

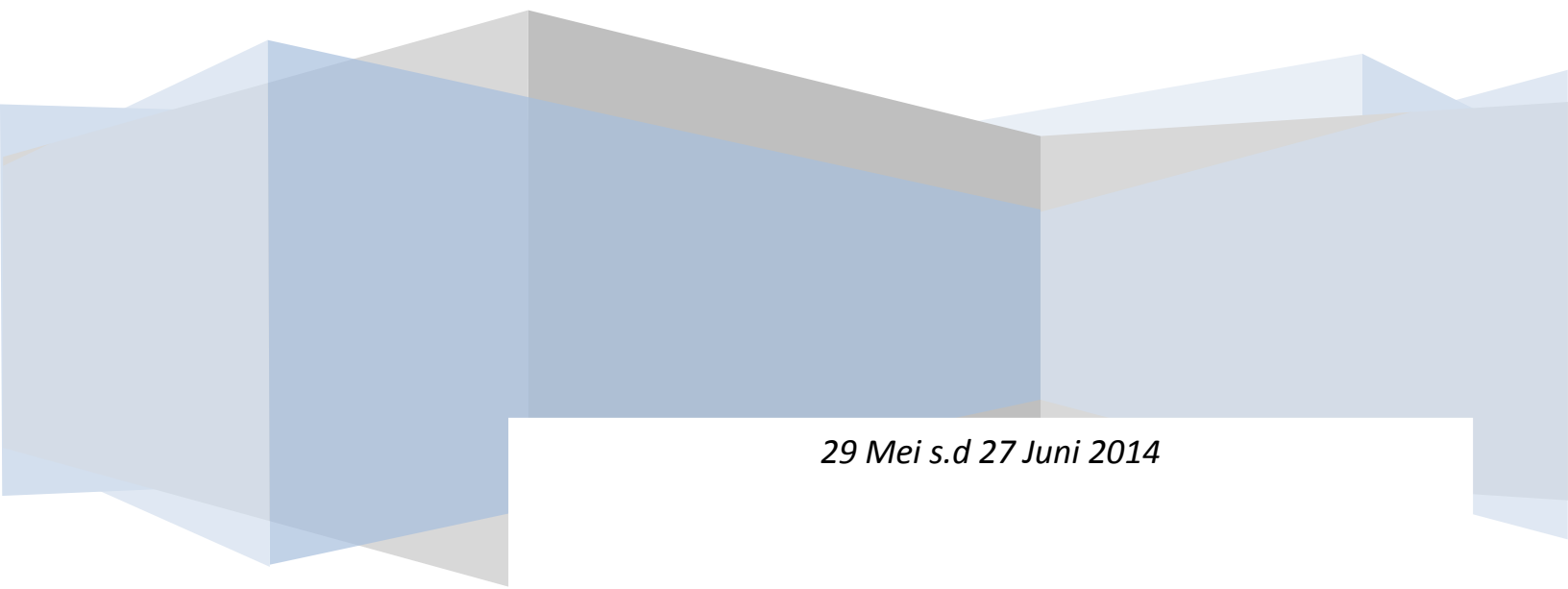
**LABORATORIUM KOMPUTASI DASAR
JURUSAN ILMU KOMPUTER FMIPA UNIVERSITAS LAMPUNG**

PANDUAN INSTALASI DAN KONFIGURASI MIKROTIK

PELATIHAN KEPALA LABORATORIUM KOMPUTER

SEKOLAH/MADRASAH

Oleh Favorisen Rossyking L dan Didik Kurniawan

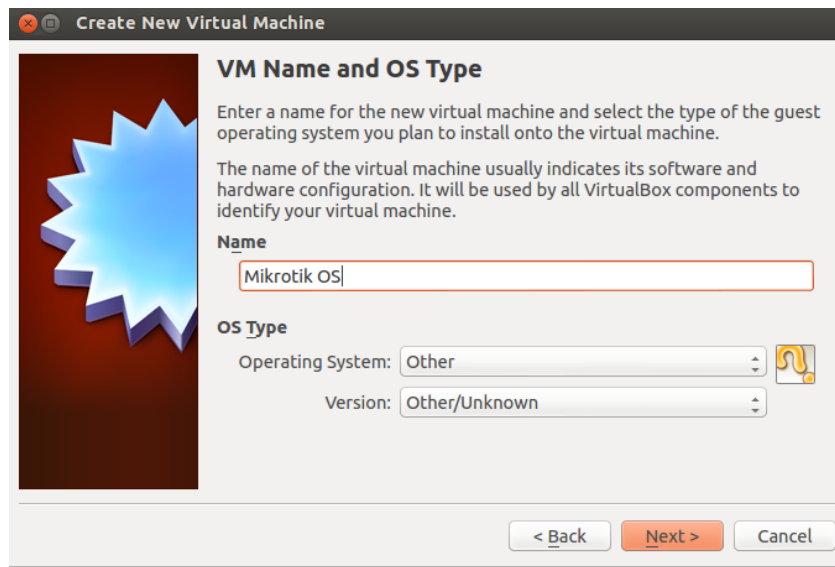


29 Mei s.d 27 Juni 2014

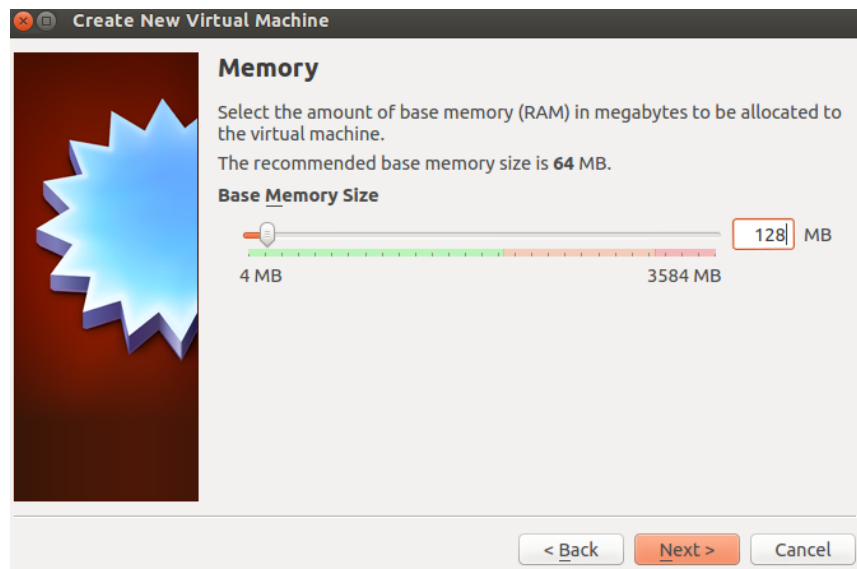
Instalasi Mikrotik

Pertama-tama kita harus menginstal mikrotik kedalam Virtual Box. Berikut ini merupakan langkah-langkah instalasinya:

1. Klik New pada Virtual Box, lalu akan muncul kotak dialog dimana kita diminta mengisi Nama OS Virtual dan memilih Tipe dan versi OS tersebut. Isikan Nama OS dengan nama **Mikrotik OS**, Tipe OSnya **Other**, dan versi OSnya **Other/Unknown**



2. Setelah itu kita diminta mengisi ukuran memori virtualnya, isikan **128MB**



3. Berikutnya kita akan diberikan pilihan untuk menggunakan Hardisk yang sudah ada(dalam bentuk vdi, kalau ada) atau membuat Hardisk yang baru. Pilih yang membuat **Hardisk yang baru**



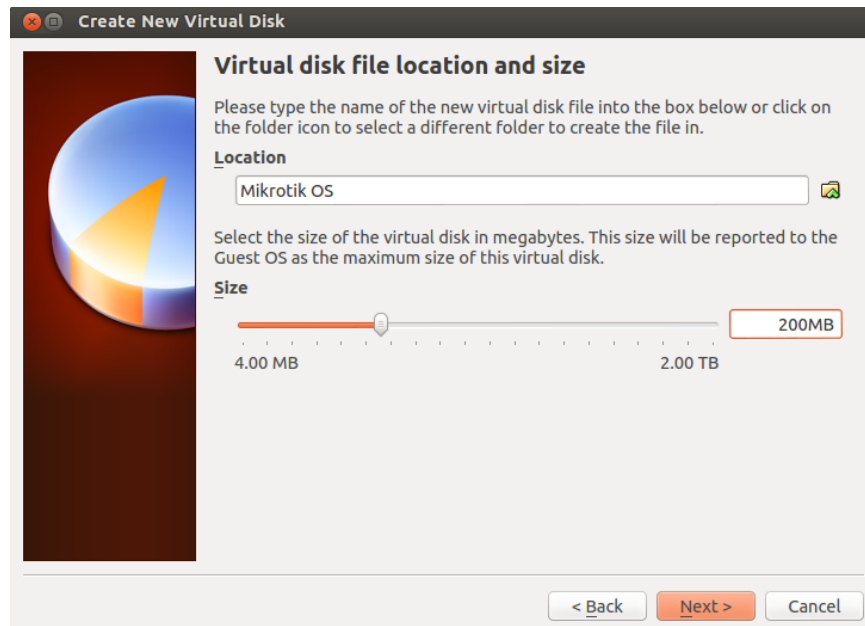
4. Pilih jenis virtual disknya VDI(VirtualBox Disk Image)



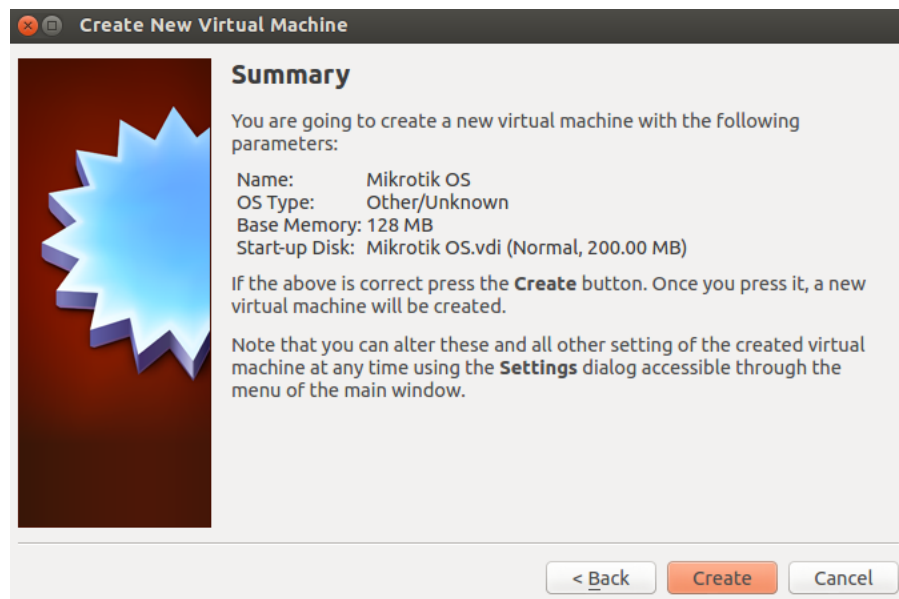
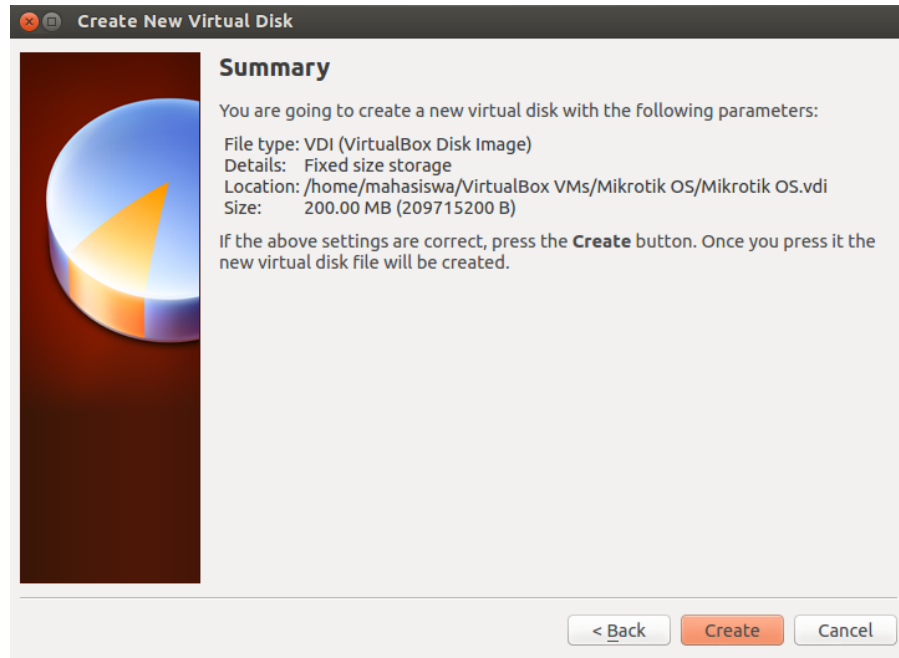
5. Kita alokasikan secara manual ukuran dari VDI, jadi pilih Fixed Size



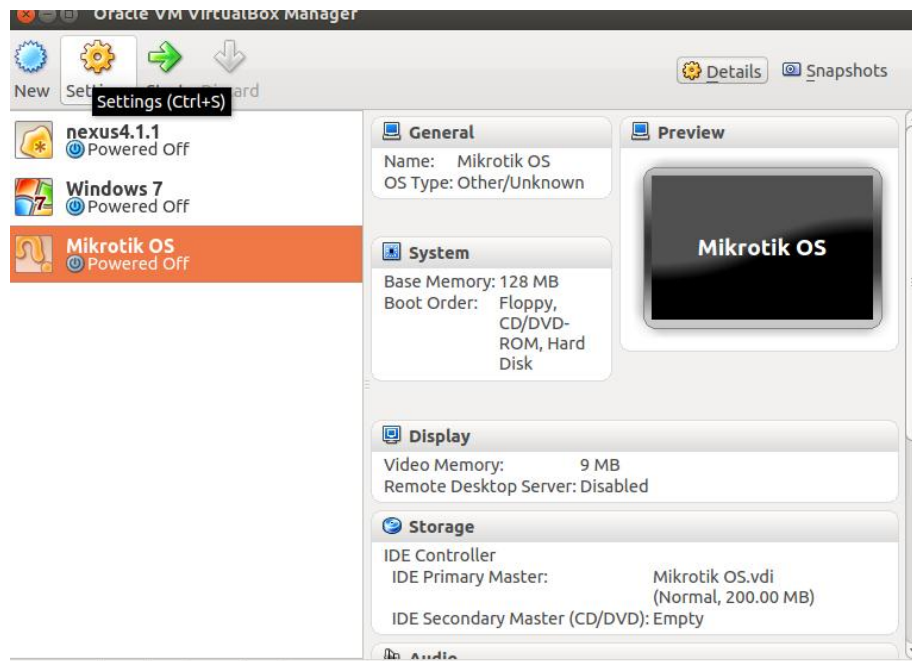
6. karena Mikrotik tidak membutuhkan terlalu banyak memori, maka **200 MB** sudah cukup untuk menampung data-data yang diperlukan



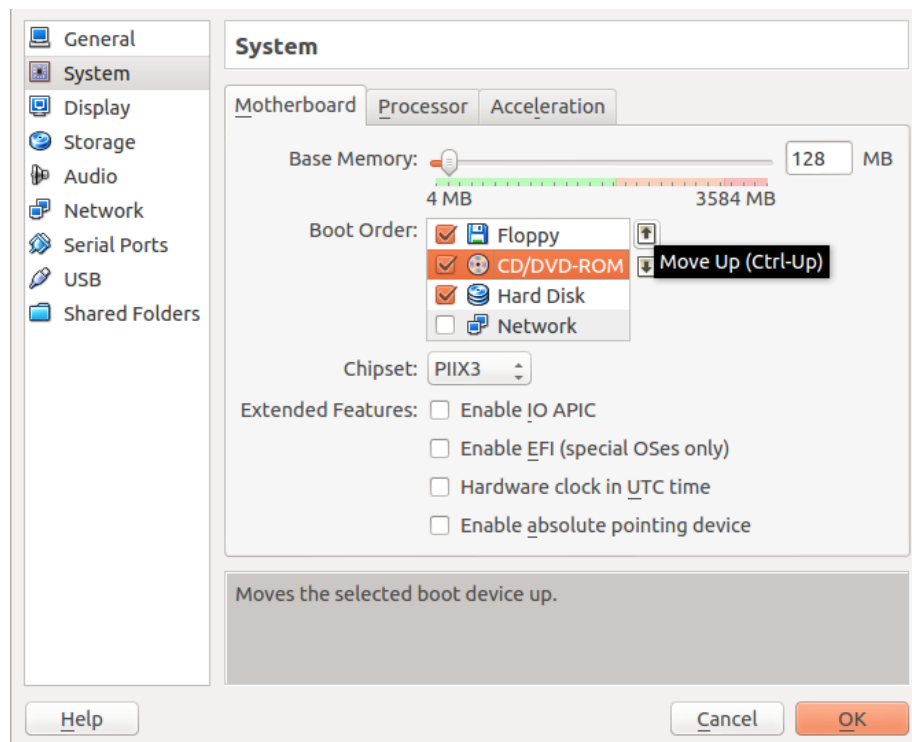
7. Selanjutnya tinggal create



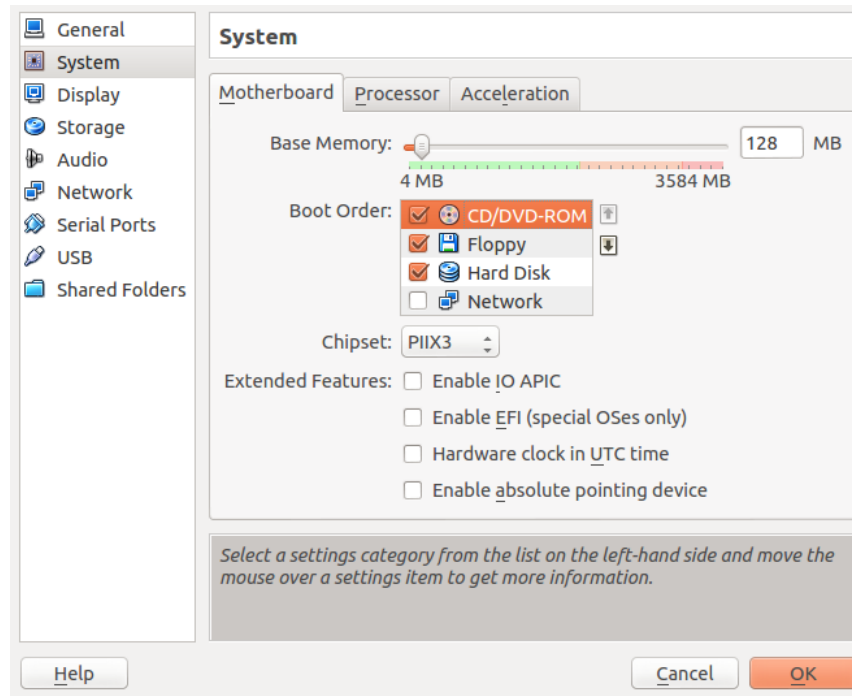
8. Setelah selesai, maka akan muncul Mikrotik OS seperti pada gambar berikut



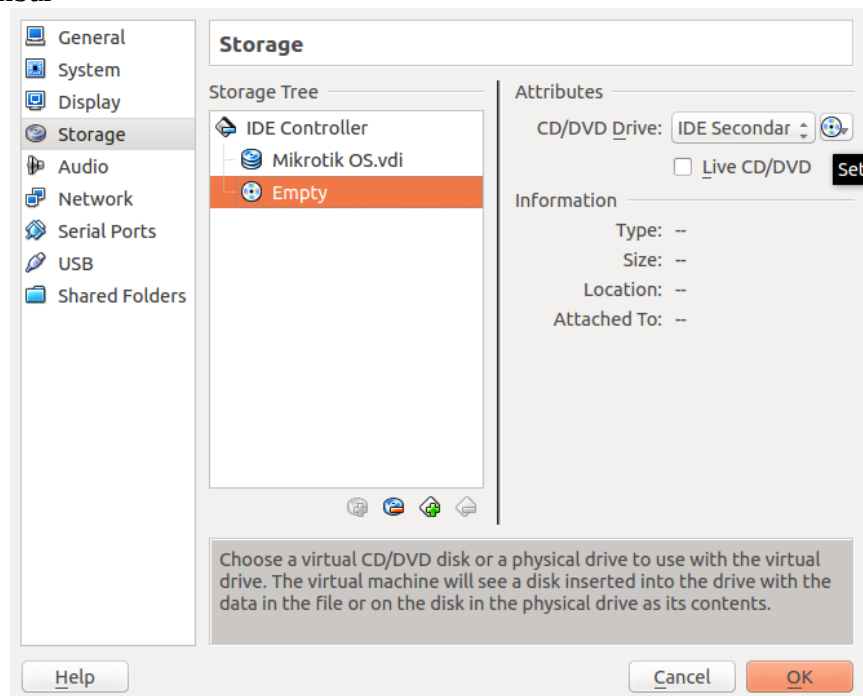
9. Klik tombol setting seperti pada gambar atau klik kanan pada icon Mikrotik OS lalu klik system. Pada boot order, kita harus memilih CD/DVD-ROM untuk booting.



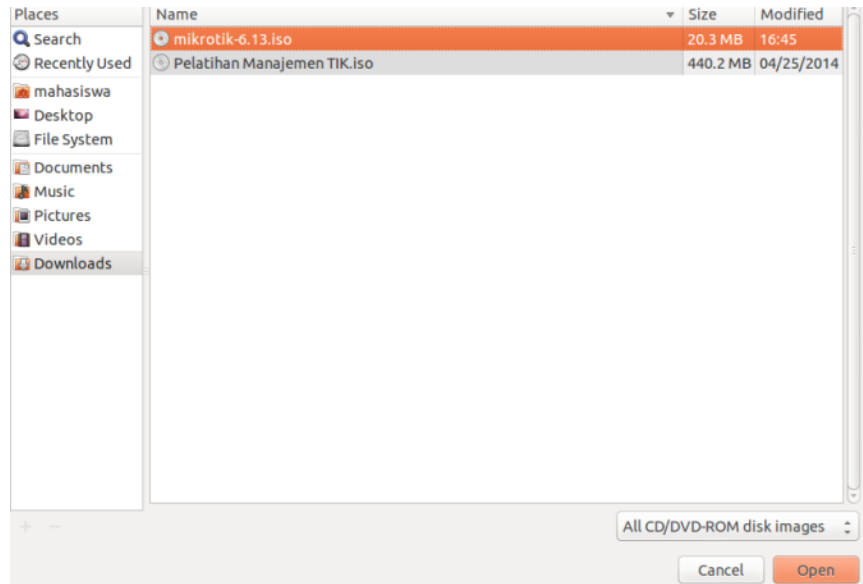
Cara memindahkannya klik gambar CD/DVD-ROM lalu klik tanda panah ke atas seperti pada gambar sampai gambar CD/DVD-ROM tadi berada paling atas dari boot order



10. Klik Storage lalu klik tombol Setup the virtual CD/DVD Drive seperti pada gambar

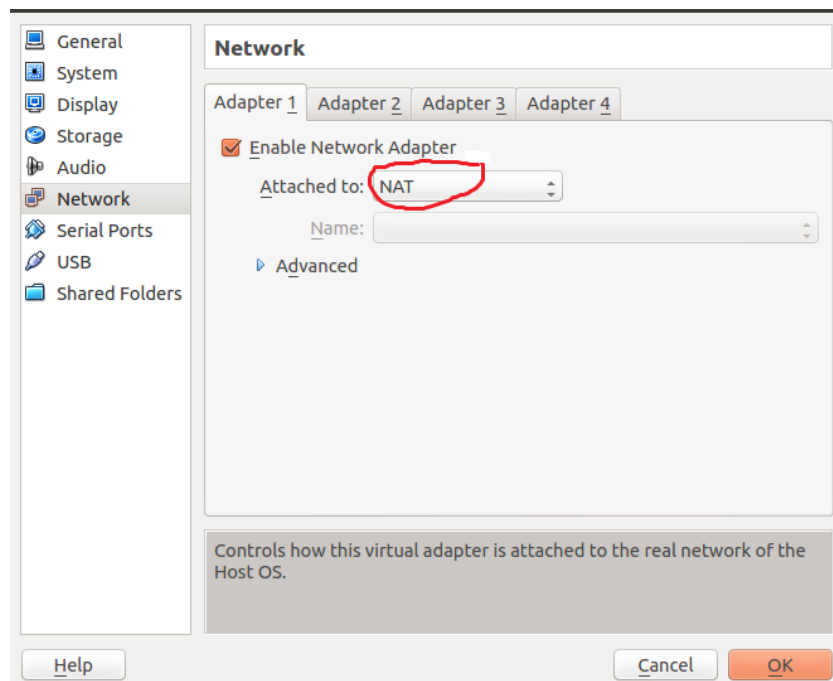


Klik **choose a virtual CD/DVD disk file**, maka akan muncul seperti pada gambar berikut

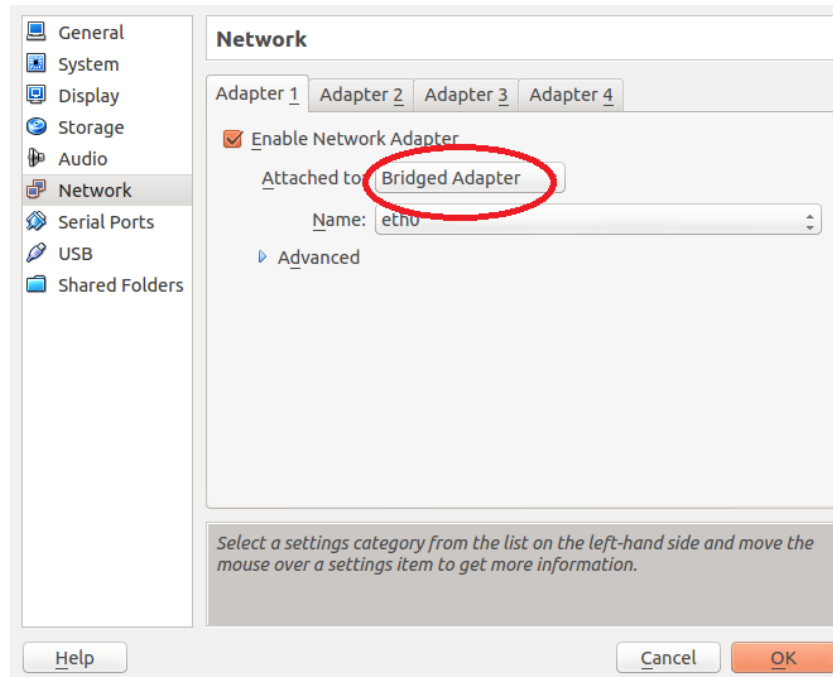


Pilih mikrotik-6.13.iso dan klik open

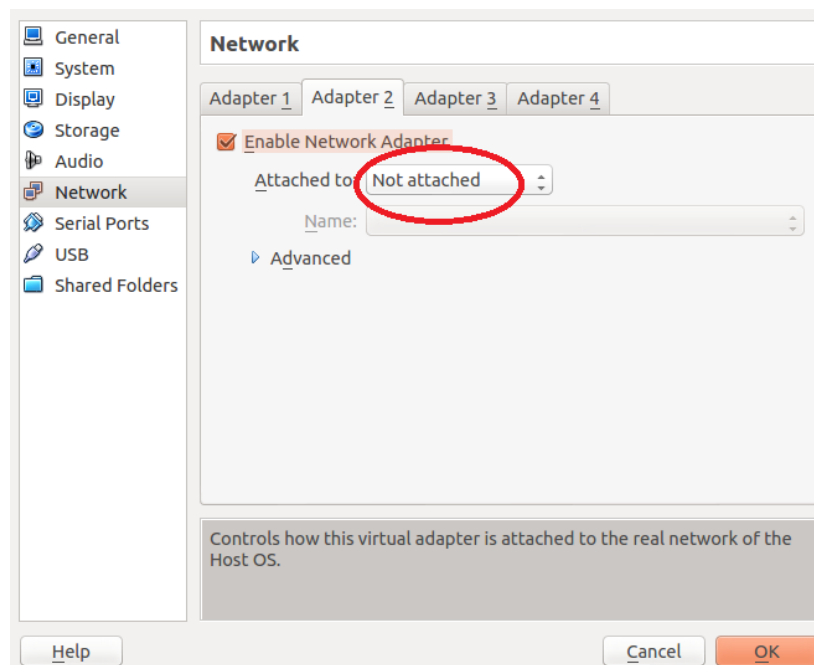
11. Klik Network, maka akan muncul gambar berikut



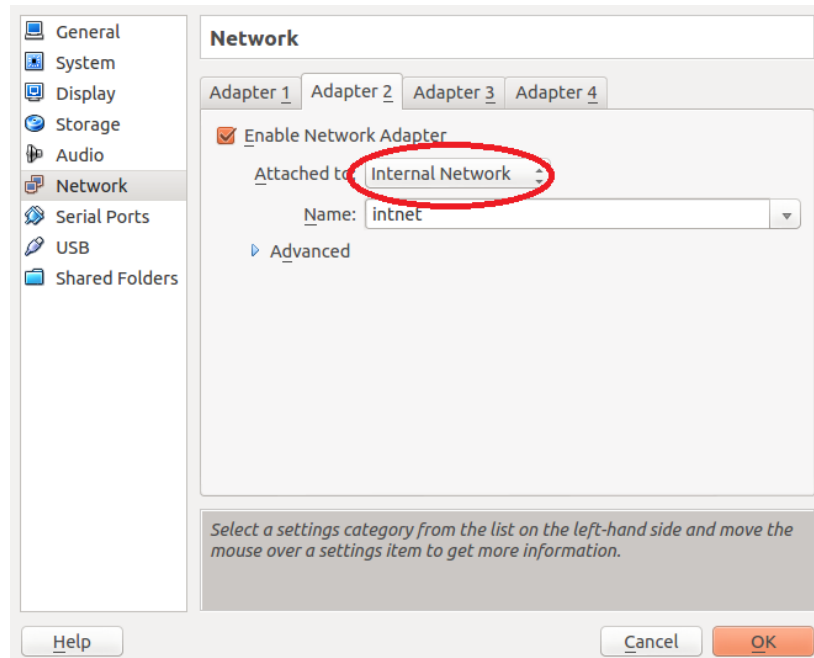
Pada Adapter 1, NAT(yang dilingkari) diubah menjadi **Bridged Adapter**



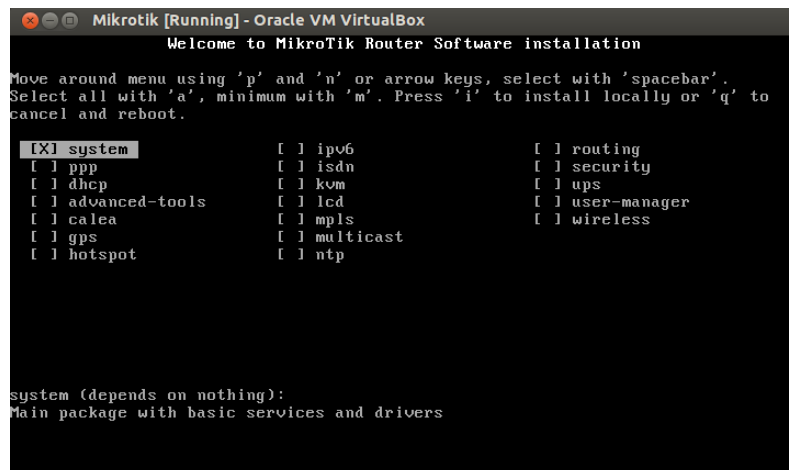
Pada Adapter 2, checklist Enable Network Adapter seperti pada gambar berikut



Not attached(yang dilingkari) diganti dengan **Internal network** lalu klik OK



12. Klik tombol start, maka akan muncul seperti pada gambar berikut:



13. Ketikkan **a** untuk memilih semuanya diinstalasi sehingga akan terlihat sebagai berikut:

```
Mikrotik [Running] - Oracle VM VirtualBox
Welcome to MikroTik Router Software installation

Move around menu using 'p' and 'n' or arrow keys, select with 'spacebar'.
Select all with 'a', minimum with 'm'. Press 'i' to install locally or 'q' to
cancel and reboot.

[X] system          [X] ipv6          [X] routing
[X] ppp             [X] isdn         [X] security
[X] dhcp            [X] kvm           [X] ups
[X] advanced-tools  [X] lcd           [X] user-manager
[X] cala             [X] mpls          [X] wireless
[X] gps             [X] multicast
[X] hotspot         [X] ntp

system (depends on nothing):
Main package with basic services and drivers
```

14. Ketikkan **i** untuk menginstallasi

```
Mikrotik OS [Running] - Oracle VM VirtualBox
Welcome to MikroTik Router Software installation

Move around menu using 'p' and 'n' or arrow keys, select with 'spacebar'.
Select all with 'a', minimum with 'm'. Press 'i' to install locally or 'q' to
cancel and reboot.

[X] system          [X] ipv6          [X] routing
[X] ppp             [X] isdn         [X] security
[X] dhcp            [X] kvm           [X] ups
[X] advanced-tools  [X] lcd           [X] user-manager
[X] cala             [X] mpls          [X] wireless
[X] gps             [X] multicast
[X] hotspot         [X] ntp

system (depends on nothing):
Main package with basic services and drivers

Do you want to keep old configuration? [y/n]:_
```

15. Lalu tinggal ketik y saja dan tunggu sampai proses installasi selesai

```
Mikrotik OS [Running] - Oracle VM VirtualBox
cancel and reboot.

[X] system          [X] ipv6          [X] routing
[X] ppp             [X] isdn         [X] security
[X] dhcp            [X] kvm           [X] ups
[X] advanced-tools  [X] lcd           [X] user-manager
[X] calea            [X] mpls          [X] wireless
[X] gps             [X] multicast
[X] hotspot         [X] ntp

system (depends on nothing):
Main package with basic services and drivers

Do you want to keep old configuration? [y/n]:y
Warning: all data on the disk will be erased!
Continue? [y/n]:_
```

```
Mikrotik OS [Running] - Oracle VM VirtualBox

[X] ppp             [X] isdn         [X] security
[X] dhcp            [X] kvm           [X] ups
[X] advanced-tools  [X] lcd           [X] user-manager
[X] calea            [X] mpls          [X] wireless
[X] gps             [X] multicast
[X] hotspot         [X] ntp

system (depends on nothing):
Main package with basic services and drivers

Do you want to keep old configuration? [y/n]:y
Warning: all data on the disk will be erased!
Continue? [y/n]:y

WARNING: couldn't keep config - current license does not allow that
Creating partition.....
```

16. Setelah proses installasi selesai, klik tombol close lalu pilih **Power Off the machine** dan klik **OK**

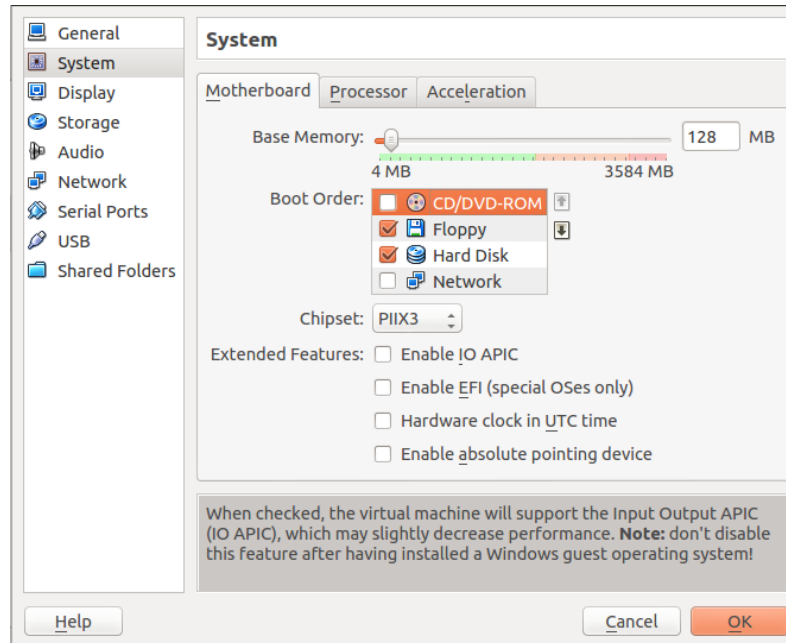
```
Mikrotik OS [Paused] - Oracle VM VirtualBox

installed system-6.13
installed wireless-6.13
installed user-manager-6.13
installed ups-6.13
installed security-6.13
installed routing-6.13
installed ntp-6.13
installed multicast-6.13
installed mpls-6.13
installed lcd-6.13
installed kvm-6.13
installed isdn-6.13
installed ipv6-6.13
installed hotspot-6.13
installed gps-6.13
installed calea-6.13
installed advanced-tool
installed dhcp-6.13
installed ppp-6.13
Checking disk integrity...

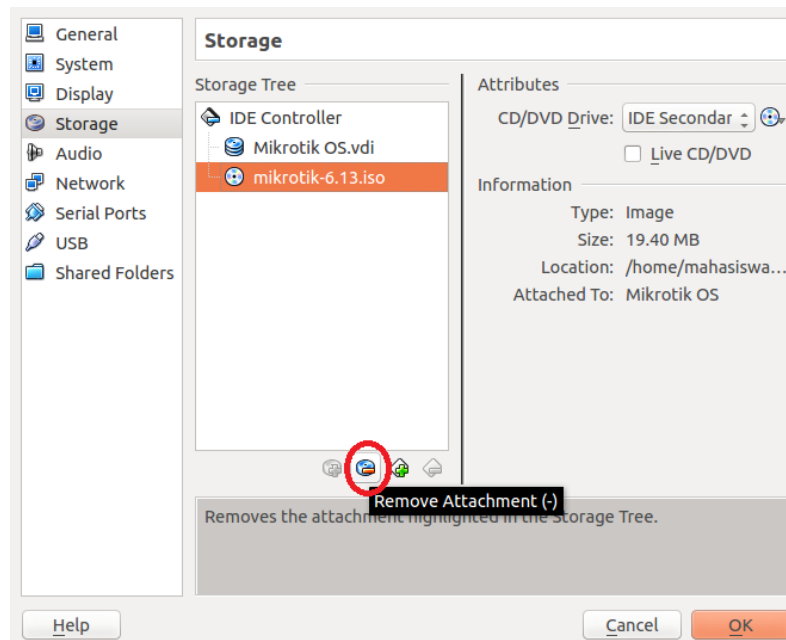
Software installed.
Press ENTER to reboot

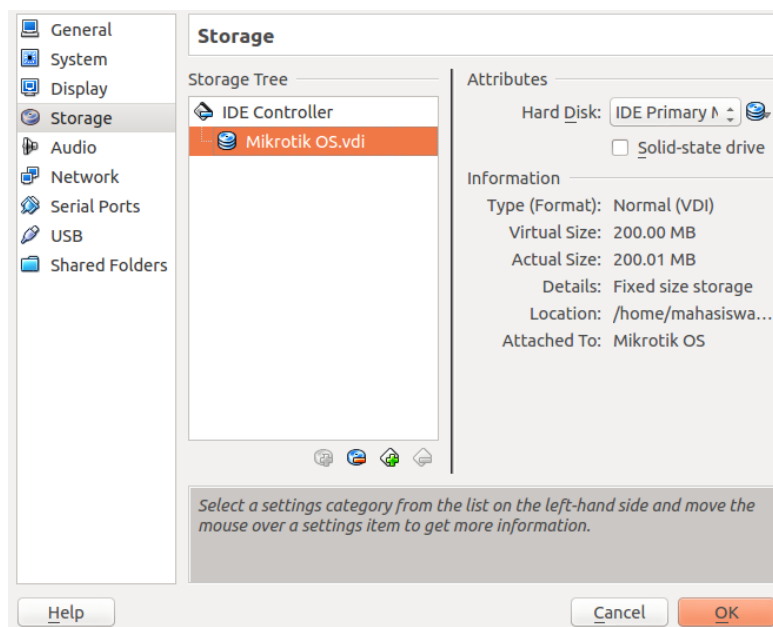
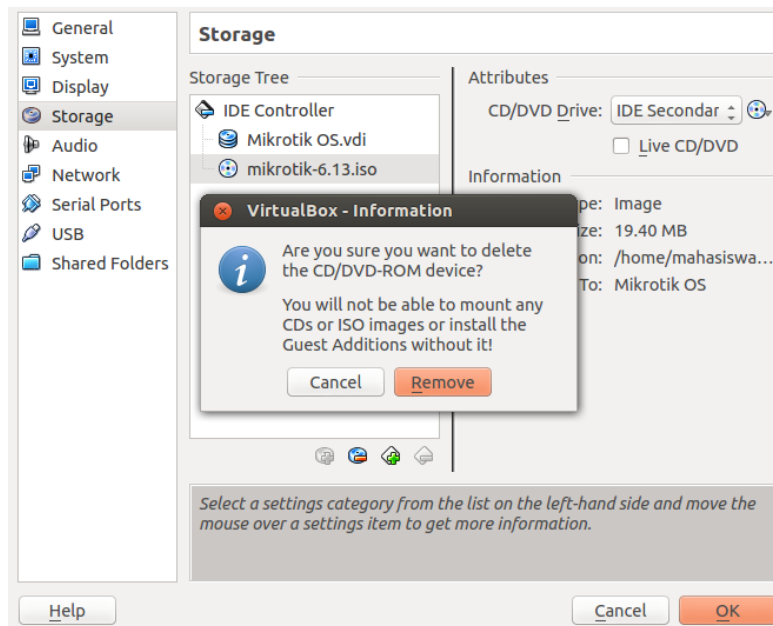
Close Virtual Machine
You want to:
☐ Save the machine state
☐ Send the shutdown signal
☒ Power off the machine
[Help] [Cancel] [OK]
```

17. Setelah keluar, klik tombol setting, lalu klik System. Setelah itu, uncheck CD/DVD-ROM



18. Klik Storage lalu remove mikrotik-6.13.iso dengan menggunakan tombol seperti pada gambar berikut:





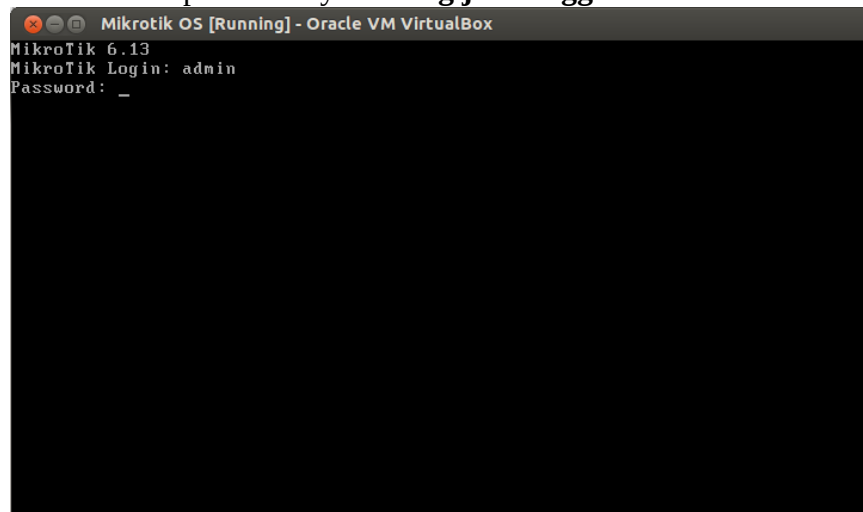
Penggunaan Mikrotik

Setelah installasi, sekarang kita masuk ke penggunaan mikrotik. Berikut ini merupakan langkah-langkah dalam menghidupkan OS Mikrotik ini:

1. Klik Mikrotik OS, lalu tekan tombol show, tunggu sampai keluar tampilan seperti pada gambar berikut



2. Untuk masuk kita membutuhkan login dan password. Login yang digunakan disini adalah **admin** dan passwordnya **kosong jadi tinggal** tekan tombol Enter



3. Setelah itu akan muncul tampilan seperti gambar berikut:

```
Mikrotik OS [Running] - Oracle VM VirtualBox

MMM      MMM      KKK                      TTTTTTTTTT      KKK
MMMM     MMMM     KKK                      TTTTTTTTTT      KKK
MMM MMMM MMM III  KKK KKK RRRRRR      000000      TTT      III  KKK KKK
MMM MM  MMM III  KKKKK RRR RRR 000 000      TTT      III  KKKKK
MMM     MMM III  KKK KKK RRRRRR 000 000      TTT      III  KKK KKK
MMM     MMM III  KKK KKK RRR RRR 000000      TTT      III  KKK KKK

MikroTik RouterOS 6.13 (c) 1999-2014      http://www.mikrotik.com/

ROUTER HAS NO SOFTWARE KEY
-----
You have 23h49m to configure the router to be remotely accessible,
and to enter the key by pasting it in a Telnet window or in Winbox.
Turn off the device to stop the timer.
See www.mikrotik.com/key for more details.

Current installation "software ID": 9IBS-NFBC
Please press "Enter" to continue!
```

Setelah menekan tombol enter berarti Mikrotik siap digunakan

```
Mikrotik OS [Running] - Oracle VM VirtualBox

MMM      MMM      KKK                      TTTTTTTTTT      KKK

MMM     MMM III  KKK KKK RRRRRR      000 000      TTT      III  KKK KKK
MMM     MMM III  KKK KKK RRR RRR 000000      TTT      III  KKK KKK

MikroTik RouterOS 6.13 (c) 1999-2014      http://www.mikrotik.com/

ROUTER HAS NO SOFTWARE KEY
-----
You have 23h49m to configure the router to be remotely accessible,
and to enter the key by pasting it in a Telnet window or in Winbox.
Turn off the device to stop the timer.
See www.mikrotik.com/key for more details.

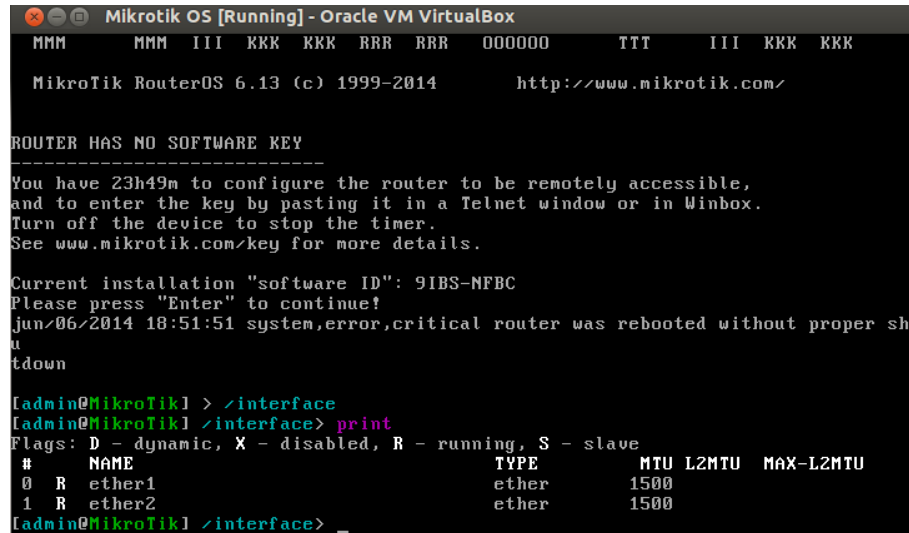
Current installation "software ID": 9IBS-NFBC
Please press "Enter" to continue!
jun/06/2014 18:51:51 system,error,critical router was rebooted without proper shutdown
[admin@MikroTik] >
```


Routing Menggunakan Mikrotik

Untuk melakukan Routing berikut ini merupakan tata caranya:

1. Kita tidak tahu nama dari interface yang digunakan yang sudah ada sebelumnya, untuk melihat interface kita ketikkan:

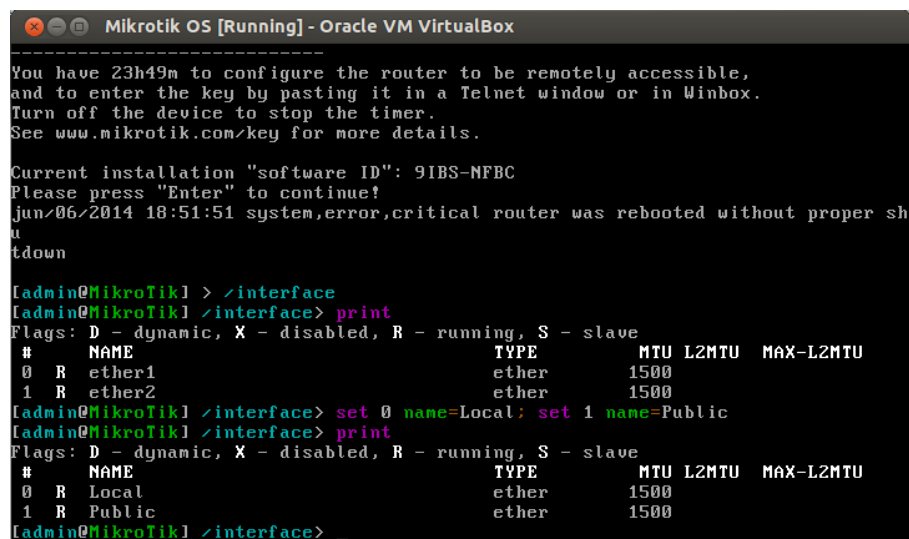
```
/interface  
print
```



```
Mikrotik OS [Running] - Oracle VM VirtualBox  
MMM      MMM  III  KKK  KKK  RRR  RRR  000000      TTT      III  KKK  KKK  
  
MikroTik RouterOS 6.13 (c) 1999-2014      http://www.mikrotik.com/  
  
ROUTER HAS NO SOFTWARE KEY  
-----  
You have 23h49m to configure the router to be remotely accessible,  
and to enter the key by pasting it in a Telnet window or in Winbox.  
Turn off the device to stop the timer.  
See www.mikrotik.com/key for more details.  
  
Current installation "software ID": 9IBS-NFBC  
Please press "Enter" to continue!  
Jun/06/2014 18:51:51 system,error,critical router was rebooted without proper shutdown  
  
[admin@MikroTik] > /interface  
[admin@MikroTik] /interface> print  
Flags: D - dynamic, X - disabled, R - running, S - slave  
#      NAME      TYPE      MTU  L2MTU  MAX-L2MTU  
0  R  ether1      ether      1500  
1  R  ether2      ether      1500  
[admin@MikroTik] /interface> _
```

2. Setelah kita tahu nama dari interfacenya dan kita ingin mengganti nama dari interface tersebut, ketikkan:

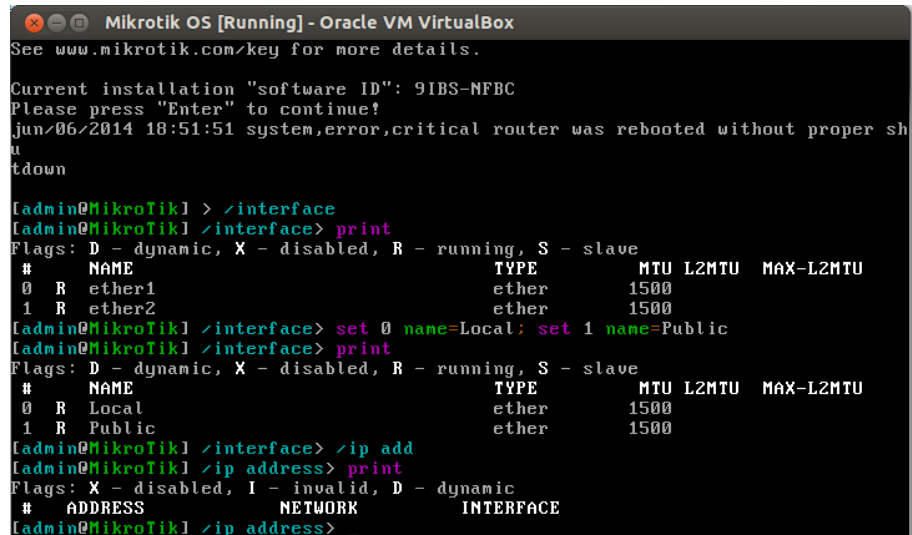
```
/interface  
set 0 name=Local; set 1 name=Public
```



```
Mikrotik OS [Running] - Oracle VM VirtualBox  
-----  
You have 23h49m to configure the router to be remotely accessible,  
and to enter the key by pasting it in a Telnet window or in Winbox.  
Turn off the device to stop the timer.  
See www.mikrotik.com/key for more details.  
  
Current installation "software ID": 9IBS-NFBC  
Please press "Enter" to continue!  
Jun/06/2014 18:51:51 system,error,critical router was rebooted without proper shutdown  
  
[admin@MikroTik] > /interface  
[admin@MikroTik] /interface> print  
Flags: D - dynamic, X - disabled, R - running, S - slave  
#      NAME      TYPE      MTU  L2MTU  MAX-L2MTU  
0  R  ether1      ether      1500  
1  R  ether2      ether      1500  
[admin@MikroTik] /interface> set 0 name=Local; set 1 name=Public  
[admin@MikroTik] /interface> print  
Flags: D - dynamic, X - disabled, R - running, S - slave  
#      NAME      TYPE      MTU  L2MTU  MAX-L2MTU  
0  R  Local      ether      1500  
1  R  Public     ether      1500  
[admin@MikroTik] /interface> _
```

3. Untuk melihat apakah mikrotik sudah memiliki IP address, ketikkan:

```
/ip add  
Print
```



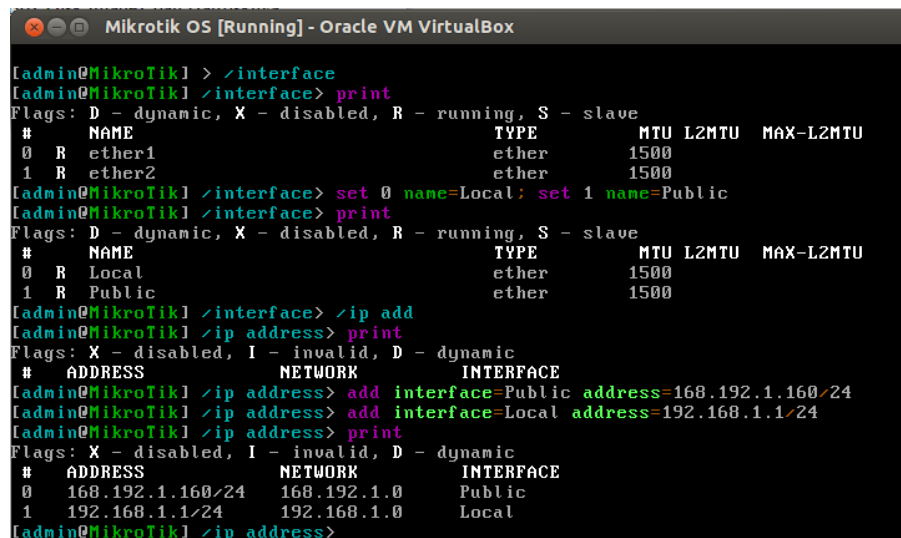
```
Mikrotik OS [Running] - Oracle VM VirtualBox
See www.mikrotik.com/key for more details.

Current installation "software ID": 9IBS-NFBC
Please press "Enter" to continue!
jun/06/2014 18:51:51 system,error,critical router was rebooted without proper shutdown

[admin@MikroTik] > /interface
[admin@MikroTik] /interface> print
Flags: D - dynamic, X - disabled, R - running, S - slave
#  NAME      TYPE      MTU  L2MTU  MAX-L2MTU
0  R  ether1     ether     1500
1  R  ether2     ether     1500
[admin@MikroTik] /interface> set 0 name=Local; set 1 name=Public
[admin@MikroTik] /interface> print
Flags: D - dynamic, X - disabled, R - running, S - slave
#  NAME      TYPE      MTU  L2MTU  MAX-L2MTU
0  R  Local      ether     1500
1  R  Public     ether     1500
[admin@MikroTik] /interface> /ip add
[admin@MikroTik] /ip address> print
Flags: X - disabled, I - invalid, D - dynamic
#  ADDRESS      NETWORK      INTERFACE
[admin@MikroTik] /ip address> _
```

4. Bisa dilihat dari gambar diatas bahwa mikrotik masih belum memiliki IP address, untuk mensetting IP address untuk mikrotik, ketikkan:

```
/ip add  
add interface=Public address=168.192.1.160/24  
add interface=Local address=192.168.1.1/24
```



```
Mikrotik OS [Running] - Oracle VM VirtualBox

[admin@MikroTik] > /interface
[admin@MikroTik] /interface> print
Flags: D - dynamic, X - disabled, R - running, S - slave
#  NAME      TYPE      MTU  L2MTU  MAX-L2MTU
0  R  ether1     ether     1500
1  R  ether2     ether     1500
[admin@MikroTik] /interface> set 0 name=Local; set 1 name=Public
[admin@MikroTik] /interface> print
Flags: D - dynamic, X - disabled, R - running, S - slave
#  NAME      TYPE      MTU  L2MTU  MAX-L2MTU
0  R  Local      ether     1500
1  R  Public     ether     1500
[admin@MikroTik] /interface> /ip add
[admin@MikroTik] /ip address> print
Flags: X - disabled, I - invalid, D - dynamic
#  ADDRESS      NETWORK      INTERFACE
[admin@MikroTik] /ip address> add interface=Public address=168.192.1.160/24
[admin@MikroTik] /ip address> add interface=Local address=192.168.1.1/24
[admin@MikroTik] /ip address> print
Flags: X - disabled, I - invalid, D - dynamic
#  ADDRESS      NETWORK      INTERFACE
0  168.192.1.160/24  168.192.1.0    Public
1  192.168.1.1/24   192.168.1.0    Local
[admin@MikroTik] /ip address> _
```

5. Setelah kita mensetting IP address, kita setting IP dnsnya, ketikkan:

```
/ip dns
```

```
set server=192.168.1.3 allow-remote-requests=yes
```

```
Mikrotik OS [Running] - Oracle VM VirtualBox
1 R Public ether 1500
[admin@MikroTik] /interface> /ip add
[admin@MikroTik] /ip address> print
Flags: X - disabled, I - invalid, D - dynamic
# ADDRESS NETWORK INTERFACE
[admin@MikroTik] /ip address> add interface=Public address=168.192.1.160/24
[admin@MikroTik] /ip address> add interface=Local address=192.168.1.1/24
[admin@MikroTik] /ip address> print
Flags: X - disabled, I - invalid, D - dynamic
# ADDRESS NETWORK INTERFACE
0 168.192.1.160/24 168.192.1.0 Public
1 192.168.1.1/24 192.168.1.0 Local
[admin@MikroTik] /ip address> /ip dns
[admin@MikroTik] /ip dns> set server=192.168.1.3 allow-remote-requests=yes
[admin@MikroTik] /ip dns> print
servers: 192.168.1.3
dynamic-servers:
allow-remote-requests: yes
max-udp-packet-size: 4096
query-server-timeout: 2s
query-total-timeout: 10s
cache-size: 2048KiB
cache-max-ttl: 1w
cache-used: 9KiB
[admin@MikroTik] /ip dns> _
```

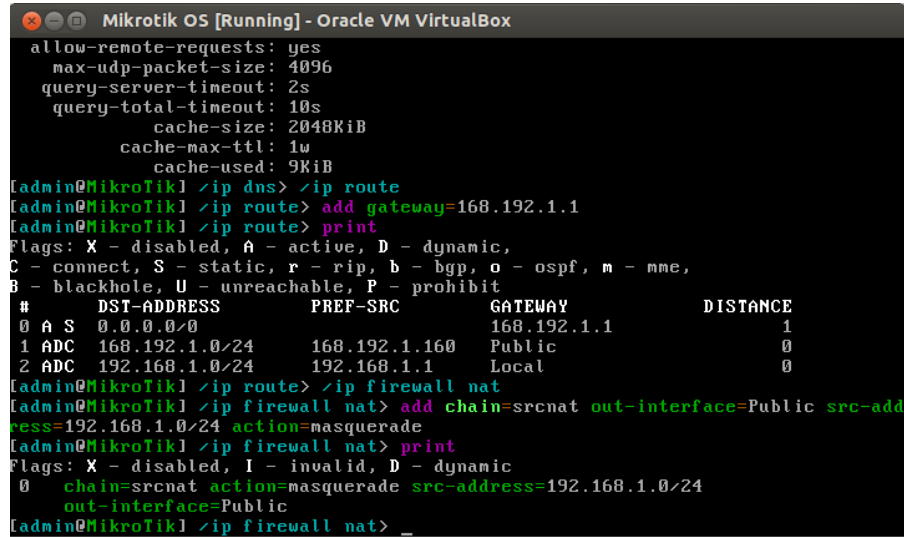
6. Sekarang tinggal buat IP gatewaynya, ketikkan:

```
/ip route
```

```
add gateway=168.192.1.1
```

```
Mikrotik OS [Running] - Oracle VM VirtualBox
0 168.192.1.160/24 168.192.1.0 Public
1 192.168.1.1/24 192.168.1.0 Local
[admin@MikroTik] /ip address> /ip dns
[admin@MikroTik] /ip dns> set server=192.168.1.3 allow-remote-requests=yes
[admin@MikroTik] /ip dns> print
servers: 192.168.1.3
dynamic-servers:
allow-remote-requests: yes
max-udp-packet-size: 4096
query-server-timeout: 2s
query-total-timeout: 10s
cache-size: 2048KiB
cache-max-ttl: 1w
cache-used: 9KiB
[admin@MikroTik] /ip dns> /ip route
[admin@MikroTik] /ip route> add gateway=168.192.1.1
[admin@MikroTik] /ip route> print
Flags: X - disabled, A - active, D - dynamic,
C - connect, S - static, r - rip, b - bgp, o - ospf, m - mme,
B - blackhole, U - unreachable, P - prohibit
# DST-ADDRESS PREF-SRC GATEWAY DISTANCE
0 A S 0.0.0.0/0 168.192.1.1 1
1 ADC 168.192.1.0/24 168.192.1.160 Public 0
2 ADC 192.168.1.0/24 192.168.1.1 Local 0
[admin@MikroTik] /ip route> _
```

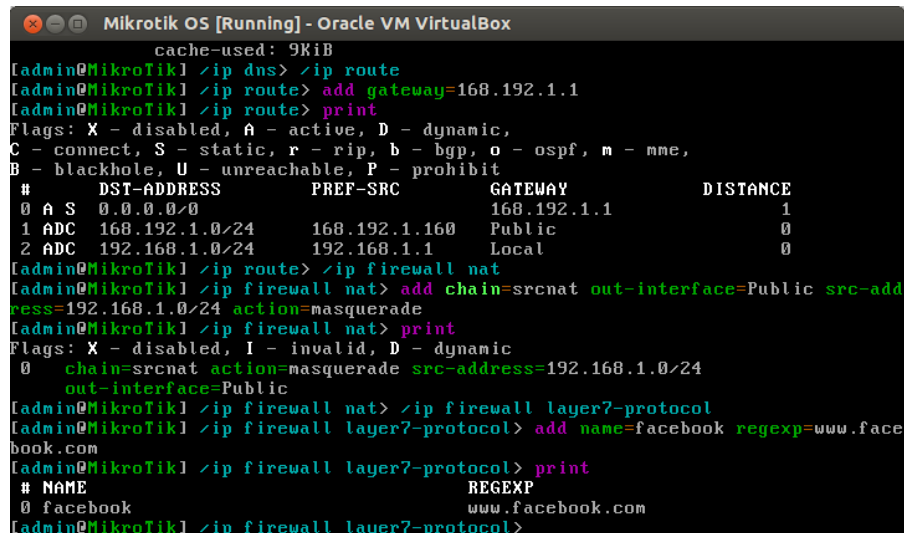
7. Untuk mengkonversi alamat Local menjadi Public, ketikkan:
- ```
/ip firewall nat
add chain=srcnat out-interface=Public src-address=192.168.1.0/24 action=masquerade
```



```
Mikrotik OS [Running] - Oracle VM VirtualBox
allow-remote-requests: yes
max-udp-packet-size: 4096
query-server-timeout: 2s
query-total-timeout: 10s
 cache-size: 2048KiB
 cache-max-ttl: 1w
 cache-used: 9KiB
[admin@MikroTik] /ip dns> /ip route
[admin@MikroTik] /ip route> add gateway=168.192.1.1
[admin@MikroTik] /ip route> print
Flags: X - disabled, A - active, D - dynamic,
C - connect, S - static, r - rip, b - bgp, o - ospf, m - mme,
B - blackhole, U - unreachable, P - prohibit
DST-ADDRESS PREF-SRC GATEWAY DISTANCE
0 A S 0.0.0.0/0 168.192.1.1 1
1 ADC 168.192.1.0/24 168.192.1.160 Public 0
2 ADC 192.168.1.0/24 192.168.1.1 Local 0
[admin@MikroTik] /ip route> /ip firewall nat
[admin@MikroTik] /ip firewall nat> add chain=srcnat out-interface=Public src-address=192.168.1.0/24 action=masquerade
[admin@MikroTik] /ip firewall nat> print
Flags: X - disabled, I - invalid, D - dynamic
0 chain=srcnat action=masquerade src-address=192.168.1.0/24
 out-interface=Public
[admin@MikroTik] /ip firewall nat> _
```

192.168.1.0 merupakan network local, bukan IP Local. Jadi yang dikonversi menjadi IP Public dimulai dari 0 sampai seterusnya.

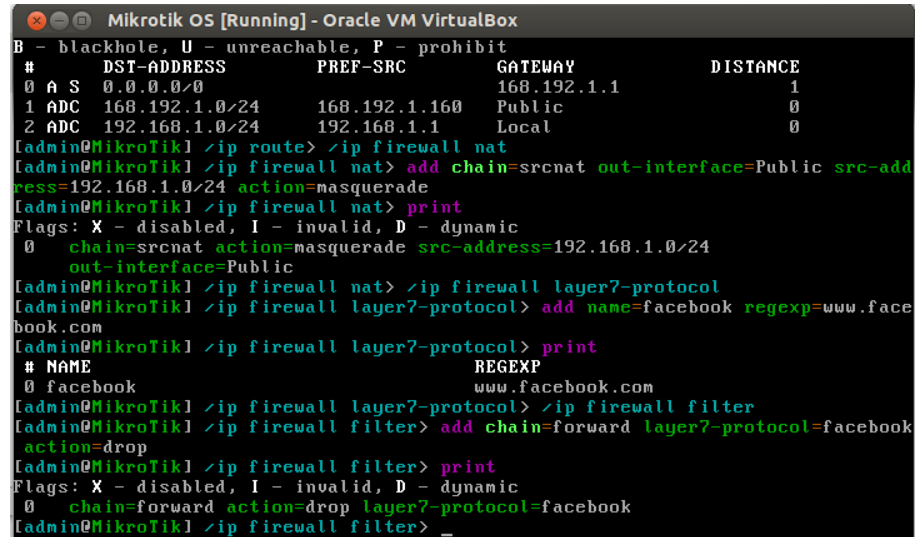
8. Berikut ini merupakan cara untuk memblokir suatu website agar tidak dapat dibuka secara bebas: (misal: Facebook)
- ```
/ip firewall layer7-protocol
add name=facebook regexp=www.facebook.com
```



```
Mikrotik OS [Running] - Oracle VM VirtualBox
cache-used: 9KiB
[admin@MikroTik] /ip dns> /ip route
[admin@MikroTik] /ip route> add gateway=168.192.1.1
[admin@MikroTik] /ip route> print
Flags: X - disabled, A - active, D - dynamic,
C - connect, S - static, r - rip, b - bgp, o - ospf, m - mme,
B - blackhole, U - unreachable, P - prohibit
#   DST-ADDRESS      PREF-SRC  GATEWAY      DISTANCE
0 A S 0.0.0.0/0         168.192.1.1  1
1 ADC 168.192.1.0/24   168.192.1.160 Public        0
2 ADC 192.168.1.0/24   192.168.1.1  Local         0
[admin@MikroTik] /ip route> /ip firewall nat
[admin@MikroTik] /ip firewall nat> add chain=srcnat out-interface=Public src-address=192.168.1.0/24 action=masquerade
[admin@MikroTik] /ip firewall nat> print
Flags: X - disabled, I - invalid, D - dynamic
0   chain=srcnat action=masquerade src-address=192.168.1.0/24
    out-interface=Public
[admin@MikroTik] /ip firewall nat> /ip firewall layer7-protocol
[admin@MikroTik] /ip firewall layer7-protocol> add name=facebook regexp=www.facebook.com
[admin@MikroTik] /ip firewall layer7-protocol> print
#   NAME      REGEXP
0   facebook  www.facebook.com
[admin@MikroTik] /ip firewall layer7-protocol> _
```

Akan tetapi, kalau hanya sampai disini saja, website tersebut masih bisa dibuka.
Jadi harus buat filternya juga, dengan mengetikkan:

```
/ip firewall filter  
add chain=forward layer7-protocol=facebook action=drop
```



```
Mikrotik OS [Running] - Oracle VM VirtualBox  
B - blackhole, U - unreachable, P - prohibit  
# DST-ADDRESS      PREF-SRC  GATEWAY      DISTANCE  
0 A S  0.0.0.0/0             168.192.1.1      1  
1 ADC  168.192.1.0/24       168.192.1.160   Public        0  
2 ADC  192.168.1.0/24       192.168.1.1     Local         0  
[admin@MikroTik] /ip route> /ip firewall nat  
[admin@MikroTik] /ip firewall nat> add chain=srcnat out-interface=Public src-address=192.168.1.0/24 action=masquerade  
[admin@MikroTik] /ip firewall nat> print  
Flags: X - disabled, I - invalid, D - dynamic  
0 chain=srcnat action=masquerade src-address=192.168.1.0/24  
  out-interface=Public  
[admin@MikroTik] /ip firewall nat> /ip firewall layer7-protocol  
[admin@MikroTik] /ip firewall layer7-protocol> add name=facebook regexp=www.facebook.com  
[admin@MikroTik] /ip firewall layer7-protocol> print  
# NAME      REGEXP  
0 facebook  www.facebook.com  
[admin@MikroTik] /ip firewall layer7-protocol> /ip firewall filter  
[admin@MikroTik] /ip firewall filter> add chain=forward layer7-protocol=facebook action=drop  
[admin@MikroTik] /ip firewall filter> print  
Flags: X - disabled, I - invalid, D - dynamic  
0 chain=forward action=drop layer7-protocol=facebook  
[admin@MikroTik] /ip firewall filter> _
```