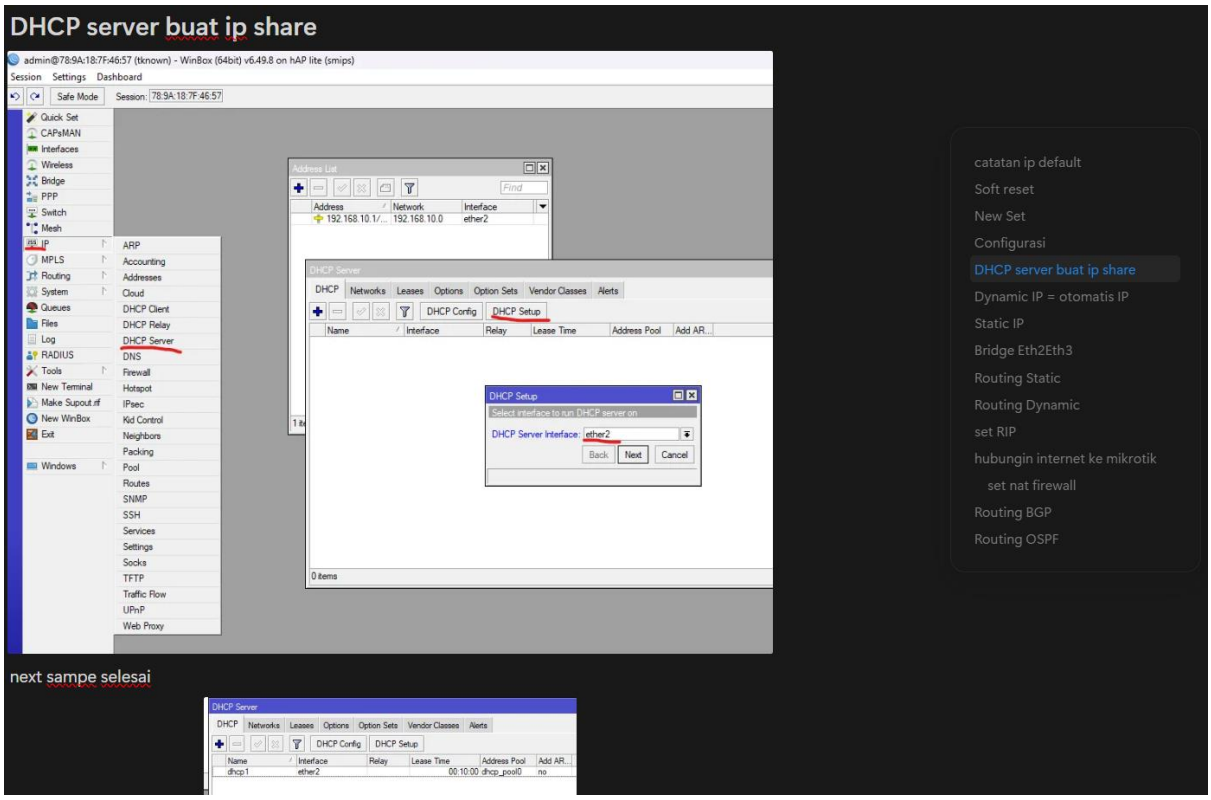
Dari catatan yang ada di aplikasi notion saya

https://noisy-scallion-c56.notion.site/TUTORIAL-Mikrotik-2-0-homemade-132d7aa336dd8024957ffc17c1d8f6c8?pvs=4

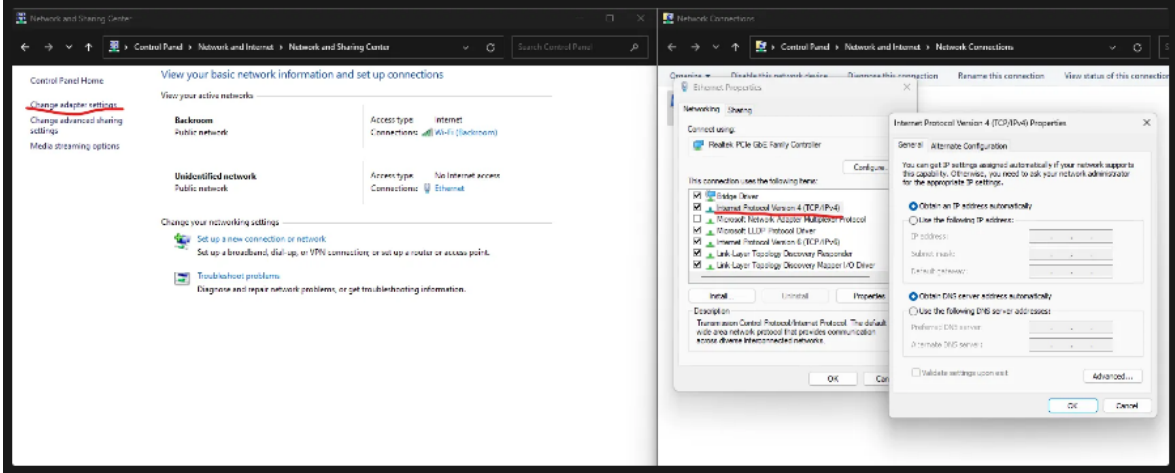




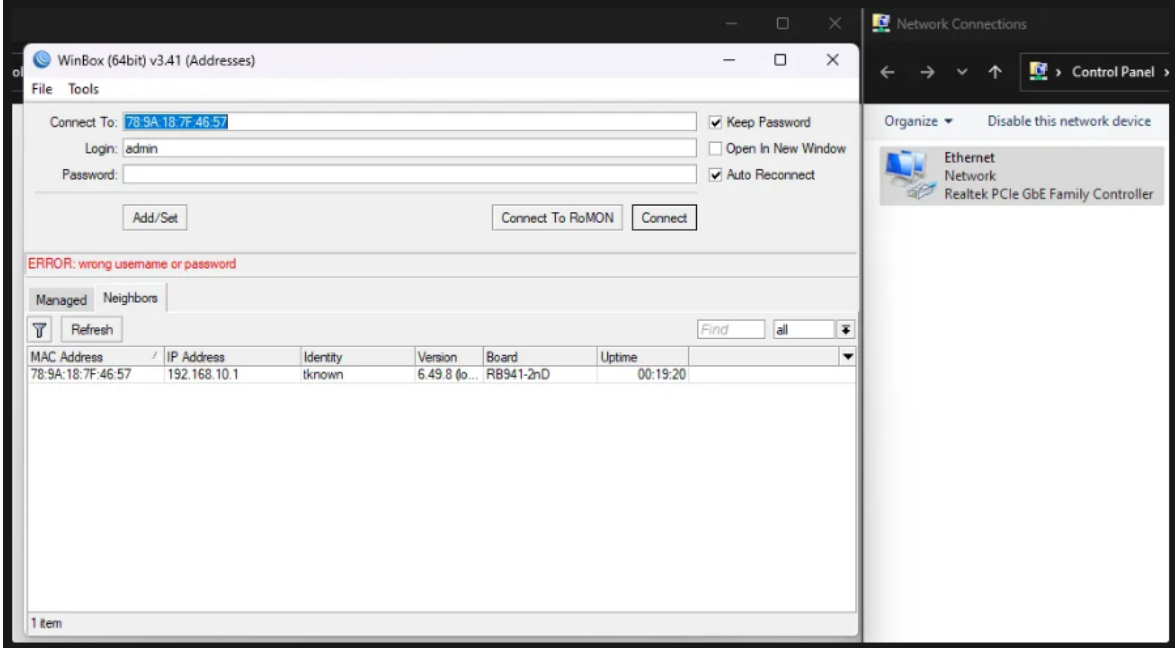

New Address
Address: 192.168.10.1/24
Network:
Interface: ether2
OK
Cancel
Apply
Disable
Comment
Copy
Remove
enabled
192.168.10.1/24


DHCP server buat ip share
admin@78:9A:18:7F:46:57 (tknown) - WinBox (64bit) v6.49.8 on hAP lite (smips)
Session Settings Dashboard
Safe Mode
Session: 78:9A:18:7F:46:57
Quick Set
CAPsMAN
Interfaces
Wireless
Bridge
PPP
Switch
Mesh
IP
MPLS
Routing
System
Queues
Files
Log
RADIUS
Tools
New Terminal
Make Supout.rif
New WinBox
Exit
Windows
ARP
Accounting
Addresses
Cloud
DHCP Client
DHCP Relay
DHCP Server
DNS
Firewall
Hotspot
IPsec
Kid Control
Neighbors
Packing
Pool
Routes
SNMP
SSH
Services
Settings
Socks
TFTP
Traffic Flow
UPnP
Web Proxy
Address List
Address
Network
Interface
192.168.10.1/...
192.168.10.0
ether2
DHCP Server
DHCP
Networks
Leases
Options
Option Sets
Vendor Classes
Alerts
DHCP Config
DHCP Setup
Name
Interface
Relay
Lease Time
Address Pool
Add AR...
0 items
DHCP Setup
Select interface to run DHCP server on
DHCP Server Interface: ether2
Back
Next
Cancel
catatan ip default
Soft reset
New Set
Configurasi
DHCP server buat ip share
Dynamic IP = otomatis IP
Static IP
Bridge Eth2Eth3
Routing Static
Routing Dynamic
set RIP
hubungin internet ke mikrotik
set nat firewall
Routing BGP
Routing OSPF
next sampe selesai
DHCP Server
DHCP
Networks
Leases
Options
Option Sets
Vendor Classes
Alerts
DHCP Config
DHCP Setup
Name
Interface
Relay
Lease Time
Address Pool
Add AR...
dhcp1
ether2
00:10:00
dhcp_pool0
no

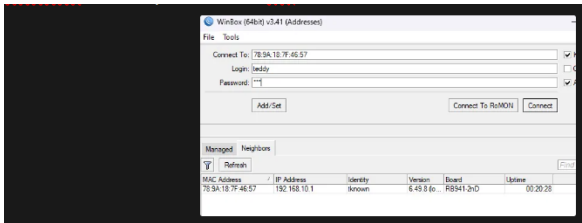
Dynamic IP = otomatis IP



disable enable ethernet



masukkan user dan pass new user tadi

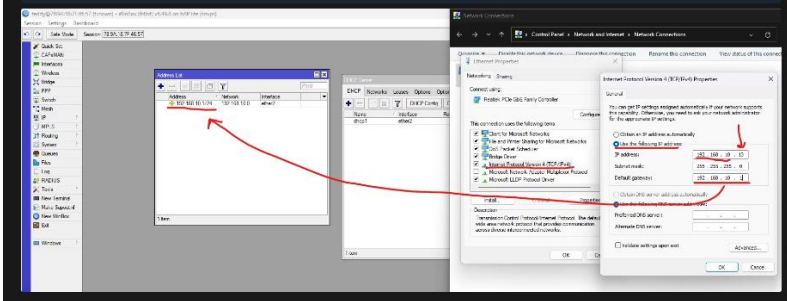


buka cmd

ipconfig

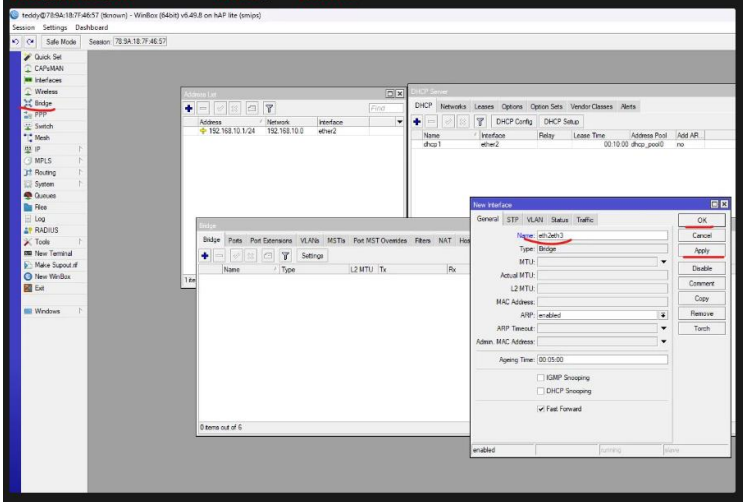
```
Windows IP Configuration


Wireless LAN adapter Local Area Connection* 1:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Wireless LAN adapter Local Area Connection* 2:

   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :

Ethernet adapter Ethernet:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::7356:d053:c884:becd%9
   IPv4 Address. . . . . . . . . . . : 192.168.10.254
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 192.168.10.1

Wireless LAN adapter Wi-Fi:

   Connection-specific DNS Suffix  . :
   Link-local IPv6 Address . . . . . : fe80::8aad:efbf:734:4ce9%18
   IPv4 Address. . . . . . . . . . . : 192.168.18.55
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Default Gateway . . . . . . . . . : 192.168.18.1
PS C:\Users\t3ddy>
```

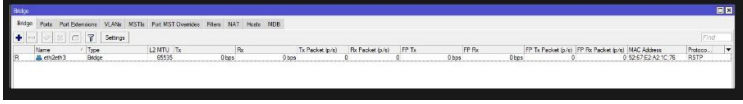

Static IP



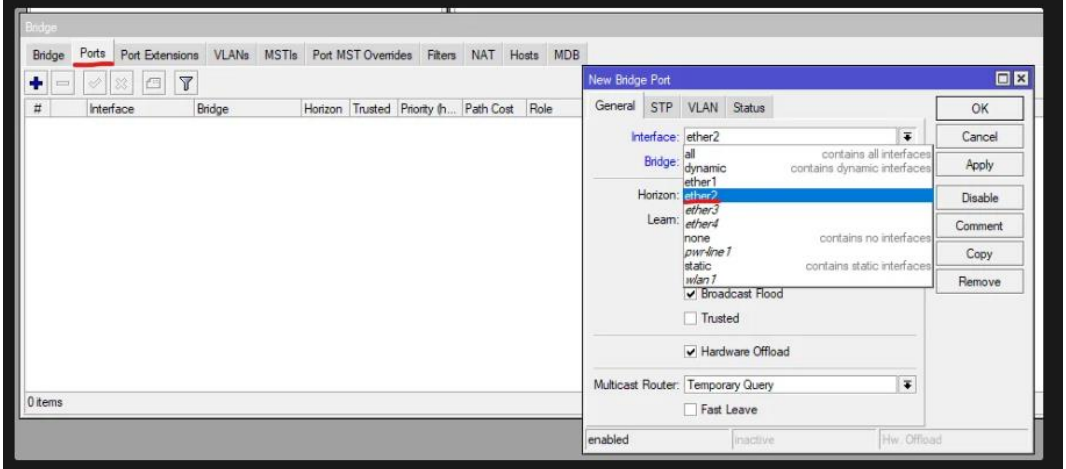
Bridge Eth2Eth3

menggabungkan 2 ethernet sesuai port mikrotik

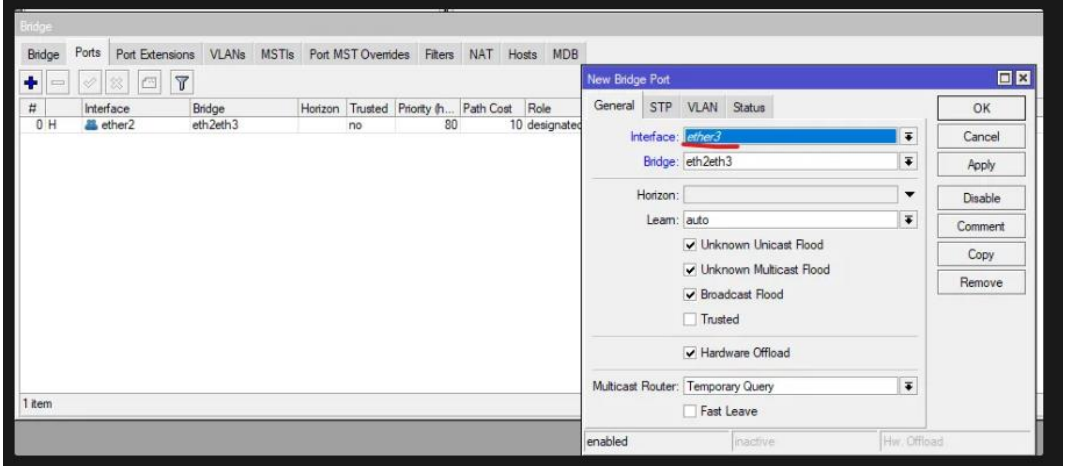




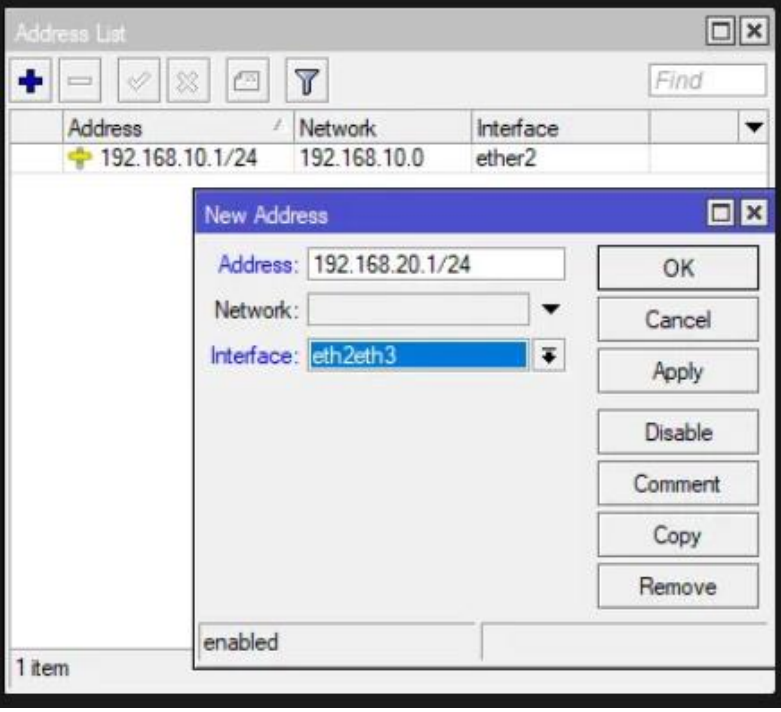
SET ETHER 2



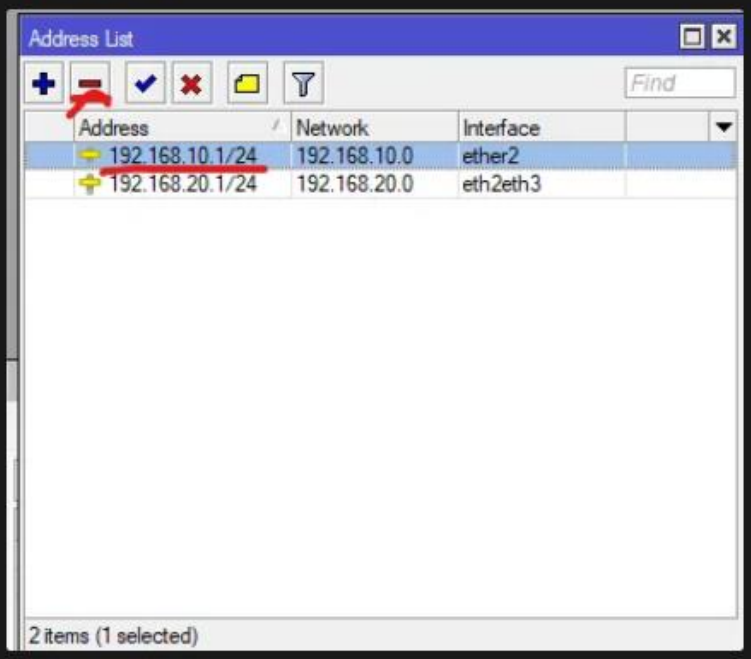
SET ETHER 3

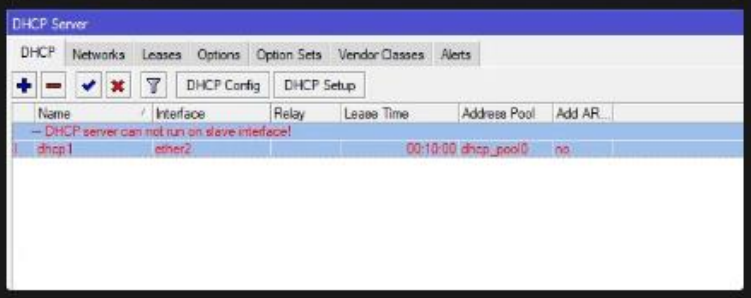


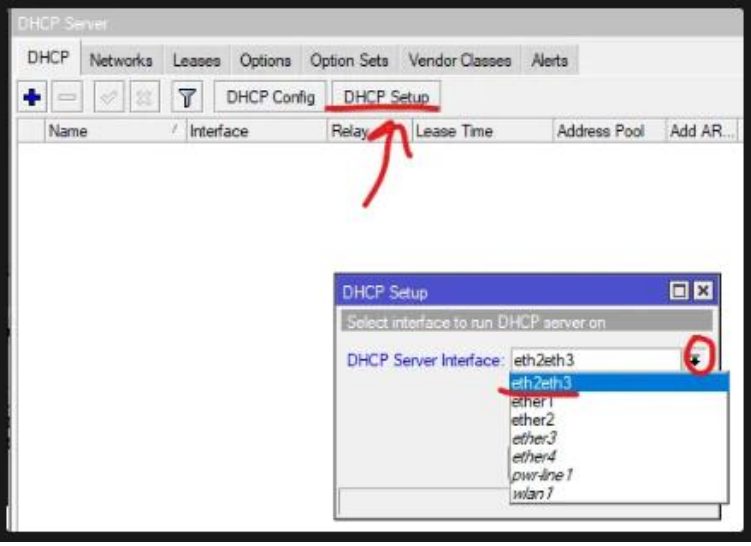
SET IP BRIDGE



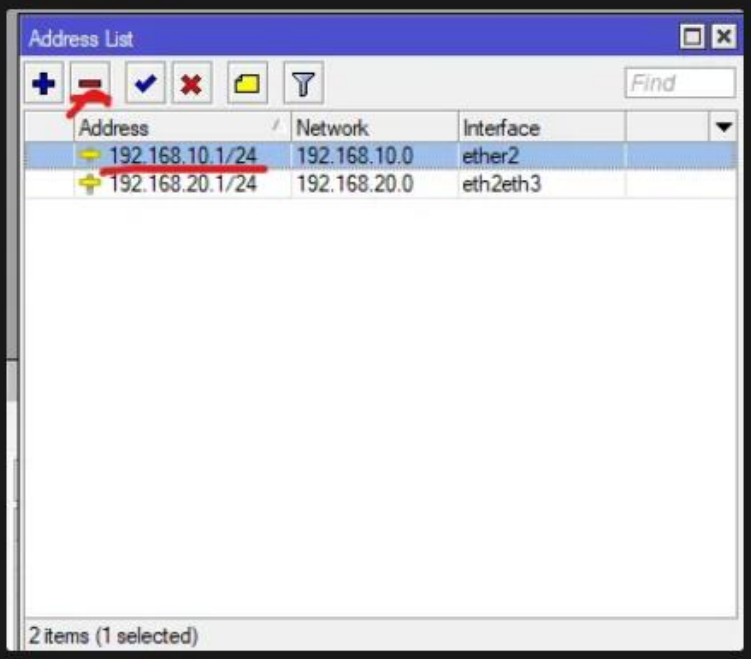
DELETE IP LAMA & DHCP SERVER LAMA

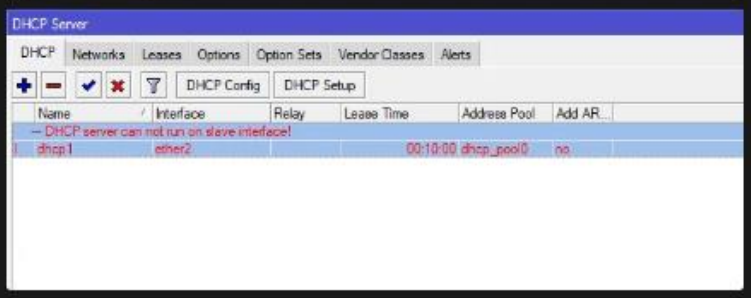


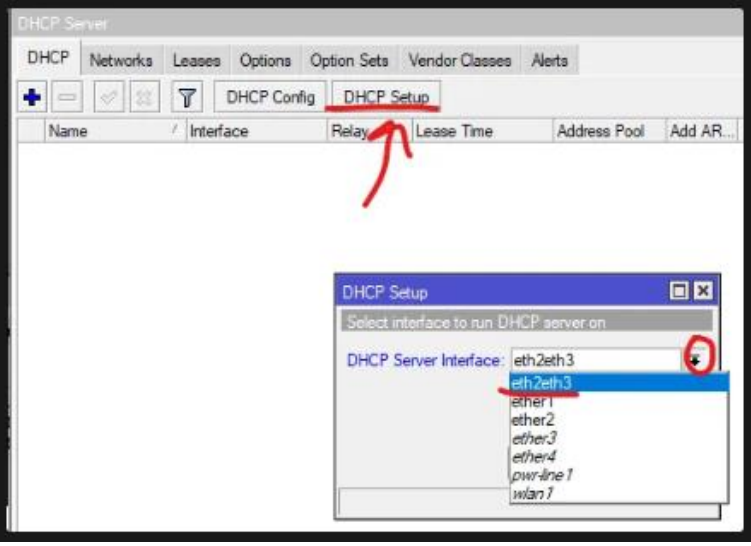




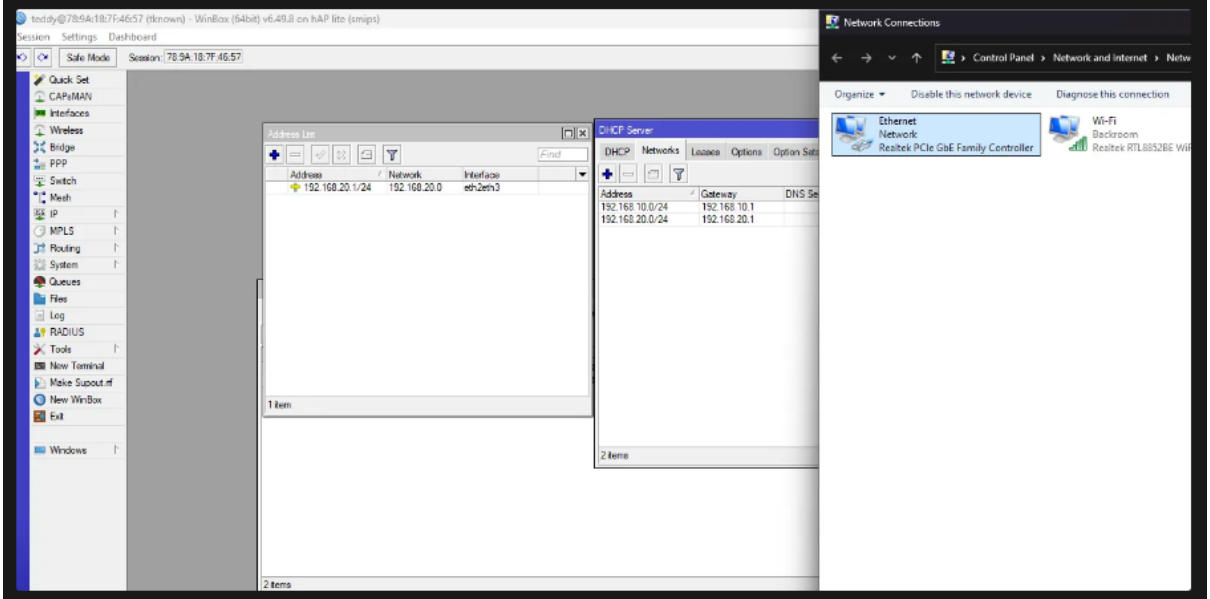
DELETE IP LAMA & DHCP SERVER LAMA



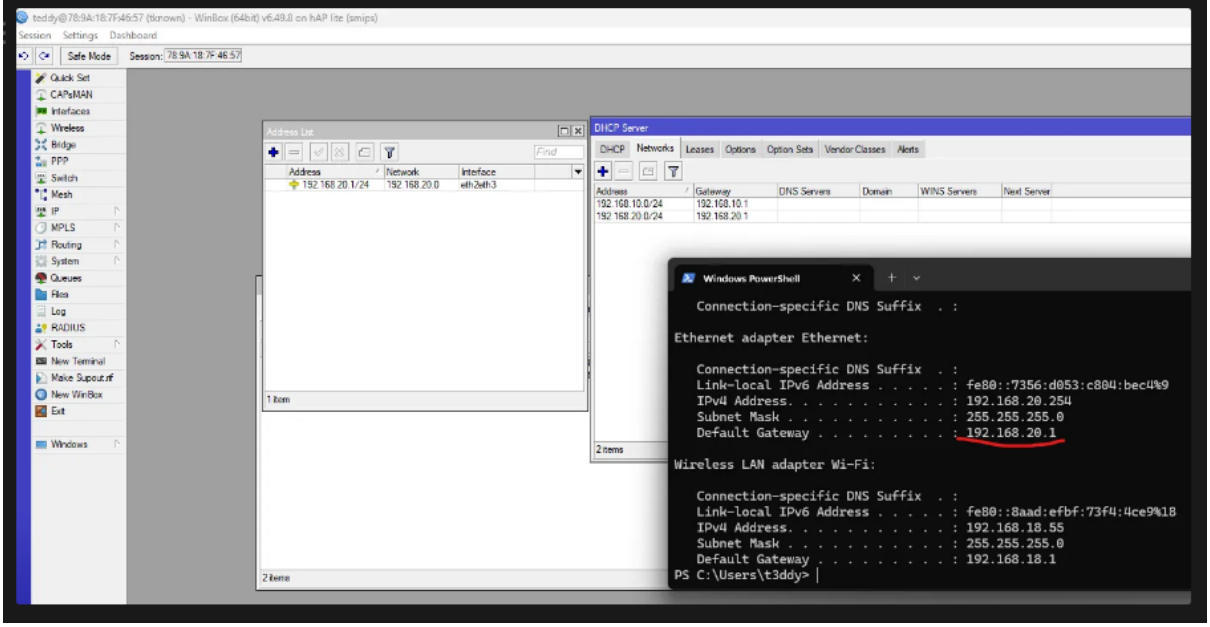


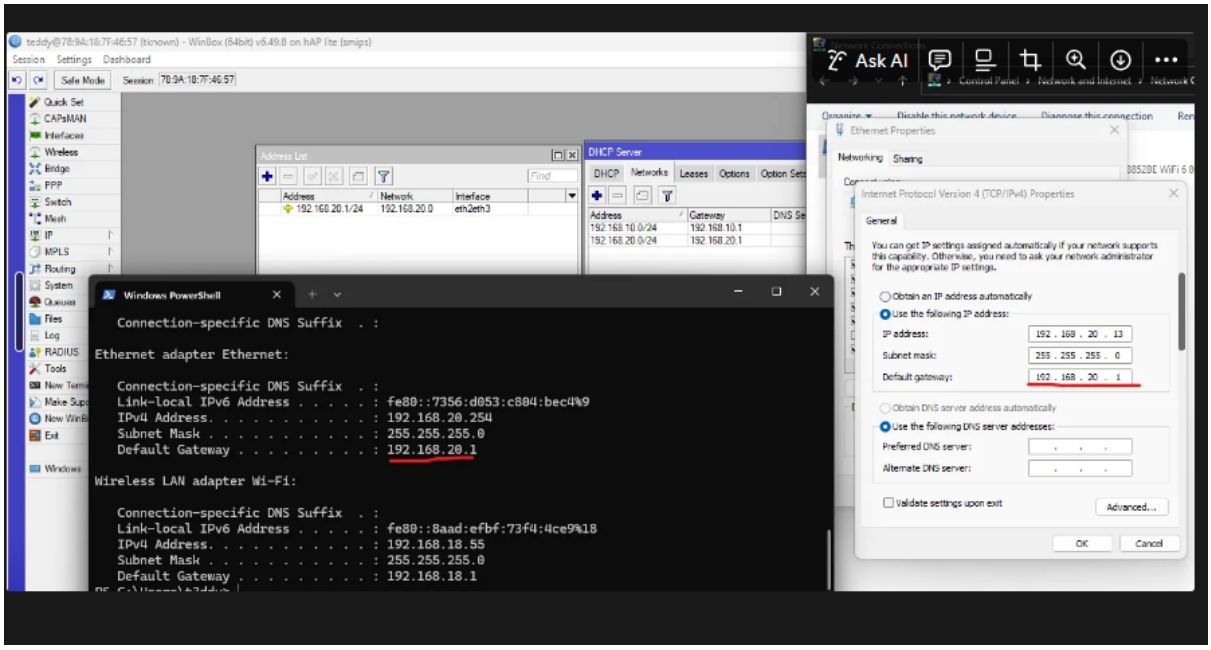


DISABLE ENABLE ETHER



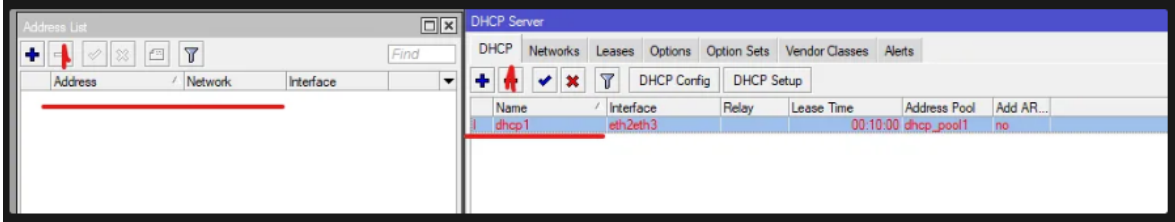
ipconfig

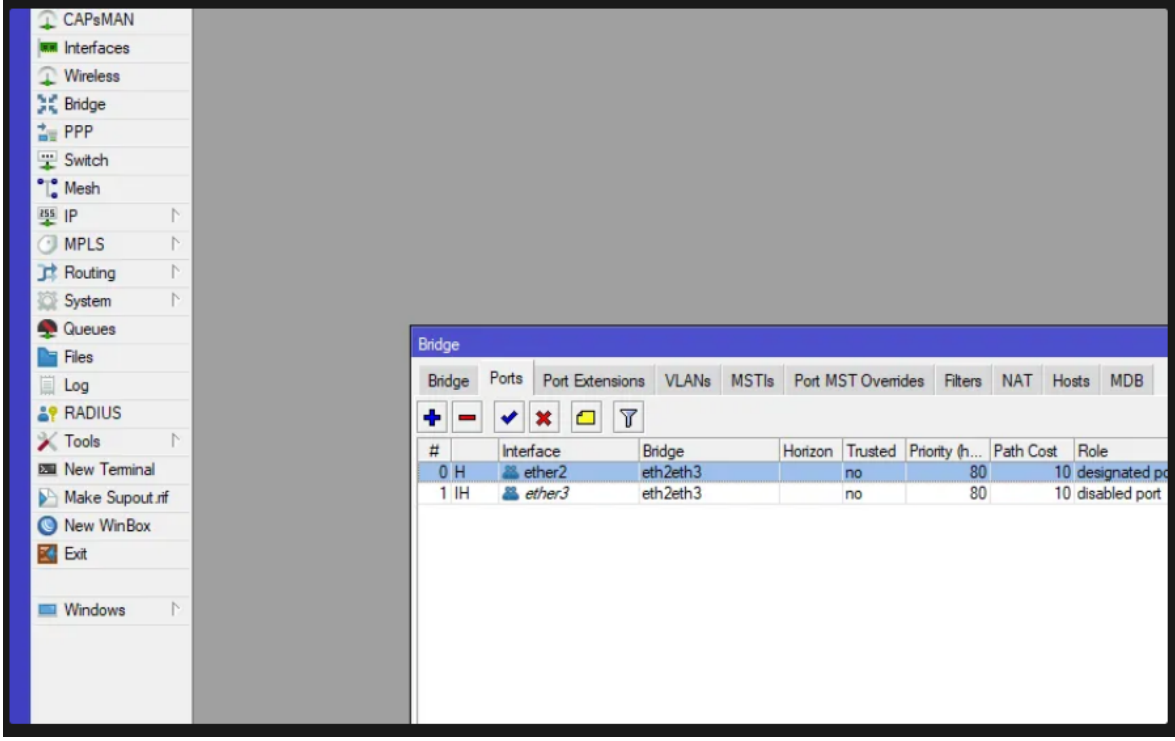


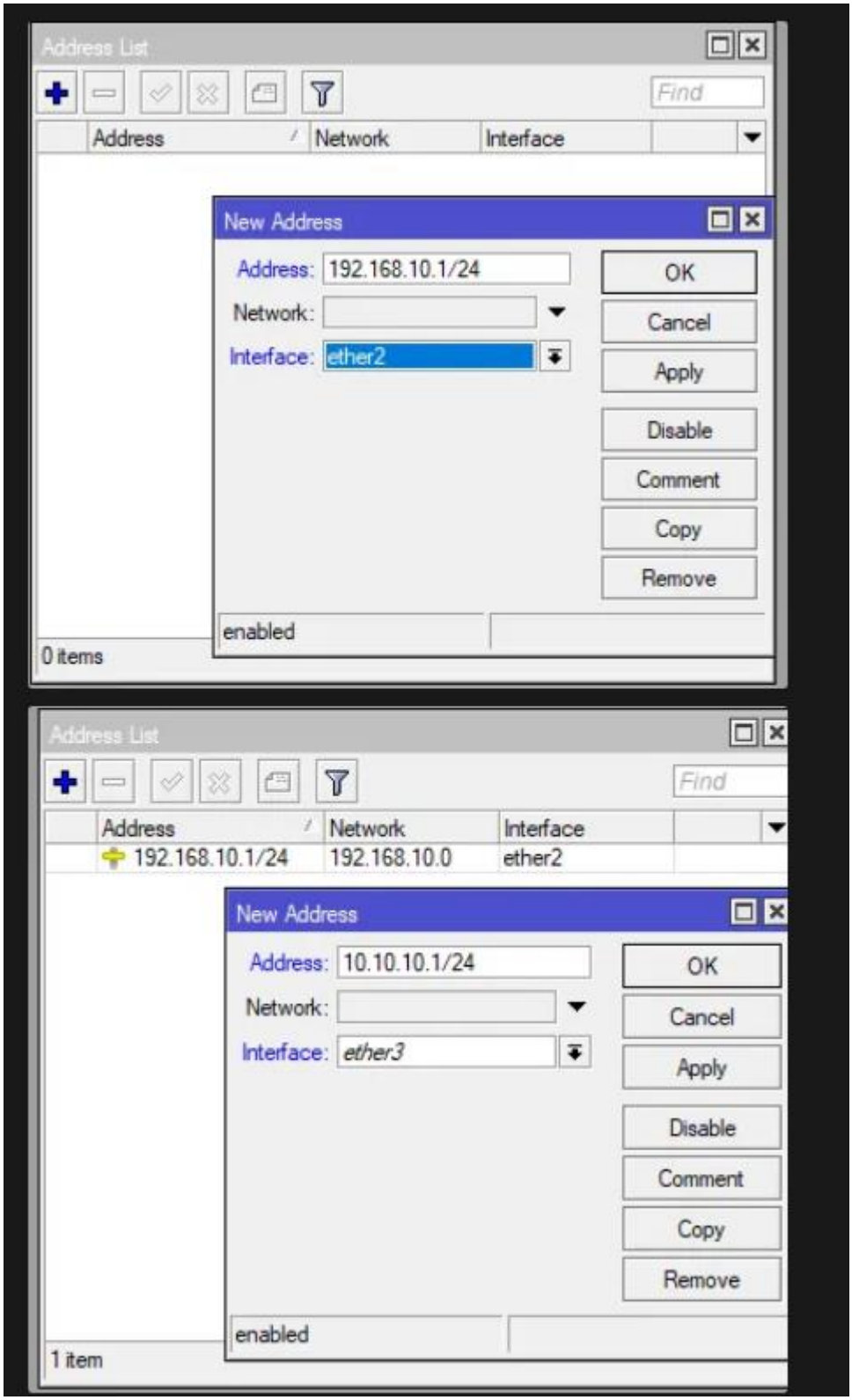


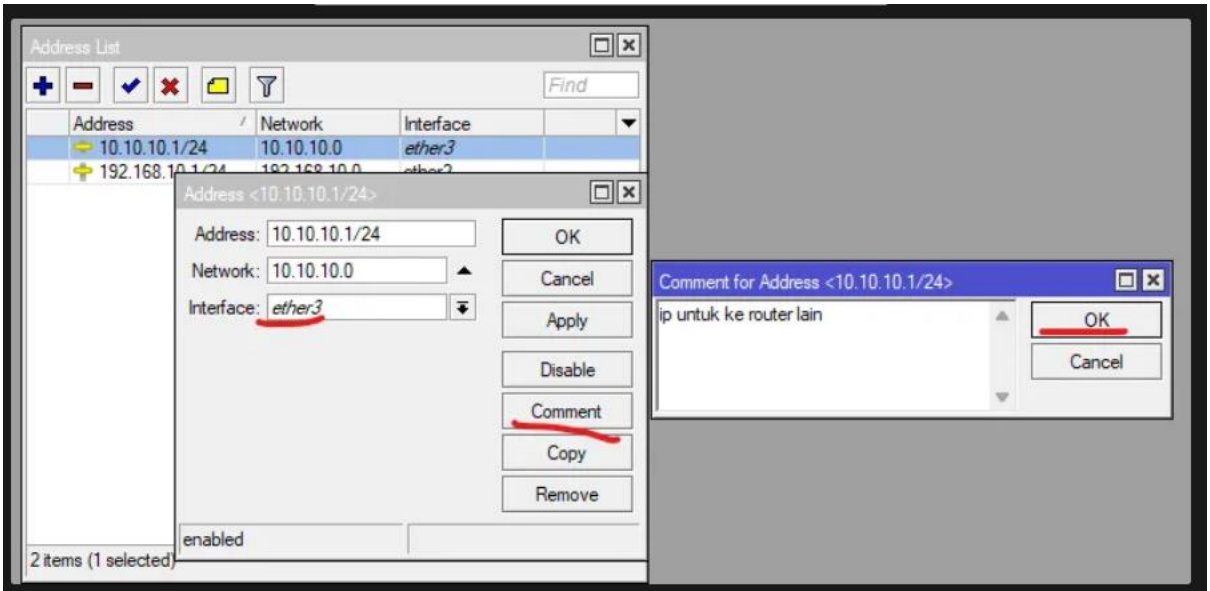
Routing Static

delete IP & dhcp & bridge






Address List
Find
Address
Network
Interface
New Address
Address: 192.168.10.1/24
Network:
Interface: ether2
OK
Cancel
Apply
Disable
Comment
Copy
Remove
enabled
0 items
Address List
Find
Address
Network
Interface
192.168.10.1/24
192.168.10.0
ether2
New Address
Address: 10.10.10.1/24
Network:
Interface: ether3
OK
Cancel
Apply
Disable
Comment
Copy
Remove
enabled
1 item



router kita

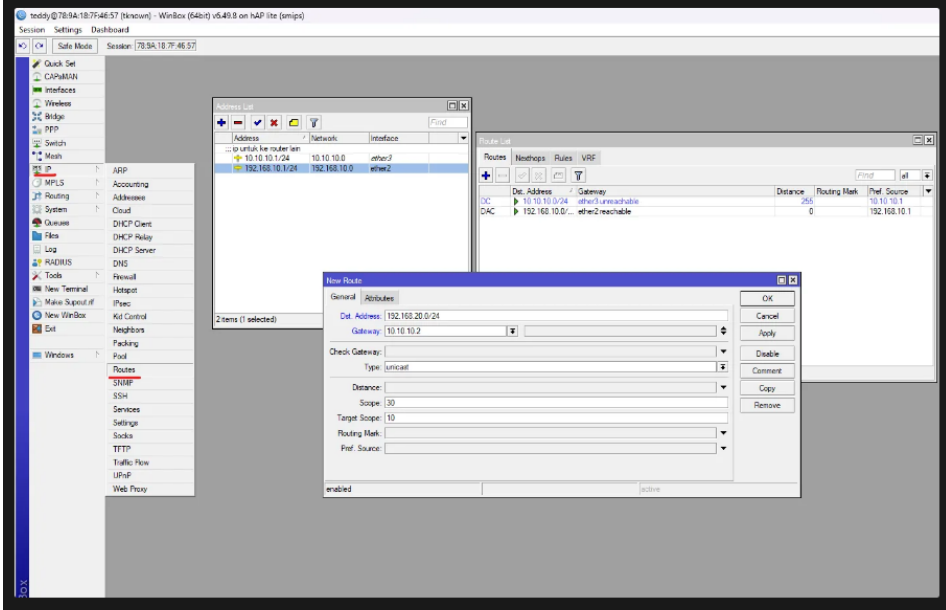
router 1 ip eth2= 192.168.10.1/24

buat sambung ke router lain eth 3 = 10.10.10.1/24

router lain

router 2 ip eth 2 = 192.168.20.1/24

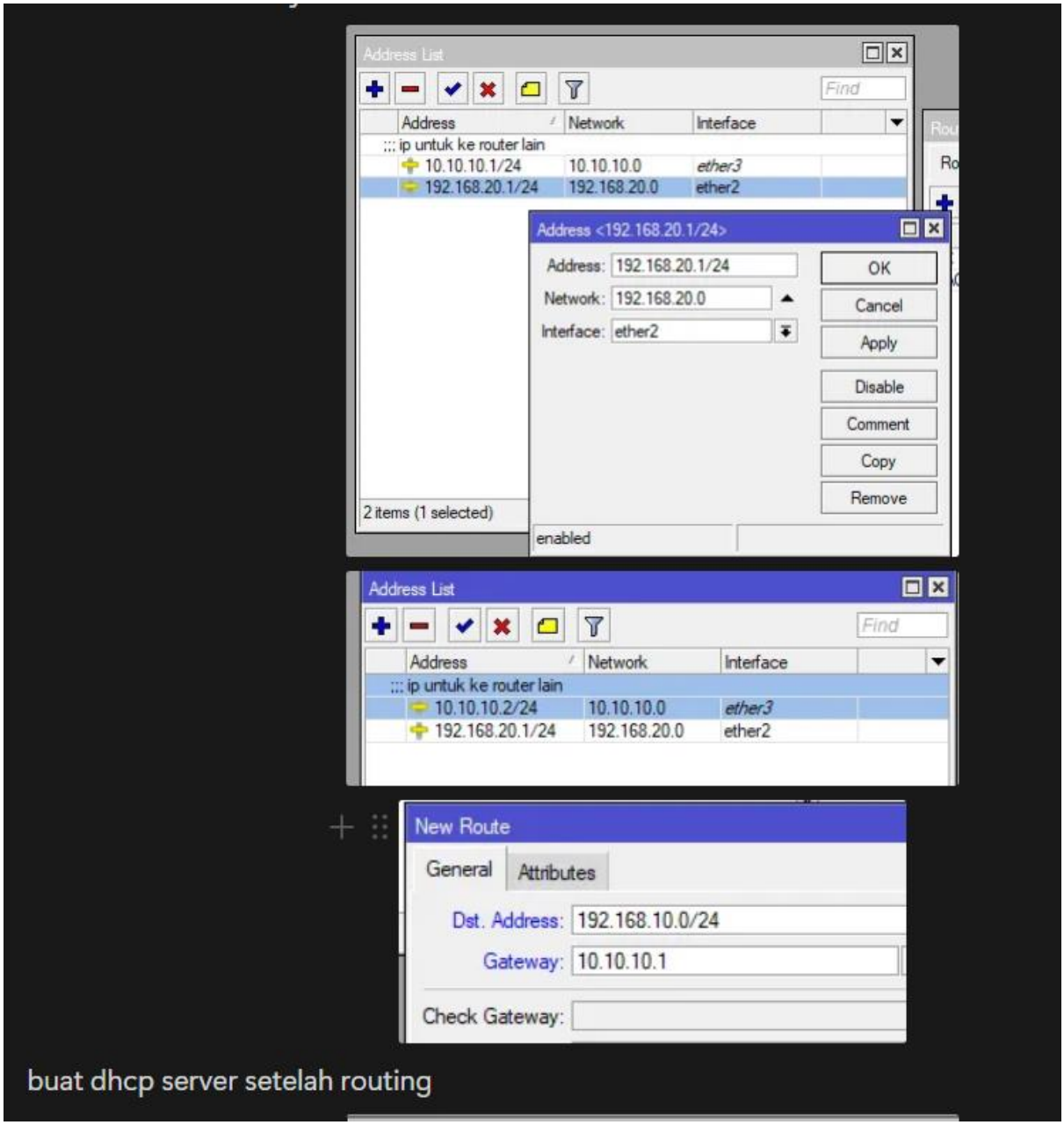
config router 1

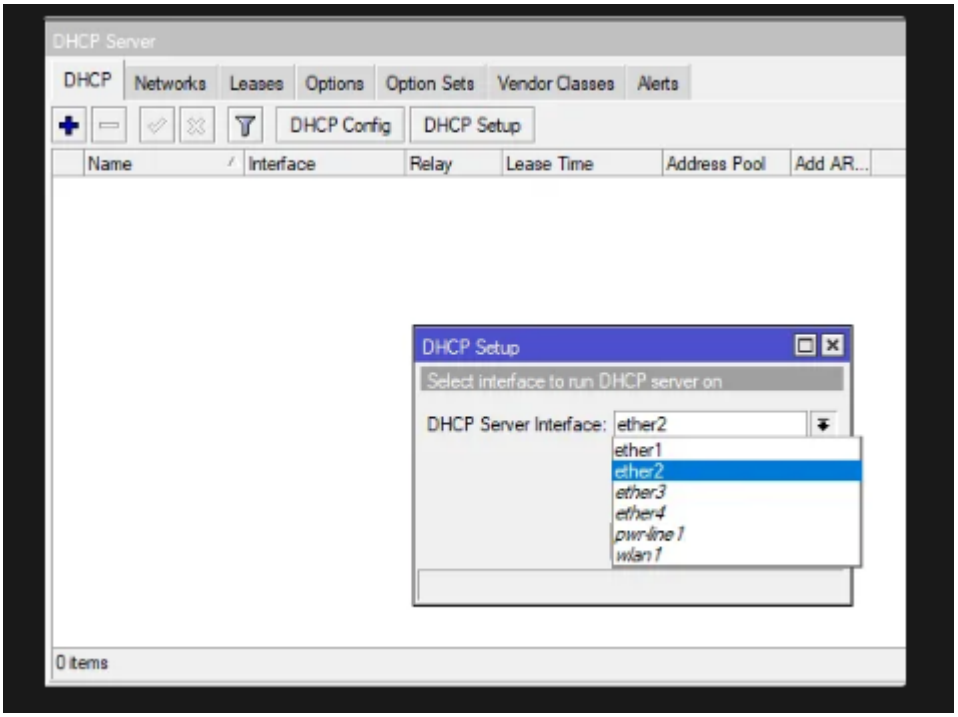


Teddy Adi K Nov 2

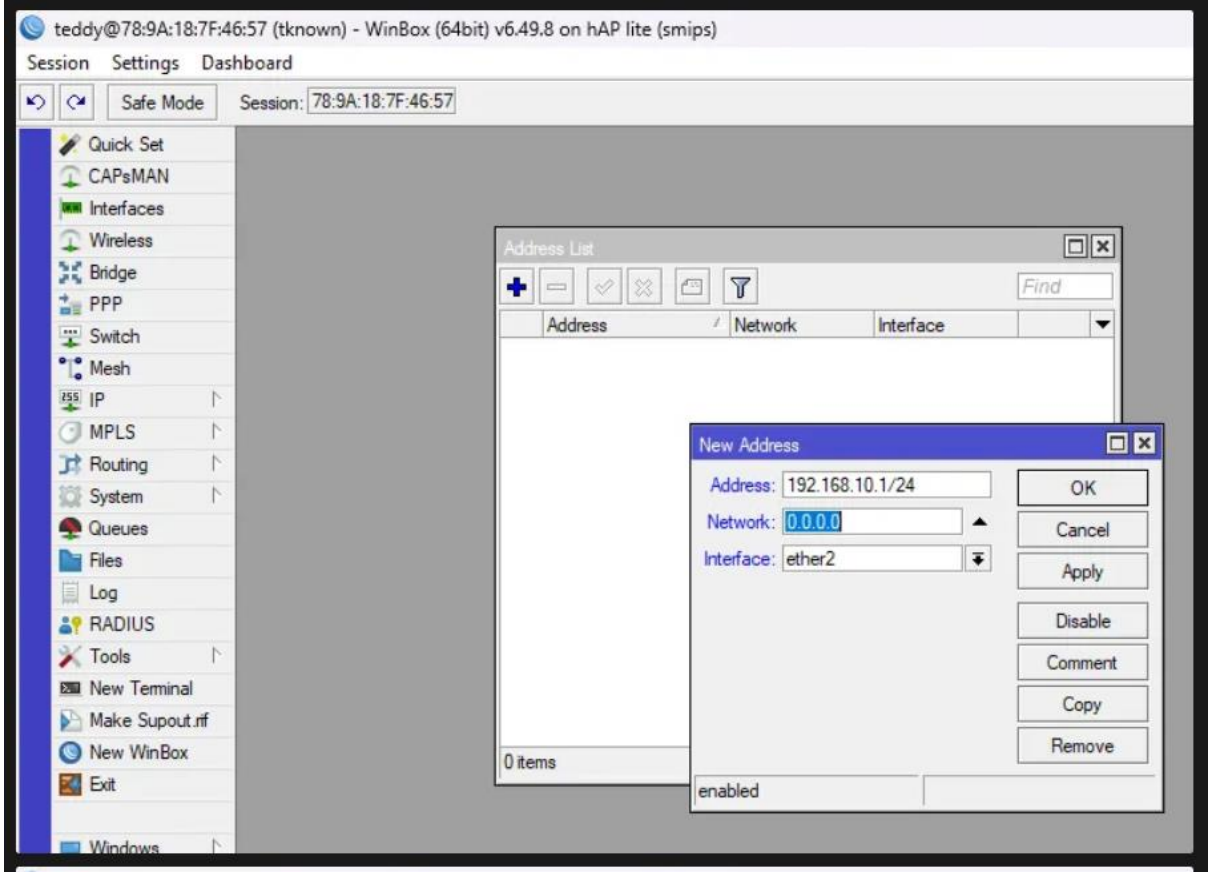
Config router 1

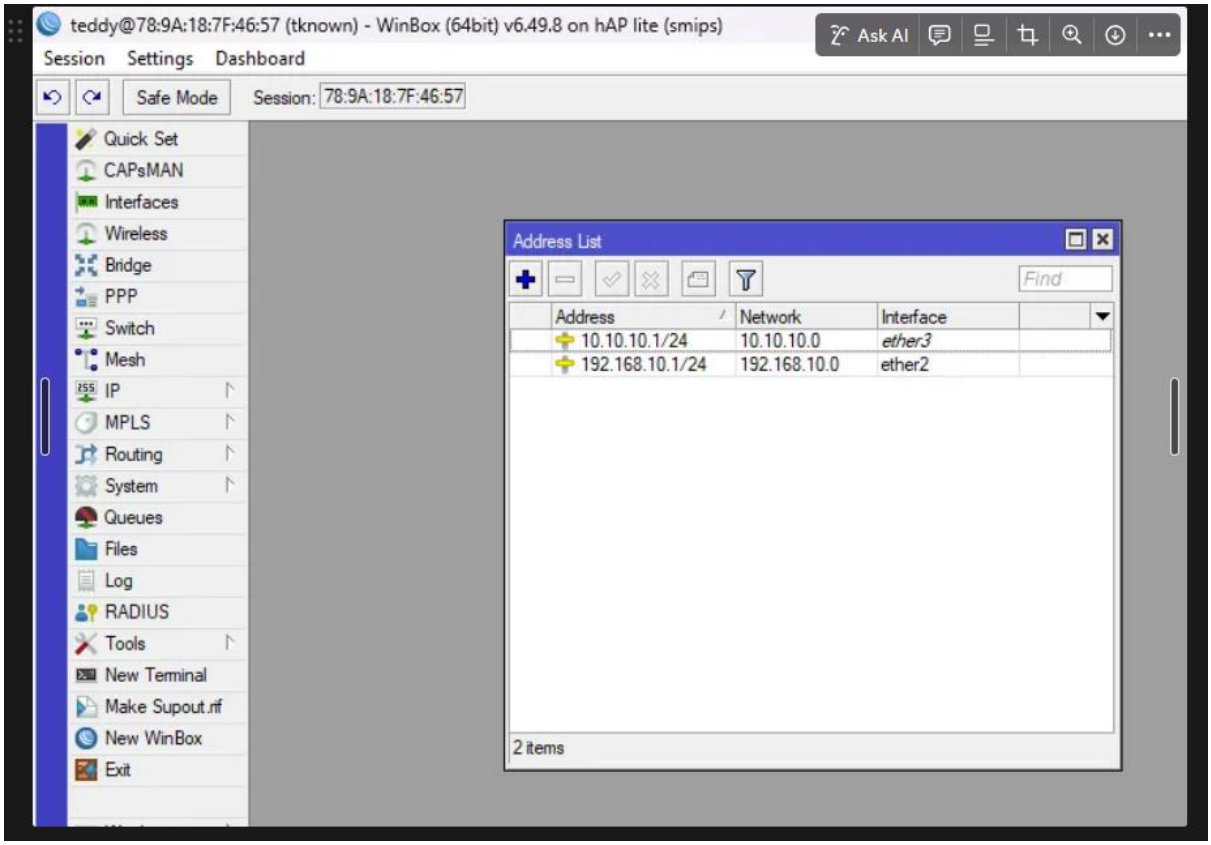
double klik re addres jadi 20 ke router lain

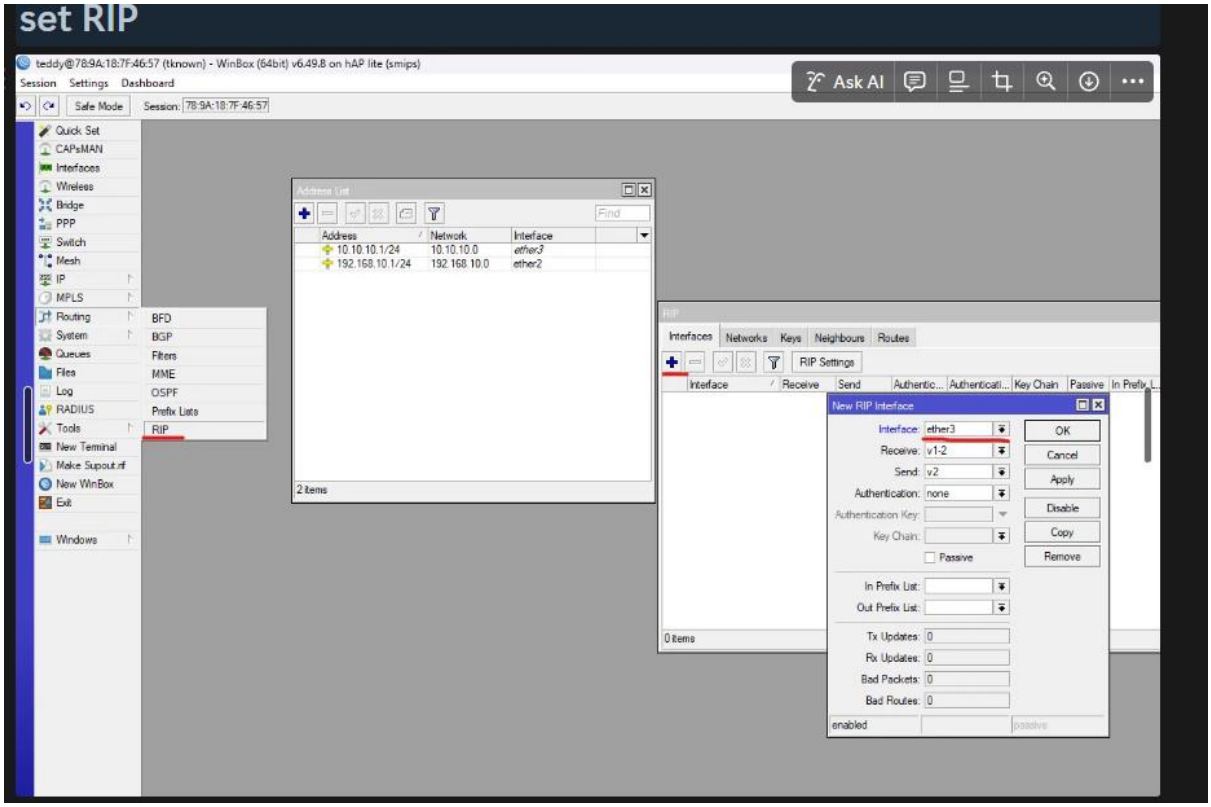

Address List
Find
Address
Network
Interface
;;; ip untuk ke router lain
10.10.10.1/24
10.10.10.0
ether3
192.168.20.1/24
192.168.20.0
ether2
2 items (1 selected)
Address <192.168.20.1/24>
Address: 192.168.20.1/24
Network: 192.168.20.0
Interface: ether2
OK
Cancel
Apply
Disable
Comment
Copy
Remove
enabled
Address List
Find
Address
Network
Interface
;;; ip untuk ke router lain
10.10.10.2/24
10.10.10.0
ether3
192.168.20.1/24
192.168.20.0
ether2
New Route
General
Attributes
Dst. Address: 192.168.10.0/24
Gateway: 10.10.10.1
Check Gateway:
buat dhcp server setelah routing

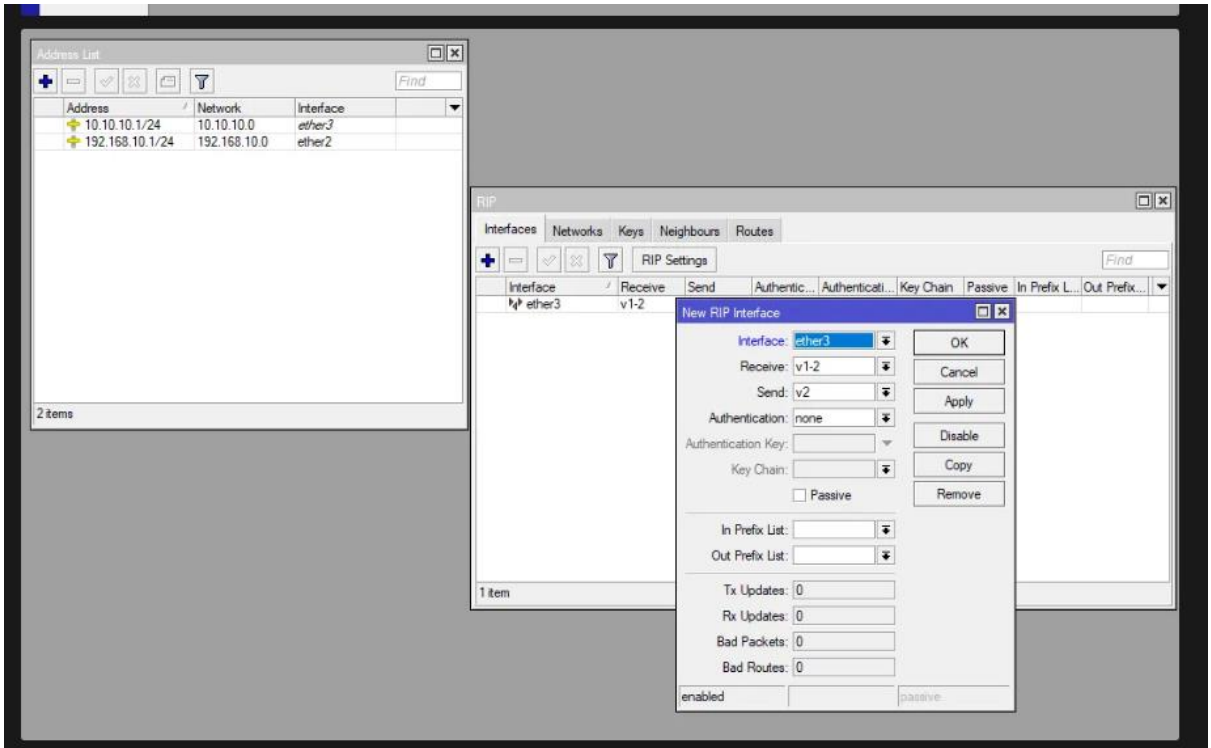


Routing Dynamic

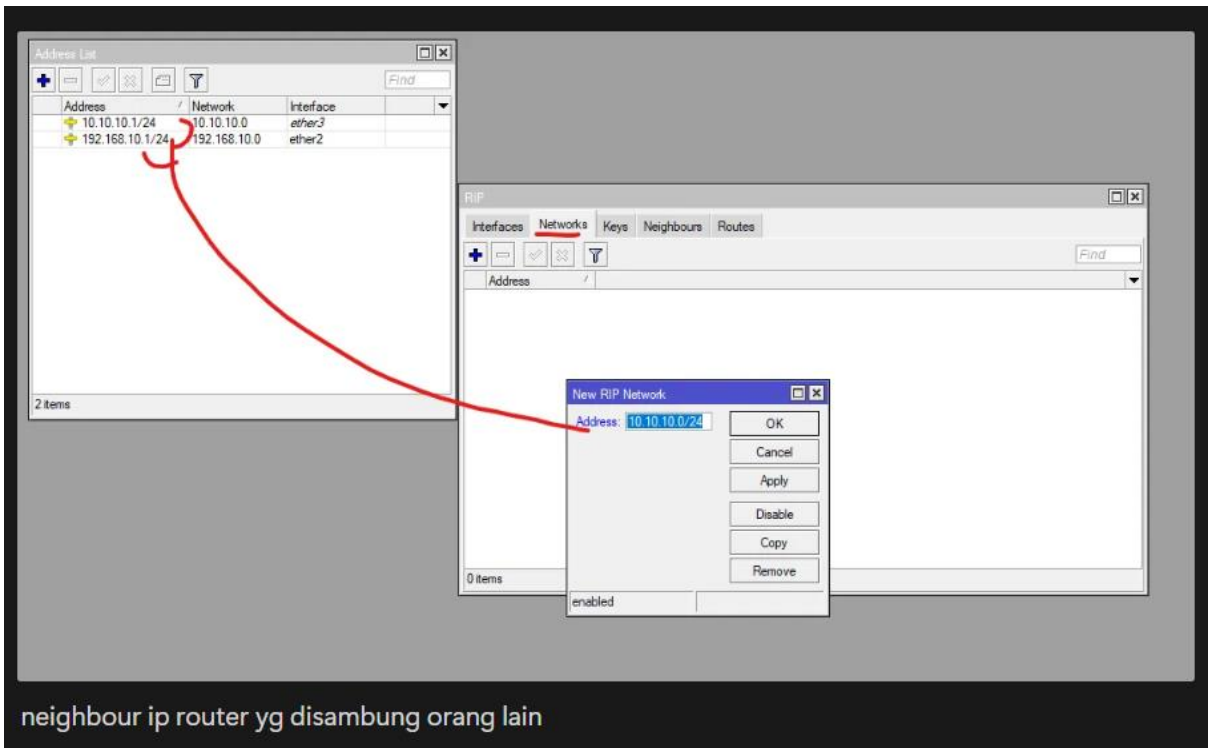



teddy@78:9A:18:7F:46:57 (tknown) - WinBox (64bit) v6.49.8 on hAP lite (smips)
Ask AI
Session Settings Dashboard
Safe Mode
Session: 78:9A:18:7F:46:57
Quick Set
CAPsMAN
Interfaces
Wireless
Bridge
PPP
Switch
Mesh
IP
MPLS
Routing
System
Queues
Files
Log
RADIUS
Tools
New Terminal
Make Supout.rif
New WinBox
Exit
Address List
Find
Address
Network
Interface
10.10.10.1/24
10.10.10.0
ether3
192.168.10.1/24
192.168.10.0
ether2
2 items

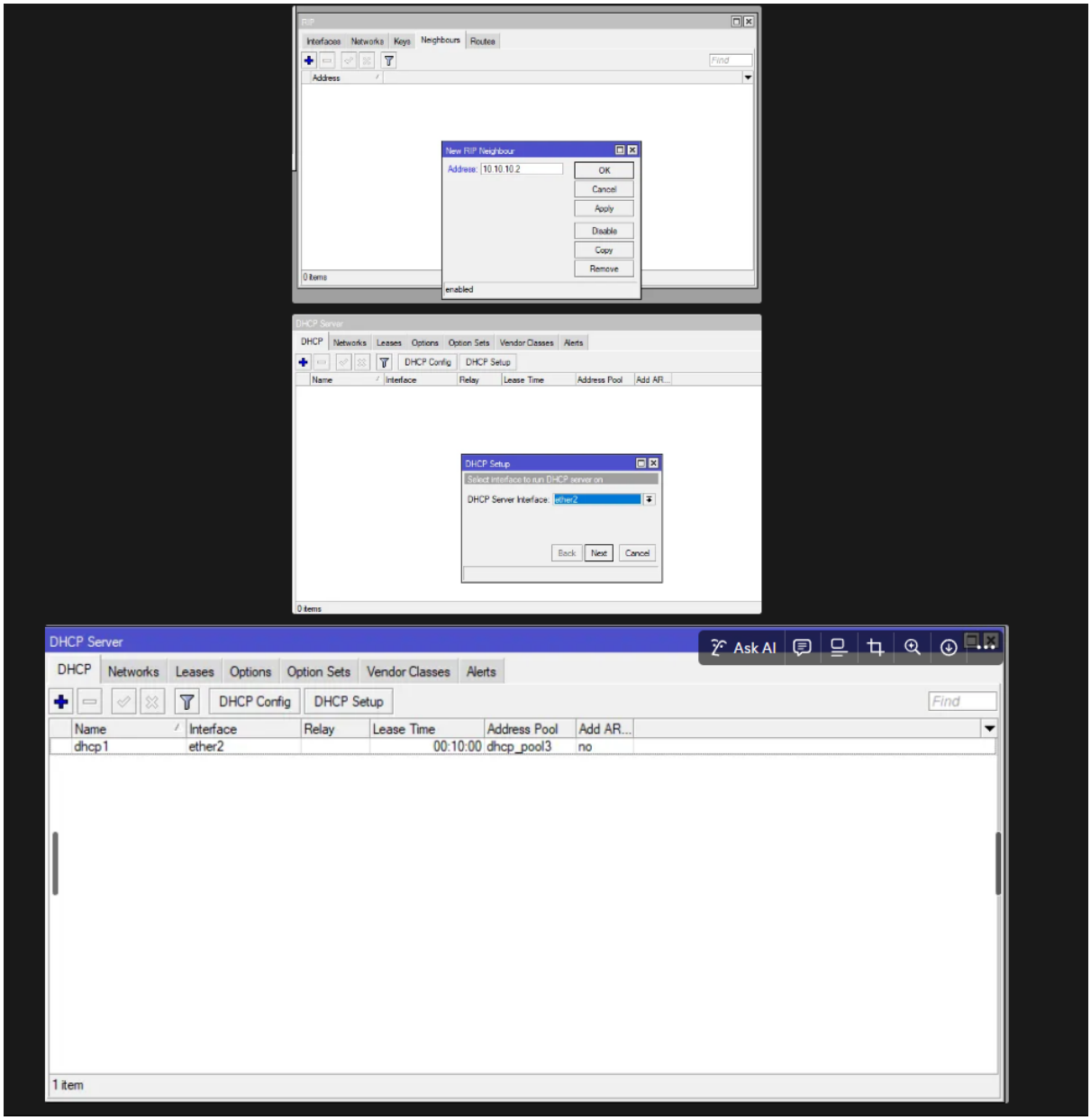

set RIP
Ask AI
BFD
BGP
Filters
MME
OSPF
Prefix Lists
RIP
Interfaces
Networks
Keys
Neighbours
Routes
RIP Settings
New RIP Interface
Interface: ether3
Receive: v1-2
Send: v2
Authentication: none
Key Chain:
Passive
In Prefix List:
Out Prefix List:
Tx Updates: 0
Rx Updates: 0
Bad Packets: 0
Bad Routes: 0
OK
Cancel
Apply
Disable
Copy
Remove
enabled

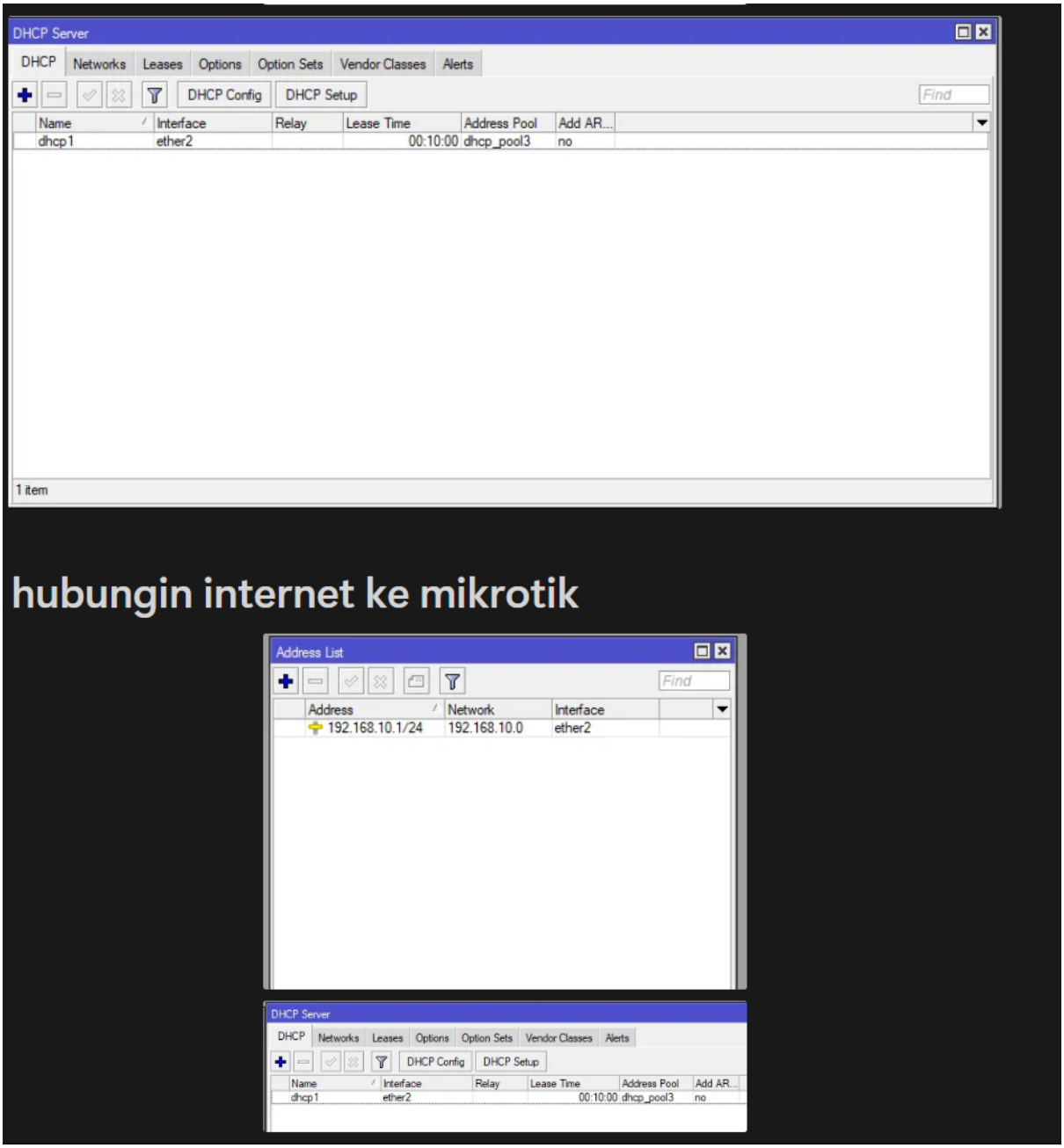


masukkan dari ip address list router 1

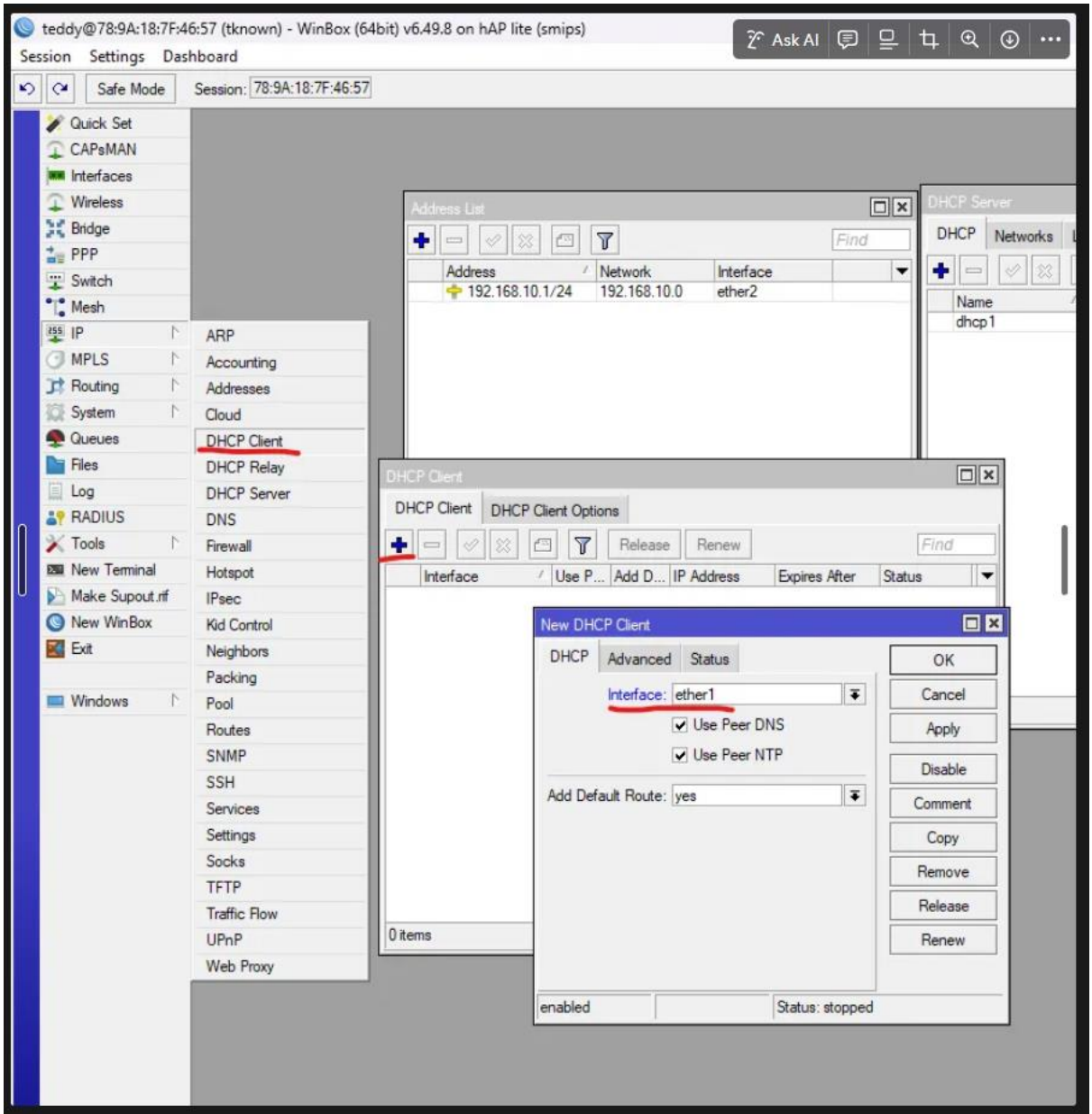


neighbour ip router yg disambung orang lain


RIP
Interfaces
Networks
Keys
Neighbours
Routes
Find
Address
New RIP Neighbour
Address: 10.10.10.2
OK
Cancel
Apply
Disable
Copy
Remove
0 items
enabled
DHCP Server
DHCP
Networks
Leases
Options
Option Sets
Vendor Classes
Alerts
DHCP Config
DHCP Setup
Name
Interface
Relay
Lease Time
Address Pool
Add AR...
DHCP Setup
Select interface to run DHCP server on
DHCP Server Interface: ether2
Back
Next
Cancel
0 items
DHCP Server
Ask AI
DHCP
Networks
Leases
Options
Option Sets
Vendor Classes
Alerts
DHCP Config
DHCP Setup
Find
Name
Interface
Relay
Lease Time
Address Pool
Add AR...
dhcp1
ether2
00:10:00
dhcp_pool3
no
1 item



hubungin internet ke mikrotik

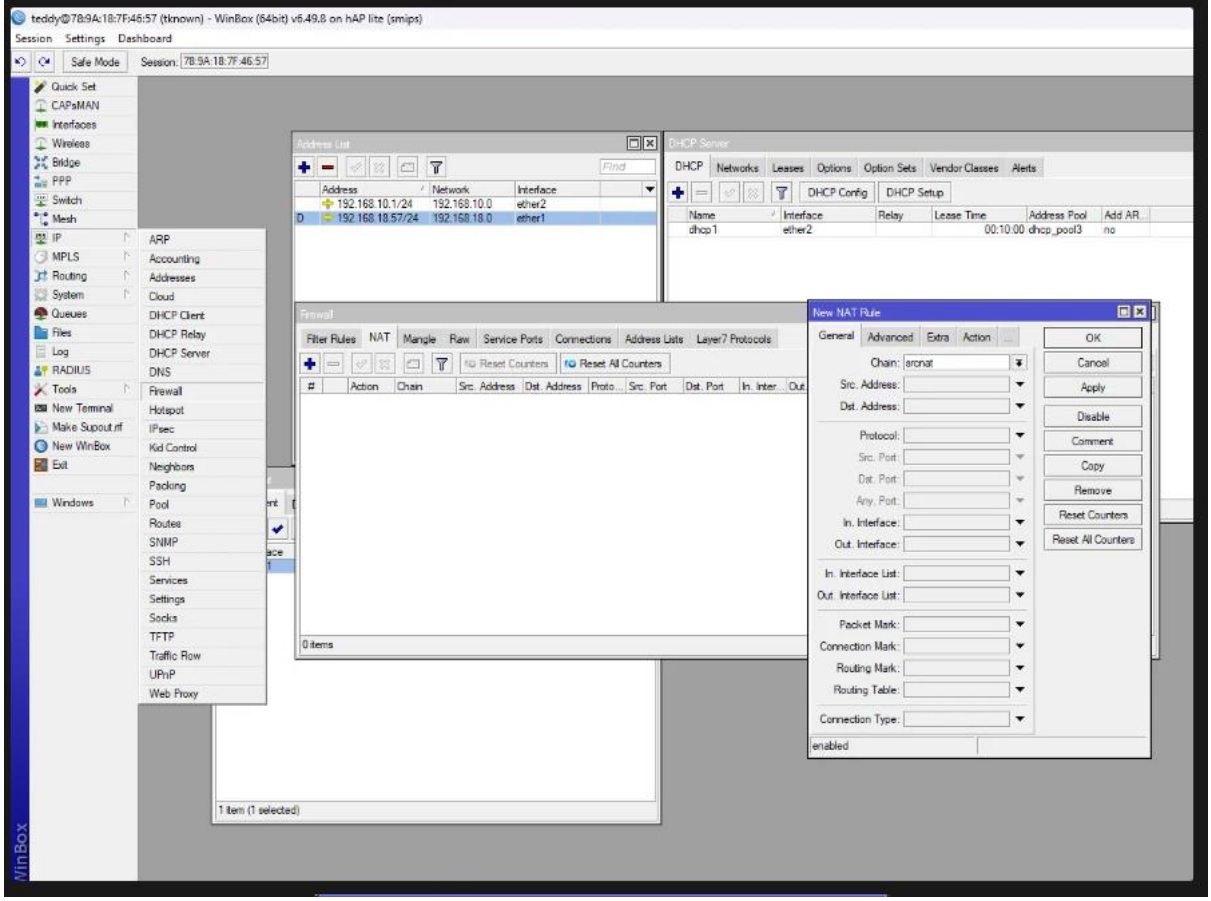


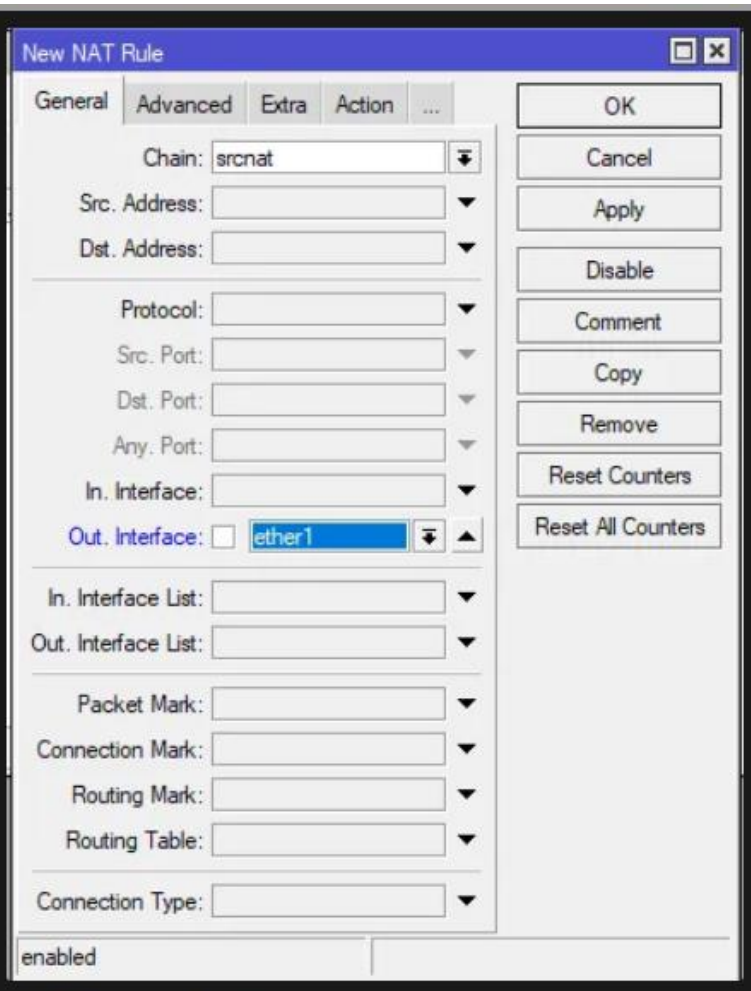
kalau stopped brt tidak terhubung kabel lan

kalau searching brt internet sedang bermasalah

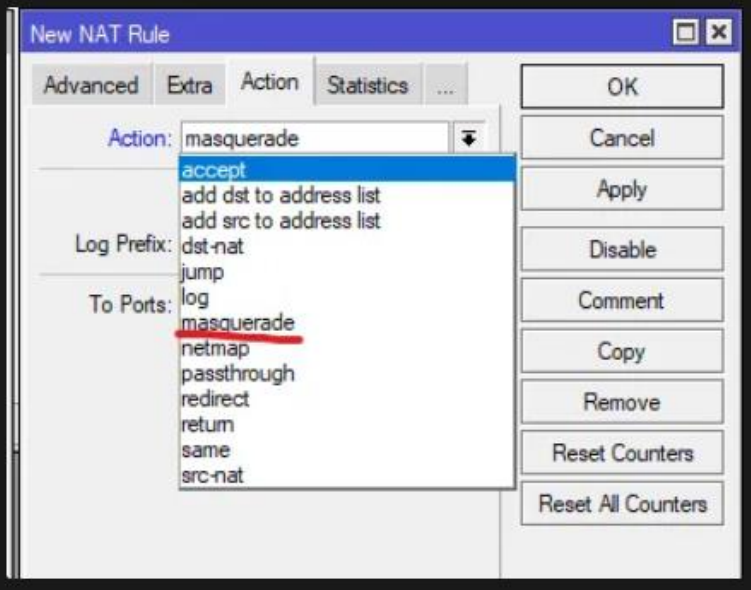
kalau bound itu terkoneksi

set nat firewall

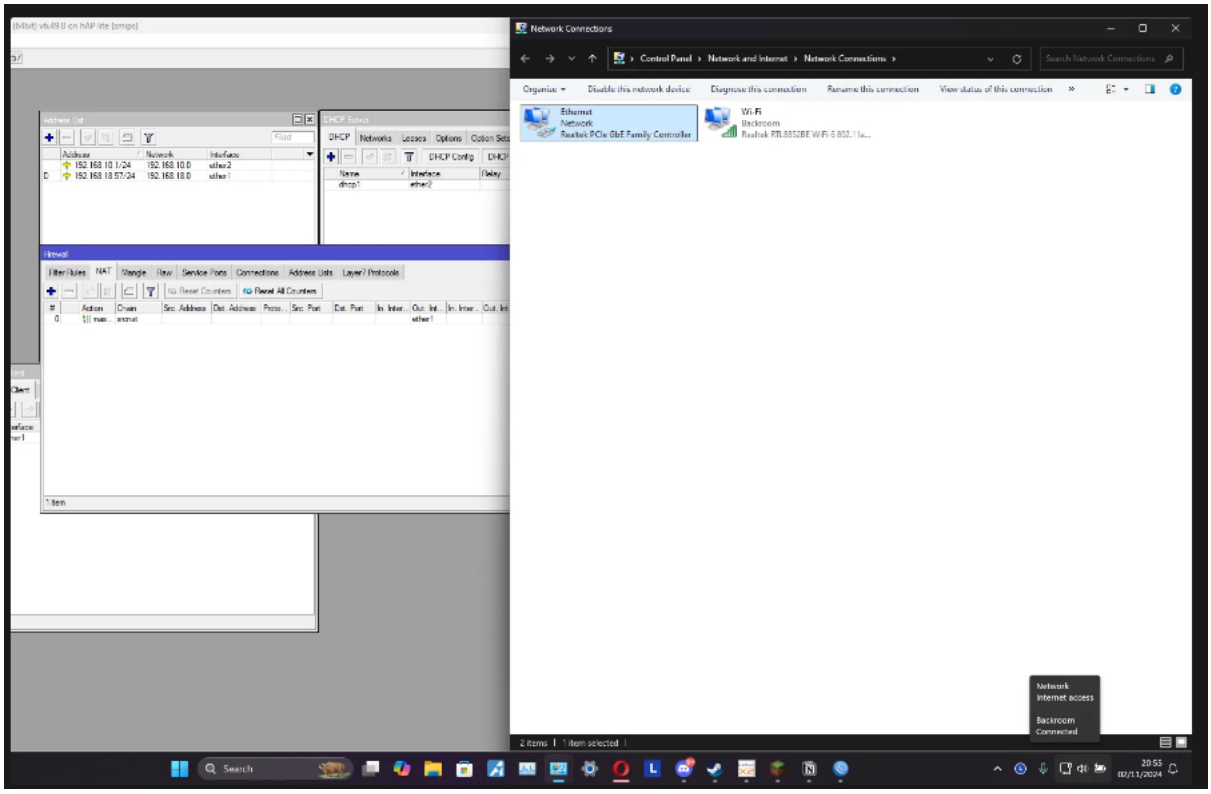




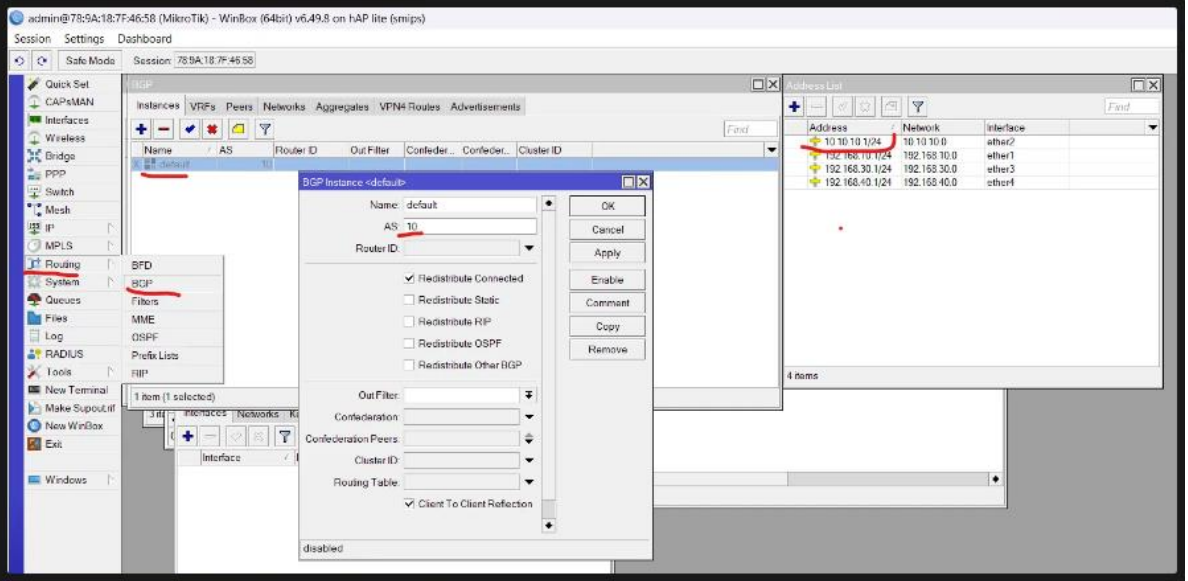
ether 1 karena internet lan terhubung di eth 1

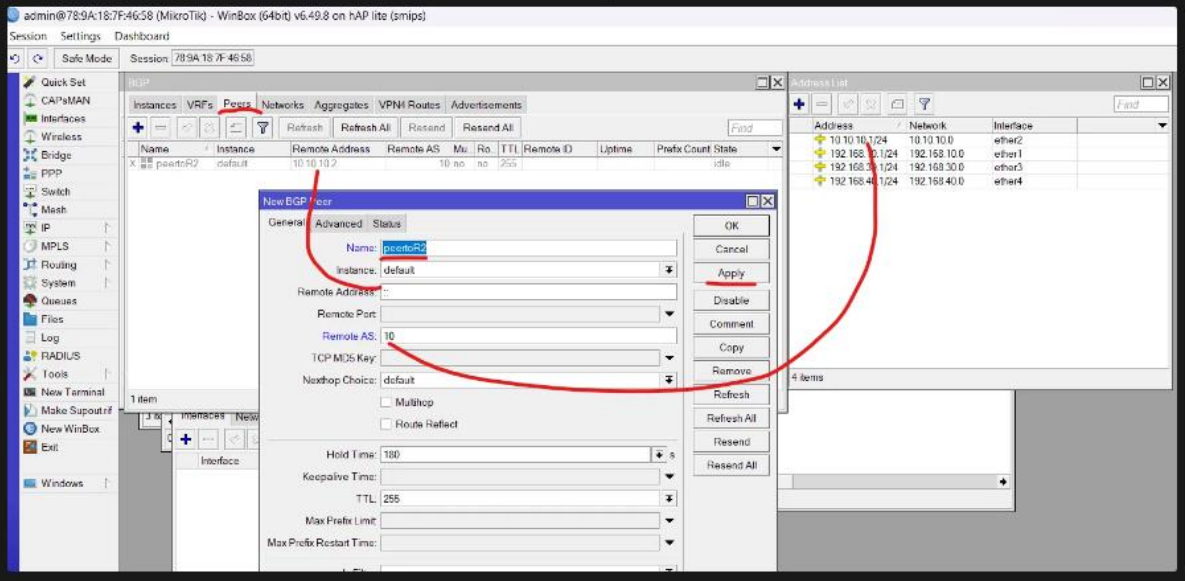


disable enable ethernet


Network Connections
Control Panel › Network and Internet › Network Connections ›
Search Network Connections
Organize
Disable this network device
Diagnose this connection
Rename this connection
View status of this connection
Ethernet
Network
Realtek PCIe GbE Family Controller
Wi-Fi
Backroom
Network
Internet access
Backroom
Connected
2 items | 1 item selected
Search
20:55
02/11/2024

Routing BGP





Remote address untuk ip router lain

10.10.10.1

tidak bisa ping cmd tapi ping dari terminal bisa

Remote AS 10 itu akses untuk router luar ke kita

ping router luar tracert 192.168.0.0

tracert -d 192.168.0.0

routing static buat connect 1 - 3

koneksi ke router lain jika untuk ke router 1 tinggal melanjutkan static yang sudah ada

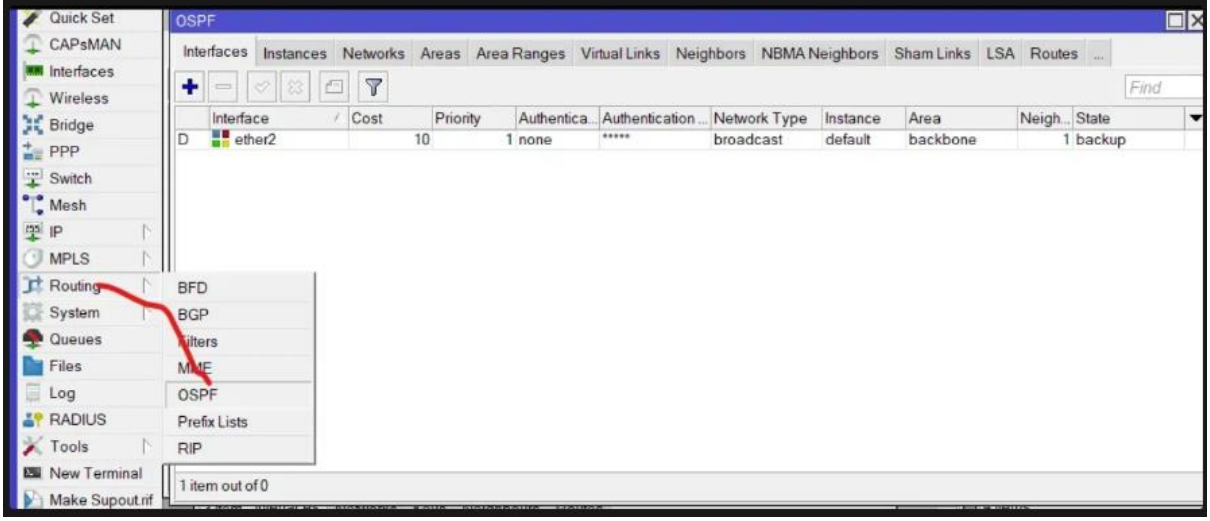
routing >BGP >routing >peer

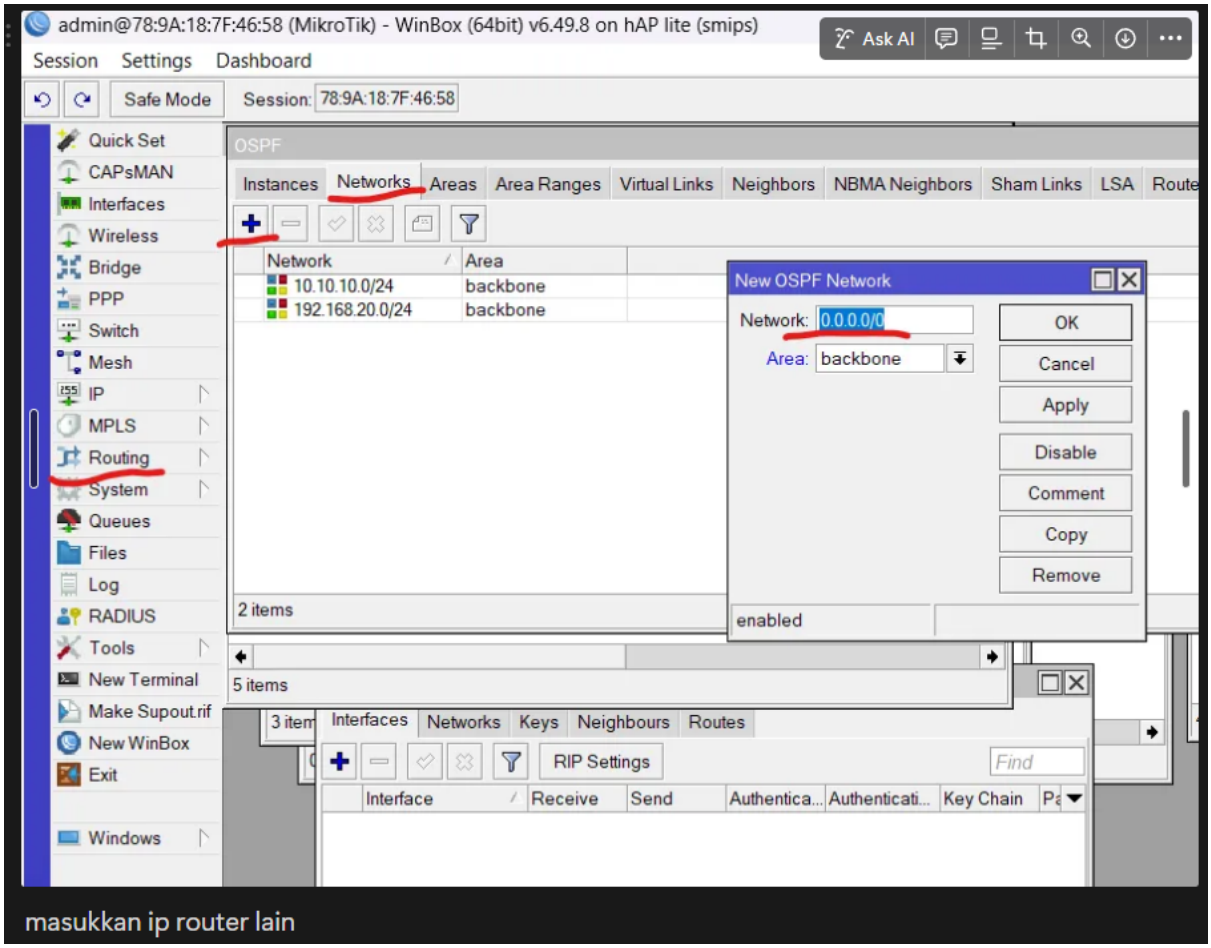
route list

jika tidak bisa terhubung di cmd disable wifi dari control panel

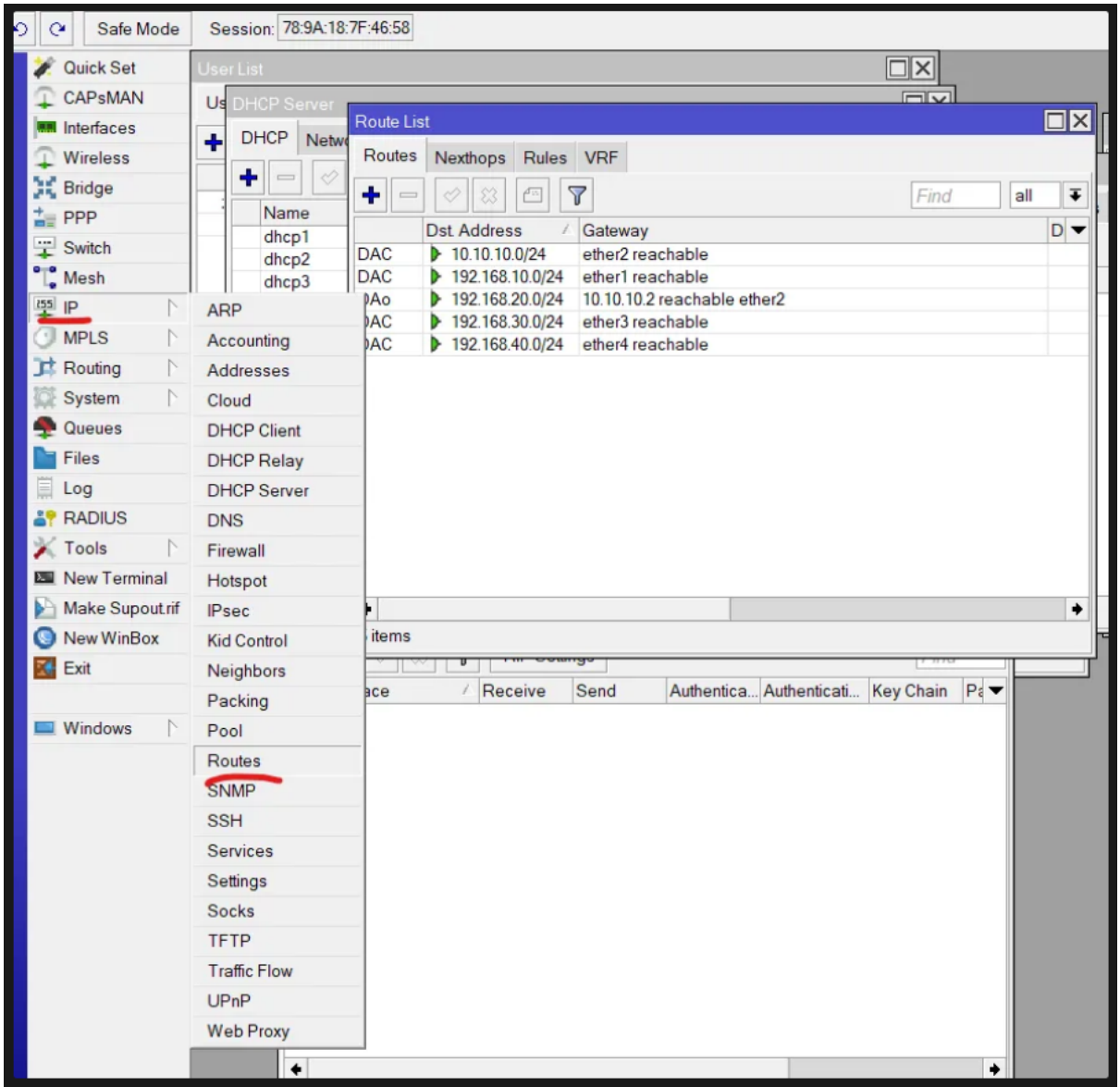
Routing OSPF

routing >OSPF >Instance





masukkan ip router lain



cek koneksi di new terminal mikrotik atau cmd

jika tidak bisa terhubung di cmd disable wifi dari control panel