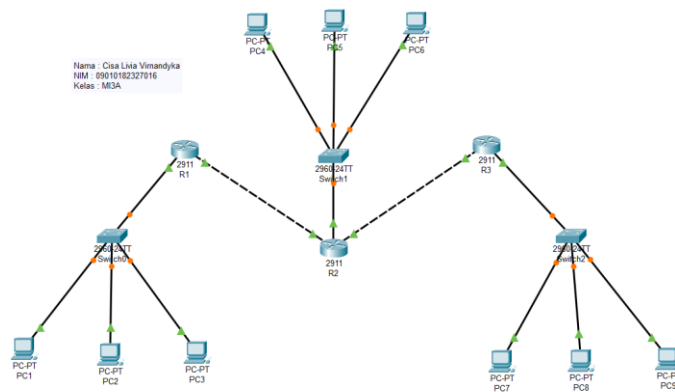


DYNAMIC ROUTING

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TOPOLOGI



ROUTER 1

```
R1
Physical Config CLI Attributes
IOS Command Line Interface

09010182327016_R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
09010182327016_R1(config)#int gig 0/0
09010182327016_R1(config-if)#ip add 192.168.2.1 255.255.255.0
09010182327016_R1(config-if)#ex
09010182327016_R1(config)#int gig 0/1
09010182327016_R1(config-if)#ip add 10.10.10.1 255.255.255.252
09010182327016_R1(config-if)#ex
09010182327016_R1(config)#
09010182327016_R1(config)#router rip
09010182327016_R1(config-router)#version 2
09010182327016_R1(config-router)#net 192.168.2.0
09010182327016_R1(config-router)#net 10.10.10.0
09010182327016_R1(config-router)#ex
09010182327016_R1#
$SYS-S-CONFIG_I: Configured from console by console

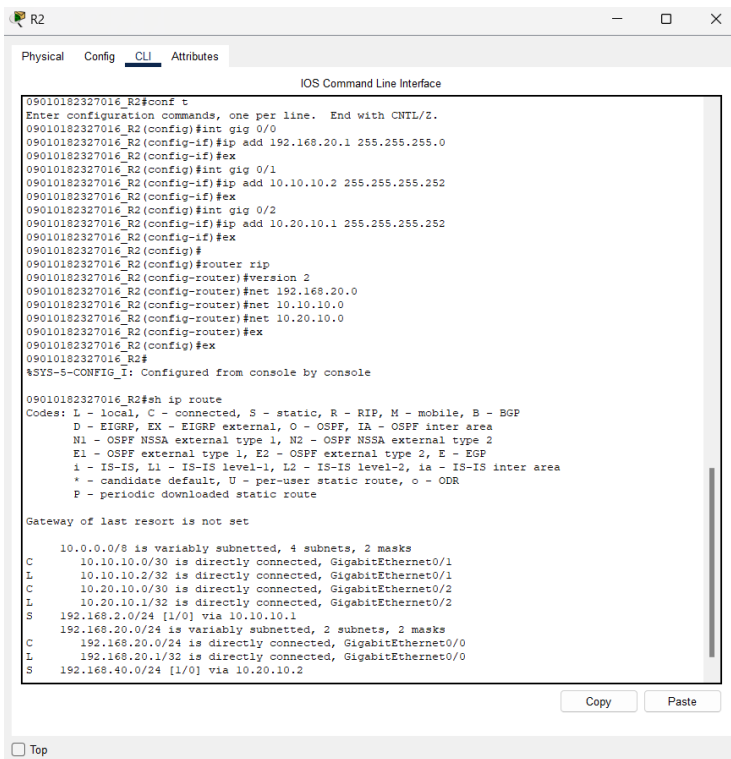
09010182327016_R1#sh ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external type 2, E - EGP
I - IS-IS, 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    10.10.10.1/32 is directly connected, GigabitEthernet0/1
S    10.20.10.0/30 [1/0] via 10.10.10.2
S    10.20.10.0/32 [1/0] via 10.10.10.2
C    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
S    192.168.20.0/24 [1/0] via 10.10.10.2
S    192.168.40.0/24 [1/0] via 10.10.10.2

09010182327016_R1#
```

ROUTER 2



The screenshot shows the configuration window for Router 2 (R2). The window has tabs for Physical, Config, CLI, and Attributes, with CLI selected. The title bar says "R2". The main area is titled "IOS Command Line Interface" and contains the following text:

```
09010182327016_R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
09010182327016_R2(config)#int gig 0/0
09010182327016_R2(config-if)#ip add 192.168.20.1 255.255.255.0
09010182327016_R2(config-if)#ex
09010182327016_R2(config)#int gig 0/1
09010182327016_R2(config-if)#ip add 10.10.10.2 255.255.255.252
09010182327016_R2(config-if)#ex
09010182327016_R2(config)#int gig 0/2
09010182327016_R2(config-if)#ip add 10.20.10.1 255.255.255.252
09010182327016_R2(config-if)#ex
09010182327016_R2(config)#
09010182327016_R2(config)#router rip
09010182327016_R2(config-router)#version 2
09010182327016_R2(config-router)#net 192.168.20.0
09010182327016_R2(config-router)#net 10.10.10.0
09010182327016_R2(config-router)#net 10.20.10.0
09010182327016_R2(config-router)#ex
09010182327016_R2(config)#ex
09010182327016_R2#
%SYS-5-CONFIG_I: Configured from console by console

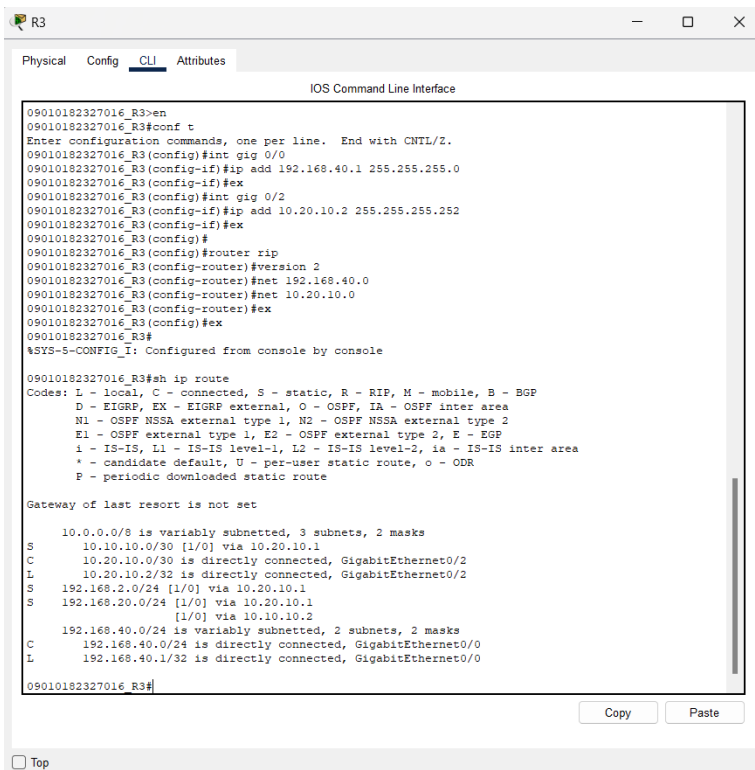
09010182327016_R2#sh ip route
Codes: L - local, C - connected, S - static, R - RIP, M - mobile, B - BGP
        D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
        N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
        E1 - OSPF external type 1, E2 - OSPF external type 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
S       192.168.2.0/24 [1/0] via 10.10.10.1
        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
S       192.168.40.0/24 [1/0] via 10.20.10.2
```

At the bottom right of the CLI window are "Copy" and "Paste" buttons. Below the CLI window is a "Top" button.

ROUTER 3



The screenshot shows the configuration window for Router 3 (R3). The window has tabs for Physical, Config, CLI, and Attributes, with CLI selected. The title bar says "R3". The main area is titled "IOS Command Line Interface" and contains the following text:

```
09010182327016_R3>en
09010182327016_R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
09010182327016_R3(config)#int gig 0/0
09010182327016_R3(config-if)#ip add 192.168.40.1 255.255.255.0
09010182327016_R3(config-if)#ex
09010182327016_R3(config)#int gig 0/2
09010182327016_R3(config-if)#ip add 10.20.10.2 255.255.255.252
09010182327016_R3(config-if)#ex
09010182327016_R3(config)#
09010182327016_R3(config)#router rip
09010182327016_R3(config-router)#version 2
09010182327016_R3(config-router)#net 192.168.40.0
09010182327016_R3(config-router)#net 10.20.10.0
09010182327016_R3(config-router)#ex
09010182327016_R3(config)#ex
09010182327016_R3#
%SYS-5-CONFIG_I: Configured from console by console

09010182327016_R3#sh 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
S       10.10.10.0/30 [1/0] via 10.20.10.1
C       10.20.10.0/30 is directly connected, GigabitEthernet0/2
L       10.20.10.2/32 is directly connected, GigabitEthernet0/2
S       192.168.2.0/24 [1/0] via 10.20.10.1
S       192.168.20.0/24 [1/0] via 10.20.10.1
        [1/0] via 10.10.10.2
        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
```

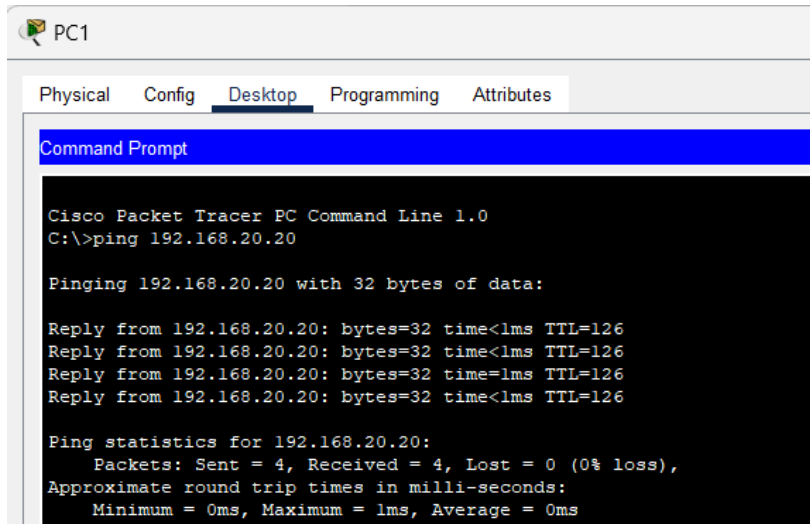
At the bottom right of the CLI window are "Copy" and "Paste" buttons. Below the CLI window is a "Top" button.

TES KONEKSI ICMP

No	Sumber	Tujuan	Hasil	
			Ya	Tidak
1	PC1	PC2	Ya	-
		PC3	Ya	-
		PC4	Ya	-
		PC5	Ya	-
		PC6	Ya	-
		PC7	Ya	-
		PC8	Ya	-
		PC9	Ya	-
2	PC2	PC1	Ya	-
		PC2	Ya	-
		PC3	Ya	-
		PC5	Ya	-
		PC6	Ya	-
		PC7	Ya	-
		PC8	Ya	-
		PC9	Ya	-
3	PC/	PC1	Ya	-
		PC2	Ya	-
		PC3	Ya	-
		PC4	Ya	-
		PC5	Ya	-
		PC6	Ya	-
		PC8	Ya	-
		PC9	Ya	-

Screenshot Hasil Ping PC (CMD)

PC1 -> PC5



The screenshot shows the Cisco Packet Tracer PC Command Line interface for PC1. The 'Desktop' tab is selected. The command prompt displays the output of a ping command to 192.168.20.20. The output shows four successful replies with 32 bytes of data, a time of less than 1ms, and a TTL of 126. The statistics indicate that all four packets were sent and received with 0% loss, and the average round trip time was 0ms.

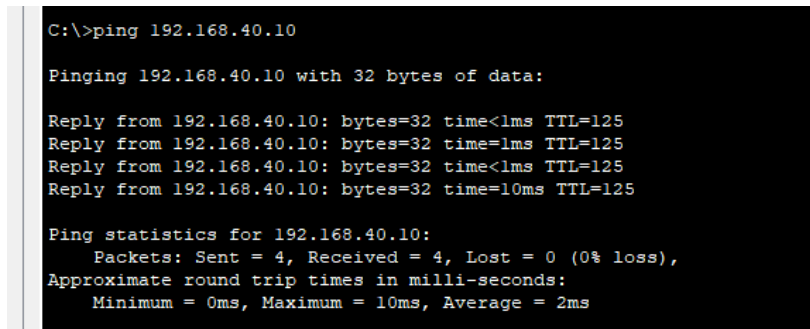
```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.20.20

Pinging 192.168.20.20 with 32 bytes of data:

Reply from 192.168.20.20: bytes=32 time<1ms TTL=126
Reply from 192.168.20.20: bytes=32 time<1ms TTL=126
Reply from 192.168.20.20: bytes=32 time<1ms TTL=126
Reply from 192.168.20.20: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.20.20:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

PC1 -> PC7



The screenshot shows the Cisco Packet Tracer PC Command Line interface for PC1. The command prompt displays the output of a ping command to 192.168.40.10. The output shows four successful replies with 32 bytes of data, a time of less than 1ms, and a TTL of 125. The statistics indicate that all four packets were sent and received with 0% loss, and the average round trip time was 2ms.

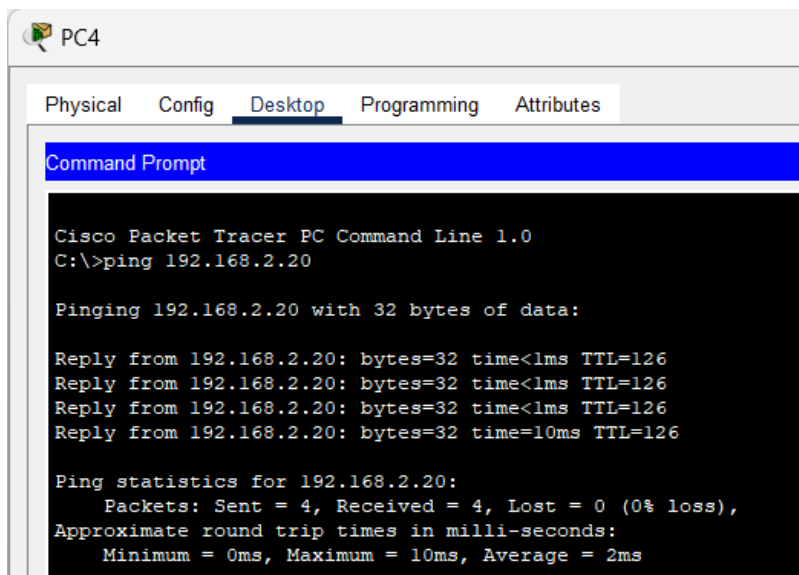
```
C:\>ping 192.168.40.10

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<1ms TTL=125
Reply from 192.168.40.10: bytes=32 time<1ms TTL=125
Reply from 192.168.40.10: bytes=32 time=10ms 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 = 10ms, Average = 2ms
```

PC4 -> PC2



The screenshot shows the Cisco Packet Tracer PC Command Line interface for PC4. The 'Desktop' tab is selected. The command prompt displays the output of a ping command to 192.168.2.20. The output shows four successful replies with 32 bytes of data, a time of less than 1ms, and a TTL of 126. The statistics indicate that all four packets were sent and received with 0% loss, and the average round trip time was 2ms.

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.2.20

Pinging 192.168.2.20 with 32 bytes of data:

Reply from 192.168.2.20: bytes=32 time<1ms TTL=126
Reply from 192.168.2.20: bytes=32 time<1ms TTL=126
Reply from 192.168.2.20: bytes=32 time<1ms TTL=126
Reply from 192.168.2.20: bytes=32 time=10ms TTL=126

Ping statistics for 192.168.2.20:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 10ms, Average = 2ms
```

PC4 -> PC8


```
C:\>ping 192.168.40.20

Pinging 192.168.40.20 with 32 bytes of data:

Reply from 192.168.40.20: bytes=32 time<1ms TTL=126
Reply from 192.168.40.20: bytes=32 time<1ms TTL=126
Reply from 192.168.40.20: bytes=32 time=2ms TTL=126
Reply from 192.168.40.20: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.40.20:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 2ms, Average = 0ms
```

PC7 -> PC3

 PC7

Physical Config Desktop Programming Attributes

Command Prompt

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.2.30

Pinging 192.168.2.30 with 32 bytes of data:

Reply from 192.168.2.30: bytes=32 time<1ms TTL=125
Reply from 192.168.2.30: bytes=32 time=10ms TTL=125
Reply from 192.168.2.30: bytes=32 time=11ms TTL=125
Reply from 192.168.2.30: bytes=32 time<1ms TTL=125

Ping statistics for 192.168.2.30:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 11ms, Average = 5ms
```

PC7 -> PC9

```
C:\>ping 192.168.40.30

Pinging 192.168.40.30 with 32 bytes of data:

Reply from 192.168.40.30: bytes=32 time<1ms TTL=128
Reply from 192.168.40.30: bytes=32 time<1ms TTL=128
Reply from 192.168.40.30: bytes=32 time<1ms TTL=128
Reply from 192.168.40.30: bytes=32 time<1ms TTL=128

Ping statistics for 192.168.40.30:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

HASIL PRAKTIKUM

1. Konfigurasi Router dan IP:

- Setiap router (R1, R2, R3) dikonfigurasi dengan alamat IP yang telah ditentukan pada tabel pengalamatan dan disimpan di NVRAM.
- Banner dan pengaturan jaringan dibuat pada masing-masing router menggunakan RIP versi 2 untuk memastikan dynamic routing berjalan.

2. Dynamic Routing dengan RIP:

- RIP v2 dikonfigurasi untuk mendukung protokol routing dinamis pada setiap router. Masing-masing router memiliki network yang ditetapkan, seperti 192.168.2.0 pada R1 dan 10.20.10.0 pada R3.

3. Pengujian Tabel Routing:

- Perintah show ip route digunakan untuk memverifikasi bahwa konfigurasi dynamic routing berhasil, dengan rute bertanda "D" sebagai indikasi rute dinamis.

4. Pengujian Koneksi ICMP:

- Ping diuji antara berbagai PC dalam jaringan. Hasil menunjukkan apakah koneksi berhasil atau tidak untuk kombinasi PC yang berbeda, seperti PC1 ke PC5 dan PC7 ke PC3. Koneksi yang berhasil menunjukkan bahwa routing telah berhasil menghubungkan jaringan yang berbeda, sedangkan kegagalan koneksi mungkin disebabkan oleh kendala teknis atau pengaturan yang perlu diperiksa kembali.

ANALISA

- Penggunaan RIP versi 2 dalam jaringan ini memungkinkan setiap router berbagi informasi routing secara otomatis dengan router lainnya, sehingga setiap router dapat mengenali jaringan tetangga tanpa pengaturan rute manual. RIP v2 bekerja dengan mengandalkan hop count sebagai metrik utama untuk menentukan jalur terpendek ke tujuan. Metode ini efektif dalam menyederhanakan konfigurasi jaringan kecil atau menengah, terutama ketika perubahan jaringan terjadi, karena protokol ini dapat memperbarui tabel routing secara otomatis.
- Evaluasi Koneksi Antar PC:
 - Sebagian besar koneksi ICMP (ping) berhasil, menunjukkan bahwa jalur antara jaringan telah terbentuk dengan baik melalui dynamic routing. Kegagalan pada

beberapa koneksi dapat disebabkan oleh kesalahan konfigurasi atau batasan pada rentang alamat IP yang digunakan.

- Efektivitas RIP v2:
 - RIP v2 terbukti efektif untuk jaringan dengan ukuran terbatas, tetapi terbatas oleh batas maksimum hop count sebesar 15. Protokol ini cocok untuk topologi sederhana, seperti pada percobaan ini, namun kurang optimal untuk jaringan yang lebih besar.

KESIMPULAN

Hasil pengujian menunjukkan bahwa konfigurasi RIP v2 memungkinkan setiap router untuk secara otomatis mengenali jaringan yang terhubung ke router tetangganya dan mengisi tabel routing tanpa intervensi manual. Koneksi ICMP yang berhasil antara PC di jaringan yang berbeda menjadi bukti bahwa RIP v2 berfungsi dengan baik untuk jaringan sederhana hingga menengah. Namun, keterbatasan RIP dalam mendukung jumlah hop yang terbatas menjadi perhatian penting ketika mempertimbangkan penggunaan di jaringan yang lebih luas. Oleh karena itu, meskipun RIP v2 merupakan solusi praktis untuk jaringan kecil, jaringan yang lebih besar atau kompleks sebaiknya mempertimbangkan penggunaan protokol lain yang lebih efisien, seperti OSPF atau EIGRP, untuk mendukung skala dan stabilitas yang lebih baik.