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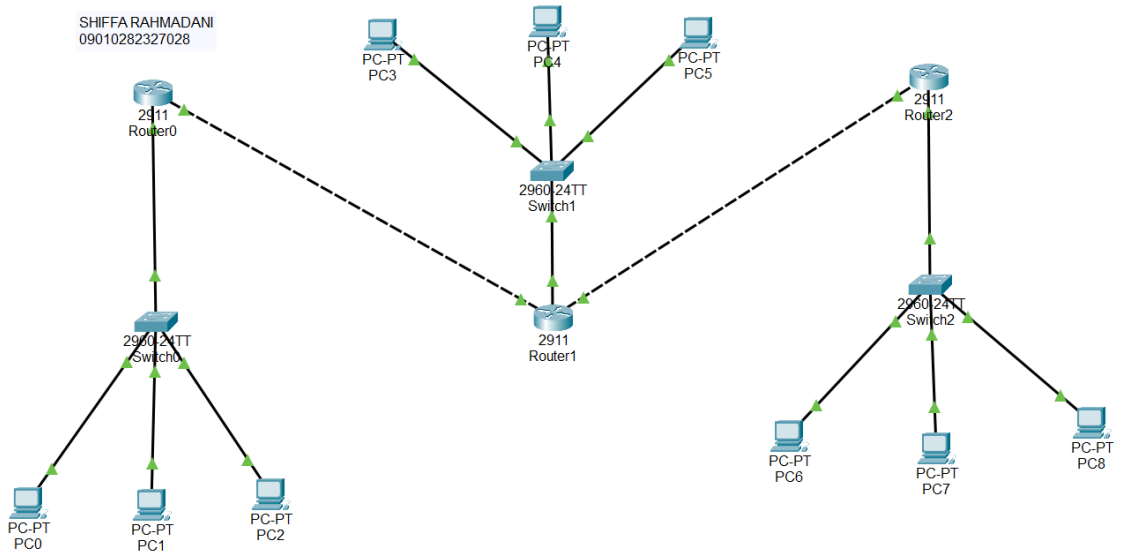
KELAS : MI 3A

LAPORAN PRAKTIKUM JARINGAN KOMPUTER (DYNAMIC)



ROUTER 0

GigabitEthernet0/0

Port Status	On
Bandwidth	1000 Mbps / 100 Mbps / 10 Mbps, Auto
Duplex	Half Duplex / Full Duplex, Auto
MAC Address	000A.4172.8701
IP Configuration	
IPv4 Address	192.168.2.1
Subnet Mask	255.255.255.0

GigabitEthernet0/1

Port Status	On
Bandwidth	1000 Mbps / 100 Mbps / 10 Mbps, Auto
Duplex	Half Duplex / Full Duplex, Auto
MAC Address	000A.4172.8702
IP Configuration	
IPv4 Address	10.10.10.1
Subnet Mask	255.255.255.252

```
028_R0(config)#router rip
028_R0(config-router)#version 2
028_R0(config-router)#network 192.168.2.0
028_R0(config-router)#network 10.10.10.0
028_R0(config-router)#exit
028_R0(config)#exit
028_R0#
%SYS-5-CONFIG_I: Configured from console by console
show ip route
Codes: L - local, C - connected, S - static, 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

     10.0.0.0/8 is variably subnetted, 3 subnets, 2 masks
C       10.10.10.0/30 is directly connected, GigabitEthernet0/1
L       10.10.10.1/32 is directly connected, GigabitEthernet0/1
R       10.20.10.0/30 [120/1] via 10.10.10.2, 00:00:20, GigabitEthernet0/1
     192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.2.0/24 is directly connected, GigabitEthernet0/0
L       192.168.2.1/32 is directly connected, GigabitEthernet0/0
R    192.168.20.0/24 [120/1] via 10.10.10.2, 00:00:20, GigabitEthernet0/1
R    192.168.40.0/24 [120/2] via 10.10.10.2, 00:00:20, GigabitEthernet0/1

028_R0#
```

ROUTER 1

GigabitEthernet0/0

Port Status	On
Bandwidth	1000 Mbps / 100 Mbps / 10 Mbps, Auto
Duplex	Half Duplex / Full Duplex, Auto
MAC Address	00E0.F96E.A601
IP Configuration	
IPv4 Address	192.168.20.1
Subnet Mask	255.255.255.0

GigabitEthernet0/1

Port Status	On
Bandwidth	1000 Mbps / 100 Mbps / 10 Mbps, Auto
Duplex	Half Duplex / Full Duplex, Auto
MAC Address	00E0.F96E.A602
IP Configuration	
IPv4 Address	10.10.10.2
Subnet Mask	255.255.255.252

GigabitEthernet0/2

Port Status	On
Bandwidth	1000 Mbps / 100 Mbps / 10 Mbps, Auto
Duplex	Half Duplex / Full Duplex, Auto
MAC Address	00E0.F96E.A603
IP Configuration	
IPv4 Address	10.20.10.1
Subnet Mask	255.255.255.252

```
028_R1(config)#router rip
028_R1(config-router)#version 2
028_R1(config-router)#network 192.168.40.0
028_R1(config-router)#network 192.168.20.0
028_R1(config-router)#network 10.10.10.0
028_R1(config-router)#exit
028_R1(config)#exit
028_R1#
%SYS-5-CONFIG_I: Configured from console by console
show ip route
Codes: L - local, C - connected, S - static, 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

     10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
C       10.10.10.0/30 is directly connected, GigabitEthernet0/1
L       10.10.10.2/32 is directly connected, GigabitEthernet0/1
C       10.20.10.0/30 is directly connected, GigabitEthernet0/2
L       10.20.10.1/32 is directly connected, GigabitEthernet0/2
R    192.168.2.0/24 [120/1] via 10.10.10.1, 00:00:06, GigabitEthernet0/1
     192.168.20.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.20.0/24 is directly connected, GigabitEthernet0/0
L       192.168.20.1/32 is directly connected, GigabitEthernet0/0
R    192.168.40.0/24 [120/1] via 10.20.10.2, 00:00:06, GigabitEthernet0/2

028_R1#
```

ROUTER 2

GigabitEthernet0/0	
Port Status	On
Bandwidth	1000 Mbps / 100 Mbps / 10 Mbps, Auto
Duplex	Half Duplex / Full Duplex, Auto
MAC Address	000C.85C1.0301
IP Configuration	
IPv4 Address	192.168.40.1
Subnet Mask	255.255.255.0

GigabitEthernet0/2	
Port Status	On
Bandwidth	1000 Mbps / 100 Mbps / 10 Mbps, Auto
Duplex	Half Duplex / Full Duplex, Auto
MAC Address	000C.85C1.0303
IP Configuration	
IPv4 Address	10.20.10.2
Subnet Mask	255.255.255.252

```
028_R2(config)#router rip
028_R2(config-router)#version 2
028_R2(config-router)#network 192.168.40.0
028_R2(config-router)#10.20.10.0
                     ^
% Invalid input detected at '^' marker.

028_R2(config-router)#exit
028_R2(config)#exit
028_R2#
%SYS-5-CONFIG_I: Configured from console by console
show ip route
Codes: L - local, C - connected, S - static, 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

     10.0.0.0/8 is variably subnetted, 3 subnets, 2 masks
R       10.10.10.0/30 [120/1] via 10.20.10.1, 00:00:24, GigabitEthernet0/2
C       10.20.10.0/30 is directly connected, GigabitEthernet0/2
L       10.20.10.2/32 is directly connected, GigabitEthernet0/2
R    192.168.2.0/24 [120/2] via 10.20.10.1, 00:00:24, GigabitEthernet0/2
R    192.168.20.0/24 [120/1] via 10.20.10.1, 00:00:24, GigabitEthernet0/2
     192.168.40.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.40.0/24 is directly connected, GigabitEthernet0/0
L       192.168.40.1/32 is directly connected, GigabitEthernet0/0

028_R2#
```

Tes Koneksi ICMP

No	Sumber	Tujuan	Hasil	
			Ya	Tidak
1	PC 1	PC 2	Ya	-
		PC 3	Ya	-
		PC 4	Ya	-
		PC 5	Ya	-
		PC 6	Ya	-
		PC 7	Ya	-
		PC 8	Ya	-
		PC 9	Ya	-

No	Sumber	Tujuan	Hasil	
			Ya	Tidak
2	PC 4	PC 1	Ya	-
		PC 2	Ya	-
		PC 3	Ya	-
		PC 5	Ya	-
		PC 6	Ya	-
		PC 7	Ya	-
		PC 8	Ya	-
		PC 9	Ya	-

No	Sumber	Tujuan	Hasil	
			Ya	Tidak
3	PC 7	PC 1	Ya	-
		PC 2	Ya	-
		PC 3	Ya	-
		PC 4	Ya	-
		PC 5	Ya	-
		PC 7	Ya	-
		PC 8	Ya	-
		PC 9	Ya	-

Hasil Ping pada cmd PC :

PC1 -> PC5

PC1 -> PC7

PC4 -> PC2

PC4 -> PC8

PC7 -> PC3

PC7 -> PC9

PC1

Physical Config Desktop Programming Attributes

Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.20.11

Pinging 192.168.20.11 with 32 bytes of data:

Request timed out.
Reply from 192.168.20.11: bytes=32 time<1ms TTL=126
Reply from 192.168.20.11: bytes=32 time<1ms TTL=126
Reply from 192.168.20.11: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.20.11:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.20.11

Pinging 192.168.20.11 with 32 bytes of data:

Reply from 192.168.20.11: bytes=32 time<1ms TTL=126
Reply from 192.168.20.11: bytes=32 time<1ms TTL=126
Reply from 192.168.20.11: bytes=32 time<1ms TTL=126
Reply from 192.168.20.11: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.20.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.40.10

Pinging 192.168.40.10 with 32 bytes of data:

Reply from 192.168.40.10: bytes=32 time<1ms TTL=125
Reply from 192.168.40.10: bytes=32 time=4ms TTL=125
Reply from 192.168.40.10: bytes=32 time<1ms TTL=125
Reply from 192.168.40.10: bytes=32 time<1ms TTL=125

Ping statistics for 192.168.40.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 4ms, Average = 1ms

C:\>
```

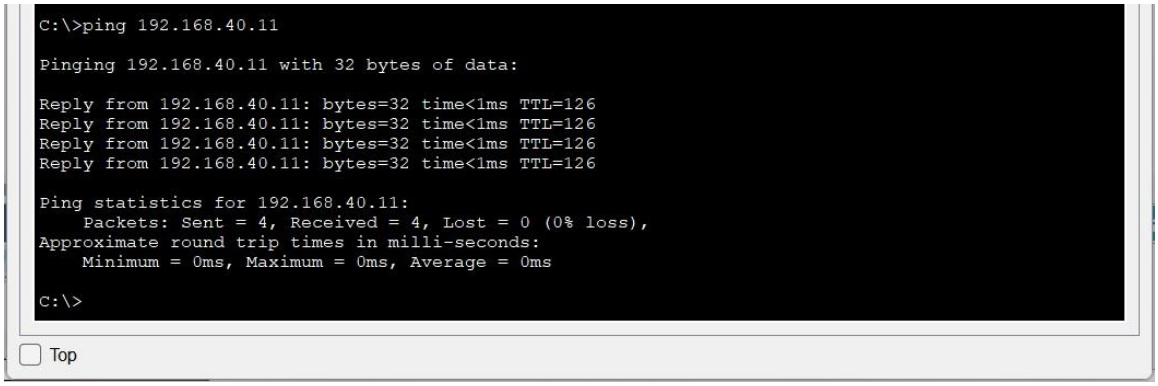
Top

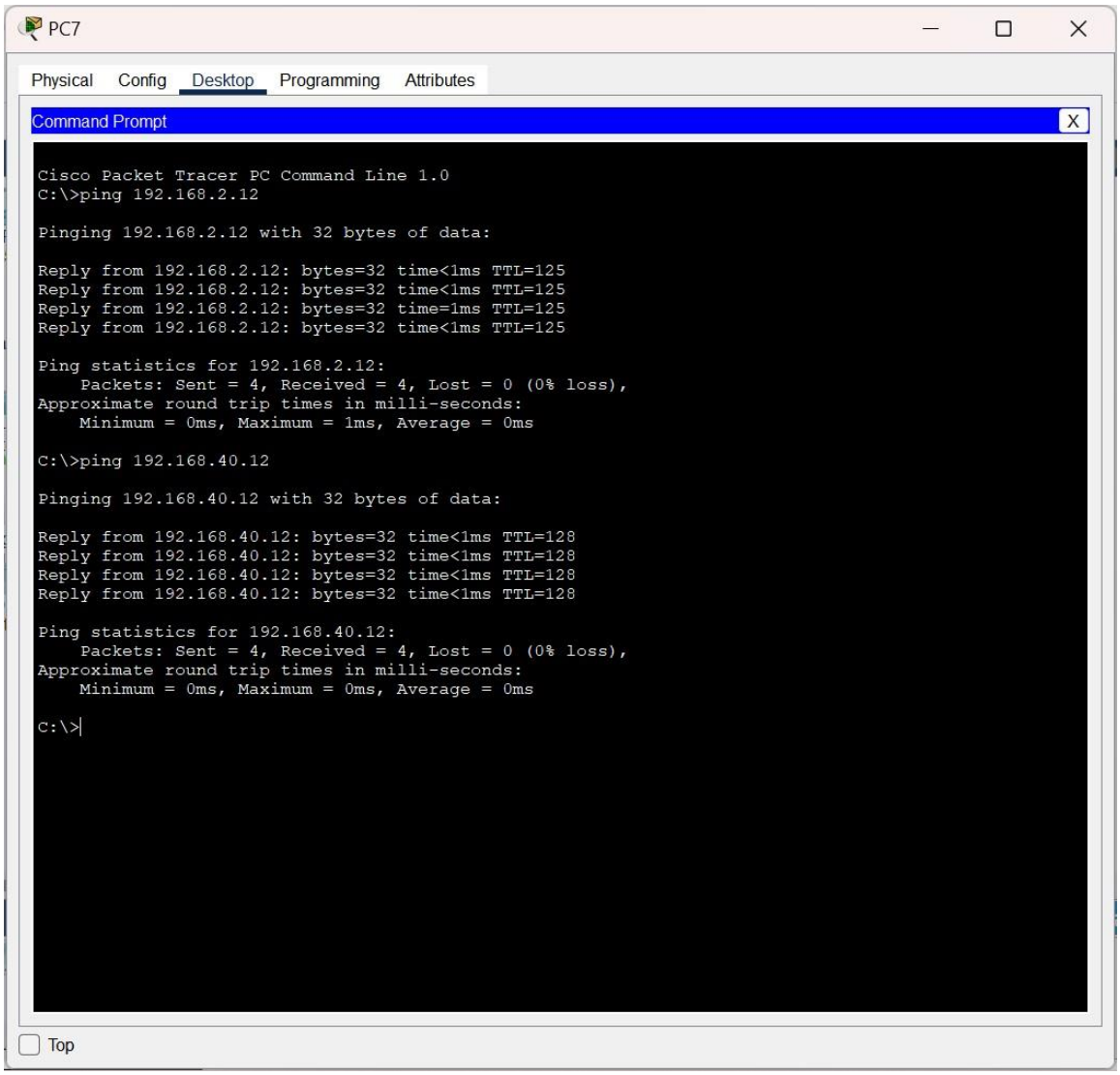
PC4

Physical Config Desktop Programming Attributes

Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.2.11

Pinging 192.168.2.11 with 32 bytes of data:

Request timed out.
Reply from 192.168.2.11: bytes=32 time<1ms TTL=126
Reply from 192.168.2.11: bytes=32 time<1ms TTL=126
Reply from 192.168.2.11: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.2.11:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.2.11

Pinging 192.168.2.11 with 32 bytes of data:

Reply from 192.168.2.11: bytes=32 time<1ms TTL=126
Reply from 192.168.2.11: bytes=32 time=1ms TTL=126
Reply from 192.168.2.11: bytes=32 time<1ms TTL=126
Reply from 192.168.2.11: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.2.11:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```


C:\>ping 192.168.40.11
Pinging 192.168.40.11 with 32 bytes of data:
Reply from 192.168.40.11: bytes=32 time<1ms TTL=126
Reply from 192.168.40.11: bytes=32 time<1ms TTL=126
Reply from 192.168.40.11: bytes=32 time<1ms TTL=126
Reply from 192.168.40.11: bytes=32 time<1ms TTL=126
Ping statistics for 192.168.40.11:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>
Top


PC7
Physical
Config
Desktop
Programming
Attributes
Command Prompt
X
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.2.12
Pinging 192.168.2.12 with 32 bytes of data:
Reply from 192.168.2.12: bytes=32 time<1ms TTL=125
Reply from 192.168.2.12: bytes=32 time<1ms TTL=125
Reply from 192.168.2.12: bytes=32 time=1ms TTL=125
Reply from 192.168.2.12: bytes=32 time<1ms TTL=125
Ping statistics for 192.168.2.12:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 1ms, Average = 0ms
C:\>ping 192.168.40.12
Pinging 192.168.40.12 with 32 bytes of data:
Reply from 192.168.40.12: bytes=32 time<1ms TTL=128
Reply from 192.168.40.12: bytes=32 time<1ms TTL=128
Reply from 192.168.40.12: bytes=32 time<1ms TTL=128
Reply from 192.168.40.12: bytes=32 time<1ms TTL=128
Ping statistics for 192.168.40.12:
Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
Minimum = 0ms, Maximum = 0ms, Average = 0ms
C:\>
Top

Hasil Praktikum

1. **Konfigurasi IP Address :**

    1) Router 1 :

    - Interface gigaEthernet/0/0: IP 192.168.2.1 / Subnet Mask 255.255.255.0
    - Interface gigaEthernet0/1: IP 10.10.10.1 / Subnet Mask 255.255.255.252

    2) Router 2 :

    - Interface gigaEthernet0/0: IP 192.168.20.1 / Subnet Mask 255.255.255.0
    - Interface gigaEthernet0/1: IP 10.10.10.2 / Subnet Mask 255.255.255.252
    - Interface gigaEthernet0/2: IP 10.20.10.1 / Subnet Mask 255.255.255.252

    3) Router 3 :

    - Interface gigaEthernet0/0: IP 192.168.40.1 / Subnet Mask 255.255.255.0
    - Interface gigaEthernet0/2: IP 10.20.10.2 / Subnet Mask 255.255.255.252

2. **Routing Dinamis :**

    1) Protokol Routing: RIP (Routing Information Protocol) diaktifkan pada ketiga router untuk mendistribusikan informasi rute secara otomatis.

    2) Konfigurasi Protokol Routing :

    - Router 1:

      network 192.168.2.0

      network 10.10.10.0

    - Router 2:

      network 192.168.40.0

      network 192.168.20.0 network

      10.10.10.0

- Router 3:

  network 192.168.40.0 network
  10.20.10.0

3. Tes Koneksi ping pada cmd PC :

1) **Ping dari PC 1 ke PC 5 – Sukses**
2) **Ping dari PC 1 ke PC 7 – Sukses**
3) **Ping dari PC 4 ke PC 2 – Sukses**
4) **Ping dari PC 4 ke PC 8 - Sukses**
5) **Ping dari PC 7 ke PC 3 - Sukses**
6) **Ping dari PC 7 ke PC 9 - Sukses**

Analisis

1. **Keberhasilan Koneksi Antar-Router** Berdasarkan hasil pengujian koneksi ICMP menggunakan perintah ping, semua pengujian koneksi antar-router berhasil tanpa adanya packet loss. Hal ini menunjukkan bahwa konfigurasi alamat IP dan protokol routing dinamis pada masing-masing router telah dilakukan dengan benar. Setiap router dapat saling berkomunikasi, yang merupakan indikasi bahwa tabel routing telah terdistribusi dengan baik melalui protokol RIP.
2. **Kinerja Protokol RIP** Protokol RIP mengirimkan tabel routing ke router tetangga setiap 30 detik, sehingga setiap router memiliki informasi tentang semua subnet yang terhubung. Dalam pengujian ini, RIP terbukti mampu memberikan rute yang diperlukan untuk mencapai setiap jaringan pada ketiga router. Kelebihan RIP adalah kemudahan konfigurasi dan kemampuannya untuk menangani topologi sederhana seperti yang digunakan dalam percobaan ini.
3. **Kecepatan Respons ICMP** Waktu respons dari ping menunjukkan bahwa waktu koneksi cukup rendah, yang merupakan indikasi jaringan dalam kondisi optimal tanpa gangguan fisik atau kesalahan konfigurasi. Ini juga menunjukkan bahwa tidak ada bottleneck pada router atau jaringan yang dapat memperlambat komunikasi antar-router.
4. **Potensi Pengembangan** Meskipun RIP bekerja dengan baik dalam percobaan ini, pada jaringan yang lebih besar dan kompleks, RIP dapat menyebabkan peningkatan lalu lintas jaringan dan waktu konvergensi yang lebih lama. Untuk skenario jaringan yang lebih besar, protokol seperti OSPF atau EIGRP mungkin akan lebih efisien.

Kesimpulan

Dari praktikum ini dapat disimpulkan bahwa:

1. **Konfigurasi IP Address dan Routing Dinamis yang Tepat**
   Konfigurasi IP dan protokol routing yang dilakukan dengan benar memungkinkan komunikasi yang stabil antar-router. Pengaturan RIP sebagai protokol routing dinamis berhasil mendistribusikan informasi rute sehingga setiap router dapat mengenali jaringan lain dengan baik.

2. **Pengujian Koneksi ICMP sebagai Verifikasi Konektivitas**
   Pengujian koneksi menggunakan ICMP (ping) membuktikan bahwa koneksi antarrouter berfungsi dengan optimal, tanpa packet loss, yang menandakan bahwa konektivitas dan tabel routing bekerja dengan benar.

3. **Efektivitas Protokol RIP untuk Jaringan Sederhana**
   RIP adalah protokol yang efektif untuk jaringan sederhana seperti dalam praktikum ini. Namun, untuk jaringan yang lebih kompleks, protokol lain yang lebih efisien mungkin lebih cocok.

Secara keseluruhan, praktikum ini menunjukkan bahwa dengan konfigurasi IP dan routing yang tepat, jaringan antar-router dapat berfungsi secara optimal dan mendukung komunikasi data yang stabil dan andal.