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**PERANCANGAN ROUTING PADA BOSON NETWORK DESIGNER
PART 1**

Lisensi Dokumen:

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Routing Protocol adalah aturan yang digunakan router untuk memperbaharui tabel routing. Contohnya adalah Routing Information Protocol (RIP). Routed Protocol adalah aturan yang digunakan untuk mengarahkan paket data yang dikirim. Contohnya Internet Protocol (IP). Routing Table adalah tabel yang dimiliki router yang berisi informasi mengenai jalur-jalur jaringan yang terhubung pada router tersebut.

Cara kerja router :

1. Pada komputer pengirim, data mengalami enkapsulasi (pembungkusan) pada OSI layer. Alamat layer 3 dari pengirim dan penerima akan ditambahkan pada data.
2. Paket data akan diterima oleh semua alat yang terhubung. Hanya router yang akan memproses data lebih lanjut.
3. Router menerima paket yang ditujukan untuk MAC addressnya dan membuka (dekapsulasi) data tersebut.
4. Router membaca IP address tujuan subnet mask yang dimilikinya untuk mendapatkan network address tujuan.
5. Data dienkapsulasi dan dikirim melalui interface serial.
6. Paket data diterima dan dibongkar oleh router tujuan.
7. Router membaca alamat tujuan pengiriman kemudian menentukan network address tujuan.
8. Paket data dienkapsulasi dan dikirim ke jaringan.
9. Komputer penerima kemudian membongkar paket data dan meneruskan data ke layer OSI teratas untuk ditampilkan kepada user.

Istilah :

router> : user mode

router# : Privileged/Execution mode

router(config)# : Global mode

router>? : help

no shutdown : untuk mengaktifkan Ethernet

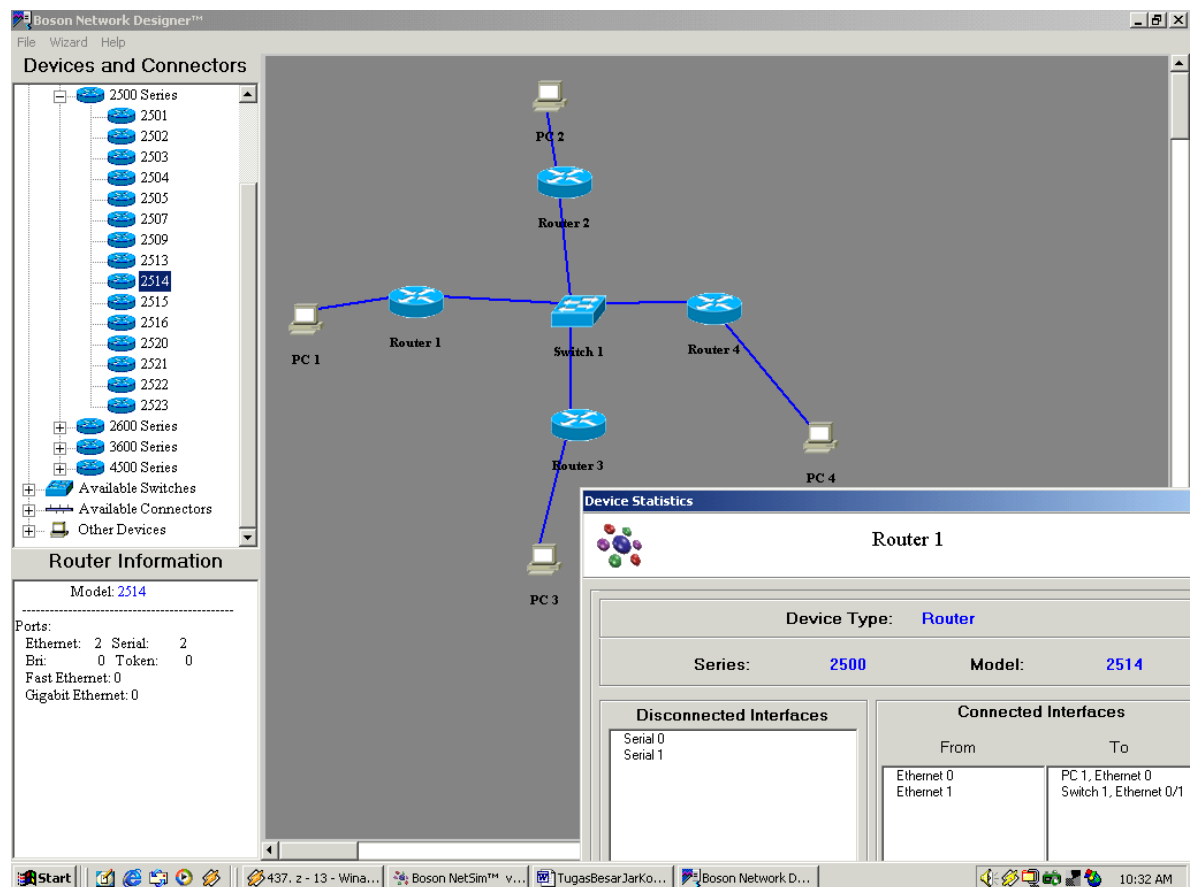
Langkah-langkah yang dilakukan dalam Routing :

Membuat topologi jaringan.

Topologi yang digunakan adalah model Star. Dengan menggunakan 4 unit router, 4 unit PC, dan 1 unit switch sebagai contoh gambaran jaringannya.

Dengan ketentuan sebagai berikut :

1. Router model 2514 yang mempunyai 2 ethernet dan 2 serial.
2. Switch dengan model 1912 yang memiliki 12 port ethernet.
3. Semua router terhubung ke switch, bukan ke router lain.
4. Setiap jaringan memiliki 1 buah router dan 1 buah PC.



Router 1

Ethernet 0 terhubung ke jaringan internal dengan IP 172.16.0.1

Ethernet 1 terhubung ke jaringan eksternal dengan IP 172.15.0.1

Router 2

Ethernet 0 terhubung ke jaringan internal dengan IP 172.17.0.1

Ethernet 1 terhubung ke jaringan eksternal dengan IP 172.15.0.2

Router 3

Ethernet 0 terhubung ke jaringan internal dengan IP 172.18.0.1

Ethernet 1 terhubung ke jaringan eksternal dengan IP 172.15.0.3

Router 4

Ethernet 0 terhubung ke jaringan internal dengan IP 172.19.0.1

Ethernet 1 terhubung ke jaringan eksternal dengan IP 172.15.0.4

PC 1 dengan IP 172.16.0.2

PC 2 dengan IP 172.17.0.2

PC 3 dengan IP 172.18.0.2

PC 4 dengan IP 172.19.0.2

Konfigurasi jaringan.

Setting router 1 :

```
Router>en
```

```
Router#conf t
```

```
Router(config)#hostname first
```

```
First(config)#int eth 0
```

```
First(config-if)#ip address 172.16.0.1 255.255.0.0
```

```
First(config-if)#no shutdown
```

```
First(config-if)#exit
```

```
First(config)#int eth 1
```

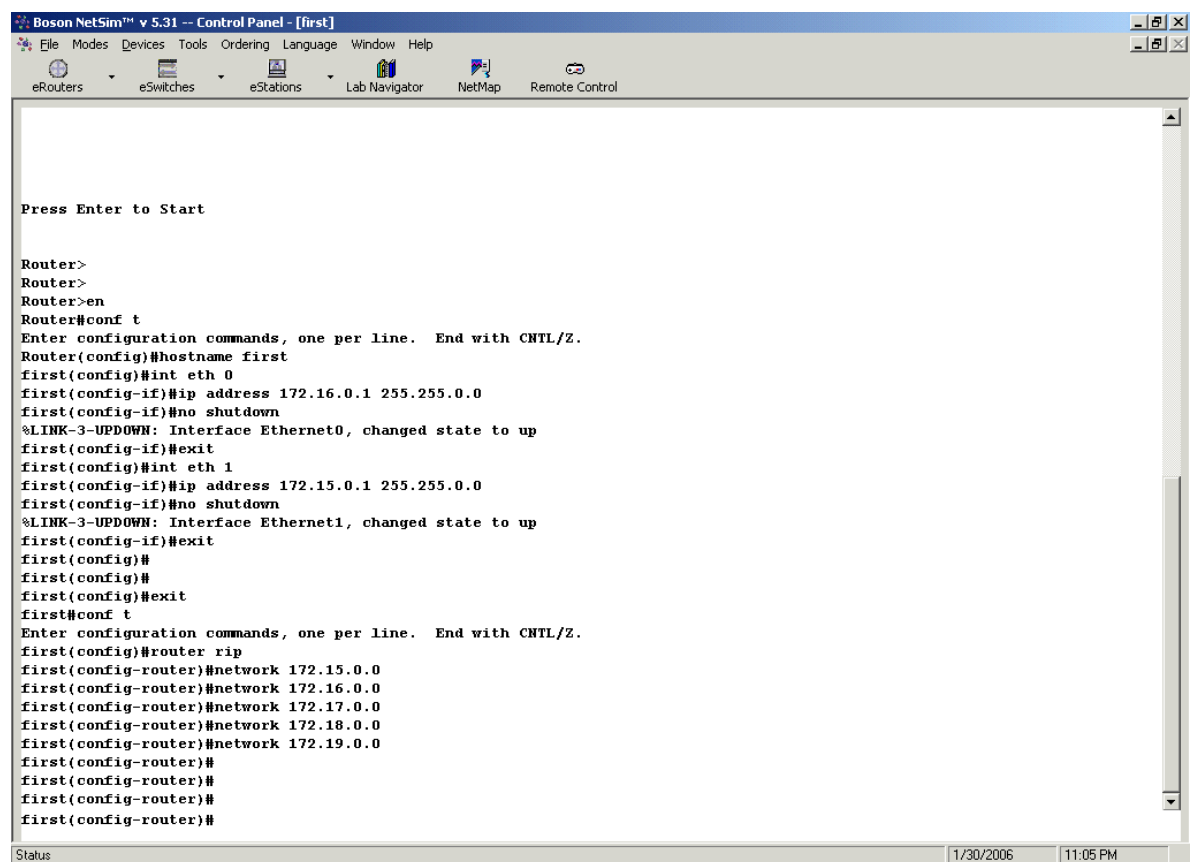
```
First(config-if)# ip address 172.15.0.1 255.255.0.0
```

```
First(config-if)#no shutdown
```

```
First(config-if)#exit
```

```
First(config)#router rip
First(config-router)#network 172.15.0.0
First(config-router)#network 172.16.0.0
First(config-router)#network 172.17.0.0
First(config-router)#network 172.18.0.0
First(config-router)#network 172.19.0.0
```

Seperti terlihat pada gambar berikut :



```
Boson NetSim™ v 5.31 -- Control Panel - [first]
File Modes Devices Tools Ordering Language Window Help
eRouters eSwitches eStations Lab Navigator NetMap Remote Control

Press Enter to Start

Router>
Router>
Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#hostname first
first(config)#int eth 0
first(config-if)#ip address 172.16.0.1 255.255.0.0
first(config-if)#no shutdown
%LINK-3-UPDOWN: Interface Ethernet0, changed state to up
first(config-if)#exit
first(config)#int eth 1
first(config-if)#ip address 172.15.0.1 255.255.0.0
first(config-if)#no shutdown
%LINK-3-UPDOWN: Interface Ethernet1, changed state to up
first(config-if)#exit
first(config)#
first(config)#
first(config)#exit
first#conf t
Enter configuration commands, one per line. End with CNTL/Z.
first(config)#router rip
first(config-router)#network 172.15.0.0
first(config-router)#network 172.16.0.0
first(config-router)#network 172.17.0.0
first(config-router)#network 172.18.0.0
first(config-router)#network 172.19.0.0
first(config-router)#
first(config-router)#
first(config-router)#
first(config-router)#
```

Setting router 2 :

```
Router>en
Router#conf t
Router(config)#hostname second
Second(config)#int eth 0
Second(config-if)#ip address 172.17.0.1 255.255.0.0
```

```
Second(config-if)#no shutdown
Second(config-if)#exit
Second(config)#int eth 1
Second(config-if)# ip address 172.15.0.2 255.255.0.0
Second(config-if)#no shutdown
Second(config-if)#exit
Second(config)#router rip
Second(config-router)#network 172.15.0.0
Second(config-router)#network 172.16.0.0
Second(config-router)#network 172.17.0.0
Second(config-router)#network 172.18.0.0
Second(config-router)#network 172.19.0.0
Setting router 3 :
Router>en
Router#conf t
Router(config)#hostname third
third(config)#int eth 0
third(config-if)#ip address 172.18.0.1 255.255.0.0
third(config-if)#no shutdown
third(config-if)#exit
third(config)#int eth 1
third(config-if)# ip address 172.15.0.3 255.255.0.0
third(config-if)#no shutdown
third(config-if)#exit
third(config)#router rip
third(config-router)#network 172.15.0.0
third(config-router)#network 172.16.0.0
third(config-router)#network 172.17.0.0
third(config-router)#network 172.18.0.0
third(config-router)#network 172.19.0.0
Setting router 4 :
Router>en
```

```
Router#conf t
Router(config)#hostname fourth
fourth(config)#int eth 0
fourth(config-if)#ip address 172.19.0.1 255.255.0.0
fourth(config-if)#no shutdown
fourth(config-if)#exit
fourth(config)#int eth 1
fourth(config-if)# ip address 172.15.0.4 255.255.0.0
fourth(config-if)#no shutdown
fourth(config-if)#exit
fourth(config)#router rip
fourth(config-router)#network 172.15.0.0
fourth(config-router)#network 172.16.0.0
fourth(config-router)#network 172.17.0.0
fourth(config-router)#network 172.18.0.0
fourth(config-router)#network 172.19.0.0
```

Setting PC 1 :

```
C:>winipcfg
```

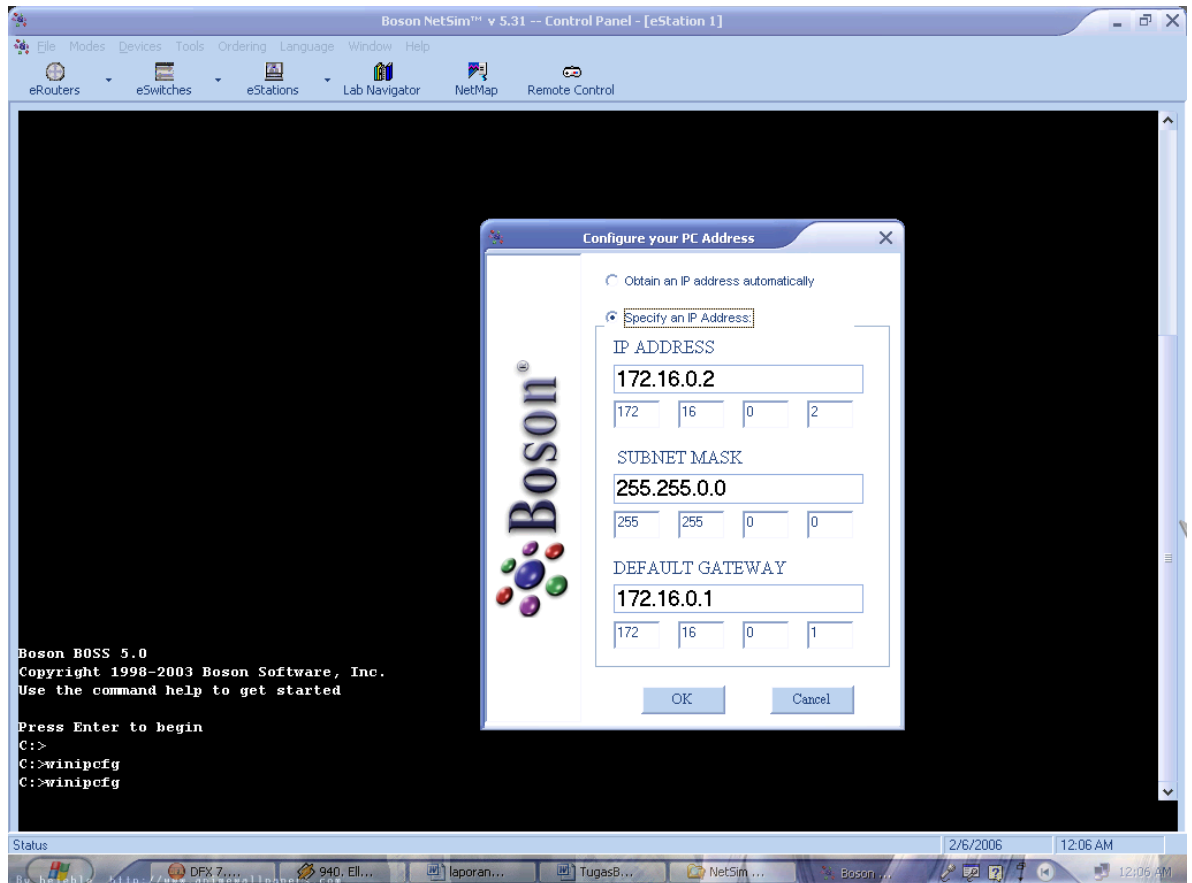
Masukkan IP,subnet mask, dan gateway :

IP ADDRESS : 172.16.0.2

SUBNET MASK : 255.255.0.0

DEFAULT GATEWAY : 172.16.0.1

Seperti gambar berikut :



Setting PC 2 :

C:>winipcfg

Masukkan IP, subnet mask, dan gateway :

IP ADDRESS : 172.17.0.2

SUBNET MASK : 255.255.0.0

DEFAULT GATEWAY : 172.17.0.1

Setting PC 3 :

C:>winipcfg

Masukkan IP, subnet mask, dan gateway :

IP ADDRESS : 172.18.0.2

SUBNET MASK : 255.255.0.0

DEFAULT GATEWAY : 172.18.0.1

Setting PC 4 :

C:>winipcfg

Masukkan IP, subnet mask, dan gateway :

IP ADDRESS : 172.19.0.2

SUBNET MASK : 255.255.0.0

DEFAULT GATEWAY : 172.19.0.1

Ping

Terakhir adalah meng-ping ip dari komputer yang satu ke komputer yang lain.

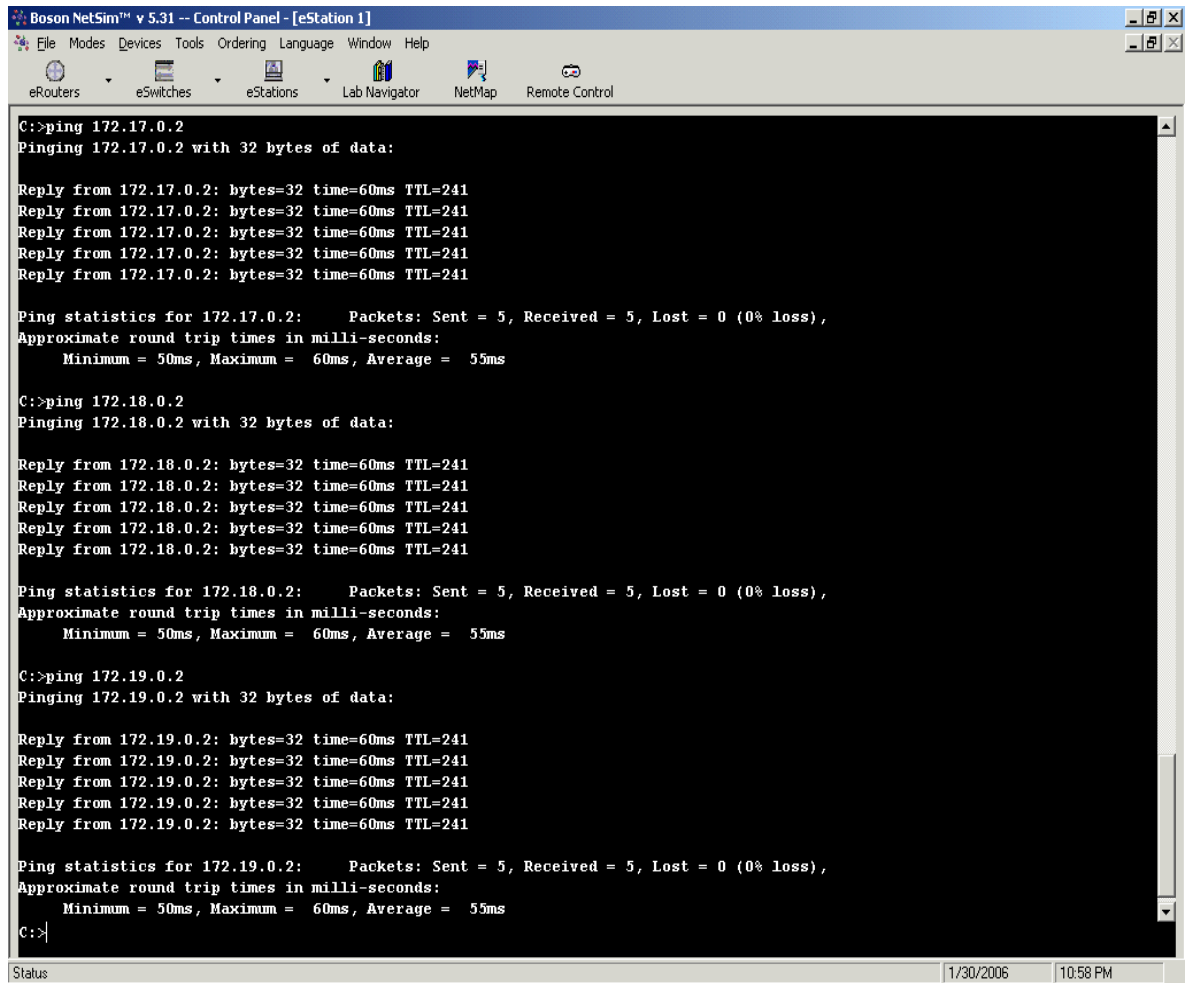
Contohnya pada PC 1 :

C:>ping 172.17.0.2

C:>ping 172.18.0.2

C:>ping 172.19.0.2

Maka akan muncul tampilan :



```
Boson NetSim™ v 5.31 -- Control Panel - [eStation 1]
File Modes Devices Tools Ordering Language Window Help
eRouters eSwitches eStations Lab Navigator NetMap Remote Control

C:>ping 172.17.0.2
Pinging 172.17.0.2 with 32 bytes of data:

Reply from 172.17.0.2: bytes=32 time=60ms TTL=241
Reply from 172.17.0.2: bytes=32 time=60ms TTL=241
Reply from 172.17.0.2: bytes=32 time=60ms TTL=241
Reply from 172.17.0.2: bytes=32 time=60ms TTL=241
Reply from 172.17.0.2: bytes=32 time=60ms TTL=241

Ping statistics for 172.17.0.2:    Packets: Sent = 5, Received = 5, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 50ms, Maximum = 60ms, Average = 55ms

C:>ping 172.18.0.2
Pinging 172.18.0.2 with 32 bytes of data:

Reply from 172.18.0.2: bytes=32 time=60ms TTL=241
Reply from 172.18.0.2: bytes=32 time=60ms TTL=241
Reply from 172.18.0.2: bytes=32 time=60ms TTL=241
Reply from 172.18.0.2: bytes=32 time=60ms TTL=241
Reply from 172.18.0.2: bytes=32 time=60ms TTL=241

Ping statistics for 172.18.0.2:    Packets: Sent = 5, Received = 5, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 50ms, Maximum = 60ms, Average = 55ms

C:>ping 172.19.0.2
Pinging 172.19.0.2 with 32 bytes of data:

Reply from 172.19.0.2: bytes=32 time=60ms TTL=241
Reply from 172.19.0.2: bytes=32 time=60ms TTL=241
Reply from 172.19.0.2: bytes=32 time=60ms TTL=241
Reply from 172.19.0.2: bytes=32 time=60ms TTL=241
Reply from 172.19.0.2: bytes=32 time=60ms TTL=241

Ping statistics for 172.19.0.2:    Packets: Sent = 5, Received = 5, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 50ms, Maximum = 60ms, Average = 55ms

C:>|
```

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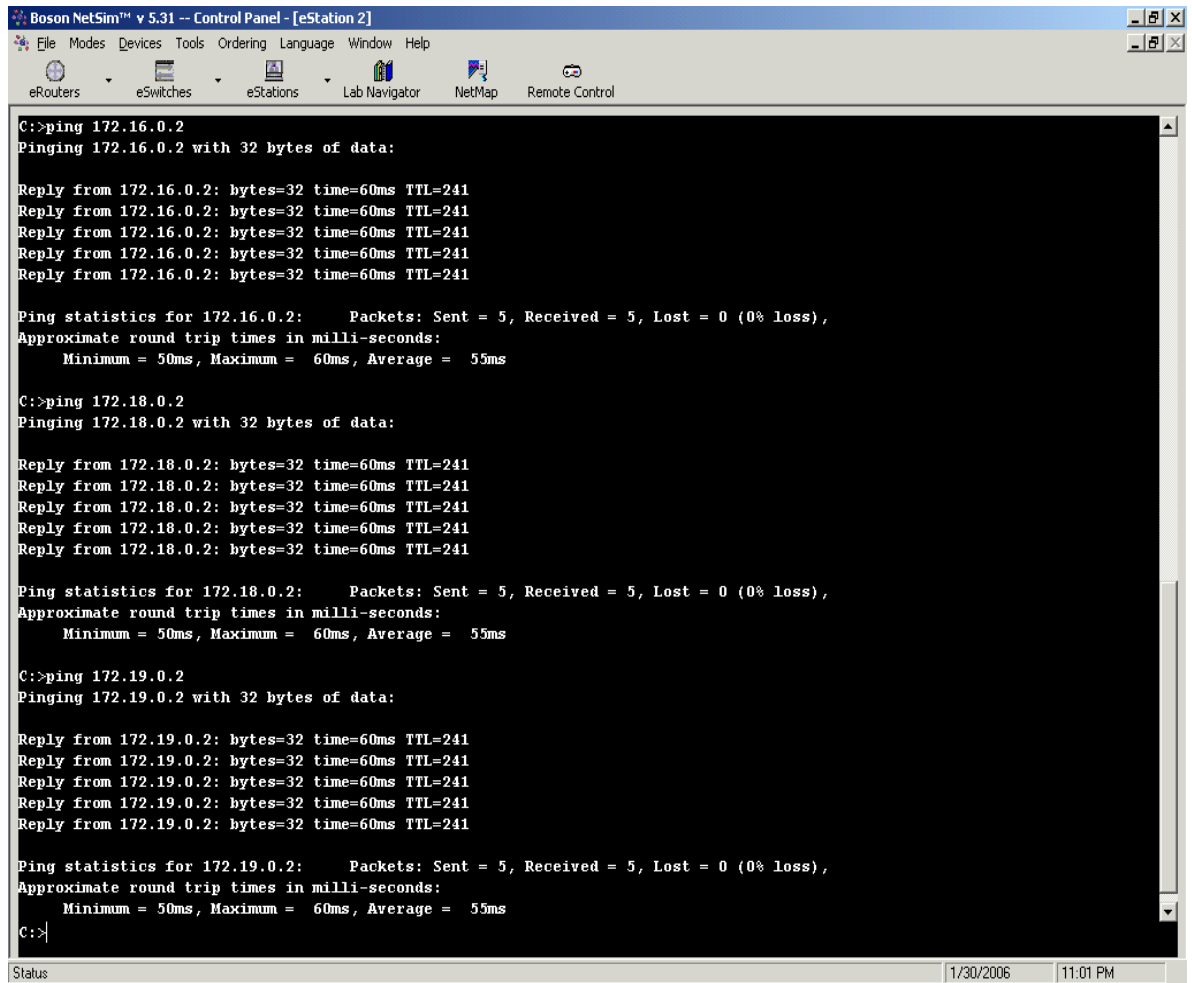
Pada PC 2 :

C:>ping 172.16.0.2

C:>ping 172.18.0.2

C:>ping 172.19.0.2

Maka akan muncul tampilan :



```
Boson NetSim™ v 5.31 -- Control Panel - [eStation 2]
File Modes Devices Tools Ordering Language Window Help
eRouters eSwitches eStations Lab Navigator NetMap Remote Control

C:>ping 172.16.0.2
Pinging 172.16.0.2 with 32 bytes of data:

Reply from 172.16.0.2: bytes=32 time=60ms TTL=241
Reply from 172.16.0.2: bytes=32 time=60ms TTL=241
Reply from 172.16.0.2: bytes=32 time=60ms TTL=241
Reply from 172.16.0.2: bytes=32 time=60ms TTL=241
Reply from 172.16.0.2: bytes=32 time=60ms TTL=241

Ping statistics for 172.16.0.2:    Packets: Sent = 5, Received = 5, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 50ms, Maximum = 60ms, Average = 55ms

C:>ping 172.18.0.2
Pinging 172.18.0.2 with 32 bytes of data:

Reply from 172.18.0.2: bytes=32 time=60ms TTL=241
Reply from 172.18.0.2: bytes=32 time=60ms TTL=241
Reply from 172.18.0.2: bytes=32 time=60ms TTL=241
Reply from 172.18.0.2: bytes=32 time=60ms TTL=241
Reply from 172.18.0.2: bytes=32 time=60ms TTL=241

Ping statistics for 172.18.0.2:    Packets: Sent = 5, Received = 5, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 50ms, Maximum = 60ms, Average = 55ms

C:>ping 172.19.0.2
Pinging 172.19.0.2 with 32 bytes of data:

Reply from 172.19.0.2: bytes=32 time=60ms TTL=241
Reply from 172.19.0.2: bytes=32 time=60ms TTL=241
Reply from 172.19.0.2: bytes=32 time=60ms TTL=241
Reply from 172.19.0.2: bytes=32 time=60ms TTL=241
Reply from 172.19.0.2: bytes=32 time=60ms TTL=241

Ping statistics for 172.19.0.2:    Packets: Sent = 5, Received = 5, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 50ms, Maximum = 60ms, Average = 55ms

C:>|
```

Status 1/30/2006 11:01 PM

Pada PC 3 :

C:>ping 172.16.0.2

C:>ping 172.17.0.2

C:>ping 172.19.0.2

Maka akan muncul tampilan :

```
Boson NetSim™ v 5.31 -- Control Panel - [eStation 3]
File Modes Devices Tools Ordering Language Window Help
eRouters eSwitches eStations Lab Navigator NetMap Remote Control

C:>ping 172.16.0.2
Pinging 172.16.0.2 with 32 bytes of data:

Reply from 172.16.0.2: bytes=32 time=60ms TTL=241
Reply from 172.16.0.2: bytes=32 time=60ms TTL=241
Reply from 172.16.0.2: bytes=32 time=60ms TTL=241
Reply from 172.16.0.2: bytes=32 time=60ms TTL=241
Reply from 172.16.0.2: bytes=32 time=60ms TTL=241

Ping statistics for 172.16.0.2:    Packets: Sent = 5, Received = 5, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 50ms, Maximum = 60ms, Average = 55ms

C:>ping 172.17.0.2
Pinging 172.17.0.2 with 32 bytes of data:

Reply from 172.17.0.2: bytes=32 time=60ms TTL=241
Reply from 172.17.0.2: bytes=32 time=60ms TTL=241
Reply from 172.17.0.2: bytes=32 time=60ms TTL=241
Reply from 172.17.0.2: bytes=32 time=60ms TTL=241
Reply from 172.17.0.2: bytes=32 time=60ms TTL=241

Ping statistics for 172.17.0.2:    Packets: Sent = 5, Received = 5, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 50ms, Maximum = 60ms, Average = 55ms

C:>ping 172.19.0.2
Pinging 172.19.0.2 with 32 bytes of data:

Reply from 172.19.0.2: bytes=32 time=60ms TTL=241
Reply from 172.19.0.2: bytes=32 time=60ms TTL=241
Reply from 172.19.0.2: bytes=32 time=60ms TTL=241
Reply from 172.19.0.2: bytes=32 time=60ms TTL=241
Reply from 172.19.0.2: bytes=32 time=60ms TTL=241

Ping statistics for 172.19.0.2:    Packets: Sent = 5, Received = 5, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 50ms, Maximum = 60ms, Average = 55ms

C:>|
```

Status 1/30/2006 11:03 PM



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Riwayat Hidup : saya anak pertama lahir di kebumen pada tanggal 20 Oktober 1990 tahun 2006 lulus SMP 06 kebumen dan melanjutkan di SMK telkom shandy putra purwokerto mengambil jurusan jaringan komputer, pada tahun 2009 melanjutkan D4 Telekomunikasi di Politeknik Negeri Semarang sampai sekarang.