#### LAPORAN PRAKTIKUM JARINGAN KOMPUTER

#### **MODUL VII**

## "STATIC ROUTE, RIP DAN IGRP"

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Kelas: D

#### TUGAS MODUL

## **Kegiatan 1. Topologi 1 (Static Routing)**

**Tugas 11A**: Tuliskan langkah penambahan route table (static route) pada router puma dan eagle)

- ⇒ Langkah penambahan route table pada:
- Router Eagle
  - Masuk ke mode configuration
  - Ketik ip route 172.21.20.0 255.255.255.0 172.21.1.2
  - Ketik ip route 172.21.30.0 255.255.255.0 172.21.2.3
- Router Puma
  - Masuk ke mode configuration
  - Ketik ip route 172.21.10.0 255.255.255.0 172.21.1.1
  - Ketik ip route 172.21.30.0 255.255.255.0 172.21.3.3

**Tugas 12A**: Apakah mendapatkan tanggapan dari leo? Jelaskan secara singkat mengapa demikian

⇒ Ya, karena sudah dibuat routing untuk lewat jalur tersebut.

**Tugas 12B**: Jika alamat jaringan pada segmen leo diubah dari 172.21.10.0/24 menjadi 172.21.100.0/24. Tuliskan langkah perubahan konfigurasi yang dilakukan pada setiap router agar PC leo dapat dihubungi (ping) dari PC aries dan virgo. Mengapa langkah-langkah tersebut harus dilakukan?

- ⇒ Langkah perubahan konfigurasi:
- Lakukan konfigurasi pada router eagle
- Lakukan konfigurasi pada PC leo dan ubah default gateway
- Lakukan routing pada masing-masing router sesuai dengan blok ip PC
- Lakukan pengecekan dengan cara ping

#### **Kegiatan 2. RIP (Routing Information Protocol)**

Tugas 4A: Berapa nomor alamat jaringan yang terdaftar pada konfigurasi routing RIP?

⇒ 172.21.0.0

**Tugas 4B**: Mengapa alamat jaringan yang langsung terhubung dengan interface e0 (172.21.10.0), s0 (172.21.1.0), dan s1 (172.21.2.0) tidak didaftarkan ke konfigurasi routing RIP?

⇒ Karena pada alamat jaringan 172.21.0.0 mencakup semua alamat jaringan.

**Tugas 5A**: Jelaskan secara singkat proses tersebut?

⇒ Debug ip rip untuk melihat proses send-receive update RIP, prosesnya yaitu:

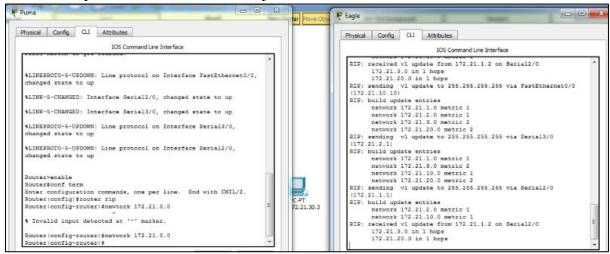
```
Router#debug ip rip
RIP protocol debugging is on
Router#RIP: sending v1 update to 255.255.255.255 via
FastEthernet0/0 (172.21.10.10)
RIP: build update entries
     network 172.21.1.0 metric 1
     network 172.21.2.0 metric 1
RIP: sending v1 update to 255.255.255.255 via Serial2/0
(172.21.1.1)
RIP: build update entries
     network 172.21.2.0 metric 1
     network 172.21.10.0 metric 1
RIP: sending v1 update to 255.255.255.255 via Serial3/0
(172.21.2.1)
RIP: build update entries
     network 172.21.1.0 metric 1
     network 172.21.10.0 metric 1
```

**Tugas 6A**: Tuliskan langkah konfigurasi routing RIP yang dilakukan pada salah satu router (puma atau tiger)

- ⇒ Langkah konfigurasi (puma) :
  - Masuk mode configuration
  - Ketik router rip
  - Ketik network 172.21.0.0

**Tugas 6B**: Jelaskan secara singkat proses update yang terjadi pada router eagle ketika konfigurasi salah satu router (puma atau tiger) dilakukan. (Perhatikan bagian "RIP : Received updated from 172.21.X.X on SerialX" dan tambahkan subnet yang terjadi)

⇒ Setelah router puma dilakukan routing rip maka router eagle secara otomatis mengupdate entries untuk router rip.



- **Tugas 6C**: Jika alamat jaringan pada segmen leo diubah dari 172.21.10.0/24 menjadi 172..21.100.0/24. Apakah perlu dilakukan perubahan konfigurasi pada setiap router agar PC leo dapat dihubungi (ping) dari PC aries dan virgo? Mengapa demikian?
  - ⇒ Tidak perlu, karena network yang dipakai ialah 172.21.0.0 yang mana masih dalam satu jaringan.
- **Tugas 8A**: Jelaskan secara singkat proses update yang terjadi pada router eagle (perhatikan bagian "RIP: Received update from 172.21.2.3 on Serial 1" dan perubahan hops dari subnet 172.21.20.0 yang terjadi)
  - ⇒ Routing otomatis di-downkan dan pada serial 3/0 terjadi perubahan hops.

**Tugas 9A**: Apakah hasil yang diperoleh berbeda dengan langkah 7 diatas (ketika langkah 8 belum dilakukan?) Jelaskan secara singkat mengapa demikian

⇒ Hasilnya ialah:

```
C:\>tracert 172.21.20.2
Tracing route to 172.21.20.2 over a maximum of 30 hops:
               0 ms
                        0 ms
     68 ms
                                  172.21.10.10
                        2 ms
     1 ms
               1 ms
                        1 ms
     1 ms
               1 ms
                                  172.21.3.2
               11 ms
                        1 ms
Trace complete.
```

Dikarenakan hubungan di-downkan maka hasil routing yang awalnya terjadi trace menjadi RTO karena jaringan tidak terhubung.

## **Kegiatan 3. EIGRP** (*Interior Gateway Routing Protocol*)

**Tugas 4A**: Berapa nomor alamat jaringan yang terdaftar pada konfigurasi routing EIGRP?

⇒ 172.21.0.0

**Tugas 5A**: Jelaskan secara singkat proses tersebut?

⇒ Terjadi suatu transaksi yang mengirim tanda untuk router lain dan komputer melalui fa dan serial.

**Tugas 7A**: Tuliskan langkah konfigurasi routing EIGRP ysng dilakukan pada salah satu router (puma atau tiger)

- ⇒ Langkah konfigurasi routing EIGRP, yaitu
  - Masuk mode configuration.
  - Ketik route eigrp 100
  - Ketik network 172.21.0.0

**Tugas 7B**: Jelaskan secara singkat proses update yang terjadi pada router eagle ketika konfigurasi salah satu router (puma atau tiger) dilakukan. (perhatikan bagian "EIGRP: Received updated from 172.21.X.X on SerialX"

⇒ Setelah router puma dikonfigurasi maka router eagle otomatis meng-update kemudian mengirimkan ACK hingga proses selesai.

**Tugas 7C**: Jika alamat jaringan pada segmen leo diubah dari 172.21.10.0/24 menjadi 172.21.100.0/24. Apakah perlu dilakukan perubahan konfigurasi pada setiap router agar PC leo dapat dihubungi (ping) dari PC aries dan virgo? Mengapa demikian

⇒ Tidak perlu, karena dalam jaringan yang sama dan routing sudah dinamis.

**Tugas 9A**: Jelaskan secara singkat proses update yang terjadi pada router eagle. (perhatikan bagian "EIGRP: Received updated from 172.21.2.3 on Serial 1")

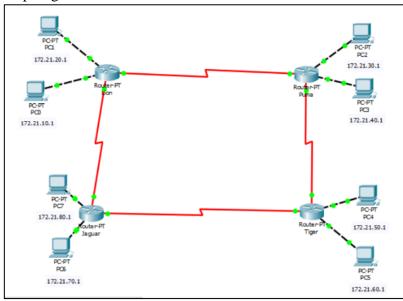
⇒ Setelah pemutusan pada router puma dan eagle pada router puma, maka akan ada notifikasi dan update pada router eagle

**Tugas 10A**: Apakah hasil yang diperoleh berbeda dengan langkah 8 diatas (ketika langkah 9 belum dilakukan?). Jelaskan secara singkat mengapa demikian

⇒ Setelah router terputus, waktu yang dibutuhkan untuk mengirim data menjadi berubah dan juga terdapat perbedaan pada hops.

# **Tugas Modul 7**

- 1. Buatlah konfigurasi static routing dan dinamic routing tang terdiri dari 4 router dan setiap router terdiri dari 2 PC. Dengan IP address sesuai kebutuhan!
  - ⇒ Static routing
    - 1) Topologi



## 2) Konfigurasi masing-masing router

#### - Lion

```
Router>enable
Router#conf term
Enter configuration commands, one per line. End with CNTL/Z.
Router(config) #int fa 0/0
Router(config-if) #ip address 172.21.10.10 255.255.255.0
Router(config-if) #no shutdown
Router(config-if) #int fa 1/0
Router(config-if) #ip address 172.21.20.20 255.255.255.0
Router(config-if) #no shutdown
Router(config-if) #int se 2/0
Router(config-if) #clock rate 2000000
Router(config-if) #ip address 172.21.1.1 255.255.255.0
Router(config-if) #no shutdown
Router(config-if) #int se 3/0
Router(config-if) #clock rate 2000000
Router(config-if) #ip address 172.21.2.1 255.255.255.0
Router(config-if) #no shutdown
Router(config-if)#
```

#### - Puma

```
Router#conf term
Enter configuration commands, one per line. End with CNTL/2.
Router(config)#int fa 0/0
Router(config-if)#ip address 172.21.30.30 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#int fa 1/0
Router(config-if)#ip address 172.21.40.40 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#no shutdown
Router(config-if)#int se 2/0
Router(config-if)#int se 2/0
Router(config-if)#ip address 172.21.1.2 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#no shutdown
Router(config-if)#ip address 172.21.3.1 255.255.255.0
Router(config-if)#no shutdown
Router(config-if)#no shutdown
Router(config-if)#no shutdown
Router(config-if)#no shutdown
Router(config-if)#
```

#### Tiger

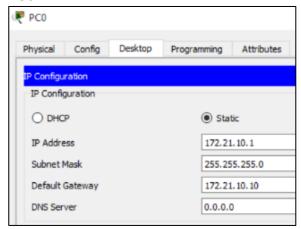
```
Router>enable
Router#conf term
Enter configuration commands, one per line. End with CNTL/Z.
Router(config) #int fa 0/0
Router(config-if) #ip address 172.21.50.50 255.255.255.0
Router(config-if) #no shutdown
Router(config-if) #int fa 1/0
Router(config-if) #ip address 172.21.60.60 255.255.255.0
Router(config-if) #no shutdown
Router(config-if) #int se 2/0
Router(config-if) #clock rate 2000000
Router(config-if) #ip address 172.21.4.1 255.255.255.0
Router(config-if) #no shutdown
Router(config-if) #int se 3/0
Router(config-if) #ip address 172.21.3.2 255.255.255.0
Router(config-if) #no shutdown
Router(config-if) #
```

## - Jaguar

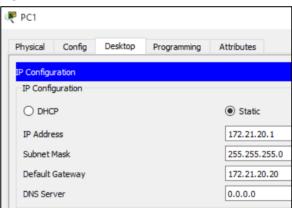
```
Router>enable
Router#conf term
Enter configuration commands, one per line. End with CNTL/Z.
Router(config) #int fa 0/0
Router(config-if) #ip address 172.21.70.70 255.255.255.0
Router(config-if) #no shutdown
Router(config-if) #int fa 1/0
Router(config-if) #ip address 172.21.80.80 255.255.255.0
Router(config-if) #no shutdown
Router(config-if) #int se 2/0
Router(config-if) #int se 2/0
Router(config-if) #ip address 172.21.4.2 255.255.255.0
Router(config-if) #in shutdown
Router(config-if) #int se 3/0
Router(config-if) #int se 3/0
Router(config-if) #ip address 172.21.2.2 255.255.255.0
Router(config-if) #in shutdown
```

# 3) Konfigurasi pada setiap PC

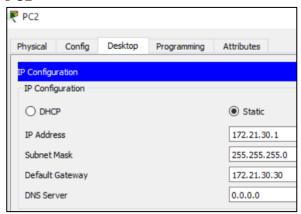
## - PC0



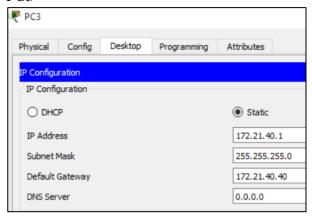
## - PC1



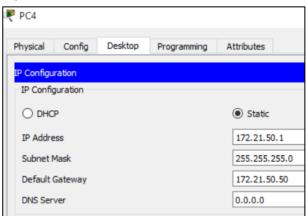
## - PC2



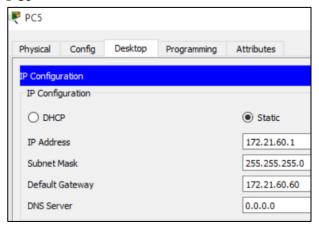
# - PC3



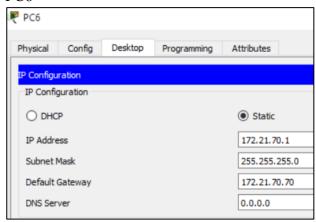
# - PC4



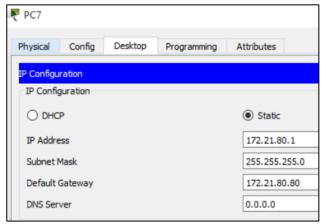
## - PC5



# - PC6



# - PC7



#### 4) Melakukan cek koneksi

- Dari PC1 ke router lion

```
Packet Tracer PC Command Line 1.0
C:\>ping 172.21.1.1
Pinging 172.21.1.1 with 32 bytes of data:
Reply from 172.21.1.1: bytes=32 time<1ms TTL=255 Reply from 172.21.1.1: bytes=32 time<1ms TTL=255
Reply from 172.21.1.1: bytes=32 time<1ms TTL=255
Reply from 172.21.1.1: bytes=32 time<1ms TTL=255
Ping statistics for 172.21.1.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = Oms, Maximum = Oms, Average = Oms
C:\>ping 172.21.2.1
Pinging 172.21.2.1 with 32 bytes of data:
Reply from 172.21.2.1: bytes=32 time<1ms TTL=255
Reply from 172.21.2.1: bytes=32 time=1ms TTL=255
Reply from 172.21.2.1: bytes=32 time<1ms TTL=255
Reply from 172.21.2.1: bytes=32 time<1ms TTL=255
Ping statistics for 172.21.2.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = Oms, Maximum = 1ms, Average = Oms
```

- Dari router lion ke router puma

```
Router*ping 172.21.1.2

Type escape sequence to abort.

Sending 5, 100-byte ICMP Echos to 172.21.1.2, timeout is 2 seconds:
!!!!!

Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/6 ms
```

## 5) Melakukan routing

- Lion

```
Router(config) #ip route 172.21.30.0 255.255.255.0 172.21.1.2
Router(config) #ip route 172.21.40.0 255.255.255.0 172.21.1.2
Router(config) #ip route 172.21.50.0 255.255.255.0 172.21.1.2
Router(config) #ip route 172.21.60.0 255.255.255.0 172.21.1.2
Router(config) #ip route 172.21.70.0 255.255.255.0 172.21.2.2
Router(config) #ip route 172.21.80.0 255.255.255.0 172.21.2.2
Router(config) #ip route 172.21.80.0 255.255.255.0 172.21.2.2
Router(config) #
```

- Puma

```
Router>enable
Router#conf term
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 172.21.10.0 255.255.255.0 172.21.1.1
Router(config)#ip route 172.21.20.0 255.255.255.0 172.21.1.1
Router(config)#ip route 172.21.50.0 255.255.255.0 172.21.3.2
Router(config)#ip route 172.21.60.0 255.255.255.0 172.21.3.2
Router(config)#ip route 172.21.60.0 255.255.255.0 172.21.3.2
Router(config)#ip route 172.21.70.0 255.255.255.0 172.21.3.2
Router(config)#ip route 172.21.80.0 255.255.255.0 172.21.3.2
Router(config)#ip route 172.21.80.0 255.255.255.0 172.21.3.2
Router(config)#ip route 172.21.80.0 255.255.255.0 172.21.3.2
```

Tiger

```
Router>enable
Router#conf term
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#ip route 172.21.10.0 255.255.255.0 172.21.4.2
Router(config)#ip route 172.21.20.0 255.255.255.0 172.21.4.2
Router(config)#ip route 172.21.20.0 255.255.255.0 172.21.3.1
Router(config)#ip route 172.21.30.0 255.255.255.0 172.21.3.1
Router(config)#ip route 172.21.40.0 255.255.255.0 172.21.3.1
Router(config)#ip route 172.21.70.0 255.255.255.0 172.21.4.2
Router(config)#ip route 172.21.80.0 255.255.255.0 172.21.4.2
Router(config)#ip route 172.21.80.0 255.255.255.0 172.21.4.2
```

- Jaguar

```
Router>enable
Router$conf term
Enter configuration commands, one per line. End with CNTL/Z.
Router(config) $ip route 172.21.10.0 255.255.255.0 172.21.2.1
Router(config) $ip route 172.21.20.0 255.255.255.0 172.21.2.1
Router(config) $ip route 172.21.30.0 255.255.255.0 172.21.2.1
Router(config) $ip route 172.21.30.0 255.255.255.0 172.21.2.1
Router(config) $ip route 172.21.40.0 255.255.255.0 172.21.2.1
Router(config) $ip route 172.21.50.0 255.255.255.0 172.21.4.1
Router(config) $ip route 172.21.60.0 255.255.255.0 172.21.4.1
Router(config) $ip route 172.21.60.0 255.255.255.0 172.21.4.1
```

6) Melihat route table pada masing-masing router

-Lion

```
Router>show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
        C - connected, S - static, I - IGRE, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
         * - candidate default, U - per-user static route, o - ODR
         P - periodic downloaded static route
Gateway of last resort is not set
      172.21.0.0/24 is subnetted, 10 subnets
           172.21.1.0 is directly connected, Serial2/0
          172.21.2.0 is directly connected, Serial3/0
          172.21.10.0 is directly connected, FastEthernet0/0
           172.21.20.0 is directly connected, FastEthernet1/0
          172.21.30.0 [1/0] via 172.21.1.2
          172.21.40.0 [1/0] via 172.21.1.2
          172.21.50.0 [1/0] via 172.21.1.2
           172.21.60.0 [1/0] via 172.21.1.2
          172.21.70.0 [1/0] via 172.21.2.2
          172.21.80.0 [1/0] via 172.21.2.2
```

#### -Puma

```
Router>show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
         D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
          * - candidate default, U - per-user static route, o - ODR
          P - periodic downloaded static route
Gateway of last resort is not set
       172.21.0.0/24 is subnetted, 10 subnets
            172.21.1.0 is directly connected, Serial2/0
           172.21.3.0 is directly connected, Serial3/0 172.21.10.0 [1/0] via 172.21.1.1
0 0 0 0 0 0 0 0 0 0
            172.21.20.0 [1/0] via 172.21.1.1
           172.21.30.0 is directly connected, FastEthernet0/0 172.21.40.0 is directly connected, FastEthernet1/0
            172.21.50.0 [1/0] via 172.21.3.2
            172.21.60.0 [1/0] via 172.21.3.2
            172.21.70.0 [1/0] via 172.21.3.2
            172.21.80.0 [1/0] via 172.21.3.2
```

## -Tiger

```
172.21.0.0/24 is subnetted, 10 subnets
C
        172.21.3.0 is directly connected, Serial3/0
C
        172.21.4.0 is directly connected, Serial2/0
S
        172.21.10.0 [1/0] via 172.21.4.2
S
        172.21.20.0 [1/0] via 172.21.4.2
S
        172.21.30.0 [1/0] via 172.21.3.1
S
        172.21.40.0 [1/0] via 172.21.3.1
        172.21.50.0 is directly connected, FastEthernet0/0
C
C
        172.21.60.0 is directly connected, FastEthernet1/0
S
        172.21.70.0 [1/0] via 172.21.4.2
                    [1/0] via 172.21.3.1
S
        172.21.80.0 [1/0] via 172.21.4.2
```

#### -Jaguar

```
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
        D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2 E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
        i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
         * - candidate default, U - per-user static route, o - ODR
        P - periodic downloaded static route
Gateway of last resort is not set
      172.21.0.0/24 is subnetted, 10 subnets
          172.21.2.0 is directly connected, Serial3/0
          172.21.4.0 is directly connected, Serial2/0
          172.21.10.0 [1/0] via 172.21.2.1
          172.21.20.0 [1/0] via 172.21.2.1
172.21.30.0 [1/0] via 172.21.2.1
S
          172.21.40.0 [1/0] via 172.21.2.1
          172.21.50.0 [1/0] via 172.21.4.1
          172.21.60.0 [1/0] via 172.21.4.1
          172.21.70.0 is directly connected, FastEthernet0/0 172.21.80.0 is directly connected, FastEthernet1/0
```

# 7) Melakukan ping dari PC0 ke PC4

```
Packet Tracer PC Command Line 1.0
C:\>ping 172.21.50.1

Pinging 172.21.50.1 with 32 bytes of data:

Request timed out.

Reply from 172.21.50.1: bytes=32 time=13ms TTL=125

Reply from 172.21.50.1: bytes=32 time=5ms TTL=125

Reply from 172.21.50.1: bytes=32 time=13ms TTL=125

Ping statistics for 172.21.50.1:

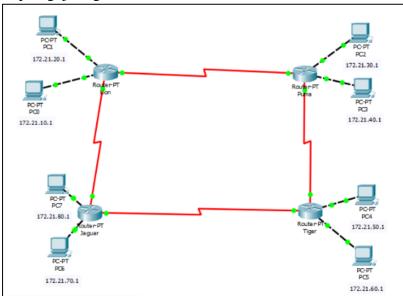
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),

Approximate round trip times in milli-seconds:

Minimum = 5ms, Maximum = 13ms, Average = 10ms
```

#### ⇒ RIP

# 1) Topologi jaringan



# 2) Melakukan konfigurasi dan routing

## -Lion

```
Router*conf term
Enter configuration commands, one per line. End with CNTL/Z.
Router(config) #router rip
Router(config-router) #network 172.21.0.0
Router(config-router) #exit
Router(config) #exit
Router#
```

#### -Puma

```
Router>enable
Router#conf term
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router rip
Router(config-router)#network 172.21.0.0
Router(config-router)#exit
Router(config)#exit
Router#
```

# -Tiger

```
Router > enable
Router # conf term
Enter configuration commands, one per line. End with CNTL/Z.
Router (config) # router rip
Router (config-router) # network 172.21.0.0
Router (config-router) # exit
Router (config) # exit
Router # Router
```

## -Jaguar

```
Router*enable
Router*conf term
Enter configuration commands, one per line. End with CNTL/Z.
Router(config) #router rip
Router(config-router) #network 172.21.0.0
Router(config-router) #exit
Router(config) #exit
Router#
```

#### 3) Ping dari PC6 ke PC2

```
C:\>ping 172.21.30.1

Pinging 172.21.30.1 with 32 bytes of data:

Request timed out.

Reply from 172.21.30.1: bytes=32 time=2ms TTL=125

Reply from 172.21.30.1: bytes=32 time=3ms TTL=123

Reply from 172.21.30.1: bytes=32 time=7ms TTL=123

Ping statistics for 172.21.30.1:

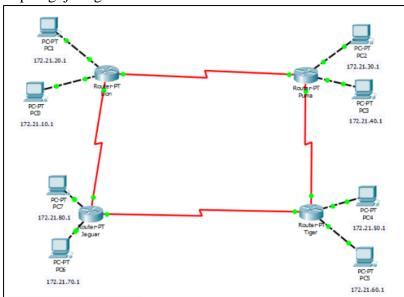
Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),

Approximate round trip times in milli-seconds:

Minimum = 2ms, Maximum = 7ms, Average = 4ms
```

#### **⇒** EIGRP

1) Topologi jaringan



## 2) Melakukan konfigurasi dan routing secara otomatis

#### -Lion

```
Router>enable
Router#conf term
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router eigrp 100
Router(config-router)#network 172.21.0.0
Router(config-router)#
```

#### -Puma

```
Router > enable
Router # conf term
Enter configuration commands, one per line. End with CNTL/Z.
Router (config) # router eigrp 100
Router (config-router) # network 172.21.0.0
Router (config-router) #
```

## -Tiger

```
Router > enable
Router # conf term
Enter configuration commands, one per line. End with CNTL/Z.
Router (config) # router eigrp 100
Router (config-router) # network 172.21.0.0
Router (config-router) #
```

## -Jaguar

```
Router>enable
Router#conf term
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#router eigrp 100
Router(config-router)#network 172.21.0.0
Router(config-router)#
```

## 3) Ping PC4 ke PC0

```
C:\>ping 172.21.10.1

Pinging 172.21.10.1 with 32 bytes of data:

Request timed out.

Reply from 172.21.10.1: bytes=32 time=2ms TTL=125

Reply from 172.21.10.1: bytes=32 time=6ms TTL=125

Reply from 172.21.10.1: bytes=32 time=3ms TTL=125

Ping statistics for 172.21.10.1:

Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),

Approximate round trip times in milli-seconds:

Minimum = 2ms, Maximum = 6ms, Average = 3ms
```