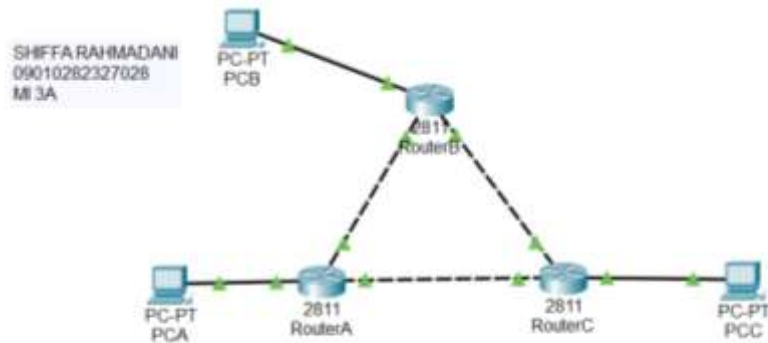


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 KELAS : MI3A
 MATA KULIAH : JARINGAN KOMPUTER

LAPORAN PRAKTIKUM EIGRP DYNAMIC ROUTING



Buatlah IP Address di PC

NO	NAMA DEVICE	ALAMAT	NETMASK	GATEWAY
1	PCA	192.168.1.10	255.255.255.0	192.168.1.1
2	PCB	192.168.2.10	255.255.255.0	192.168.2.1
3	PCC	192.168.3.10	255.255.255.0	192.168.3.1

Selanjutnya menambahkan konfigurasi IP Address di PC, selanjutnya konfigurasi EIGRP pada Router, sebagai berikut:

ROUTER A

```
RouterA_090102182327028>
RouterA_090102182327028>EN
RouterA_090102182327028#conf t
Enter configuration commands, one per line. End with CNTL/Z.
RouterA_090102182327028(config)#int fa0/0
RouterA_090102182327028(config-if)#ip address 192.168.1.1 255.255.255.0
RouterA_090102182327028(config-if)#no shutdown
RouterA_090102182327028(config-if)#int fa1/0
RouterA_090102182327028(config-if)#ip address 100.100.100.1 255.255.255.255
Bad mask /32 for address 100.100.100.1
RouterA_090102182327028(config-if)#ip address 100.100.100.1 255.255.255.252
RouterA_090102182327028(config-if)#no shutdown
RouterA_090102182327028(config-if)#int fa0/1
RouterA_090102182327028(config-if)#ip address 100.100.100.5 255.255.255.252
RouterA_090102182327028(config-if)#no shutdown
RouterA_090102182327028(config-if)#exit
RouterA_090102182327028(config)#router eigrp 1
RouterA_090102182327028(config-router)#network 192.168.1.0 0.0.0.255
RouterA_090102182327028(config-router)#network 100.100.100.0 0.0.0.3
RouterA_090102182327028(config-router)#network 100.100.100.4 0.0.0.3
RouterA_090102182327028(config-router)#no auto-summary
RouterA_090102182327028(config-router)#exit
RouterA_090102182327028(config)#exit
RouterA_090102182327028#
%SYS-5-CONFIG_I: Configured from console by console
```

ROUTER B

```
RouterB_090102182327028>en
RouterB_090102182327028#conf t
Enter configuration commands, one per line. End with CNTL/Z.
RouterB_090102182327028(config)#int fa0/0
RouterB_090102182327028(config-if)#ip address 192.168.2.1 255.255.255.0
RouterB_090102182327028(config-if)#no shutdown
RouterB_090102182327028(config-if)#exit
RouterB_090102182327028(config)#int fa1/0
RouterB_090102182327028(config-if)#ip address 100.100.100.6 255.255.255.252
RouterB_090102182327028(config-if)#no shutdown
RouterB_090102182327028(config-if)#exit
RouterB_090102182327028(config)#fa0/1
^
% Invalid input detected at '^' marker.

RouterB_090102182327028(config)#int fa 0/1
RouterB_090102182327028(config-if)#ip address 100.100.100.9 255.255.255.252
RouterB_090102182327028(config-if)#no shutdown
RouterB_090102182327028(config-if)#exit
RouterB_090102182327028(config)#router eigrp 1
RouterB_090102182327028(config-router)#network 192.168.2.0 0.0.0.255
RouterB_090102182327028(config-router)#network 100.100.100.4 0.0.0.3
RouterB_090102182327028(config-router)#network 100.100.100.8 0.0.0.3
RouterB_090102182327028(config-router)#no auto-summary
RouterB_090102182327028(config-router)#exit
RouterB_090102182327028(config)#exit
RouterB_090102182327028#
%SYS-5-CONFIG_I: Configured from console by console
```

ROUTER C

```
RouterC_090102182327028>en
RouterC_090102182327028#conf t
Enter configuration commands, one per line. End with CNTL/Z.
RouterC_090102182327028(config)#int fa0/0
RouterC_090102182327028(config-if)#ip address 192.168.3.1 255.255.255.0
^
% Invalid input detected at '^' marker.

RouterC_090102182327028(config-if)#ip address 192.168.3.1 255.255.255.0
RouterC_090102182327028(config-if)#no shutdown
RouterC_090102182327028(config-if)#exit
RouterC_090102182327028(config)#int fa 1/0
RouterC_090102182327028(config-if)#ip address 100.100.100.10 255.255.255.252
RouterC_090102182327028(config-if)#no shutdown
RouterC_090102182327028(config-if)#exit
RouterC_090102182327028(config)#router eigrp 1
RouterC_090102182327028(config-router)#network 192.168.3.0 0.0.0.255
RouterC_090102182327028(config-router)#network 100.100.100.0 0.0.0.3
RouterC_090102182327028(config-router)#network 100.100.100.8 0.0.0.3
RouterC_090102182327028(config-router)#end
RouterC_090102182327028#
%SYS-5-CONFIG_I: Configured from console by console
```

Hasil 'SHOW IP ROUTE EIGRP'

ROUTER A

```
RouterA_090102182327028#show ip route eigrp
100.0.0.0/8 is variably subnetted, 5 subnets, 2 masks
D    100.100.100.8/30 [90/30720] via 100.100.100.2, 00:07:05, FastEthernet1/0
     [90/30720] via 100.100.100.6, 00:07:05, FastEthernet0/1
192.168.1.0/24 is variably subnetted, 2 subnets, 2 masks
D    192.168.2.0/24 [90/30720] via 100.100.100.6, 00:07:05, FastEthernet0/1
D    192.168.3.0/24 [90/30720] via 100.100.100.2, 00:07:05, FastEthernet1/0

RouterA_090102182327028#
```

ROUTER B

```

RouterB_090102182327028#show ip route eigrp
 100.0.0.0/8 is variably subnetted, 5 subnets, 2 masks
D    100.100.100.0/30 [90/30720] via 100.100.100.5, 00:10:56, FastEthernet1/0
    [90/30720] via 100.100.100.10, 00:10:56, FastEthernet0/1
D    192.168.1.0/24 [90/30720] via 100.100.100.5, 00:10:56, FastEthernet1/0
    192.168.2.0/24 is variably subnetted, 2 subnets, 2 masks
D    192.168.3.0/24 [90/30720] via 100.100.100.10, 00:10:56, FastEthernet0/1

RouterB_090102182327028#

```

ROUTER C

```

RouterC_090102182327028#show ip route eigrp
 100.0.0.0/8 is variably subnetted, 5 subnets, 2 masks
D    100.100.100.4/30 [90/30720] via 100.100.100.1, 00:14:36, FastEthernet0/1
    [90/30720] via 100.100.100.9, 00:14:36, FastEthernet1/0
D    192.168.1.0/24 [90/30720] via 100.100.100.1, 00:14:36, FastEthernet0/1
D    192.168.2.0/24 [90/30720] via 100.100.100.9, 00:14:36, FastEthernet1/0

RouterC_090102182327028#

```

Melakukan PING dan Traceroute dari PC A ke PC B dan PC C, PC B ke PC A dan PC C, serta PC C ke PC A dan PC B.

NO	SUMBER	TUJUAN	HASIL	
			YA	TIDAK
1	PC1	PC2	YA	-
		PC3	YA	-
2	PC2	PC1	YA	-
		PC3	YA	-
3	PC3	PC1	YA	-
		PC2	YA	-

PCA > PC B, PC C

```

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.2.10

Pinging 192.168.2.10 with 32 bytes of data:

Request timed out.
Reply from 192.168.2.10: bytes=32 time<1ms TTL=126
Reply from 192.168.2.10: bytes=32 time<1ms TTL=126
Reply from 192.168.2.10: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.2.10:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.2.10

Pinging 192.168.2.10 with 32 bytes of data:

Reply from 192.168.2.10: bytes=32 time=17ms TTL=126
Reply from 192.168.2.10: bytes=32 time=1ms TTL=126
Reply from 192.168.2.10: bytes=32 time<1ms TTL=126
Reply from 192.168.2.10: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.2.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 17ms, Average = 4ms

```

```
C:\>ping 192.168.3.10

Pinging 192.168.3.10 with 32 bytes of data:

Reply from 192.168.3.10: bytes=32 time<1ms TTL=126
Reply from 192.168.3.10: bytes=32 time<1ms TTL=126
Reply from 192.168.3.10: bytes=32 time<1ms TTL=126
Reply from 192.168.3.10: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.3.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>
```

PC B > PC A, PC C

```
PCB

Physical Config Desktop Programming Attributes

Command Prompt

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.10

Pinging 192.168.1.10 with 32 bytes of data:

Reply from 192.168.1.10: bytes=32 time<1ms TTL=126
Reply from 192.168.1.10: bytes=32 time<1ms TTL=126
Reply from 192.168.1.10: bytes=32 time<1ms TTL=126
Reply from 192.168.1.10: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.1.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\>ping 192.168.3.10

Pinging 192.168.3.10 with 32 bytes of data:

Reply from 192.168.3.10: bytes=32 time<1ms TTL=126
Reply from 192.168.3.10: bytes=32 time<1ms TTL=126
Reply from 192.168.3.10: bytes=32 time<1ms TTL=126
Reply from 192.168.3.10: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.3.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

PC C > PC A, PC B

```
PCC

Physical Config Desktop Programming Attributes

Command Prompt

Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.1.10

Pinging 192.168.1.10 with 32 bytes of data:

Reply from 192.168.1.10: bytes=32 time<1ms TTL=126
Reply from 192.168.1.10: bytes=32 time<1ms TTL=126
Reply from 192.168.1.10: bytes=32 time<1ms TTL=126
Reply from 192.168.1.10: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.1.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

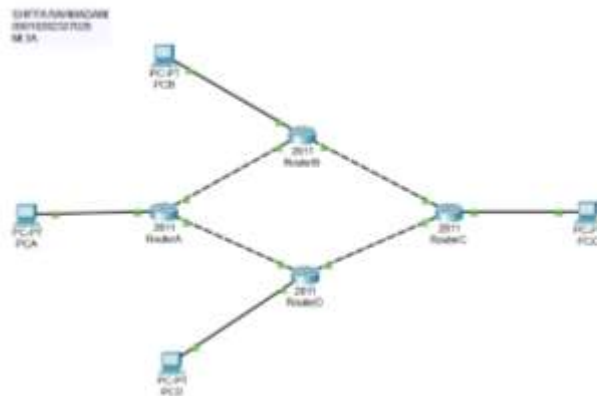
C:\>ping 192.168.2.10

Pinging 192.168.2.10 with 32 bytes of data:

Reply from 192.168.2.10: bytes=32 time<1ms TTL=126
Reply from 192.168.2.10: bytes=32 time<1ms TTL=126
Reply from 192.168.2.10: bytes=32 time<1ms TTL=126
Reply from 192.168.2.10: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.2.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

Putuskan koneksi pada Router A ke Router C, lalu tambahkan satu Router yaitu Router D dan PC yaitu PCD, dimana RouterD terhubung ke Router A dan Router C



Konfigurasi Router dengan protocol EIGRP pada Router D dan konfigurasi IP pada PC D. Lakukanlah konfigurasi seperti tahap 3, buktikan jika PC D dapat melakukan PING dan traceroute ke PC lainnya.

ROUTER D

```

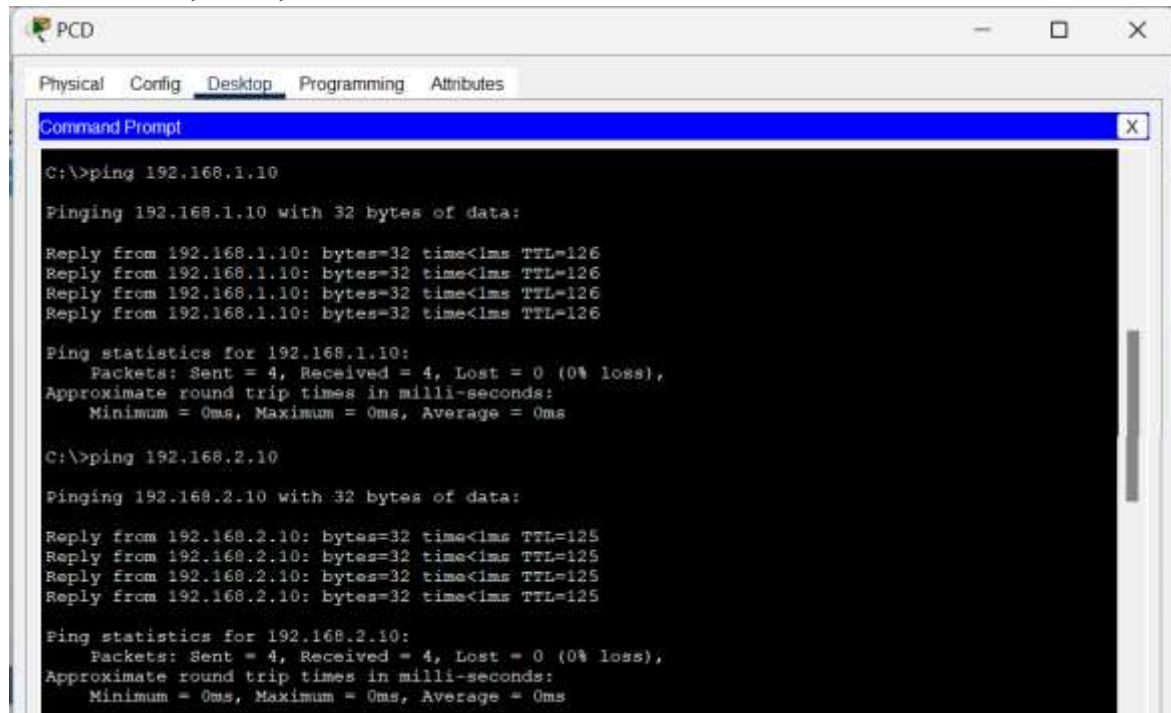
RouterD_09010282327028#conf t
Enter configuration commands, one per line. End with CNTL/Z.
RouterD_09010282327028(config)#int fa/0
RouterD_09010282327028(config-if)#ip address 100.100.100.14 255.255.255.252
RouterD_09010282327028(config-if)#no shutdown
RouterD_09010282327028(config-if)#exit
RouterD_09010282327028(config)#int fa 0/1
RouterD_09010282327028(config-if)#ip address 100.100.100.2 255.255.255.252
RouterD_09010282327028(config-if)#no shutdown
RouterD_09010282327028(config-if)#exit
RouterD_09010282327028(config)#router eigrp 1
RouterD_09010282327028(config-router)#network
% Incomplete command.
RouterD_09010282327028(config-router)#network 192.168.4.0 0.0.0.255
RouterD_09010282327028(config-router)#network 100.100.100.0 0.0.0.3
RouterD_09010282327028(config-router)#network 100.100.100.0 0.0.0.3
RouterD_09010282327028(config-router)#no auto-summary
RouterD_09010282327028(config-router)#exit
RouterD_09010282327028(config)#exit
RouterD_09010282327028#
%SYS-5-CONFIG_I: Configured from console by console

RouterD_09010282327028#show ip route eigrp
100.0.0.0/8 is variably subnetted, 6 subnets, 2 masks
D 100.100.100.4/30 [90/30720] via 100.100.100.1, 00:05:04, FastEthernet0/1
D 100.100.100.8/30 [90/33280] via 100.100.100.1, 00:05:04, FastEthernet0/1
D 192.168.1.0/24 [90/30720] via 100.100.100.1, 00:05:04, FastEthernet0/1
D 192.168.2.0/24 [90/33280] via 100.100.100.1, 00:05:04, FastEthernet0/1
D 192.168.3.0/24 [90/35840] via 100.100.100.1, 00:05:04, FastEthernet0/1

RouterD_09010282327028#

```


PC D > PC A, PC B, PC C



```
PCD
Physical Config Desktop Programming Attributes
Command Prompt
C:\>ping 192.168.1.10

Pinging 192.168.1.10 with 32 bytes of data:

Reply from 192.168.1.10: bytes=32 time<1ms TTL=126
Reply from 192.168.1.10: bytes=32 time<1ms TTL=126
Reply from 192.168.1.10: bytes=32 time<1ms TTL=126
Reply from 192.168.1.10: bytes=32 time<1ms TTL=126

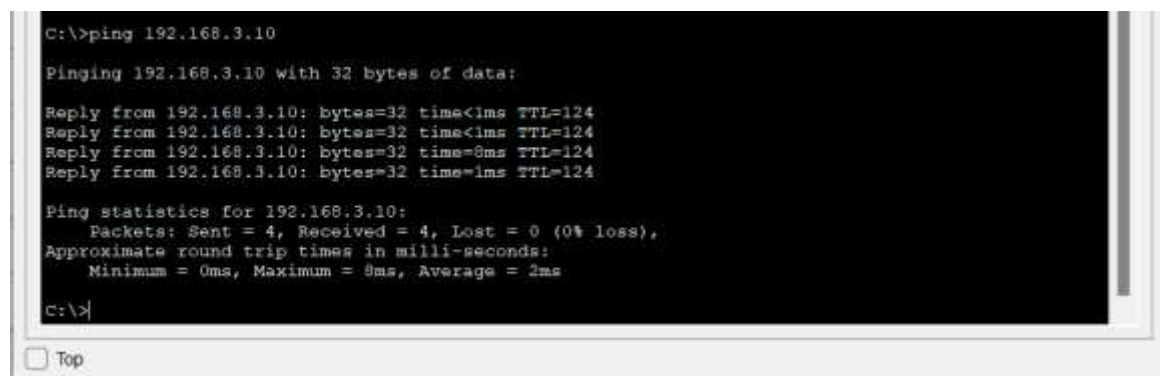
Ping statistics for 192.168.1.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms

C:\>ping 192.168.2.10

Pinging 192.168.2.10 with 32 bytes of data:

Reply from 192.168.2.10: bytes=32 time<1ms TTL=125
Reply from 192.168.2.10: bytes=32 time<1ms TTL=125
Reply from 192.168.2.10: bytes=32 time<1ms TTL=125
Reply from 192.168.2.10: bytes=32 time<1ms TTL=125

Ping statistics for 192.168.2.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```



```
C:\>ping 192.168.3.10

Pinging 192.168.3.10 with 32 bytes of data:

Reply from 192.168.3.10: bytes=32 time<1ms TTL=124
Reply from 192.168.3.10: bytes=32 time<1ms TTL=124
Reply from 192.168.3.10: bytes=32 time=8ms TTL=124
Reply from 192.168.3.10: bytes=32 time=1ms TTL=124

Ping statistics for 192.168.3.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 8ms, Average = 2ms

C:\>
```

Hasil Praktikum:

Praktik ini menyampaikan hasil terkait penerapan protokol EIGRP (Enhanced Interior Gateway Routing Protocol) pada jaringan komputer. Tujuan dari dilakukannya praktikum ini adalah untuk memahami cara kerja EIGRP dalam mengelola proses routing dinamis serta mengevaluasi kinerja dan stabilitas koneksi jaringan.

Topologi Jaringan: Jaringan yang digunakan memiliki empat router (Router A, B, C, dan D) serta empat PC (PC A, B, C, dan D). Berikut adalah deskripsi topologi yang digunakan:

- Router A terhubung dengan Router B dan Router D.
- Router B terhubung dengan Router A dan Router C.
- Router C terhubung dengan Router B dan Router D.
- Router D menghubungkan Router A dan C serta terhubung langsung ke PC D.

Pengujian Konektivitas: Pengujian konektivitas dilakukan melalui perintah PING dan Traceroute dari masing-masing PC: **Hasil PING dan Traceroute:**

- Dari PC A:

- PING ke PC B: Sukses
- PING ke PC C: Sukses
- Dari PC B:
 - PING ke PC A: Sukses
 - PING ke PC C: Sukses
- Dari PC C:
 - PING ke PC A: Sukses
 - PING ke PC B: Sukses
 -

Modifikasi Jaringan: Setelah uji awal, koneksi antara Router A dan Router C diputus untuk menguji kemampuan EIGRP dalam mengelola jalur alternatif.

- Router D ditambahkan sebagai penghubung antara Router A dan C.
- Konfigurasi EIGRP diterapkan di Router D untuk memastikan seluruh router tetap terhubung.

Pengujian Konektivitas Setelah Modifikasi: Setelah konfigurasi ulang, uji konektivitas dilakukan dari PC D:

- Dari PC D:
 - PING ke PC A: Sukses
 - PING ke PC B: Sukses
 - PING ke PC C: Sukses

Analisis:

Salah satu kelebihan utama EIGRP adalah kemampuannya untuk berkonvergensi secara cepat saat terjadi perubahan topologi. Dalam praktikum ini, ketika koneksi antara Router A dan C diputus, EIGRP secara otomatis mendeteksi perubahan dan segera menggunakan jalur alternatif melalui Router D tanpa intervensi manual. EIGRP menggunakan algoritma Diffusing Update Algorithm (DUAL) yang menjaga konsistensi tabel routing di seluruh router dalam jaringan. Saat jalur utama terganggu, EIGRP dengan cepat beralih ke jalur cadangan yang telah dipelajari, sehingga mengurangi downtime dan memastikan layanan tetap tersedia. Penambahan Router D tidak hanya meningkatkan redundansi, tetapi juga memungkinkan distribusi lalu lintas data lebih efisien melalui beberapa jalur menuju tujuan yang sama.

Kesimpulan:

- EIGRP terbukti andal dalam mengelola routing dinamis dengan waktu konvergensi yang cepat.
- Penambahan router meningkatkan stabilitas dan redundansi jaringan secara signifikan.
- Semua pengujian konektivitas berhasil setelah konfigurasi ulang, menunjukkan bahwa perangkat dapat tetap berkomunikasi meski terjadi perubahan topologi. Praktikum ini memberikan wawasan penting mengenai penerapan protokol routing dinamis dalam skenario nyata serta pentingnya desain topologi yang baik untuk memastikan konektivitas yang optimal di jaringan yang kompleks.