

# MODUL PRAKTIKUM 05

## STATIC ROUTING WINDOWS

### TUJUAN

Setelah praktikum dilaksanakan, peserta praktikum diharapkan memiliki kemampuan

1. Melakukan konfigurasi Static Routing dengan text-mode pada Router Windows XP
2. Melakukan konfigurasi Static Routing dengan GUI-mode pada Router Windows Server 2008
3. Melakukan penelusuran jaringan dengan tracert

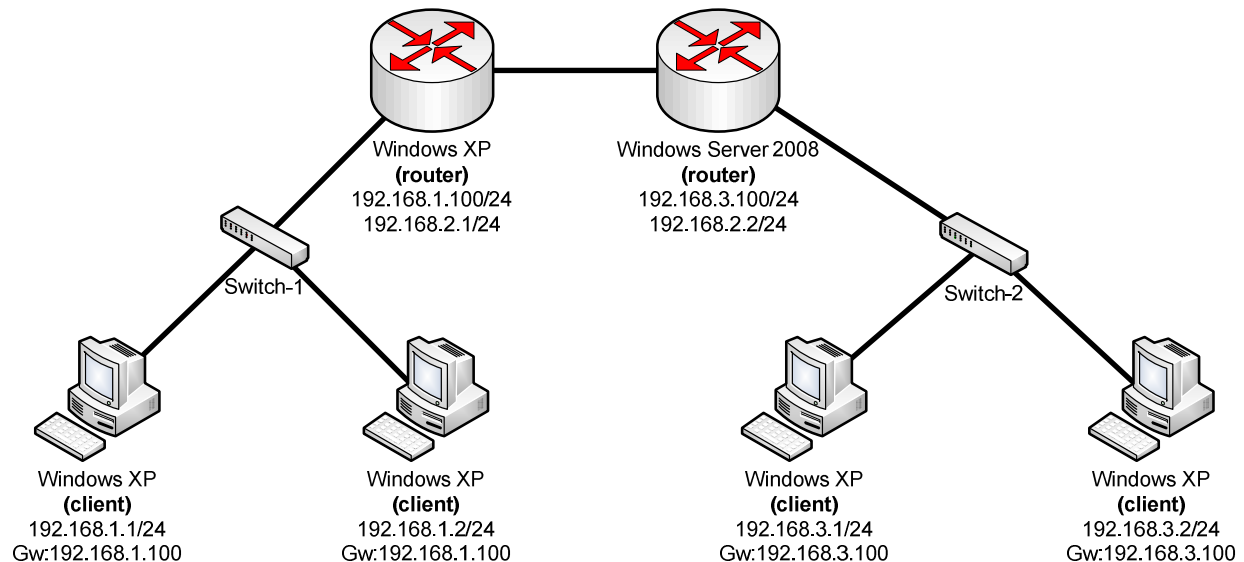
### PERANGKAT

Perangkat yang digunakan untuk praktikum adalah sbb :

1. Windows Server 2008
2. Windows XP
3. Kabel UTP Straight atau Cross
4. Switch

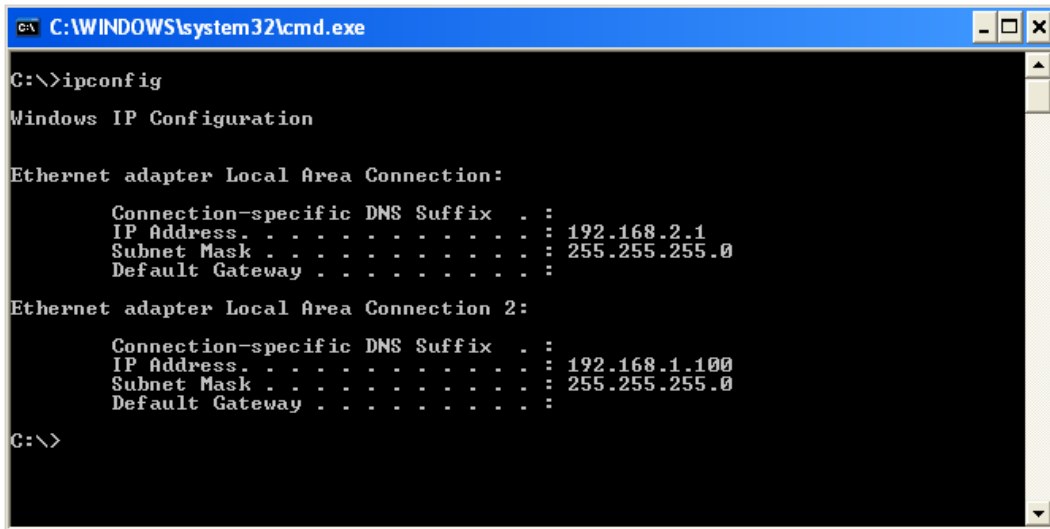
### PROSEDUR PRAKTIKUM

Berikut topologi yang akan dijadikan materi praktikum :

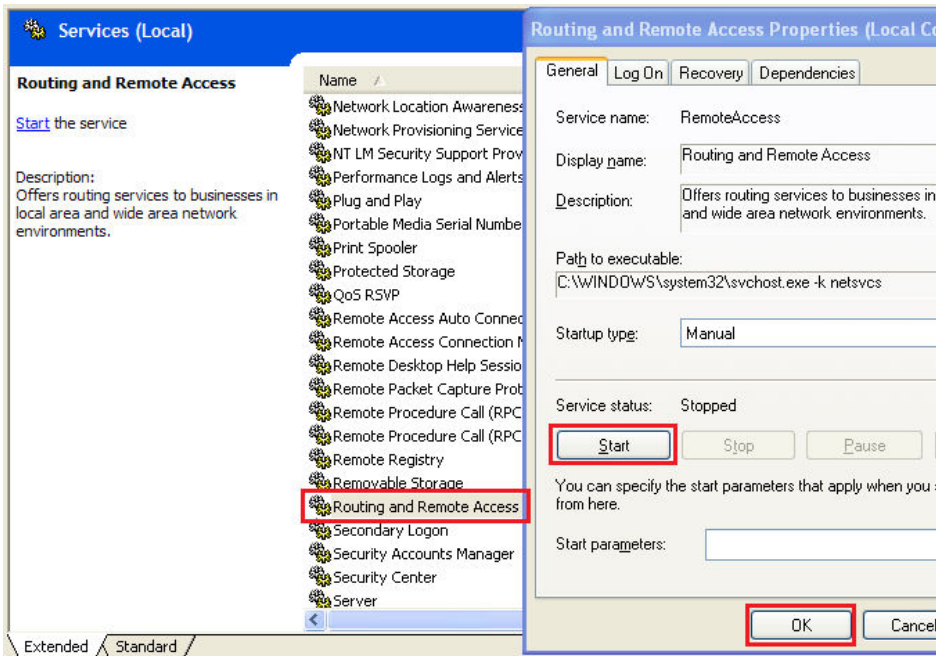


1. Melakukan konfigurasi Static Routing dengan text-mode pada Router Windows XP

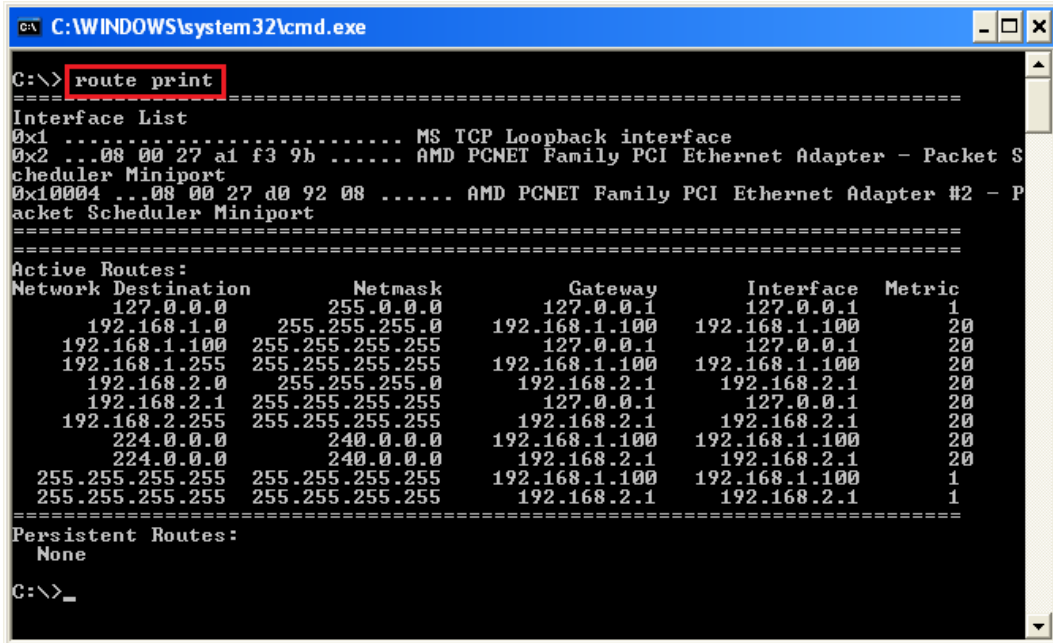
- a. Tambahkan IP Address pada interface yang sesuai



- b. Hidupkan service **Routing and Remote Access**

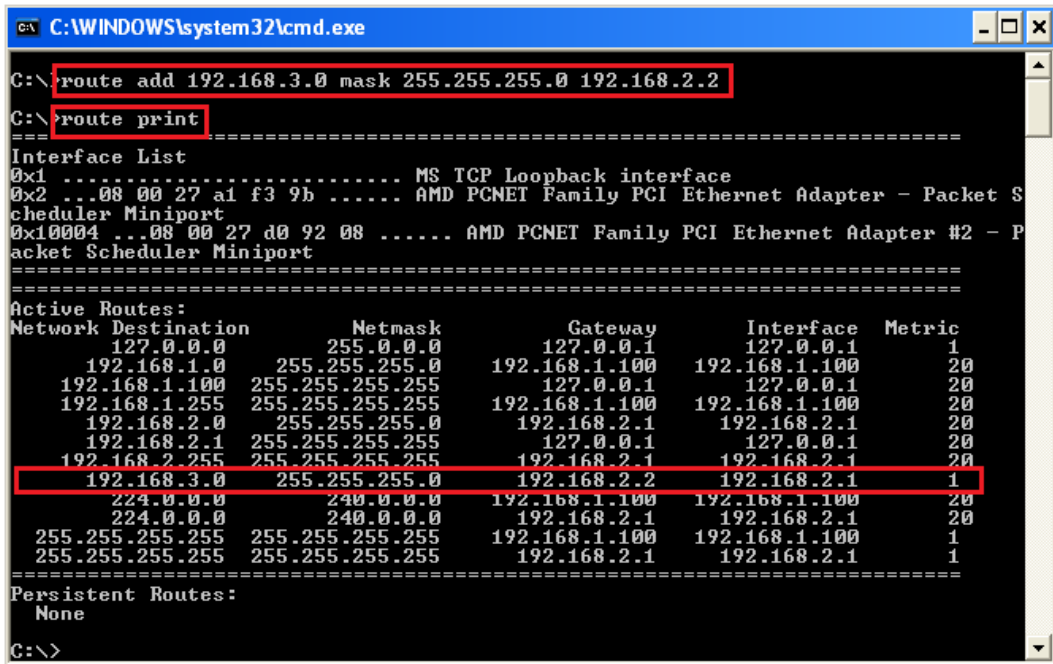


- c. Cek routing table dengan perintah “**route print**” pada command-prompt



```
C:\WINDOWS\system32\cmd.exe
C:\> route print
=====
Interface List
0x1 ..... MS TCP Loopback interface
0x2 ...08 00 27 a1 f3 9b ..... AMD PCNET Family PCI Ethernet Adapter - Packet Scheduler Miniport
0x10004 ...08 00 27 d0 92 08 ..... AMD PCNET Family PCI Ethernet Adapter #2 - Packet Scheduler Miniport
=====
Active Routes:
Network Destination        Netmask          Gateway          Interface        Metric
127.0.0.0                  255.0.0.0        127.0.0.1       127.0.0.1         1
192.168.1.0                255.255.255.0   192.168.1.100  192.168.1.100    20
192.168.1.100             255.255.255.255 127.0.0.1       127.0.0.1         20
192.168.1.255             255.255.255.255 192.168.1.100  192.168.1.100    20
192.168.2.0                255.255.255.0   192.168.2.1     192.168.2.1      20
192.168.2.1                255.255.255.255 127.0.0.1       127.0.0.1         20
192.168.2.255             255.255.255.255 192.168.2.1     192.168.2.1      20
224.0.0.0                  240.0.0.0        192.168.1.100  192.168.1.100    20
224.0.0.0                  240.0.0.0        192.168.2.1     192.168.2.1      20
255.255.255.255           255.255.255.255 192.168.1.100  192.168.1.100    1
255.255.255.255           255.255.255.255 192.168.2.1     192.168.2.1      1
=====
Persistent Routes:
None
C:\>_
```

- d. Tambahkan route ke network yang belum dikenal dengan perintah **route add <dest-network> mask <dest-subnet> <gateway> [metric <cost>] [if <interface>]**



```
C:\WINDOWS\system32\cmd.exe
C:\> route add 192.168.3.0 mask 255.255.255.0 192.168.2.2
C:\> route print
=====
Interface List
0x1 ..... MS TCP Loopback interface
0x2 ...08 00 27 a1 f3 9b ..... AMD PCNET Family PCI Ethernet Adapter - Packet Scheduler Miniport
0x10004 ...08 00 27 d0 92 08 ..... AMD PCNET Family PCI Ethernet Adapter #2 - Packet Scheduler Miniport
=====
Active Routes:
Network Destination        Netmask          Gateway          Interface        Metric
127.0.0.0                  255.0.0.0        127.0.0.1       127.0.0.1         1
192.168.1.0                255.255.255.0   192.168.1.100  192.168.1.100    20
192.168.1.100             255.255.255.255 127.0.0.1       127.0.0.1         20
192.168.1.255             255.255.255.255 192.168.1.100  192.168.1.100    20
192.168.2.0                255.255.255.0   192.168.2.1     192.168.2.1      20
192.168.2.1                255.255.255.255 127.0.0.1       127.0.0.1         20
192.168.2.255             255.255.255.255 192.168.2.1     192.168.2.1      20
192.168.3.0                255.255.255.0   192.168.2.2     192.168.2.1      1
224.0.0.0                  240.0.0.0        192.168.1.100  192.168.1.100    20
224.0.0.0                  240.0.0.0        192.168.2.1     192.168.2.1      20
255.255.255.255           255.255.255.255 192.168.1.100  192.168.1.100    1
255.255.255.255           255.255.255.255 192.168.2.1     192.168.2.1      1
=====
Persistent Routes:
None
C:\>
```

- e. Jika terjadi kesalahan penambahan, dapat dihapus menggunakan perintah `route delete <dest-network>`

```

C:\>route delete 192.168.3.0

C:\>route print
=====
Interface List
0x1 ..... MS TCP Loopback interface
0x2 ...08 00 27 a1 f3 9b ..... AMD PCNET Family PCI Ethernet Adapter - Packet S
cheduler Miniport
0x10004 ...08 00 27 d0 92 08 ..... AMD PCNET Family PCI Ethernet Adapter #2 - P
acket Scheduler Miniport
=====
Active Routes:
Network Destination    Netmask          Gateway          Interface        Metric
127.0.0.0              255.0.0.0        127.0.0.1        127.0.0.1         1
192.168.1.0            255.255.255.0    192.168.1.100    192.168.1.100    20
192.168.1.100          255.255.255.255  127.0.0.1        127.0.0.1         20
192.168.1.255          255.255.255.255  192.168.1.100    192.168.1.100    20
192.168.2.0            255.255.255.0    192.168.2.1      192.168.2.1       20
192.168.2.1            255.255.255.255  127.0.0.1        127.0.0.1         20
192.168.2.255          255.255.255.255  192.168.2.1      192.168.2.1       20
224.0.0.0              240.0.0.0        192.168.1.100    192.168.1.100    20
224.0.0.0              240.0.0.0        192.168.2.1      192.168.2.1       20
255.255.255.255        255.255.255.255  192.168.1.100    192.168.1.100    1
255.255.255.255        255.255.255.255  192.168.2.1      192.168.2.1       1
=====
Persistent Routes:
None
C:\>_

```

- f. Penambahan Static Routing menggunakan `route add` akan hilang setiap kali Windows restart. Jika ingin tetap ada, tambahkan opsi `-p`

```

C:\>route -p add 192.168.3.0 mask 255.255.255.0 192.168.2.2

C:\>route print
=====
Interface List
0x1 ..... MS TCP Loopback interface
0x2 ...08 00 27 a1 f3 9b ..... AMD PCNET Family PCI Ethernet Adapter - Packet S
cheduler Miniport
0x10004 ...08 00 27 d0 92 08 ..... AMD PCNET Family PCI Ethernet Adapter #2 - P
acket Scheduler Miniport
=====
Active Routes:
Network Destination    Netmask          Gateway          Interface        Metric
127.0.0.0              255.0.0.0        127.0.0.1        127.0.0.1         1
192.168.1.0            255.255.255.0    192.168.1.100    192.168.1.100    20
192.168.1.100          255.255.255.255  127.0.0.1        127.0.0.1         20
192.168.1.255          255.255.255.255  192.168.1.100    192.168.1.100    20
192.168.2.0            255.255.255.0    192.168.2.1      192.168.2.1       20
192.168.2.1            255.255.255.255  127.0.0.1        127.0.0.1         20
192.168.2.255          255.255.255.255  192.168.2.1      192.168.2.1       20
192.168.3.0            255.255.255.0    192.168.2.2      192.168.2.1       1
224.0.0.0              240.0.0.0        192.168.1.100    192.168.1.100    20
224.0.0.0              240.0.0.0        192.168.2.1      192.168.2.1       20
255.255.255.255        255.255.255.255  192.168.1.100    192.168.1.100    1
255.255.255.255        255.255.255.255  192.168.2.1      192.168.2.1       1
=====
Persistent Routes:
Network Address      Netmask    Gateway Address  Metric
192.168.3.0          255.255.255.0  192.168.2.2      1

```

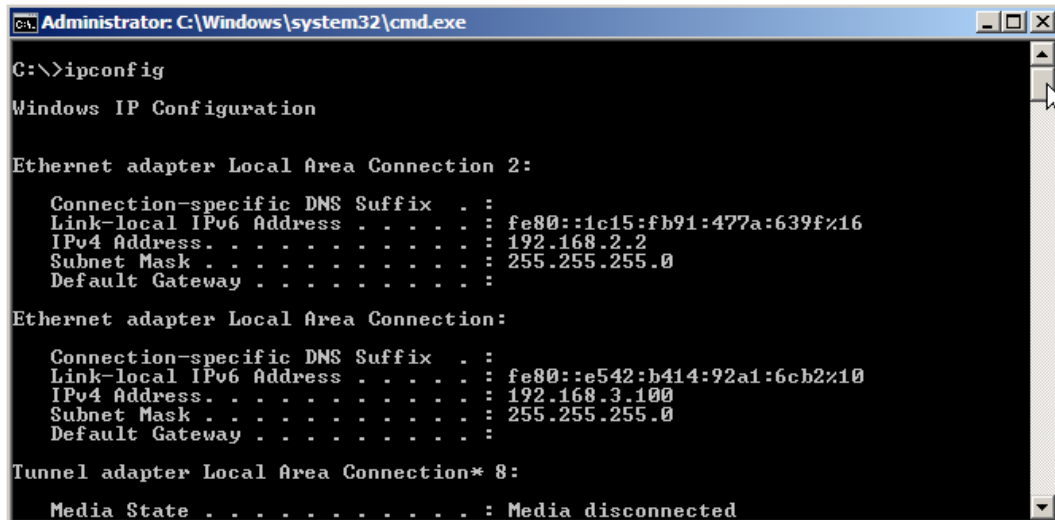
- g. Jika ingin membersihkan routing table, tambahkan opsi `-f`

```
C:\>route -f
```

(Catatan : Hati-hati dalam menggunakan opsi `-f`)

## 2. Melakukan konfigurasi Static Routing dengan GUI-mode pada Router Windows Server 2008

- a. Tambahkan IP Address pada interface yang sesuai



```
Administrator: C:\Windows\system32\cmd.exe
C:\>ipconfig

Windows IP Configuration

Ethernet adapter Local Area Connection 2:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::1c15:fb91:477a:639f%16
    IPv4 Address. . . . . : 192.168.2.2
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 

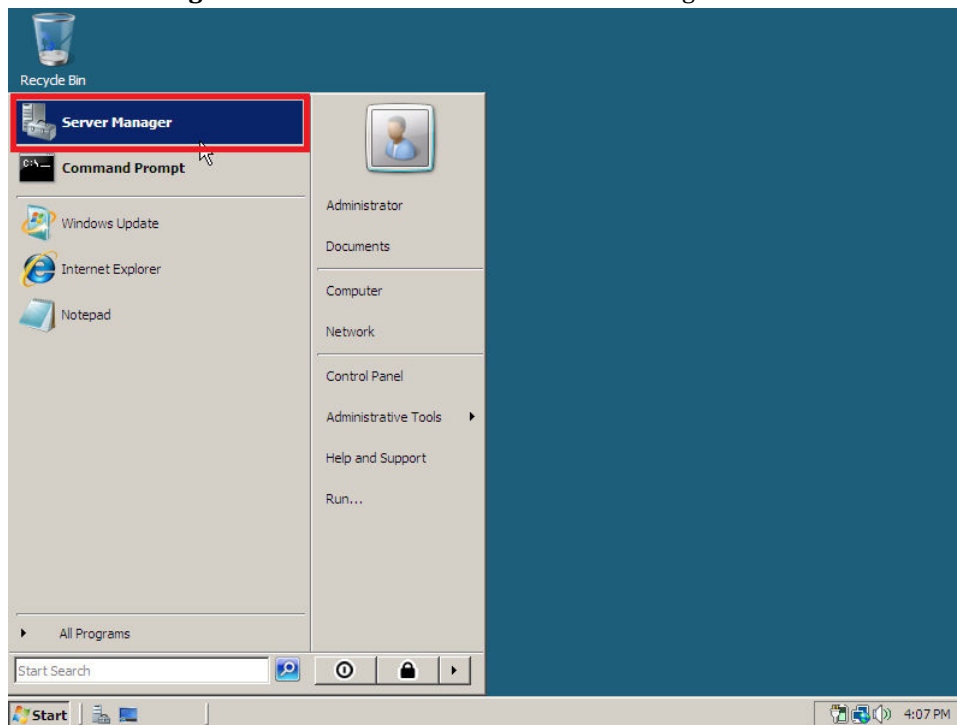
Ethernet adapter Local Area Connection:

    Connection-specific DNS Suffix  . : 
    Link-local IPv6 Address . . . . . : fe80::e542:b414:92a1:6cb2%10
    IPv4 Address. . . . . : 192.168.3.100
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 

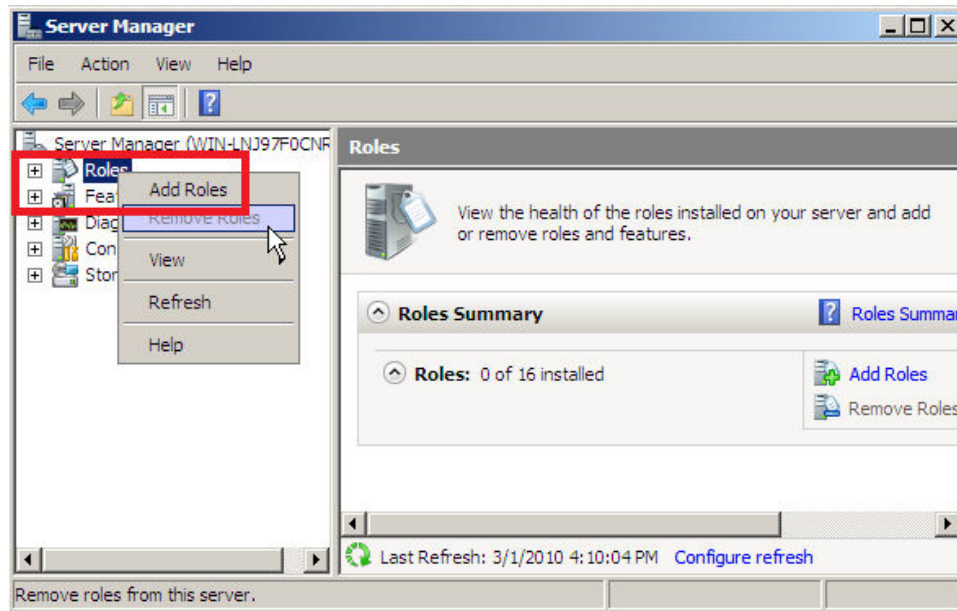
Tunnel adapter Local Area Connection* 8:

    Media State . . . . . : Media disconnected
```

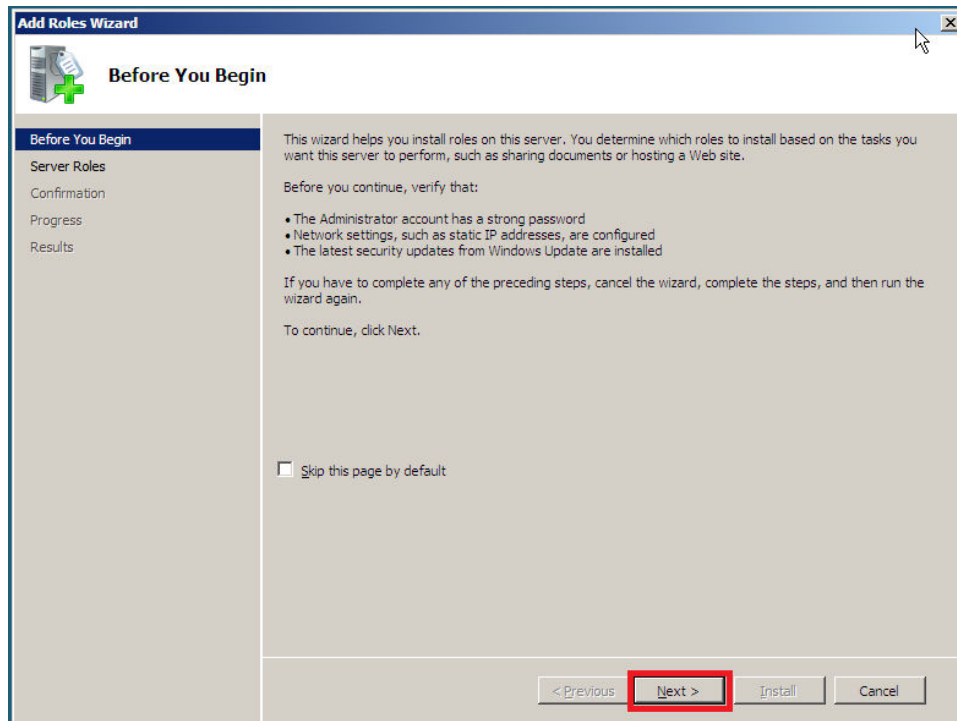
- b. Instalasi **Routing and Remote Access** melalui Server Manager



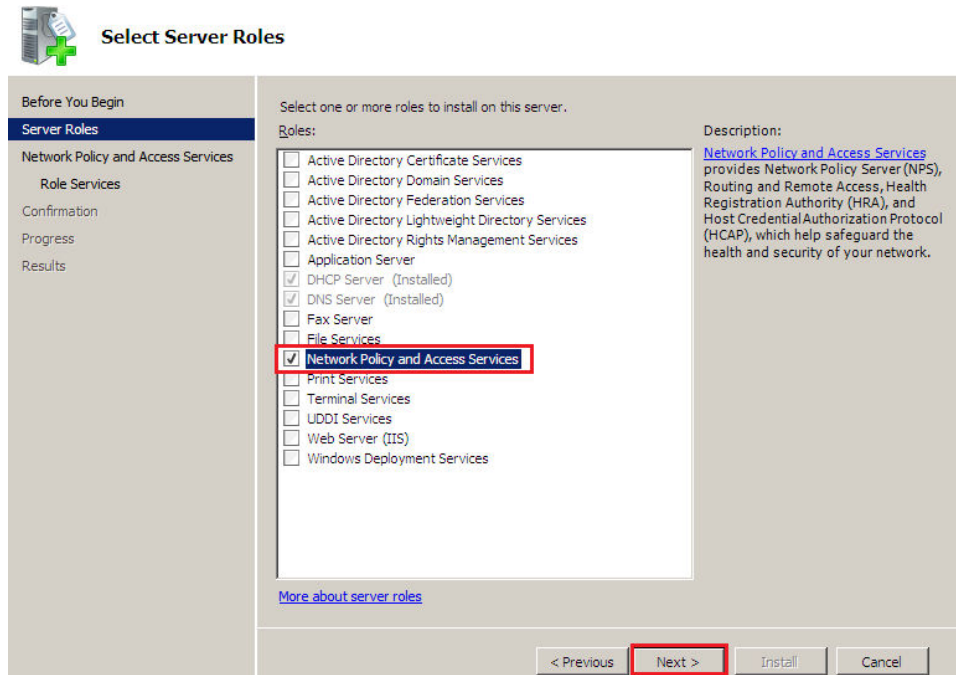
- c. Tambahkan peran Server agar menjadi **Routing and Remote Access**



- d. Ikuti Wizard instalasi



e. Pilih peran “Network Policy and Access Services”



**Select Server Roles**

Before You Begin

Server Roles

Network Policy and Access Services

Role Services

Confirmation

Progress

Results

Select one or more roles to install on this server.

Roles:

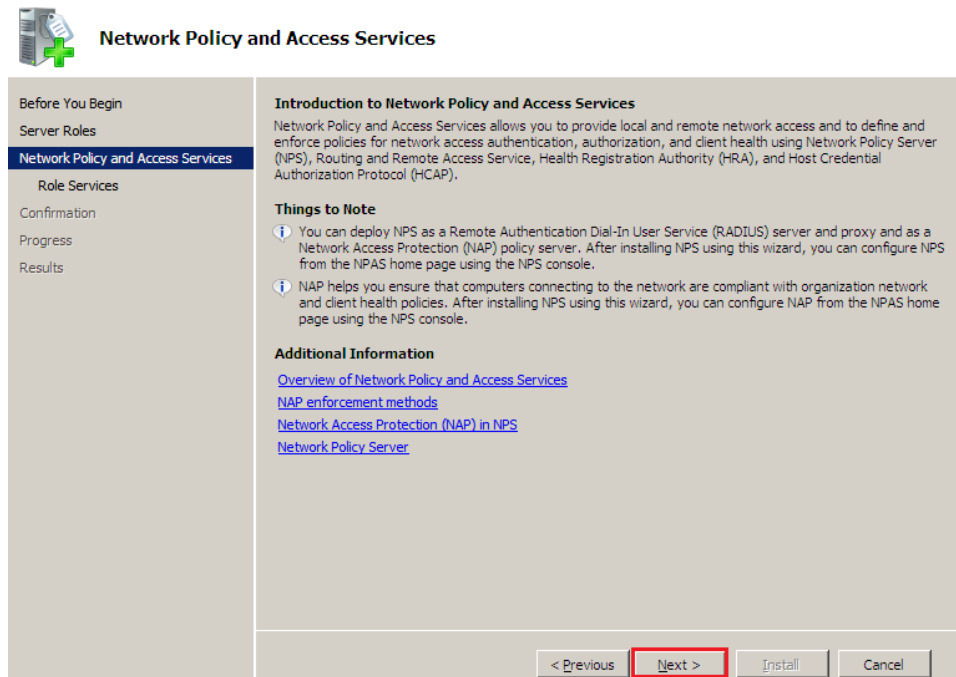
- Active Directory Certificate Services
- Active Directory Domain Services
- Active Directory Federation Services
- Active Directory Lightweight Directory Services
- Active Directory Rights Management Services
- Application Server
- DHCP Server (Installed)
- DNS Server (Installed)
- Fax Server
- File Services
- Network Policy and Access Services**
- Print Services
- Terminal Services
- UDDI Services
- Web Server (IIS)
- Windows Deployment Services

Description:

[Network Policy and Access Services](#) provides Network Policy Server (NPS), Routing and Remote Access, Health Registration Authority (HRA), and Host Credential Authorization Protocol (HCAP), which help safeguard the health and security of your network.

[More about server roles](#)

< Previous **Next >** Install Cancel



**Network Policy and Access Services**

Before You Begin

Server Roles

**Network Policy and Access Services**

Role Services

Confirmation

Progress

Results

**Introduction to Network Policy and Access Services**

Network Policy and Access Services allows you to provide local and remote network access and to define and enforce policies for network access authentication, authorization, and client health using Network Policy Server (NPS), Routing and Remote Access Service, Health Registration Authority (HRA), and Host Credential Authorization Protocol (HCAP).

**Things to Note**

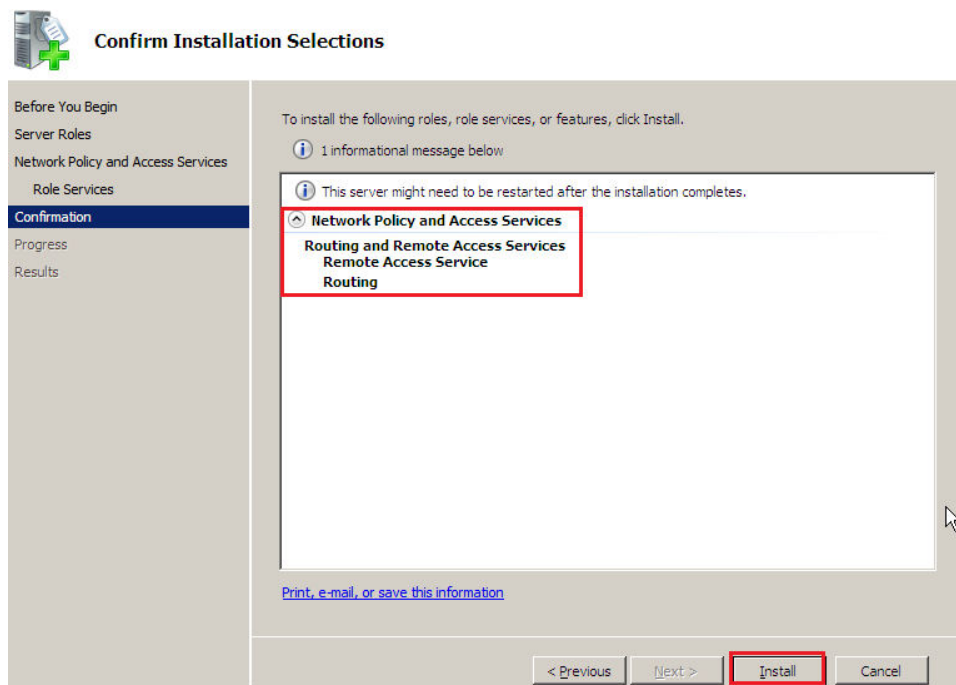
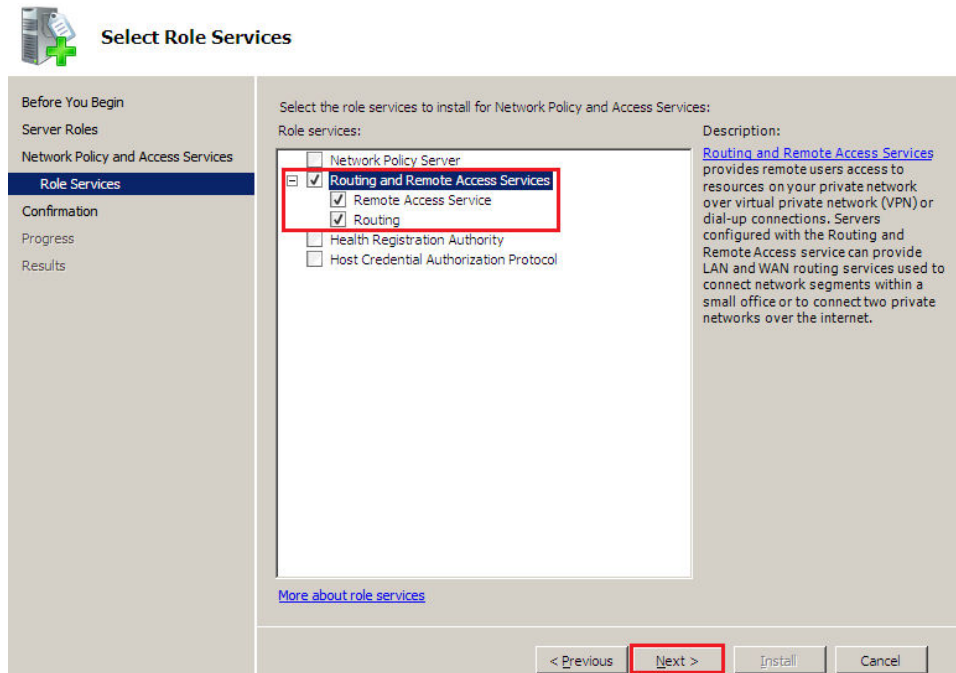
- i** You can deploy NPS as a Remote Authentication Dial-In User Service (RADIUS) server and proxy and as a Network Access Protection (NAP) policy server. After installing NPS using this wizard, you can configure NPS from the NPAS home page using the NPS console.
- i** NAP helps you ensure that computers connecting to the network are compliant with organization network and client health policies. After installing NPS using this wizard, you can configure NAP from the NPAS home page using the NPS console.

**Additional Information**

- [Overview of Network Policy and Access Services](#)
- [NAP enforcement methods](#)
- [Network Access Protection \(NAP\) in NPS](#)
- [Network Policy Server](#)

< Previous **Next >** Install Cancel

f. Pilih **“Routing and Remote Access Services”** serta konfirmasi instalasi





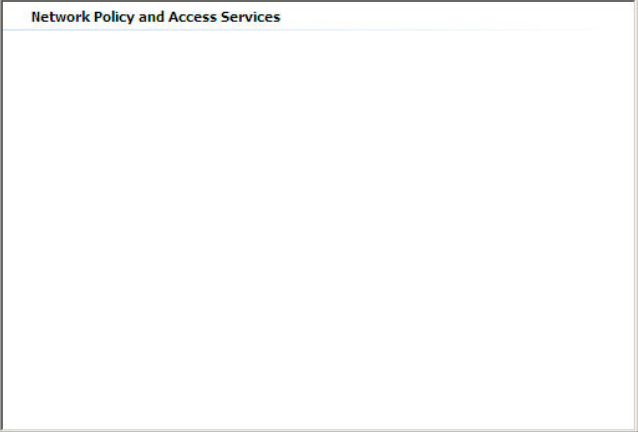


## Installation Progress

Before You Begin  
Server Roles  
Network Policy and Access Services  
    Role Services  
Confirmation  
**Progress**  
Results

The following roles, role services, or features are being installed:

**Network Policy and Access Services**



Initializing installation...

< Previous    Next >    Install    Cancel



## Installation Results

Before You Begin  
Server Roles  
Network Policy and Access Services  
    Role Services  
Confirmation  
Progress  
**Results**

The following roles, role services, or features were installed successfully:

⚠ 1 warning message below

⚠ Windows automatic updating is not enabled. To install the latest updates, use Windows Update in Control Panel to check for updates.

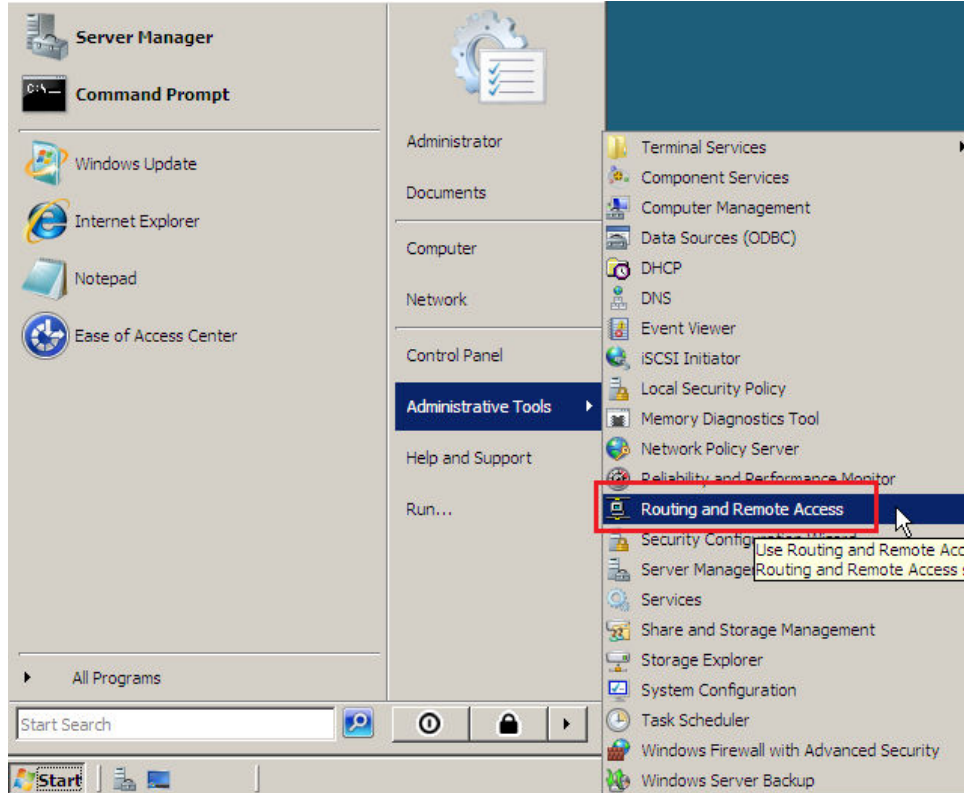
⊖ **Network Policy and Access Services**    ✓ **Installation succeeded**

The following role services were installed:  
**Routing and Remote Access Services**  
    Remote Access Service  
    Routing

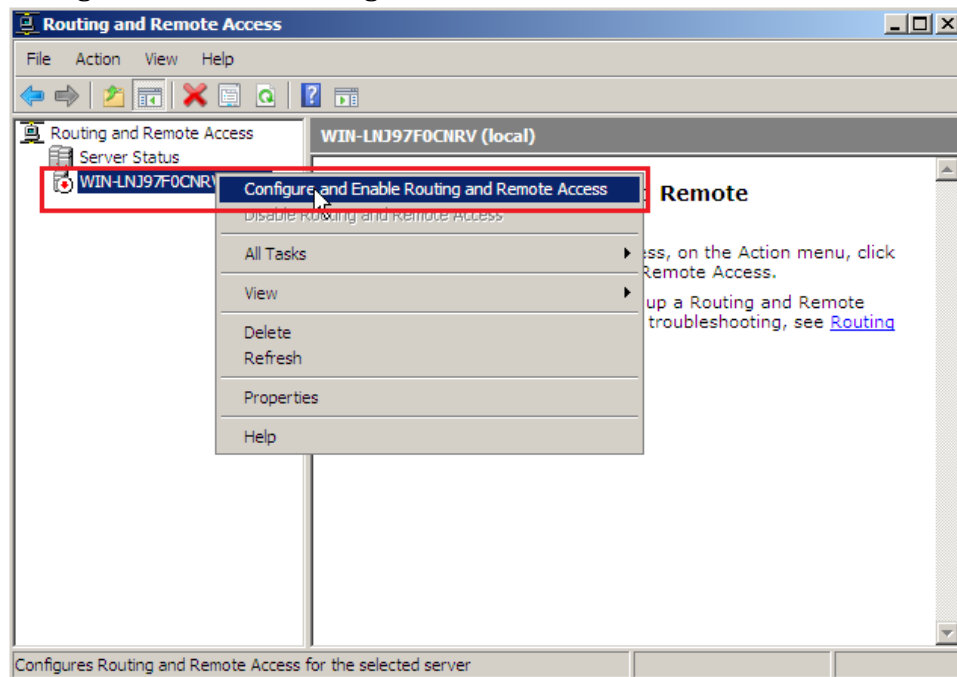
[Print, e-mail, or save the installation report](#)

< Previous    Next >    Close    Cancel

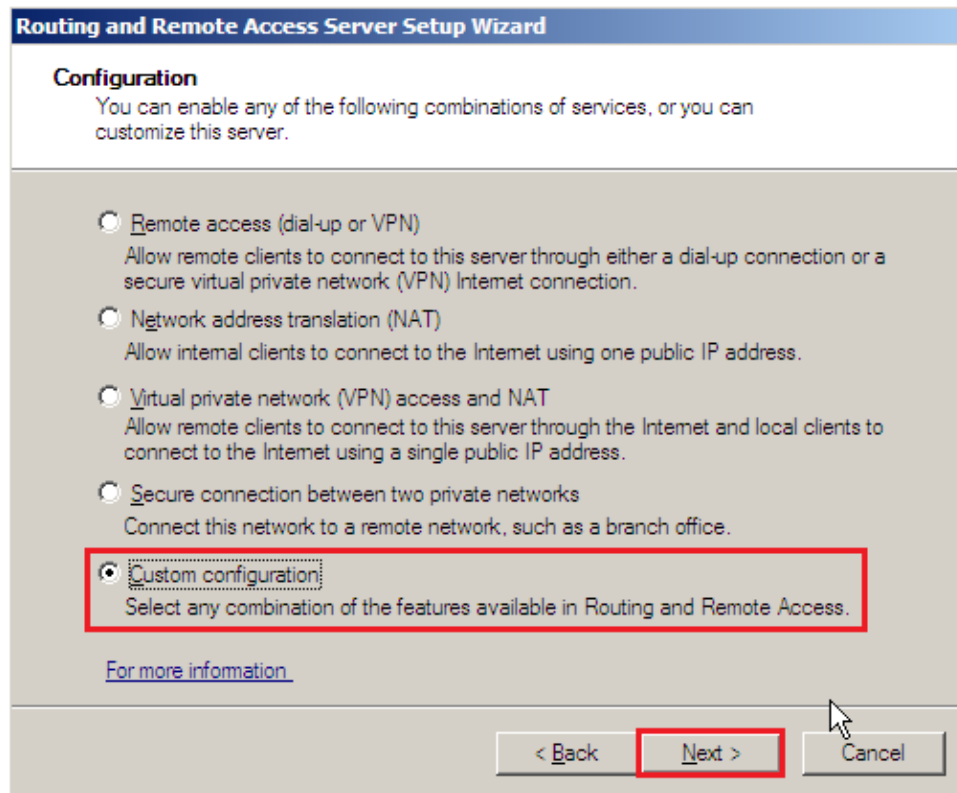
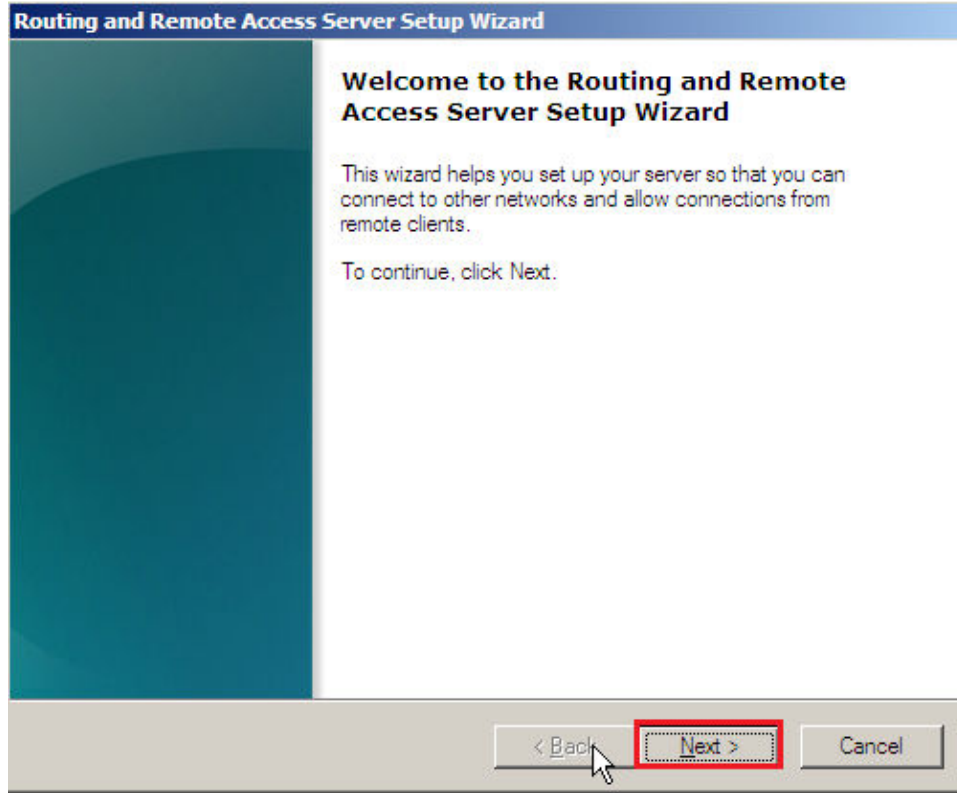
- g. Pengaturan Routing and Remote Access dapat dilakukan melalui **Administrative Tools – Routing And Remote Access**

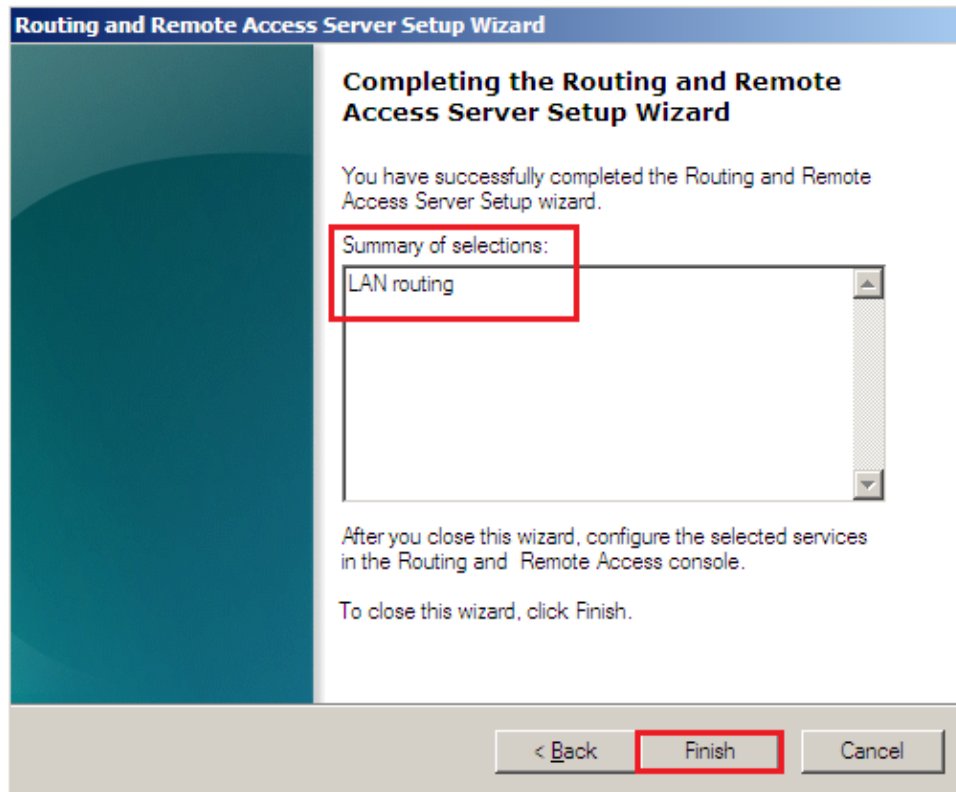
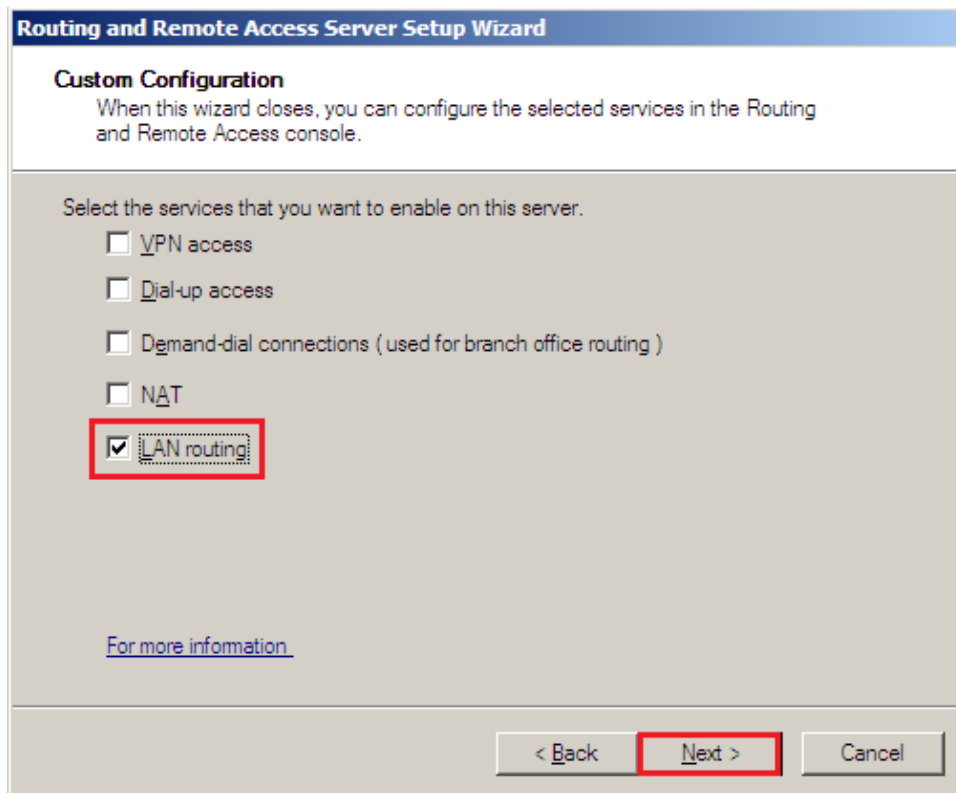


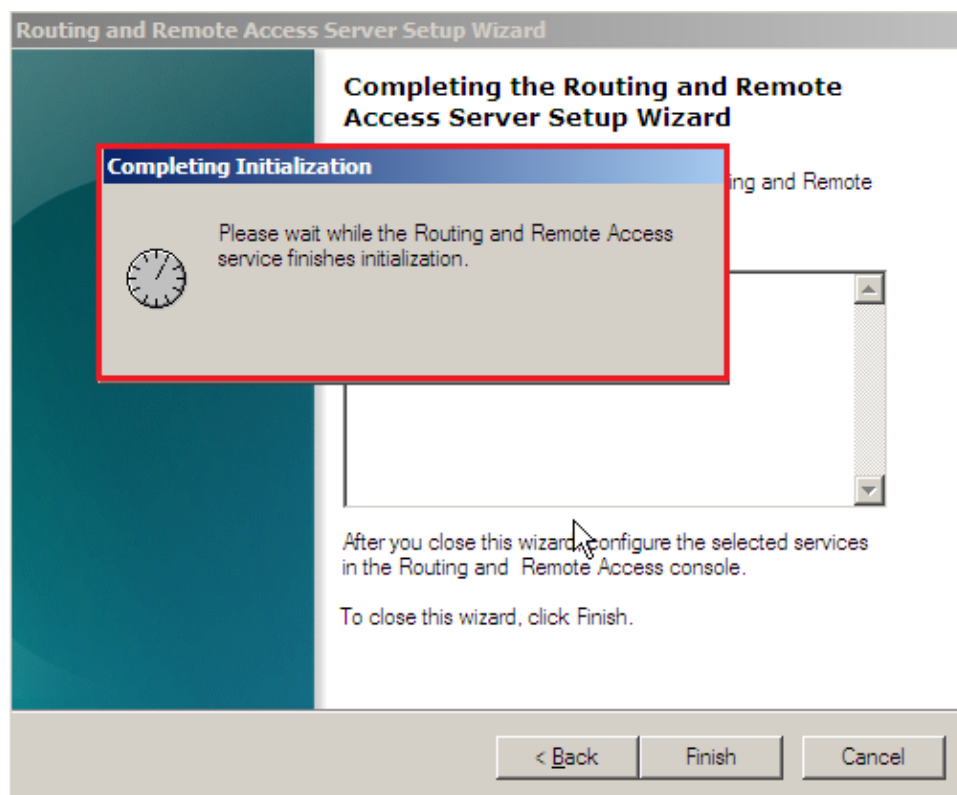
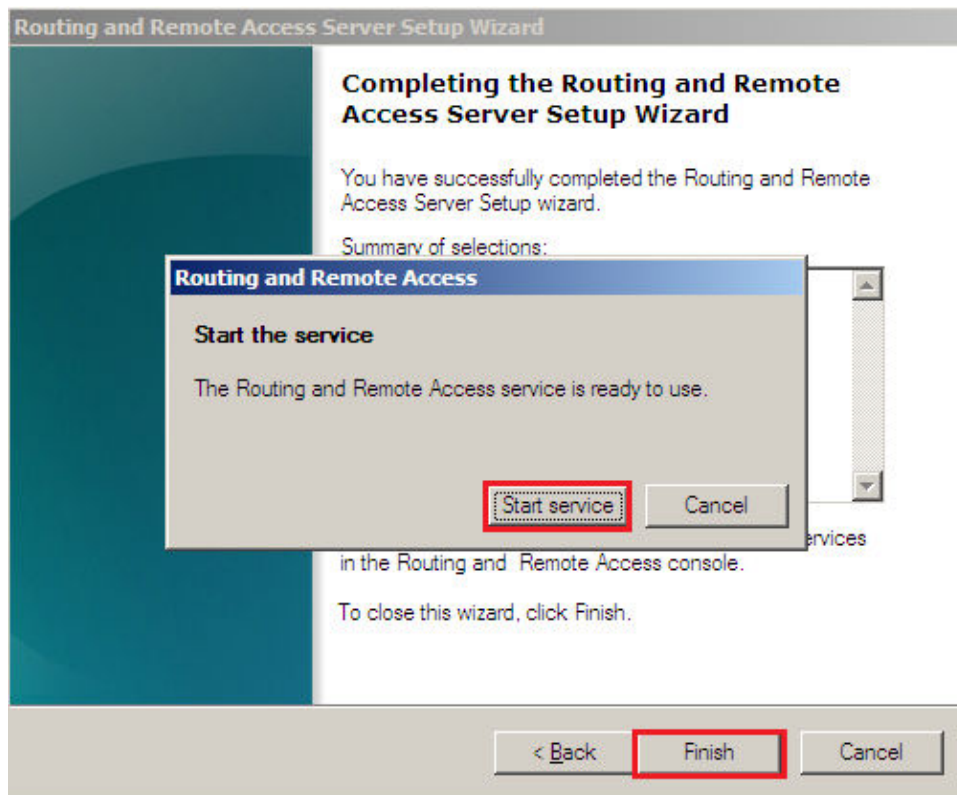
- h. Setelah jendela Routing and Remote Access terbuka, klik kanan pada komputer dan pilih **“Configure and Enable Routing and Remote Access”**



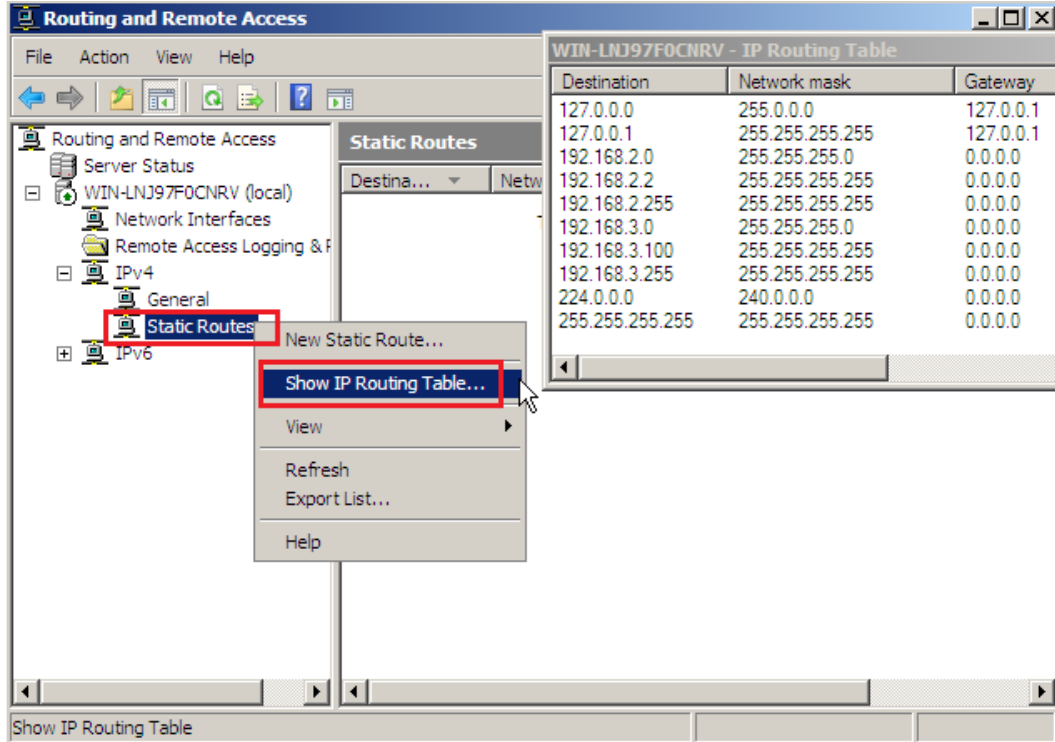
i. Ikuti Setup Wizard



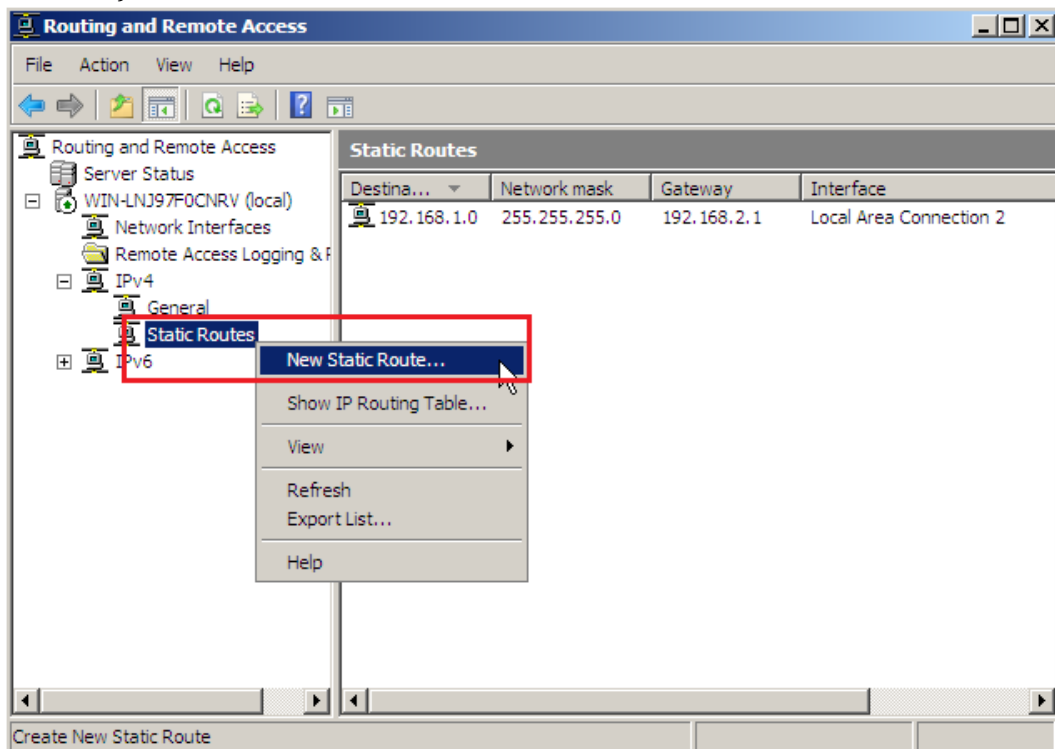


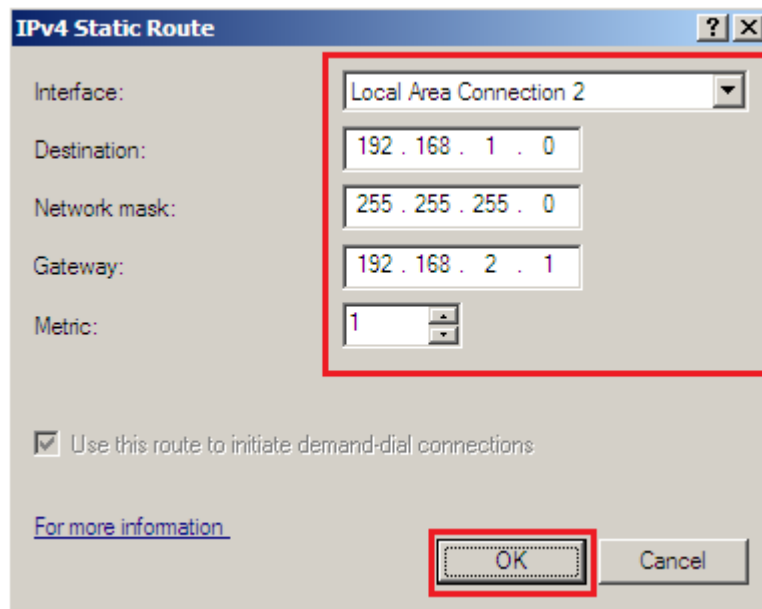


- j. Setelah proses setup selesai, untuk melihat Routing Table bisa dilakukan melalui **“IPv4 – Static Routes – Show IP Routing Table ...”**

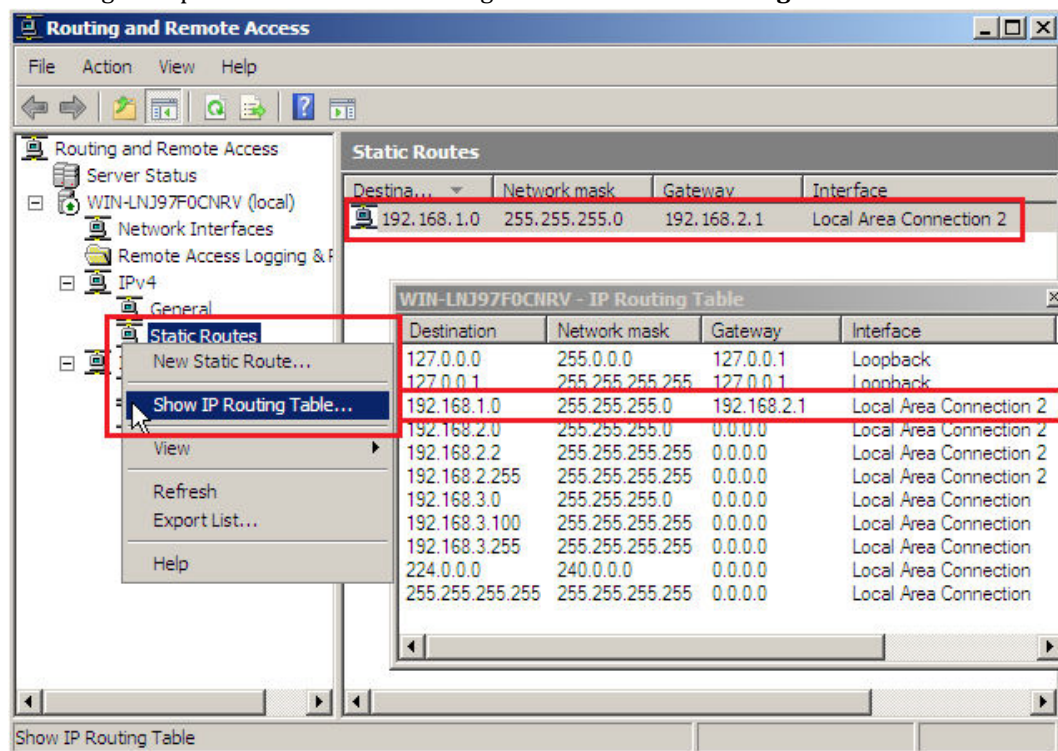


- k. Tambahkan informasi Static Routing ke network yang belum dikenali secara langsung (directly connected)



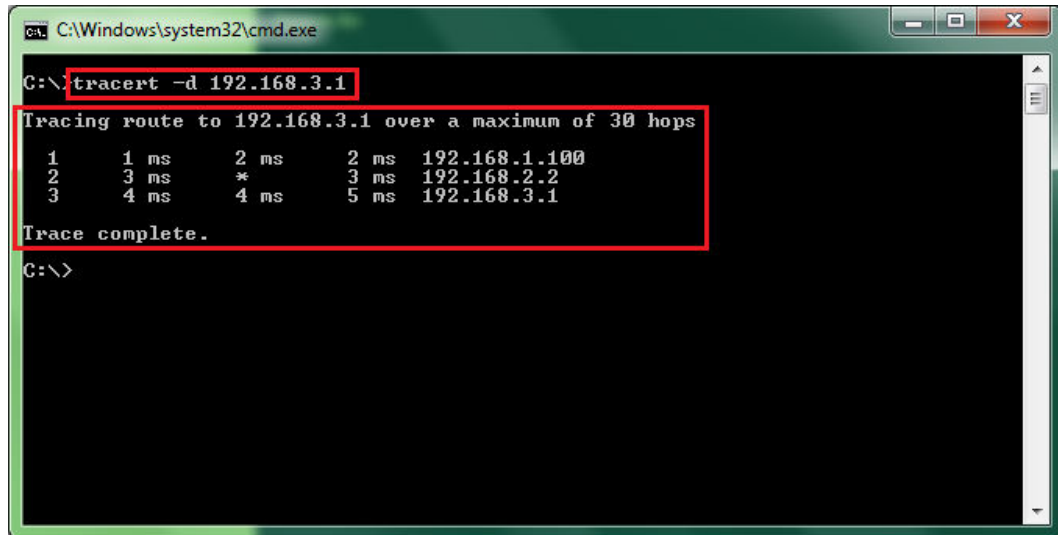


1. Cek ulang hasil penambahan Static Routing melalui **Show IP Routing Table**



### 3. Melakukan penelusuran jaringan dengan tracert

- a. Proses penelusuran jaringan dapat dilakukan dengan perintah tracert (boleh ditambahkan dengan opsi -d : Do not resolve addresses to hostnames)



```
C:\Windows\system32\cmd.exe
C:\>tracert -d 192.168.3.1
Tracing route to 192.168.3.1 over a maximum of 30 hops
  0  1 ms    2 ms    2 ms  192.168.1.100
  1  3 ms    *      3 ms  192.168.2.2
  2  4 ms    4 ms    5 ms  192.168.3.1
Trace complete.
C:\>
```