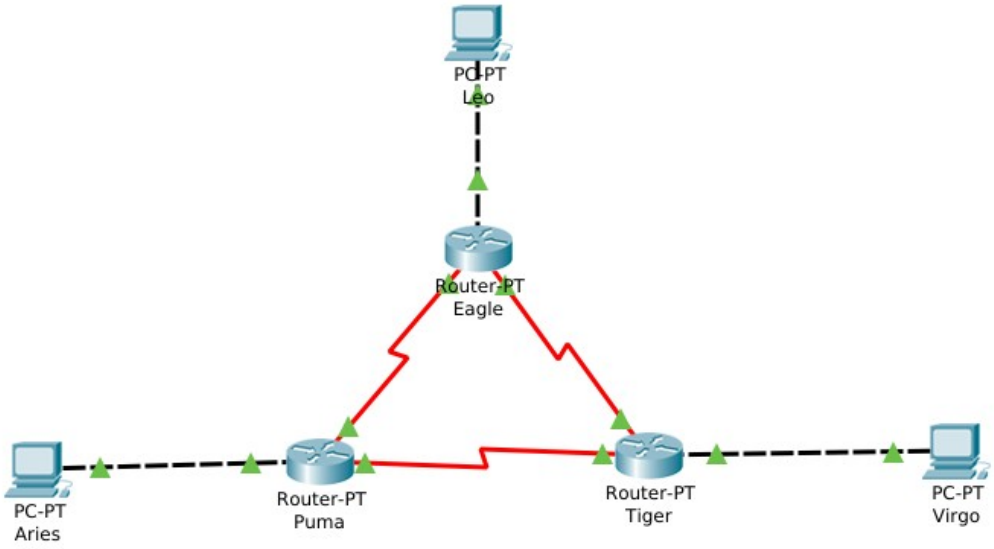
Nama : Gentur Waskita
NIM : L200170085
Kelas : D
Modul : 7

Kegiatan 1. Topologi 1 (Static Routing)

1. Tampilan topologi menggunakan Router generic. Dengan masing-masing nama Router yaitu *Eagle , Puma, dan Tiger.* Setiap hubungan antar Router dihubungkan melalui *Serial* sedangkan antara Router dan PC melalu *Fast Ethernet.*



2. Konfigurasi masing-masing Interface pada tiap Router. Sebagai berikut :
   a) Langkah konfigurasi *IP Address* interface *FastEthernet0/0(Router Eagle).*

```
Router>en
Router#conf term
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip add 172.21.10.10 255.255.255.0
Router(config-if)#no shutdown
```

   b) Konfigurasi *IP Address* interface *Serial2/0* yang *dipakai sebagai DCS side(Router Eagle).*

```
Router(config-if)#int se2/0
Router(config-if)#clock rate 2000000
Router(config-if)#ip add 172.21.1.1 255.255.255.0
Router(config-if)#no shutdown
```

   c) Konfigurasi *IP Address* interface *Serial3/0* yang *dipakai sebagai DCS side(Router Eagle).*

```
Router(config-if)#int se3/0
Router(config-if)#clock rate 2000000
Router(config-if)#ip add 172.21.2.1 255.255.255.0
Router(config-if)#no shutdown
```

   d) Langkah konfigurasi *IP Address* interface *FastEthernet0/0(Router Puma).*

```
Router>en
Router#conf term
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip add 172.21.20.20 255.255.255.0
Router(config-if)#no shutdown
```

e) Pada Router *Puma* Konfigurasi *IP Address* interface *Serial3/0* yang dipakai sebagai *DCS Side* memiliki langkah yang sama pada Konfigurasi *DCS Side* pada Router *Eagle*.

```
Router(config-if)#int se3/0
Router(config-if)#clock rate 2000000
Router(config-if)#ip add 172.21.3.2 255.255.255.0
Router(config-if)#no shutdown
```

f) Konfigurasi *IP Address* interface *Serial2/0* yang tidak dipakai sebagai *DCS Side(Router Puma).*

```
Router(config-if)#int se2/0
Router(config-if)#ip add 172.21.1.2 255.255.255.0
Router(config-if)#no shutdown
```

g) *Langkah konfigurasi IP Address* interface *FastEthernet0/0(Router Tiger).*

```
Router>en
Router#conf term
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#int fa0/0
Router(config-if)#ip add 172.21.30.30 255.255.255.0
Router(config-if)#no shutdown
```

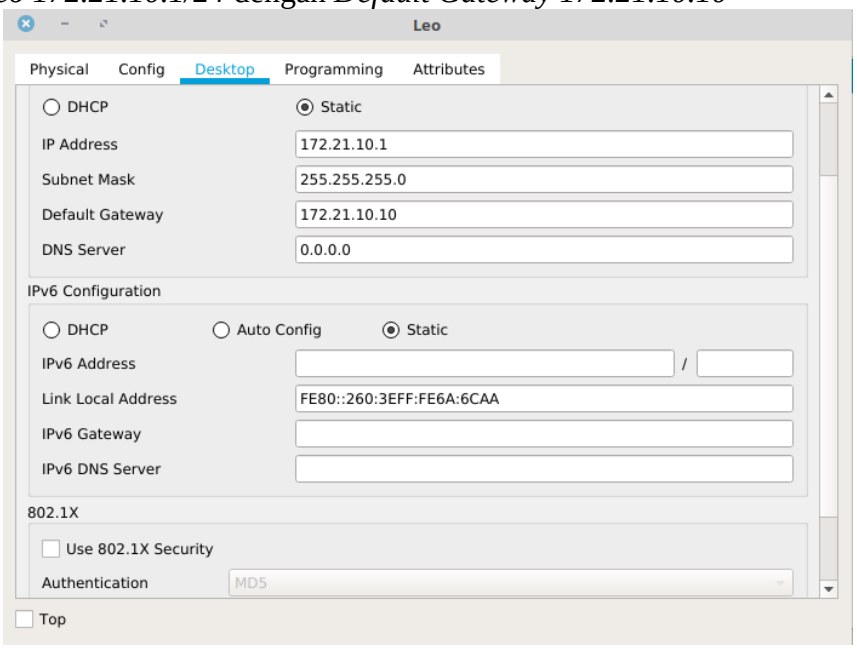
h) *Konfigurasi IP Address interface Serial2/0 yang tidak dipakai sebagai DCS Side(Router Tiger).*

```
Router(config-if)#int se2/0
Router(config-if)#ip add 172.21.2.3 255.255.255.0
Router(config-if)#no shutdown
```

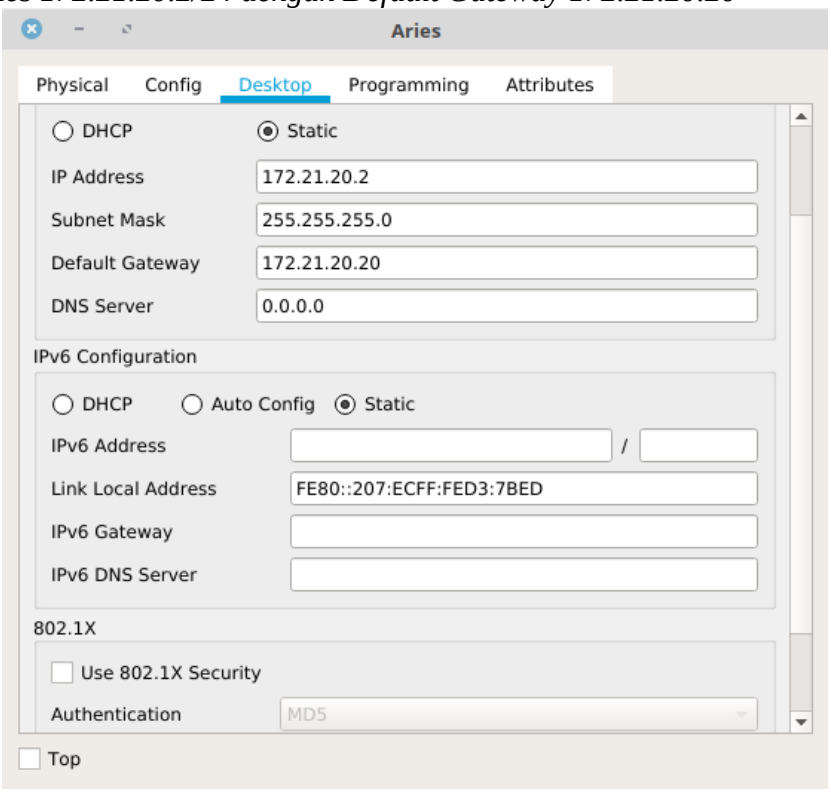
i) *Konfigurasi IP Address interface Serial3/0 yang tidak dipakai sebagai DCS Side(Router Tiger).*

```
Router(config-if)#int se3/0
Router(config-if)#ip add 172.21.3.3 255.255.255.0
Router(config-if)#no shutdown
```

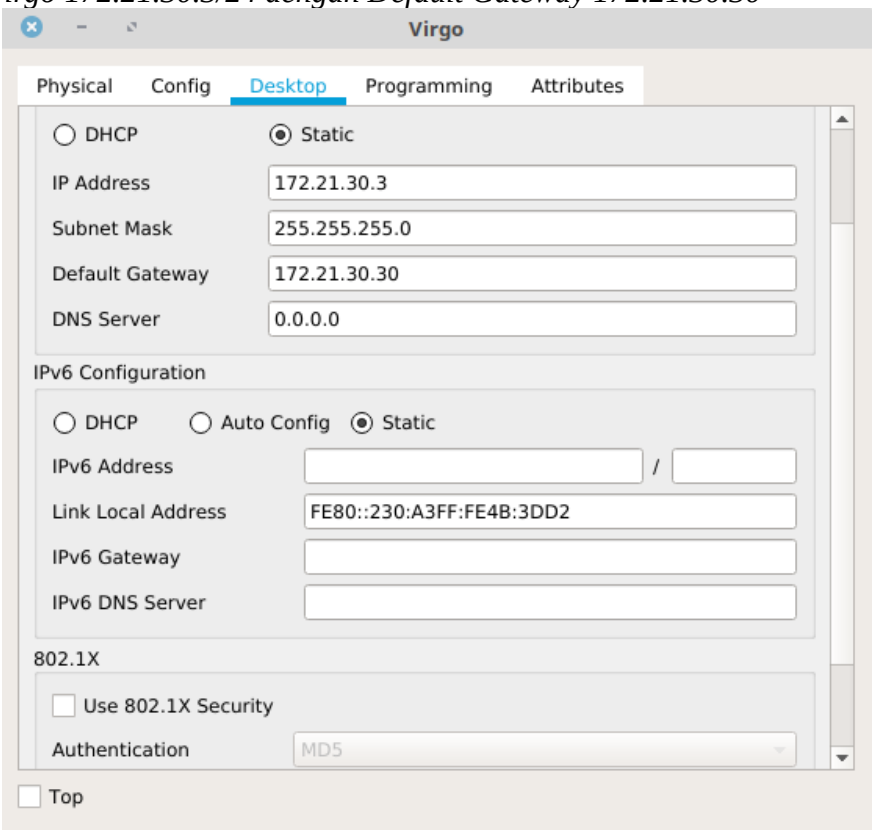
3. Konfigurasi masing-masing PC dengan IP Address yang sudah ditentukan.
   a) PC *Leo 172.21.10.1/24* dengan *Default Gateway 172.21.10.10*



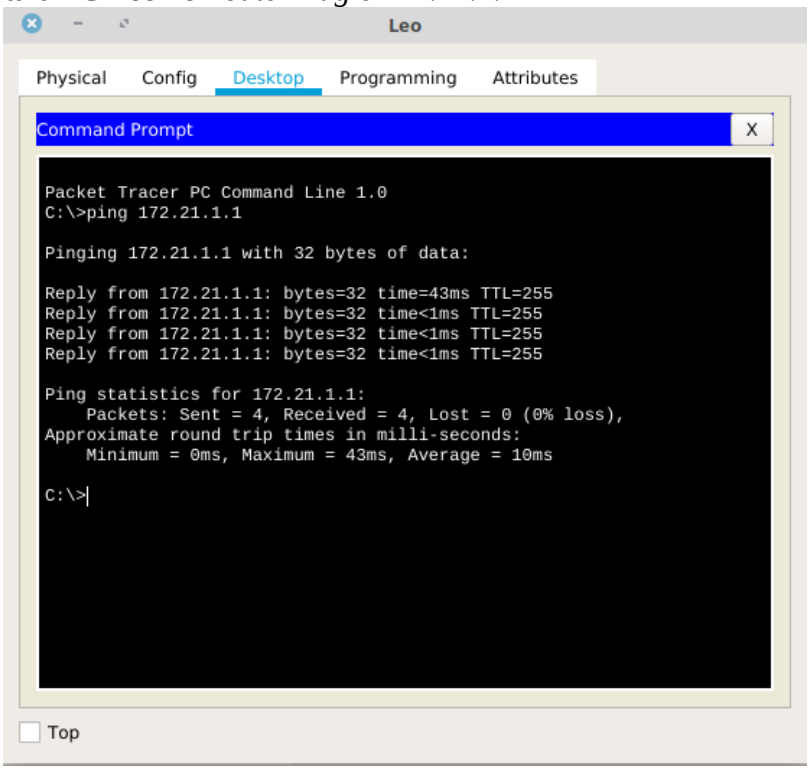
b) *PC Aries 172.21.20.2/24 dengan Default Gateway 172.21.20.20*



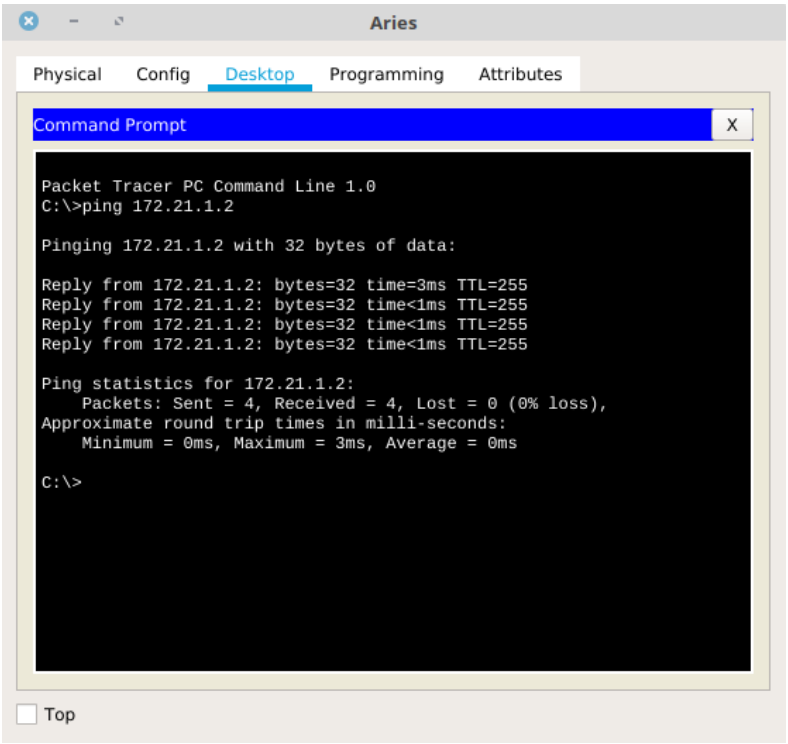
c) *PC Virgo 172.21.30.3/24 dengan Default Gateway 172.21.30.30*



4. Langkah pengujian untuk memastikan kesesuaian konfigurasi.
   a) *Ping* antara PC Leo ke *Router Eagle 172.21.1.1*



   b) *Ping* antara *PC Aries* ke *Router Puma 172.21.1.2*



c) *Ping* antara PC Virgo ke Router Tiger 172.21.3.3

```
Packet Tracer PC Command Line 1.0
C:\>ping 172.21.3.3

Pinging 172.21.3.3 with 32 bytes of data:

Reply from 172.21.3.3: bytes=32 time=3ms TTL=255
Reply from 172.21.3.3: bytes=32 time<1ms TTL=255
Reply from 172.21.3.3: bytes=32 time<1ms TTL=255
Reply from 172.21.3.3: bytes=32 time<1ms TTL=255

Ping statistics for 172.21.3.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 3ms, Average = 0ms

C:\>
```

d) *Ping* antara *Router Eagle* Ke *Router Puma 172.21.1.2*

```
Router>en
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 = 1/11/47
ms

Router#
```

e) *Ping* antara *Router Eagle* Ke *Router Tiger 172.21.2.3*

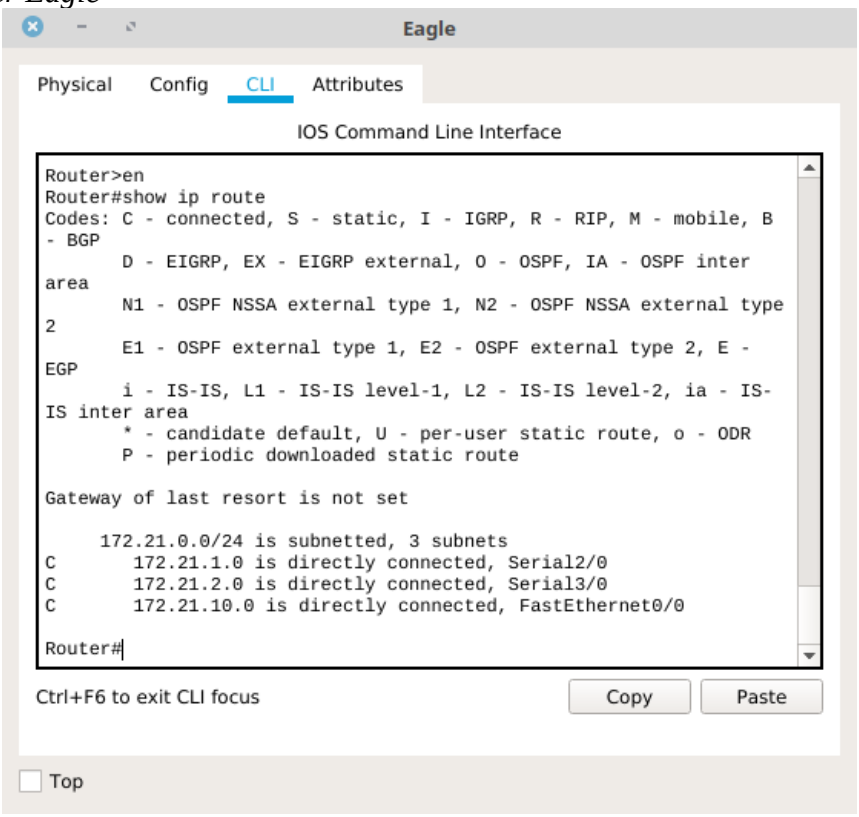
```
Router#ping 172.21.2.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.21.2.3, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/2/5
ms

Router#
```

f) *Ping* antara *Router Puma* Ke *Router Tiger 172.21.3.3*

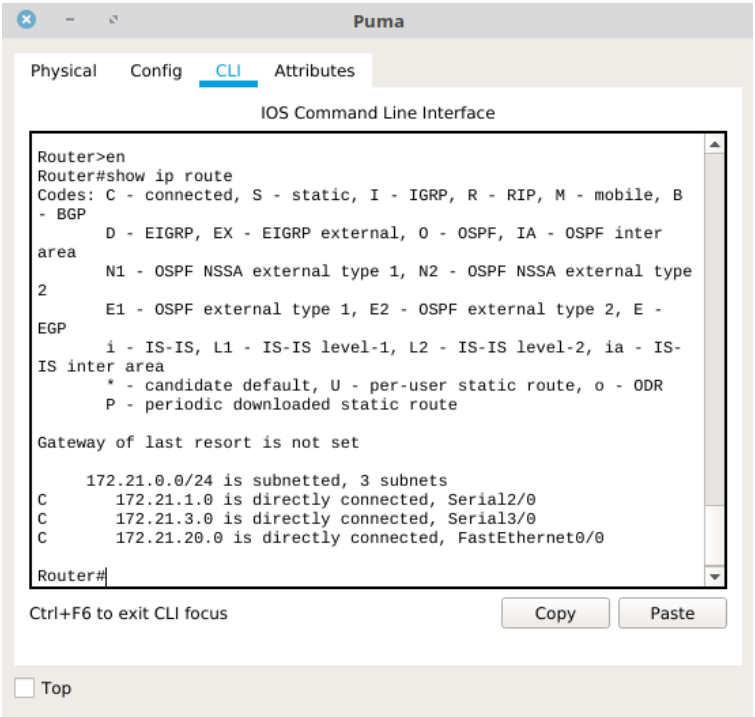
```
Router>en
Router#ping 172.21.3.3

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 172.21.3.3, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/1/3 ms

Router#
```

5. Hasil *Route Table* pada masing-masing Router.

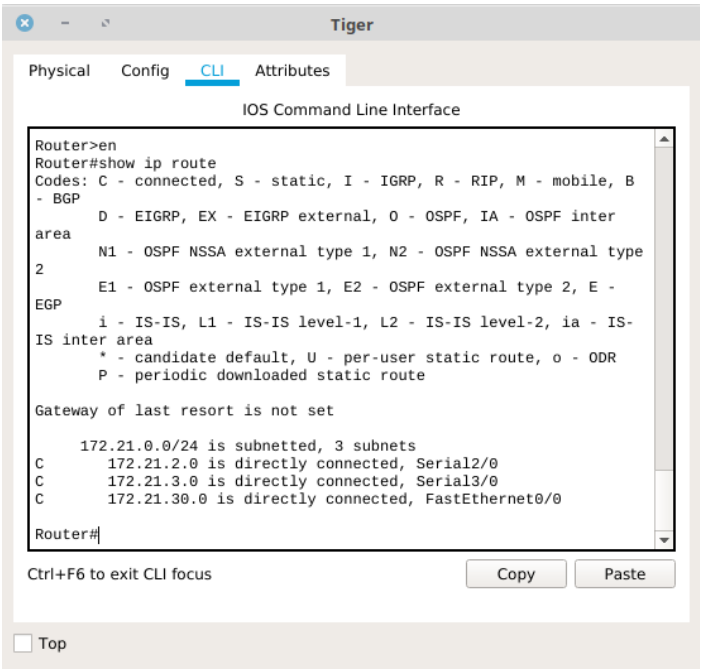
a) Router Eagle



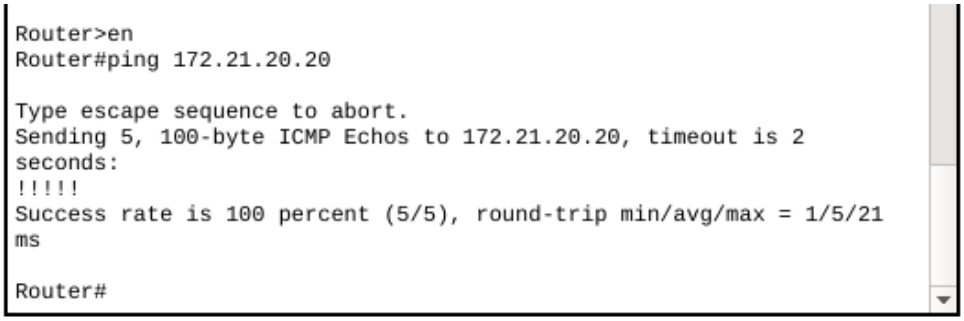
b) Router Puma



c) *Router Tiger*

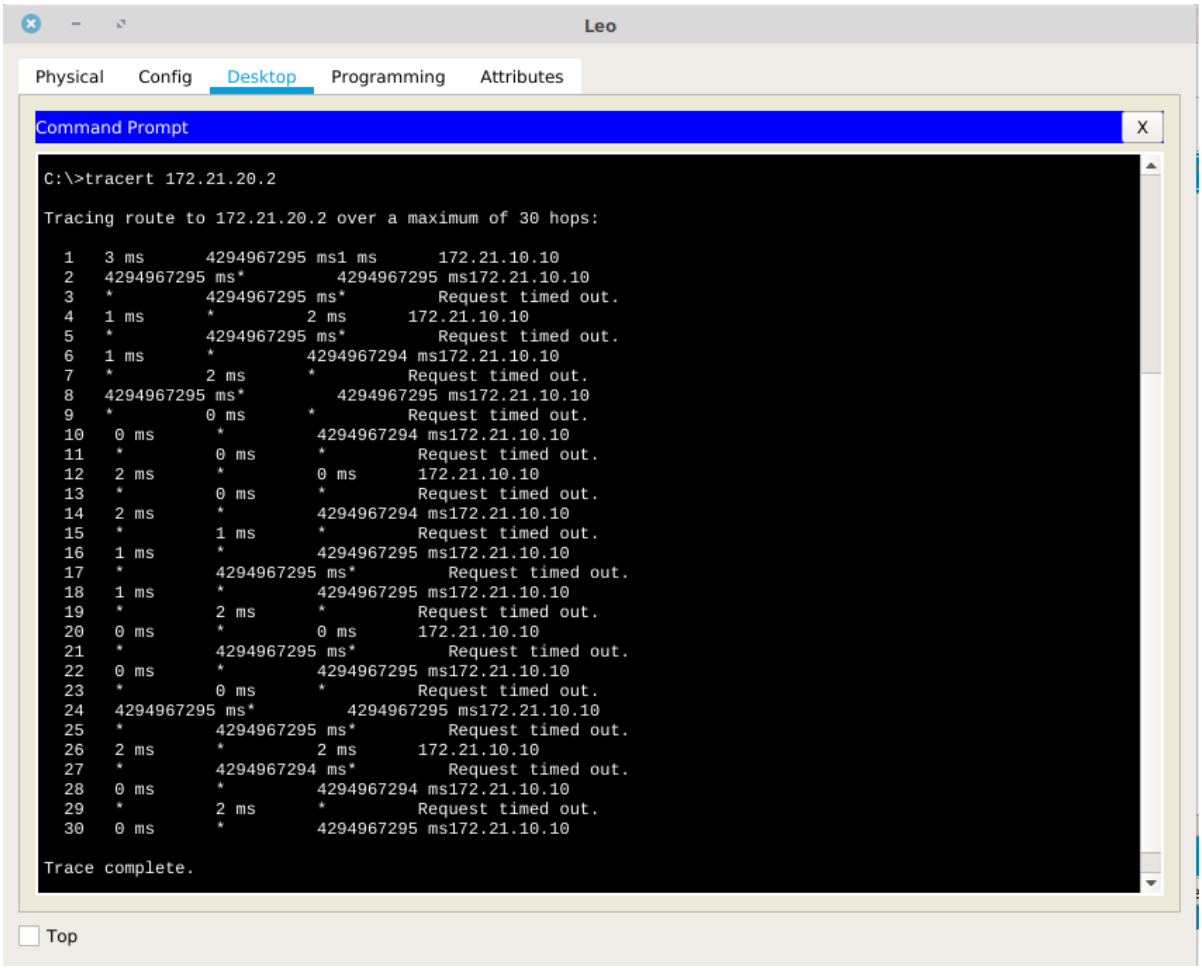


6. Ping dari *Router Eagle* ke *IP Address* interface FastEthernet0/0 pada *Router Puma* 172.21.20.20.



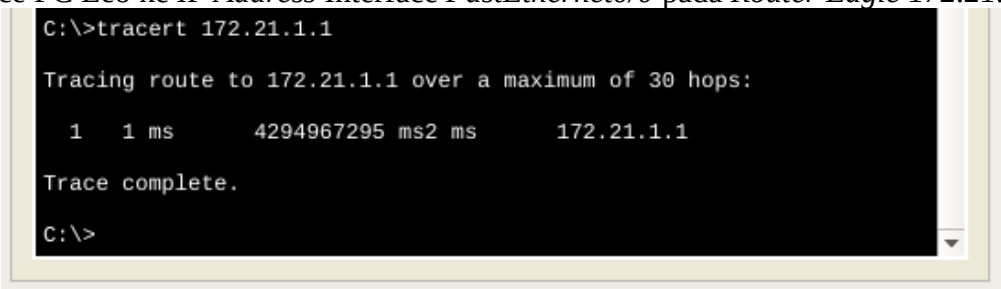
Dari hasil Ping diatas berhasil mendapat tanggapan dari Fa0/0 Router Puma. Karena Router Eagle dengan Router Puma terhubung langsung.

7. Melakukan *Trace* dari *PC Leo* ke *PC Aries.*



Proses Trace digunakan untuk mengetahui jalur pada sebuah interface apakah sudah terhubung atau interface masih mencari jalur sampai maksimal 30 Hops. Dari Trace diatas dapat disimpulkan jika PC Leo dengan PC Aries belum terhubung, perlu dilakukan Routing pada Router Eagle.

8. Trace PC Leo ke *IP Address* Interface *FastEthernet0/0* pada *Router Eagle 172.21.1.1*

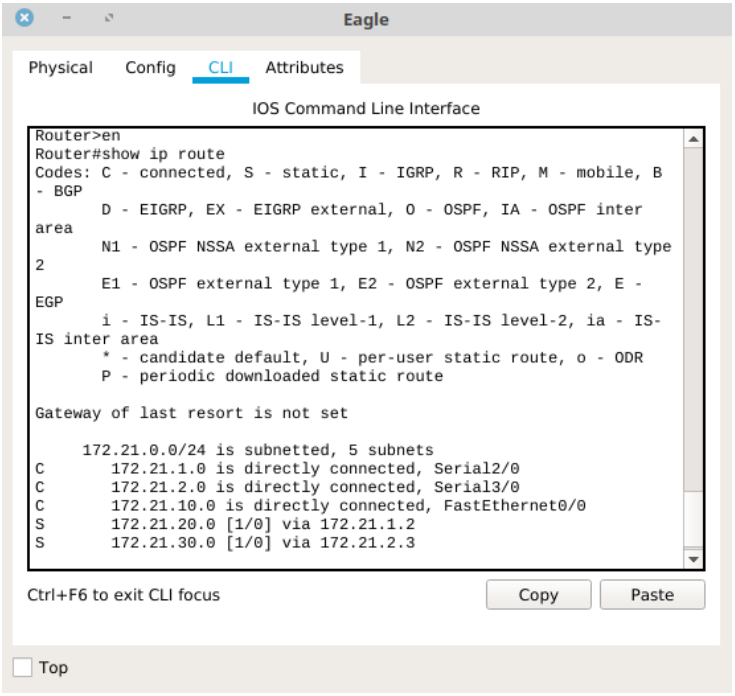


Hasil dari Trace dibutuhkan 1 Hops untuk PC Leo berkomunikasi dengan FastEthernet0/0 pada Router Eagle, karena sudah terhubung secara langsung.

9. Route table pada masing-masing Router untuk setiap alamat jaringan yang tidak terhubung secara langsung dengan interface Router.
   a) Pada Router Eagle
      - Langkah *Routing*

```
Router>en
Router#conf term
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#ip route 172.21.20.0 255.255.255.0 172.21.1.2
Router(config)#ip route 172.21.30.0 255.255.255.0 172.21.2.3
```

      - Hasil *Routing Table Router Eagle*



b) Pada Router Puma

- Langkah *Routing*

```
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 172.21.30.0 255.255.255.0 172.21.3.3
Router(config)#
```

- Hasil *Routing Table Router Puma*

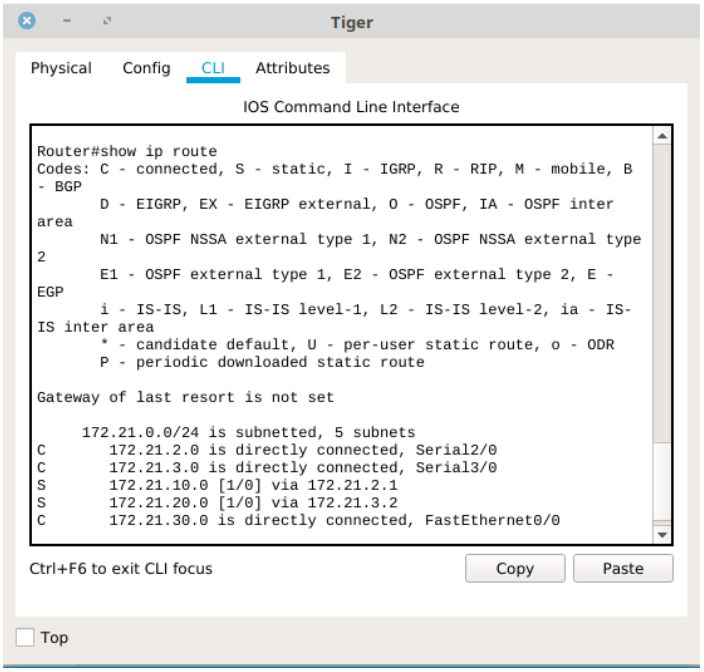
```
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
       E1 - OSPF external type 1, E2 - OSPF external type 2, E - 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, 5 subnets
C       172.21.1.0 is directly connected, Serial2/0
C       172.21.3.0 is directly connected, Serial3/0
S       172.21.10.0 [1/0] via 172.21.1.1
C       172.21.20.0 is directly connected, FastEthernet0/0
S       172.21.30.0 [1/0] via 172.21.3.3
```

c) Pada Router Tiger

- Langkah *Routing*

```
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 172.21.20.0 255.255.255.0 172.21.3.2
Router(config)#
```

- Hasil *Routing Table Router Tiger*



10. Melakukan *Ping* dan *Trace* dari *PC Leo* ke *PC Aries.*
    a) *Ping PC Leo* ke *PC Aries*

```
C:\>ping 172.21.20.2

Pinging 172.21.20.2 with 32 bytes of data:

Reply from 172.21.20.2: bytes=32 time=3ms TTL=126
Reply from 172.21.20.2: bytes=32 time=18ms TTL=126
Reply from 172.21.20.2: bytes=32 time=10ms TTL=126
Reply from 172.21.20.2: bytes=32 time=1ms TTL=126

Ping statistics for 172.21.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 18ms, Average = 8ms
```

Hasil Ping diatas berhasil, karena PC Leo dan PC Aries IP Address-nya sudah terhubung.

    b) Trace *PC Leo* ke *PC Aries*

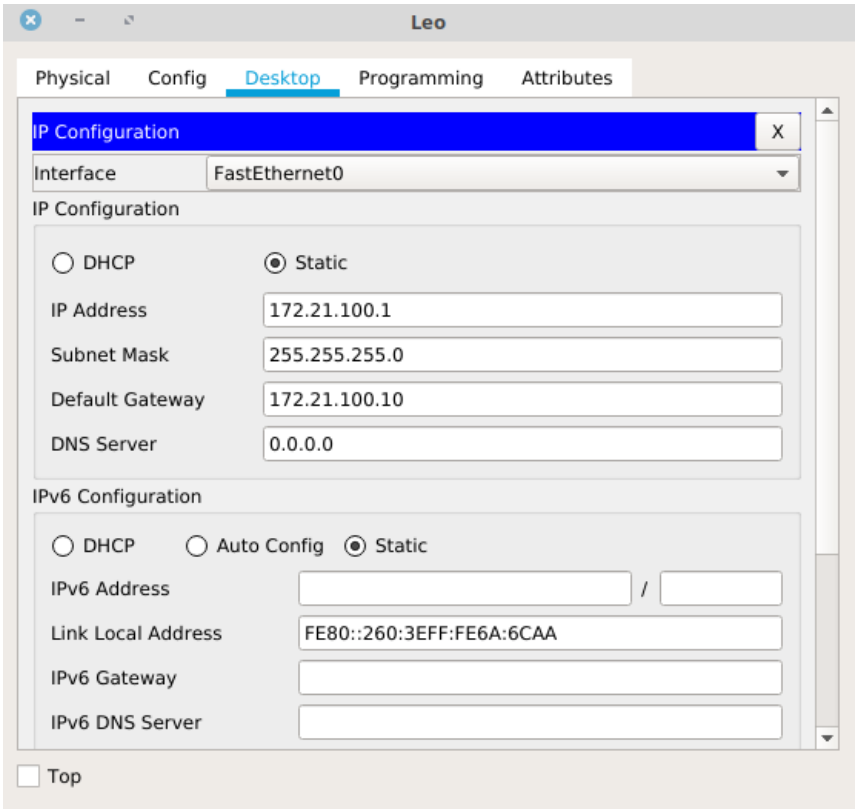
```
C:\>tracert 172.21.20.2

Tracing route to 172.21.20.2 over a maximum of 30 hops:

  1    1 ms      0 ms      4294967295 ms172.21.10.10
  2    0 ms      0 ms      4294967295 ms172.21.1.2
  3    10 ms     0 ms      1 ms      172.21.20.2

Trace complete.

C:\>
```

Hasil Trace diatas hanya membutuhkan 3 Hops karena PC Leo dan PC Aries sudah terhubung, karena sudah dilakukan Routing pada Router Eagle.

11. Apabila IP Address pada PC Leo diubah dari *172.21.10.0/24* menjadi *172.21.100.0/24.* Berikut langkah supaya PC Leo bisa berhubungan dengan PC atau Router lain.

a) Ubah Konfigurasi IP Address serta Default Gateway Pada PC Leo dan FastEthernet0/0 pada Router Eagle.

- IP Address PC Leo



- FastEthernet0/0 pada Router Eagle.

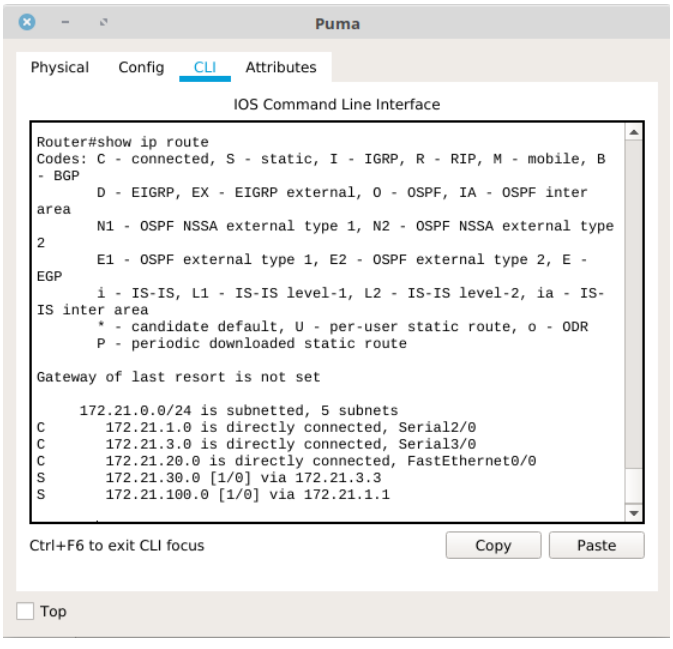
```
Router>enable
Router#
Router#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#interface FastEthernet0/0
Router(config-if)#ip address 172.21.100.10 255.255.255.0
Router(config-if)#
```

b) Routing ulang pada *Router Puma* dan *Router Tiger*.

- Router Puma

```
Router#conf term
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#ip route 172.21.100.0 255.255.255.0 172.21.1.1
```

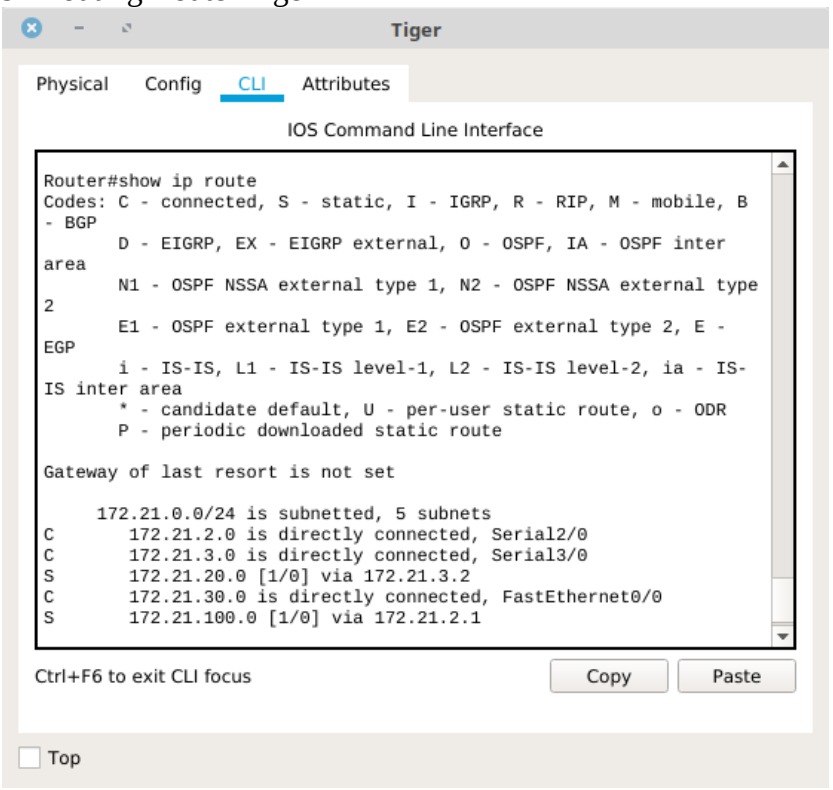
- Hasil Routing Router Puma



- Router Tiger

```
Router#conf term
Enter configuration commands, one per line.  End with CNTL/Z.
Router(config)#ip route 172.21.100.0 255.255.255.0 172.21.2.1
```

- Hasil Routing Router Tiger



c) Test Ping ke PC Leo.

- Dari PC Aries

```
C:\>ping 172.21.100.1

Pinging 172.21.100.1 with 32 bytes of data:

Reply from 172.21.100.1: bytes=32 time=3ms TTL=126
Reply from 172.21.100.1: bytes=32 time=1ms TTL=126
Reply from 172.21.100.1: bytes=32 time=10ms TTL=126
Reply from 172.21.100.1: bytes=32 time=11ms TTL=126

Ping statistics for 172.21.100.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 11ms, Average = 6ms
```

- Dari PC Virgo

```
C:\>ping 172.21.100.1

Pinging 172.21.100.1 with 32 bytes of data:

Reply from 172.21.100.1: bytes=32 time=2ms TTL=126
Reply from 172.21.100.1: bytes=32 time=6ms TTL=126
Reply from 172.21.100.1: bytes=32 time=12ms TTL=126
Reply from 172.21.100.1: bytes=32 time=12ms TTL=126

Ping statistics for 172.21.100.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 2ms, Maximum = 12ms, Average = 8ms
```

langkah diatas harus dilakukan jika kita mengganti Network pada salah satu PC, karena diperlukan Routing ulang pada masing-masing Router untuk bisa saling berkomunikasi.