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**PERANCANGAN ROUTING PADA BOSON NETWORK DESIGNER  
PART 2**

***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

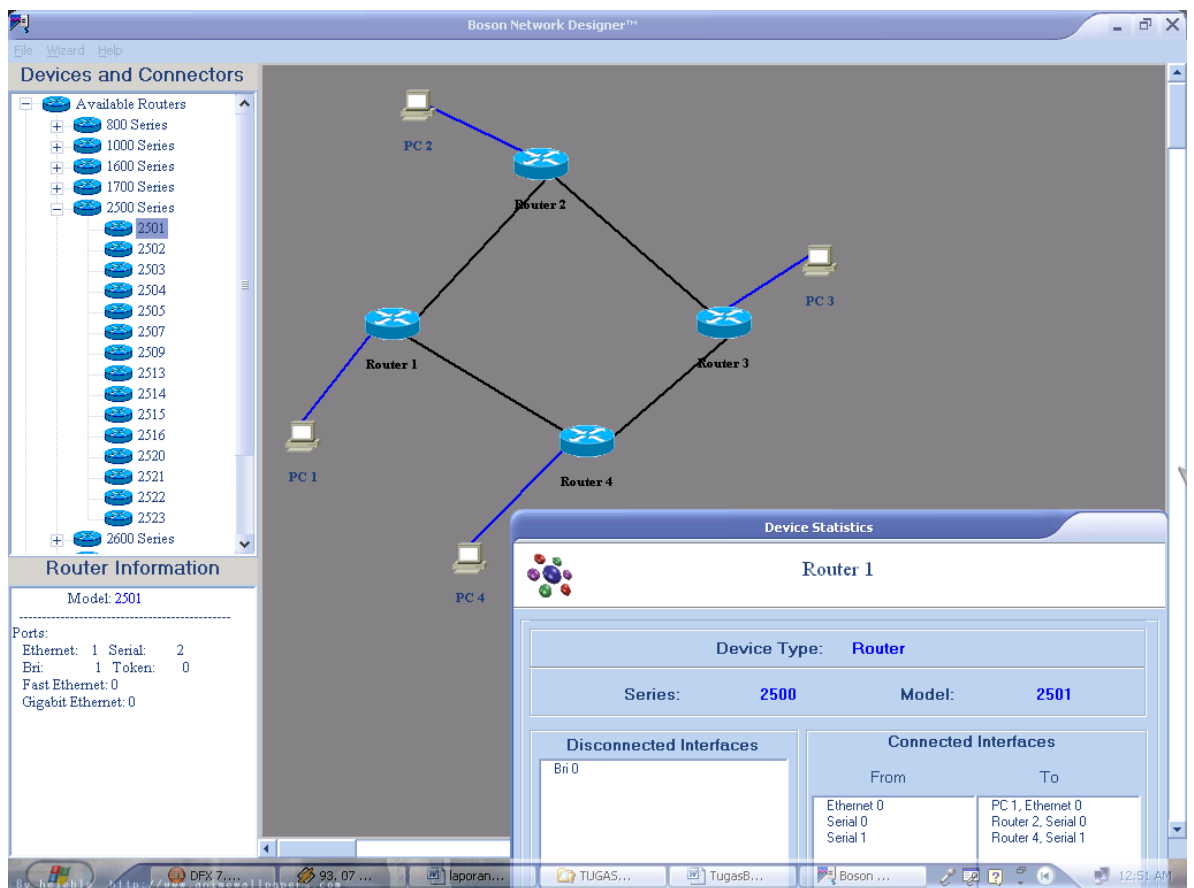
no shutdown : untuk mengaktifkan Ethernet

1. Membuat topologi jaringan.

Topologi ini menggunakan model Token ring. Dengan menggunakan 4 unit router, dan 4 unit PC sebagai contoh gambaran jaringannya.

Dengan ketentuan sebagai berikut :

1. Router model 2501 yang mempunyai 1 ethernet dan 2 serial.
2. Setiap jaringan memiliki 1 buah router dan 1 buah PC.
3. Setiap router terhubung dengan router lain melalui serial.



#### Router 1

- Ethernet 0 terhubung ke jaringan internal dengan IP 172.16.0.1
- Serial 0 terhubung ke router 2 dengan IP 172.15.0.1
- Serial 1 terhubung ke router 4 dengan IP 172.14.0.1

#### Router 2

- Ethernet 0 terhubung ke jaringan internal dengan IP 172.17.0.1
- Serial 0 terhubung ke router 1 dengan IP 172.15.0.2
- Serial 1 terhubung ke router 3 dengan IP 172.14.0.2

#### Router 3

- Ethernet 0 terhubung ke jaringan internal dengan IP 172.18.0.1
- Serial 0 terhubung ke router 4 dengan IP 172.15.0.3
- Serial 1 terhubung ke router 2 dengan IP 172.14.0.3

#### Router 4

- Ethernet 0 terhubung ke jaringan internal dengan IP 172.19.0.1
- Serial 0 terhubung ke router 3 dengan IP 172.15.0.4
- Serial 1 terhubung ke router 1 dengan IP 172.14.0.4

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

## 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 s0

First(config-if)#ip address 172.15.0.1 255.255.0.0

First(config-if)#clock rate 56000

First(config-if)#no shutdown

First(config-if)#exit

First(config)#int s1

First(config-if)#ip address 172.14.0.1 255.255.0.0

First(config-if)#clock rate 56000

First(config-if)#no shutdown

First(config-if)#exit

First(config)#router rip

First(config-router)#network 172.14.0.0

First(config-router)#network 172.15.0.0

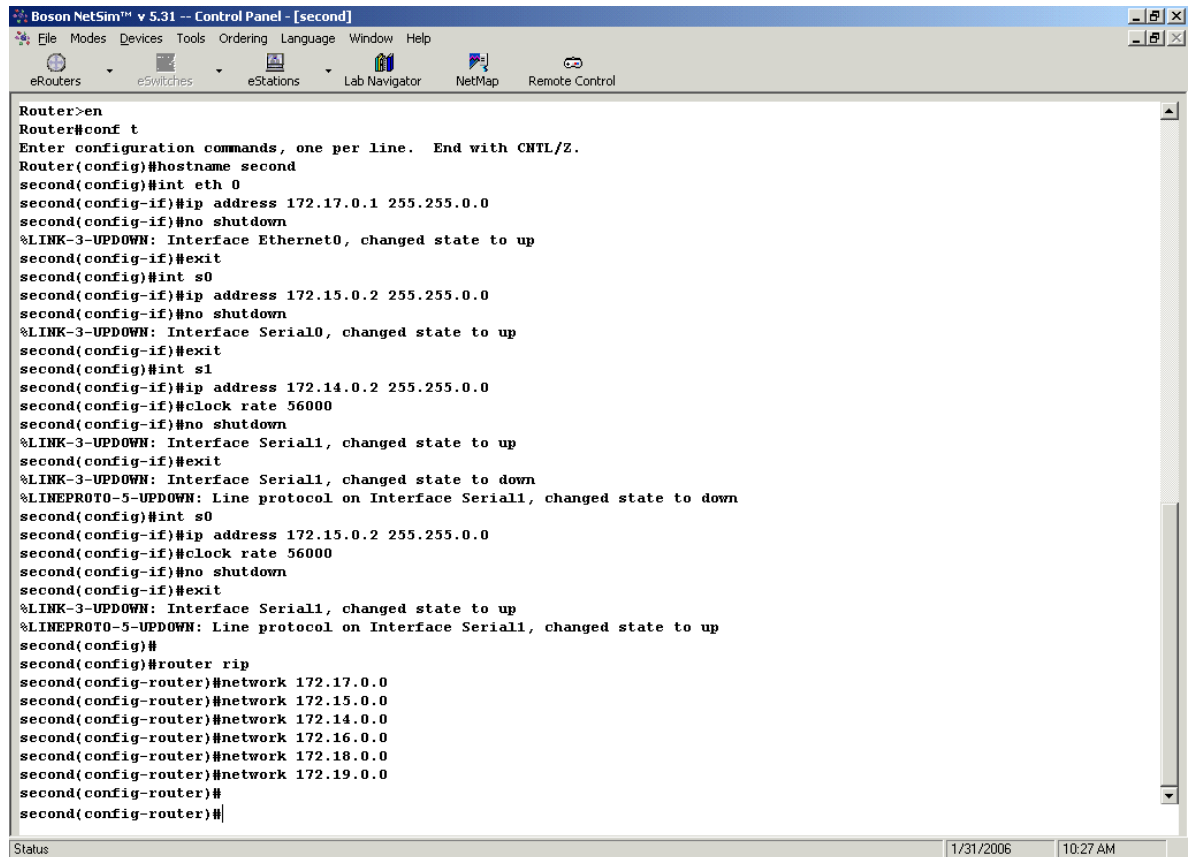
First(config-router)#network 172.16.0.0

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 - [second]
File Modes Devices Tools Ordering Language Window Help
eRouters eSwitches eStations Lab Navigator NetMap Remote Control

Router>en
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
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
%LINK-3-UPDOWN: Interface Ethernet0, changed state to up
second(config-if)#exit
second(config)#int s0
second(config-if)#ip address 172.15.0.2 255.255.0.0
second(config-if)#no shutdown
%LINK-3-UPDOWN: Interface Serial0, changed state to up
second(config-if)#exit
second(config)#int s1
second(config-if)#ip address 172.14.0.2 255.255.0.0
second(config-if)#clock rate 56000
second(config-if)#no shutdown
%LINK-3-UPDOWN: Interface Serial1, changed state to up
second(config-if)#exit
%LINK-3-UPDOWN: Interface Serial1, changed state to down
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1, changed state to down
second(config)#int s0
second(config-if)#ip address 172.15.0.2 255.255.0.0
second(config-if)#clock rate 56000
second(config-if)#no shutdown
second(config-if)#exit
%LINK-3-UPDOWN: Interface Serial1, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1, changed state to up
second(config)#
second(config)#router rip
second(config-router)#network 172.17.0.0
second(config-router)#network 172.15.0.0
second(config-router)#network 172.14.0.0
second(config-router)#network 172.16.0.0
second(config-router)#network 172.18.0.0
second(config-router)#network 172.19.0.0
second(config-router)#
second(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 s0
```

```
Second(config-if)# ip address 172.15.0.2 255.255.0.0
```

```
Second(config-if)#clock rate 56000
```

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

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

```
Second(config)#int s1
```

```
Second(config-if)# ip address 172.14.0.2 255.255.0.0
```

```
Second(config-if)#clock rate 56000
```

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

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

```
Second(config)#router rip
```

```
Second(config-router)#network 172.14.0.0
```

```
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 s0
```

```
third(config-if)# ip address 172.15.0.3 255.255.0.0
```

```
third(config-if)#clock rate 56000
```

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

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

```
third(config)#int s1
```

```
third(config-if)# ip address 172.14.0.3 255.255.0.0
```

```
third(config-if)#clock rate 56000
```

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

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

```
third(config)#router rip
```

```
third(config-router)#network 172.14.0.0
```

```
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 s0
```

```
fourth(config-if)# ip address 172.15.0.4 255.255.0.0
```

```
fourth(config-if)#clock rate 56000
```

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

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

```
fourth(config-if)# ip address 172.14.0.4 255.255.0.0
```

```
fourth(config-if)#clock rate 56000
```

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

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

```
fourth(config)#router rip
```

```
fourth(config-router)#network 172.14.0.0
```

```
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
```

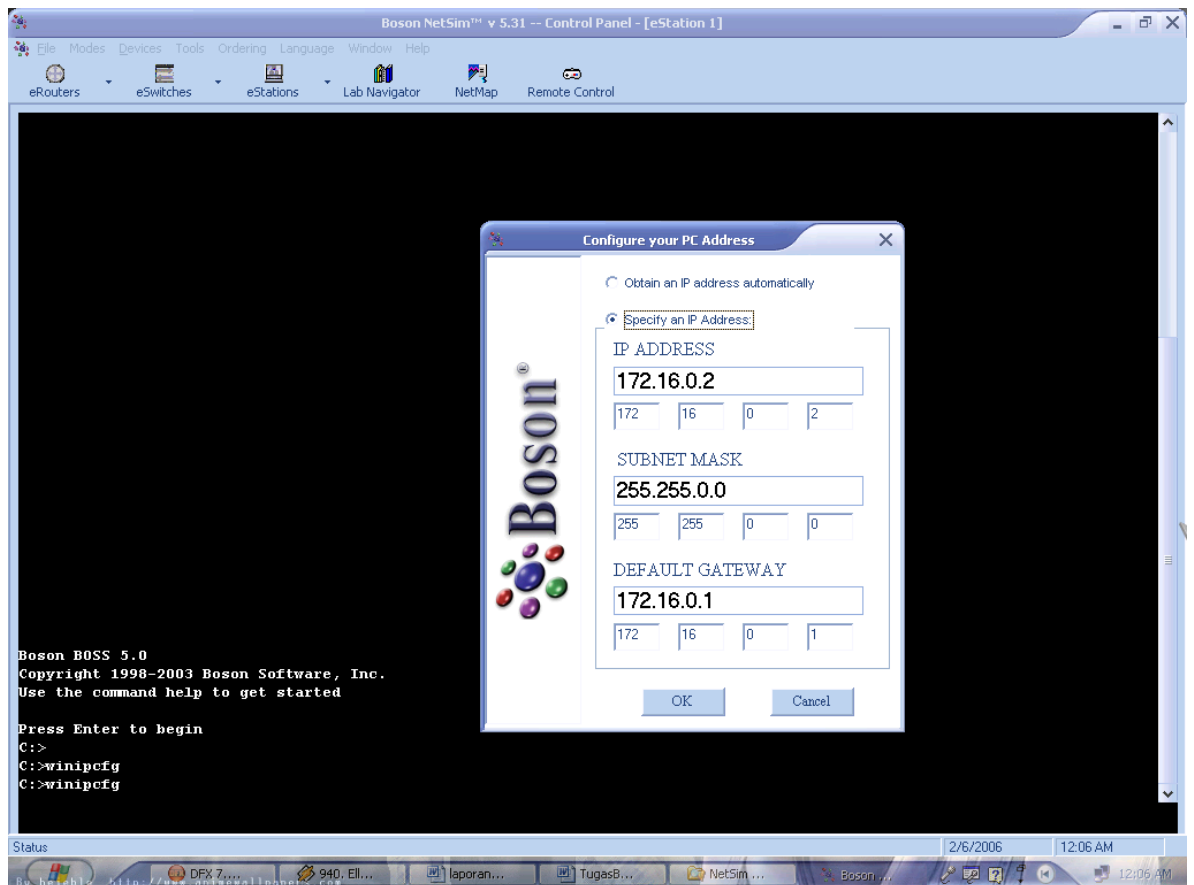
Masukkan IP, subnet mask, dan gateway :

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

### 3. Ping

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

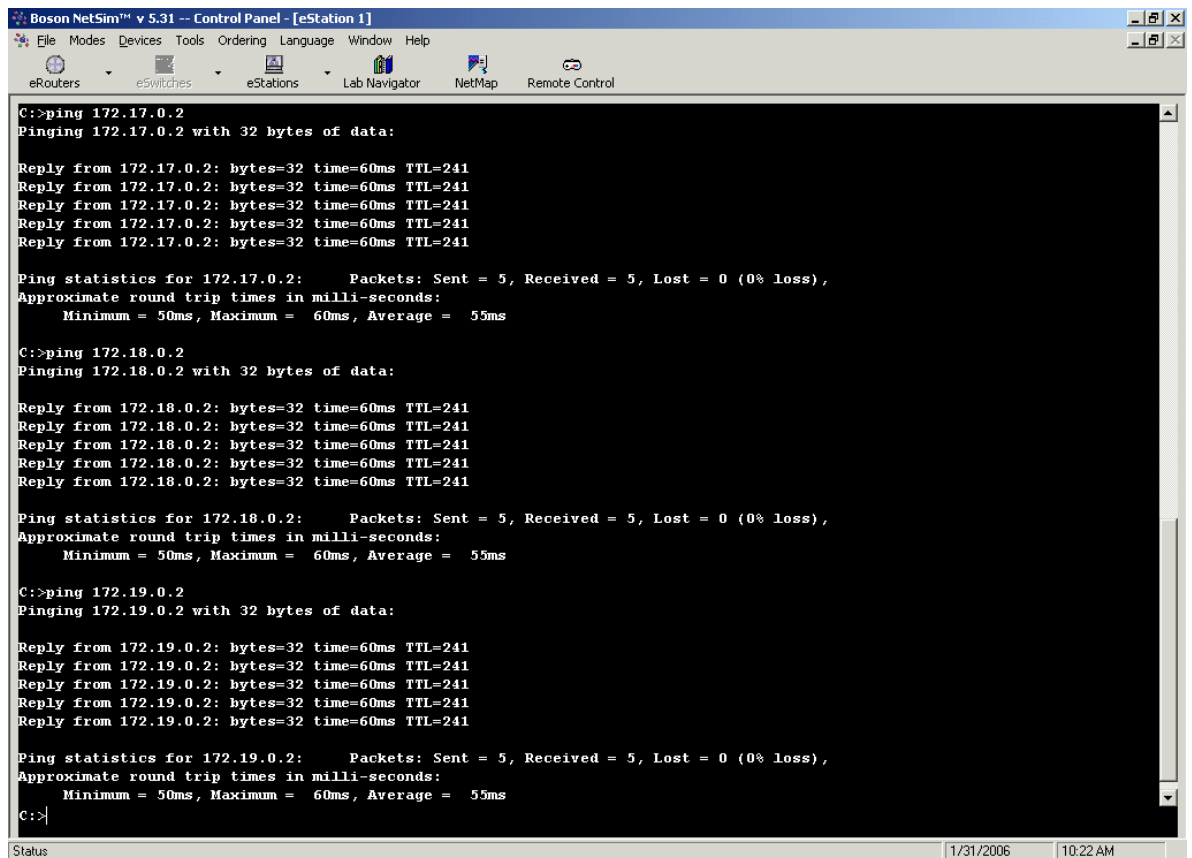
Contohnya pada PC 1 :

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:>|
```

Status | 1/31/2006 | 10:22 AM

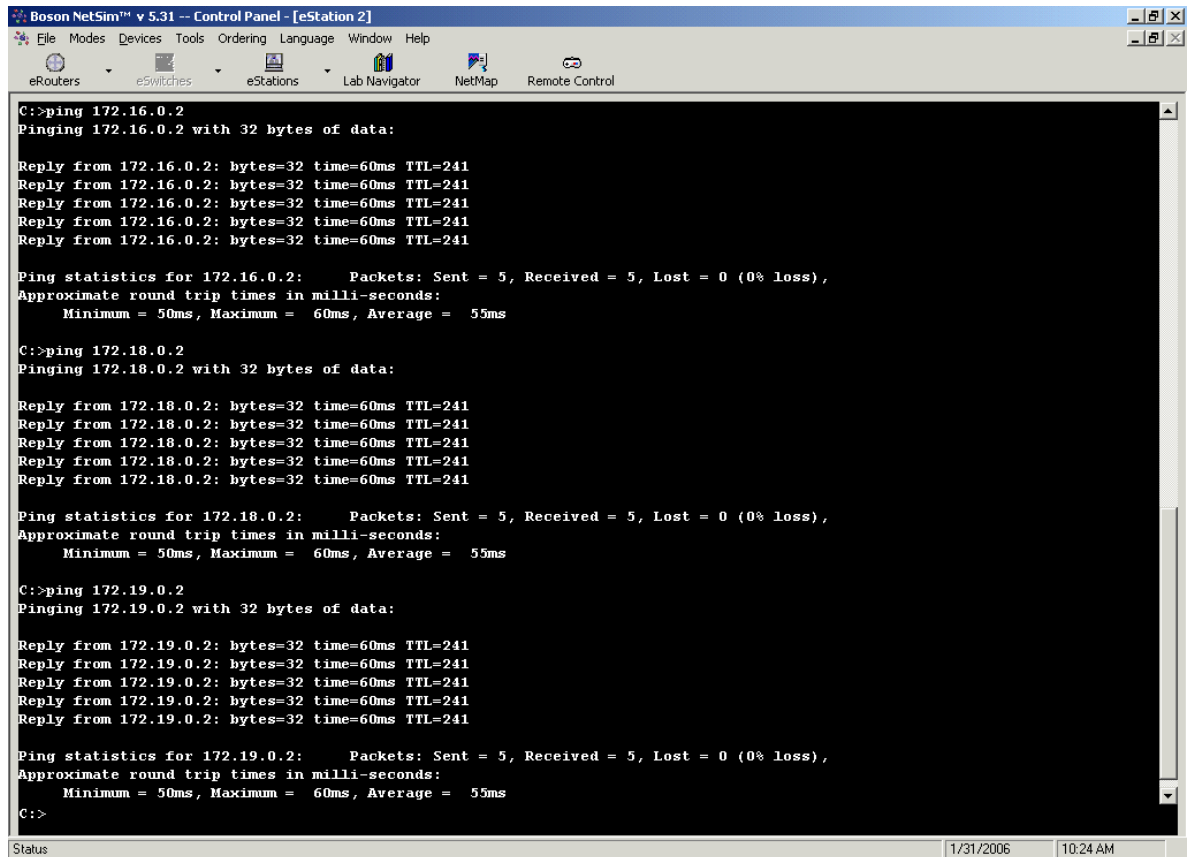
Pada PC 2 :

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 | 1/31/2006 | 10:24 AM

Dan seterusnya sampai semua komputer berhasil meng-ping semua device.



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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.