

```

C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=1ms TTL=126
Reply from 192.168.1.2: bytes=32 time=11ms TTL=126
Reply from 192.168.1.2: bytes=32 time=11ms TTL=126
Reply from 192.168.1.2: bytes=32 time=13ms TTL=126

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 13ms, Average = 9ms

```

Gambar 18. Hasil Tes Ping PC1 ke PC2

```

C:\>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Reply from 192.168.1.3: bytes=32 time=1ms TTL=126
Reply from 192.168.1.3: bytes=32 time=1ms TTL=126
Reply from 192.168.1.3: bytes=32 time=2ms TTL=126
Reply from 192.168.1.3: bytes=32 time=15ms TTL=126

Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 15ms, Average = 4ms

```

Gambar 19. Hasil Tes Ping PC1 ke PC3

```

Packet Tracer PC Command Line 1.0
C:\>ping 192.168.20.2

Pinging 192.168.20.2 with 32 bytes of data:

Reply from 192.168.20.2: bytes=32 time=1ms TTL=126
Reply from 192.168.20.2: bytes=32 time=12ms TTL=126
Reply from 192.168.20.2: bytes=32 time=12ms TTL=126
Reply from 192.168.20.2: bytes=32 time=4ms TTL=126

Ping statistics for 192.168.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 12ms, Average = 7ms

```

Gambar 20. Hasil Tes Ping PC2 ke PC0

```

C:\>ping 192.168.20.3

Pinging 192.168.20.3 with 32 bytes of data:

Reply from 192.168.20.3: bytes=32 time=2ms TTL=126
Reply from 192.168.20.3: bytes=32 time=14ms TTL=126
Reply from 192.168.20.3: bytes=32 time=16ms TTL=126
Reply from 192.168.20.3: bytes=32 time=4ms TTL=126

Ping statistics for 192.168.20.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 16ms, Average = 9ms

```

Gambar 21. Hasil Tes Ping PC2 ke PC1

```

C:\>ping 192.168.1.3

Pinging 192.168.1.3 with 32 bytes of data:

Reply from 192.168.1.3: bytes=32 time=1ms TTL=128
Reply from 192.168.1.3: bytes=32 time<1ms TTL=128
Reply from 192.168.1.3: bytes=32 time=2ms TTL=128
Reply from 192.168.1.3: bytes=32 time=3ms TTL=128

Ping statistics for 192.168.1.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 3ms, Average = 1ms

```

Gambar 22. Hasil Tes Ping PC2 ke PC3

```

C:\>ping 192.168.20.2

Pinging 192.168.20.2 with 32 bytes of data:

Reply from 192.168.20.2: bytes=32 time=2ms TTL=126
Reply from 192.168.20.2: bytes=32 time=12ms TTL=126
Reply from 192.168.20.2: bytes=32 time=4ms TTL=126
Reply from 192.168.20.2: bytes=32 time=12ms TTL=126

Ping statistics for 192.168.20.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 12ms, Average = 7ms

```

Gambar 23. Hasil Tes Ping PC3 ke PC0

```

C:\>ping 192.168.20.3

Pinging 192.168.20.3 with 32 bytes of data:

Reply from 192.168.20.3: bytes=32 time=1ms TTL=126
Reply from 192.168.20.3: bytes=32 time=14ms TTL=126
Reply from 192.168.20.3: bytes=32 time=12ms TTL=126
Reply from 192.168.20.3: bytes=32 time=12ms TTL=126

Ping statistics for 192.168.20.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 14ms, Average = 5ms

```

Gambar 24. Hasil Tes Ping PC3 ke PC1

```

C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=1ms TTL=128
Reply from 192.168.1.2: bytes=32 time<1ms TTL=128
Reply from 192.168.1.2: bytes=32 time<1ms TTL=128
Reply from 192.168.1.2: bytes=32 time<1ms TTL=128

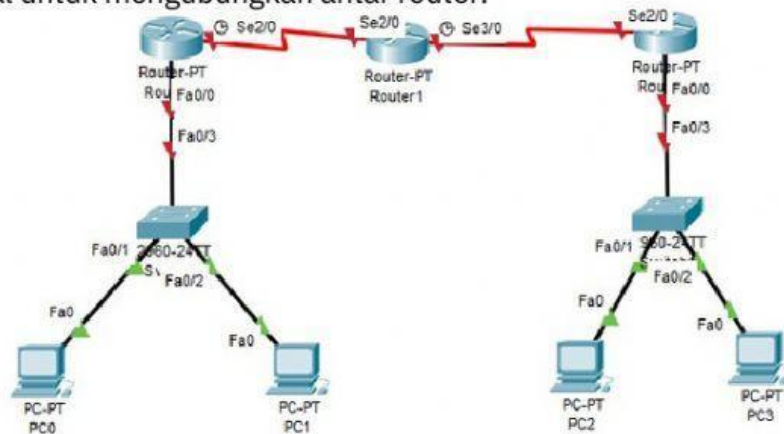
Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

```

Gambar 25. Hasil Tes Ping PC3 ke PC2

Konfigurasi *Static Routing* untuk Topologi Jaringan dengan 3 router

Pada praktikum, topologi yang digunakan adalah gabungan dari dua topologi star. Topologi star yang pertama menghubungkan router1 dan router 3 dengan personal komputer masing-masing menggunakan switch sebagai node. Topologi star yang kedua menghubungkan router1 dengan router3 menggunakan router2 sebagai node. Media transmisi yang digunakan untuk mengirim data adalah kabel UTP tipe straight untuk menyambungkan router dengan switch dan personal computer dengan switch, Kabel Serial untuk menghubungkan antar router.



Gambar 26. Topologi Jaringan yang Digunakan Spesifikasi masing-masing perangkat adalah sebagai berikut :

PC0 IP Se3/0 : 172.16.0.6/24

IP : 192.168.10.2/24 **Router2**

Gw : 192.168.10.1 IP Fa : 192.168.2.1/24

IP Se2/0 : 172.16.0.5/24

PC1 PC2

IP : 192.168.10.3/24 IP : 192.168.2.2/24

Gw : 192.168.10.1 Gw : 192.168.2.1

PC3

Router0 IP : 192.168.2.3/24

IP Fa : 192.168.10.1/24 Gw : 192.168.2.1

IP Se2/0 : 172.16.0.1/30

Router1

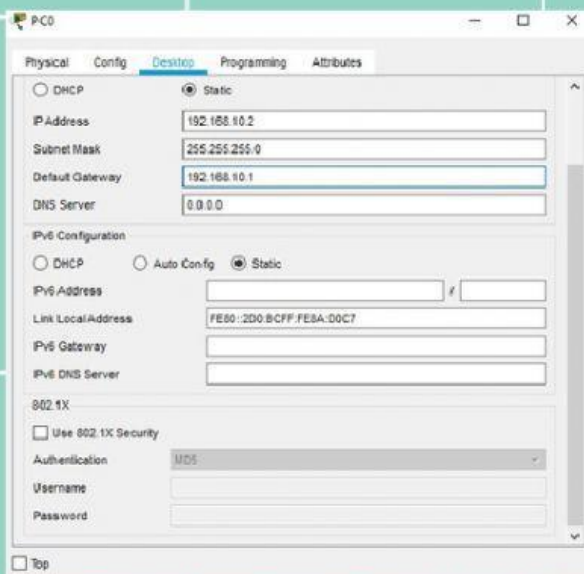
IP Se2/0 : 172.16.0.2/24

Langkah Percobaan

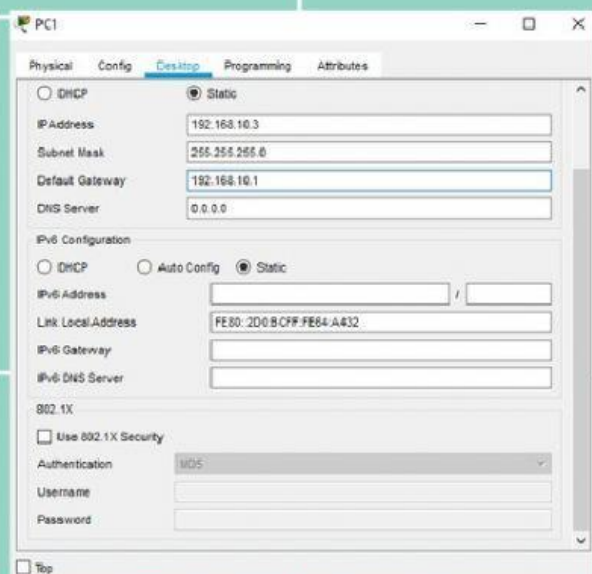
1. Membuat topologi jaringan seperti pada gambar diatas menggunakan simulator Packet Tracer, dimana perangkat yang dibutuhkan yaitu :

- a. End devices : PC
- b. Network devices : Switch 2960, Router-PT
- c. Connections : Copper Straight-Through, Serial DCE

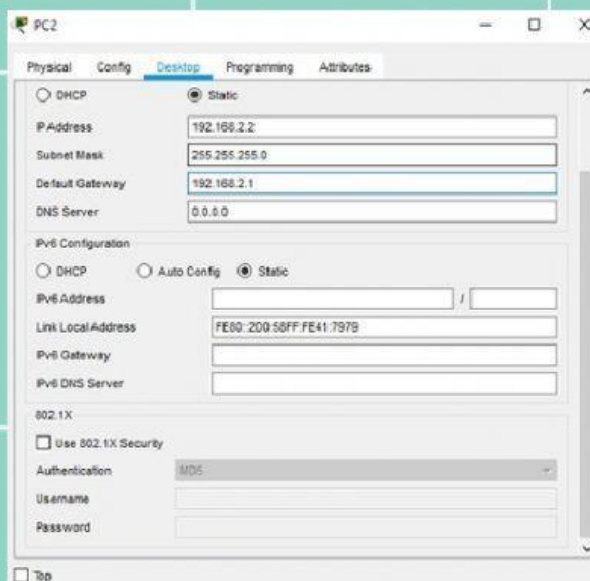
2. Lakukan konfigurasi IP address, subnetmask, dan default gateway pada semua PC



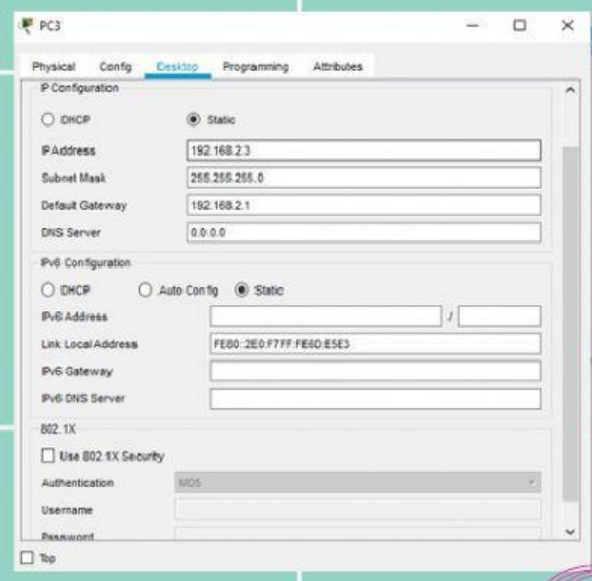
Gambar 27. Konfigurasi PC0



Gambar 28. Konfigurasi PC1

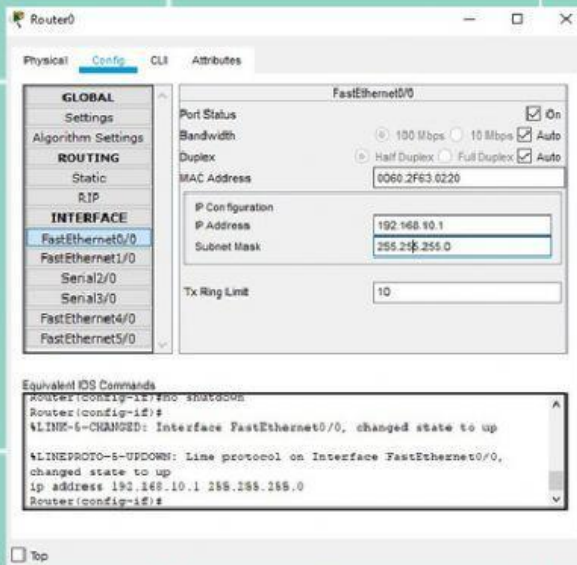


Gambar 29. Konfigurasi PC2

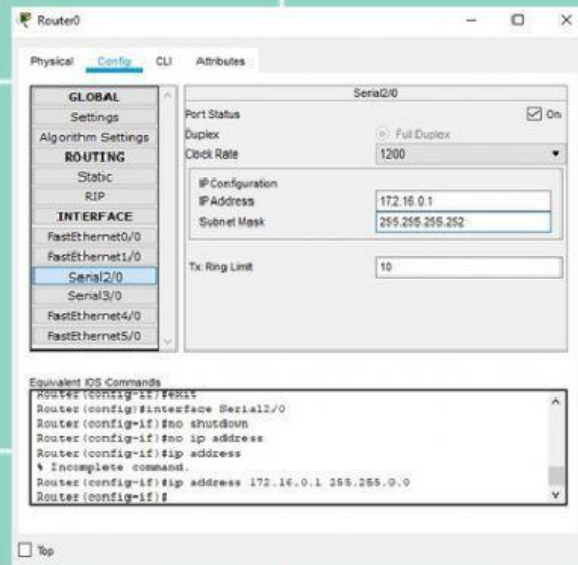


Gambar 30. Konfigurasi PC3

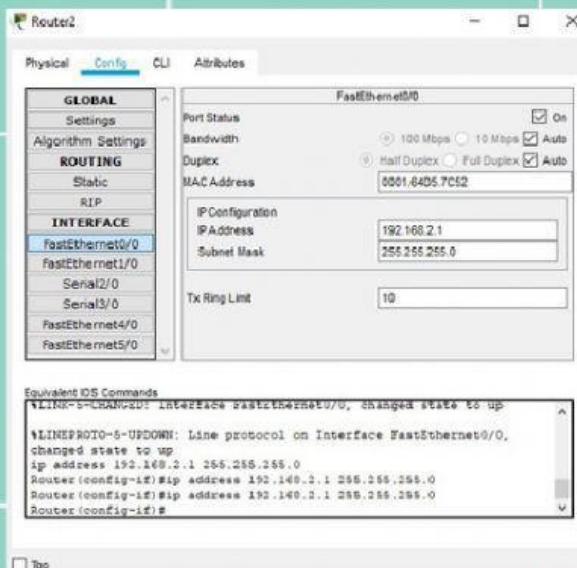
3. Lakukan konfigurasi pada semua *router* baik melalui CLI atau *router config*



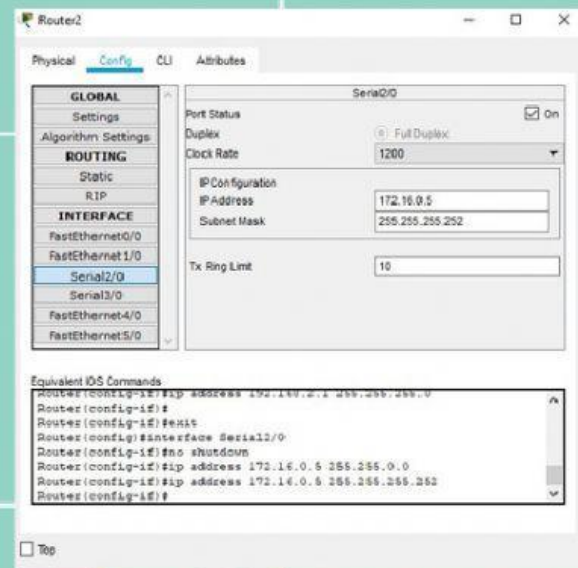
Gambar 31. Konfigurasi FastEthernet Router0



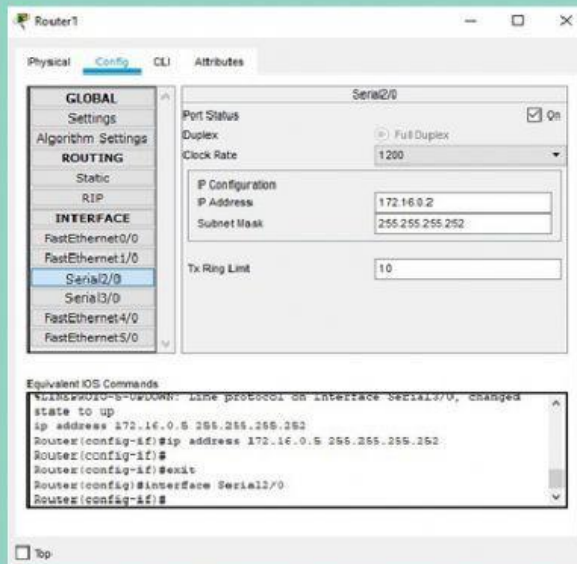
Gambar 32. Konfigurasi Serial Router0



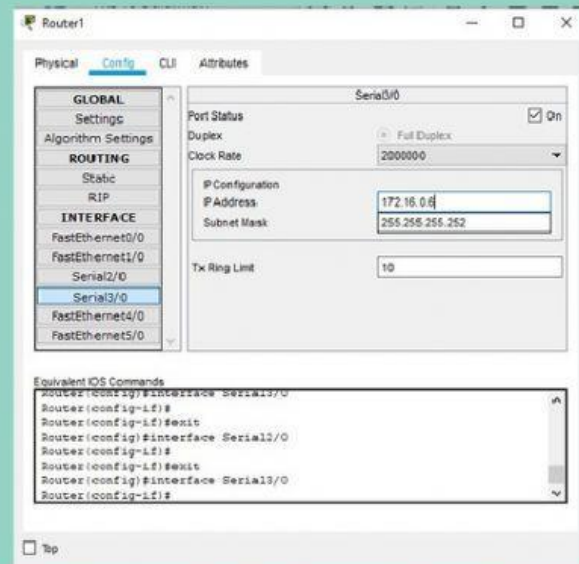
Gambar 33. Konfigurasi FastEthernet Router2



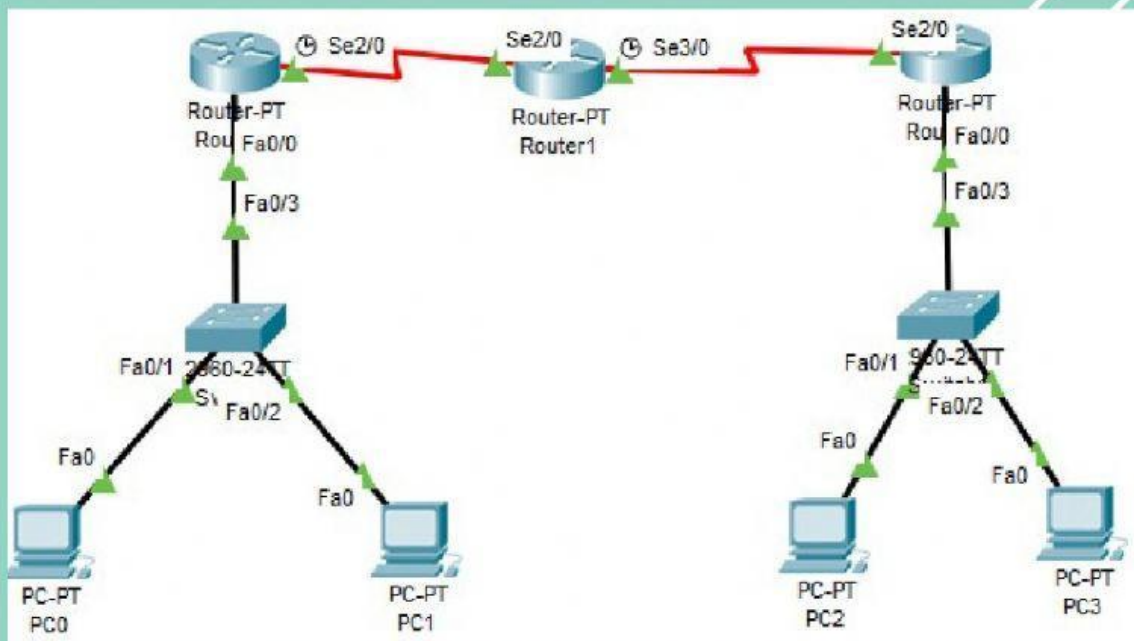
Gambar 34. Konfigurasi Serial Router2



Gambar 35. Konfigurasi Serial 2/0 Router1

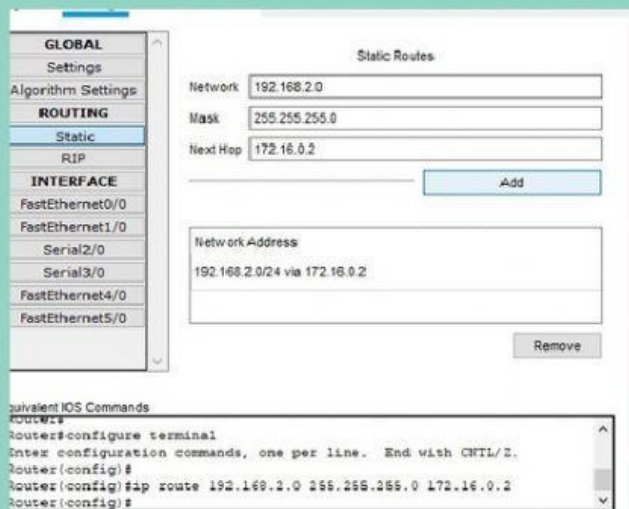


Gambar 34. Konfigurasi Serial 3/0 Router2

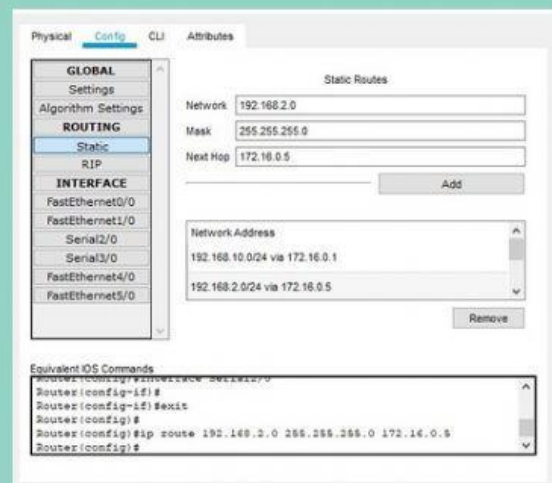


Gambar 35. Jaringan Topologi Setelah Konfigurasi PC dan Router

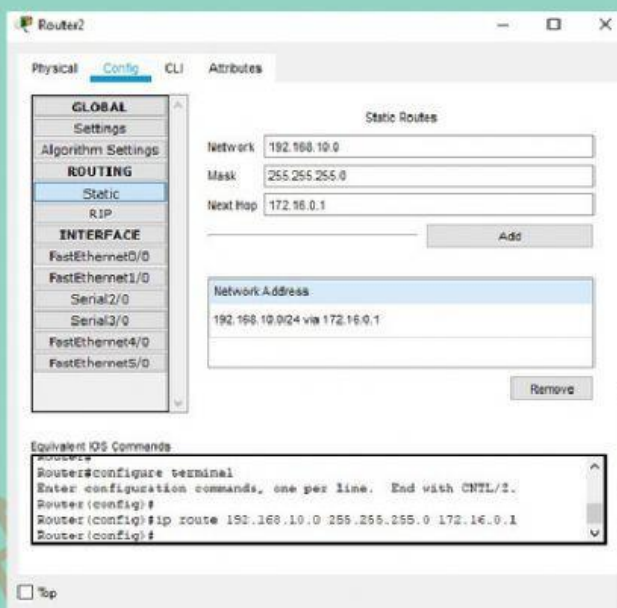
4. Lakukan konfigurasi static routing pada semua router



Gambar 36. Konfigurasi *Static Routing* Router0



Gambar 37. Konfigurasi *Static Routing* Router1



Gambar 38. Konfigurasi *Static Routing* Router2



5. Setelah semua konfigurasi selesai lakukan pengecekan tabel routing pada semua router



```
Router0
Physical Config CLI Attributes
IOS Command Line Interface
Router(config)#ip route 192.168.2.0 255.255.255.0 172.16.0.2
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

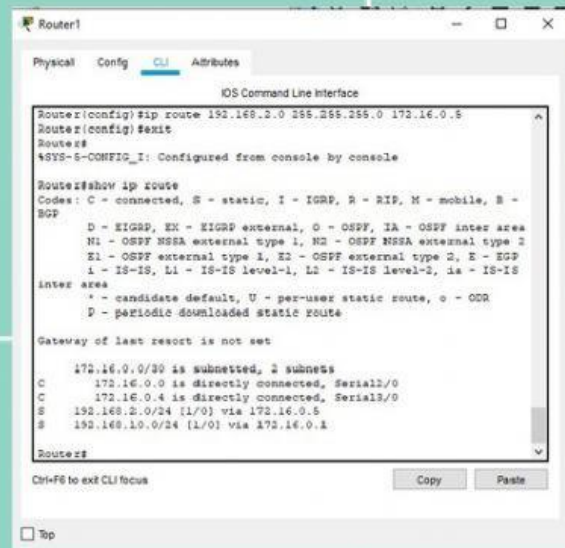
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B -
      BGP
      D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
      E1 - OSPF external type 1, E2 - OSPF external type 2, E - 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

      172.16.0.0/30 is subnetted, 1 subnets
      C      172.16.0.0 is directly connected, Serial2/0
      S      192.168.2.0/24 [1/0] via 172.16.0.2
      S      192.168.10.0/24 is directly connected, FastEthernet0/0

Router#
```

Gambar 39. Pengecekan Tabel Routing Router0



```
Router1
Physical Config CLI Attributes
IOS Command Line Interface
Router(config)#ip route 192.168.2.0 255.255.255.0 172.16.0.5
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

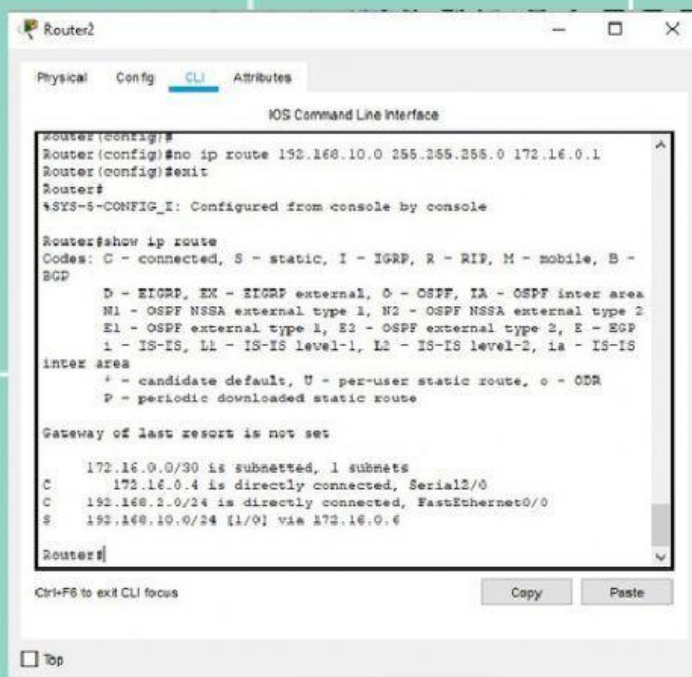
Router#show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B -
      BGP
      D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
      N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
      E1 - OSPF external type 1, E2 - OSPF external type 2, E - 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

      172.16.0.0/30 is subnetted, 2 subnets
      C      172.16.0.0 is directly connected, Serial2/0
      C      172.16.0.4 is directly connected, Serial3/0
      S      192.168.2.0/24 [1/0] via 172.16.0.5
      S      192.168.10.0/24 [1/0] via 172.16.0.1

Router#
```

Gambar 40. Pengecekan Tabel Routing Router1



```
Router2
Physical Config CLI Attributes
IOS Command Line Interface
Router(config)#
Router(config)#no ip route 192.168.10.0 255.255.255.0 172.16.0.1
Router(config)#exit
Router#
%SYS-5-CONFIG_I: Configured from console by console

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

      172.16.0.0/30 is subnetted, 1 subnets
      C      172.16.0.4 is directly connected, Serial2/0
      S      192.168.2.0/24 is directly connected, FastEthernet0/0
      S      192.168.10.0/24 [1/0] via 172.16.0.6

Router#
```

Gambar 41. Pengecekan Tabel Routing Router2

6. Lakukan tes ping ke semua PC

```
C:\>ping 192.168.10.3

Pinging 192.168.10.3 with 32 bytes of data:

Reply from 192.168.10.3: bytes=32 time=1ms TTL=128
Reply from 192.168.10.3: bytes=32 time<1ms TTL=128
Reply from 192.168.10.3: bytes=32 time<1ms TTL=128
Reply from 192.168.10.3: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Gambar 42. Hasil Tes Ping PC0 ke PC1

```
C:\>ping 192.168.2.2

Pinging 192.168.2.2 with 32 bytes of data:

Reply from 192.168.2.2: bytes=32 time=3ms TTL=125
Reply from 192.168.2.2: bytes=32 time=12ms TTL=125
Reply from 192.168.2.2: bytes=32 time=13ms TTL=125
Reply from 192.168.2.2: bytes=32 time=11ms TTL=125

Ping statistics for 192.168.2.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 3ms, Maximum = 13ms, Average = 9ms
```

Gambar 43. Hasil Tes Ping PC0 ke PC2

```
C:\>ping 192.168.2.3

Pinging 192.168.2.3 with 32 bytes of data:

Reply from 192.168.2.3: bytes=32 time=3ms TTL=125
Reply from 192.168.2.3: bytes=32 time=12ms TTL=125
Reply from 192.168.2.3: bytes=32 time=2ms TTL=125
Reply from 192.168.2.3: bytes=32 time=14ms TTL=125

Ping statistics for 192.168.2.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 14ms, Average = 7ms
```

Gambar 44. Hasil Tes Ping PC0 ke PC3

```
C:\>ping 192.168.10.2

Pinging 192.168.10.2 with 32 bytes of data:

Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128
Reply from 192.168.10.2: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.10.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Gambar 45. Hasil Tes Ping PC1 ke PC0