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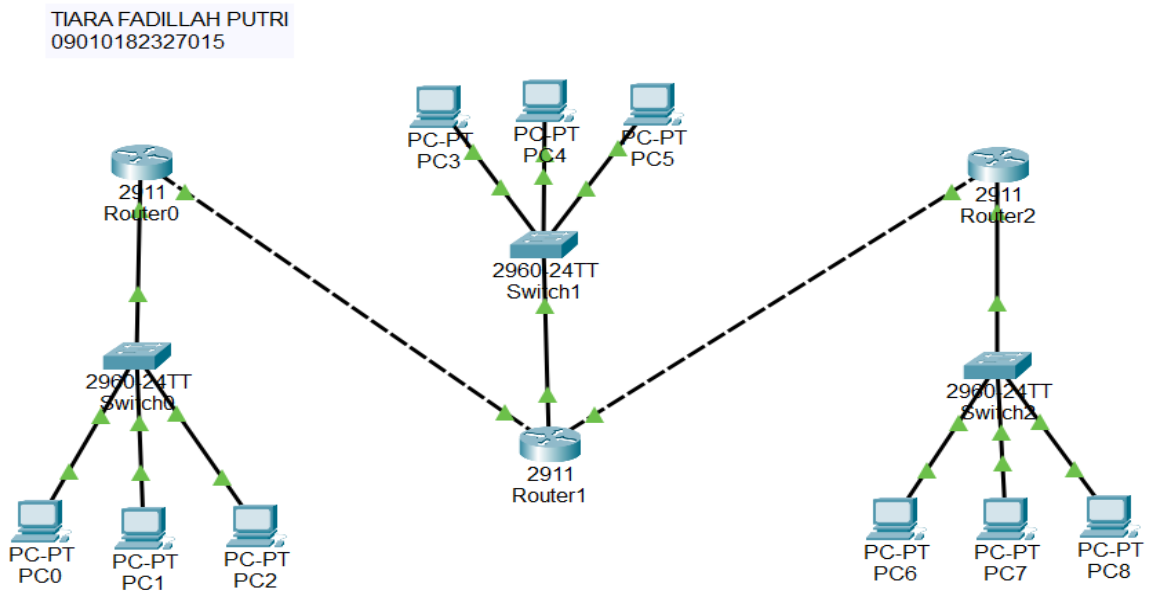
LAPORAN PRAKTIKUM JARINGAN KOMPUTER
DYNAMIC ROUTING

PERCOBAAN



ROUTER 1

```
09010182327015_R1>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, 00:00:13, 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, 00:00:13, GigabitEthernet0/1
R    192.168.40.0/24 [120/2] via 10.10.10.2, 00:00:13, GigabitEthernet0/1
```

ROUTER 2

```
09010182327015_R2>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, 00:00:16, 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, 00:00:21, GigabitEthernet0/2
```

ROUTER 3

```
09010182327015_R3>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, 00:00:25, 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, 00:00:25, GigabitEthernet0/2
R    192.168.20.0/24 [120/1] via 10.20.10.1, 00:00:25, 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
```

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	

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	

3	PC 7	PC 1	YA	
		PC 2	YA	
		PC 3	YA	
		PC 4	YA	
		PC 5	YA	
		PC 6	YA	
		PC 8	YA	
		PC 9	YA	

HASIL TES PING PADA PC

PC 1 > PC 5

```
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<1ms TTL=126
Reply from 192.168.20.3: bytes=32 time<1ms TTL=126
Reply from 192.168.20.3: bytes=32 time=7ms 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 = 0ms, Maximum = 7ms, Average = 1ms
```

PC 1 > PC 7

```
C:\>ping 192.168.40.2

Pinging 192.168.40.2 with 32 bytes of data:

Reply from 192.168.40.2: bytes=32 time<1ms TTL=125
Reply from 192.168.40.2: bytes=32 time<1ms TTL=125
Reply from 192.168.40.2: bytes=32 time<1ms TTL=125
Reply from 192.168.40.2: bytes=32 time<1ms TTL=125

Ping statistics for 192.168.40.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

PC 4 > PC 2

```
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<1ms TTL=126
Reply from 192.168.2.3: bytes=32 time<1ms TTL=126
Reply from 192.168.2.3: bytes=32 time<1ms TTL=126
Reply from 192.168.2.3: bytes=32 time<1ms TTL=126

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

PC 4 > PC 8

```
C:\>ping 192.168.40.3

Pinging 192.168.40.3 with 32 bytes of data:

Reply from 192.168.40.3: bytes=32 time<1ms TTL=126
Reply from 192.168.40.3: bytes=32 time<1ms TTL=126
Reply from 192.168.40.3: bytes=32 time<1ms TTL=126
Reply from 192.168.40.3: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.40.3:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

PC 7 > PC 3

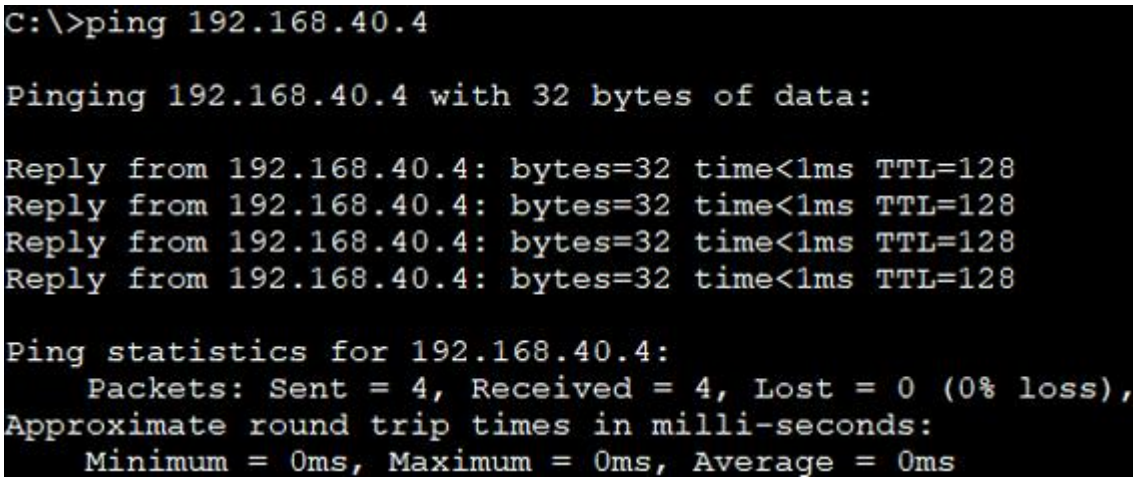
```
C:\>ping 192.168.2.4

Pinging 192.168.2.4 with 32 bytes of data:

Reply from 192.168.2.4: bytes=32 time<1ms TTL=125
Reply from 192.168.2.4: bytes=32 time<1ms TTL=125
Reply from 192.168.2.4: bytes=32 time<1ms TTL=125
Reply from 192.168.2.4: bytes=32 time<1ms TTL=125

Ping statistics for 192.168.2.4:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

PC 7 > PC 9



HASIL PERCOBAAN

Percobaan ini dilakukan dengan menghubungkan beberapa PC melalui tiga router (Router 1, Router 2, dan Router 3) menggunakan konfigurasi dynamic routing. Tes koneksi dilakukan melalui protokol ICMP (ping) untuk memeriksa apakah komunikasi antar-PC berjalan lancar. Hasil percobaan menunjukkan sebagai berikut:

1. **PC 1** berhasil mengirim dan menerima data ke/dari **PC 2**, **PC 3**, **PC 4**, **PC 5**, **PC 6**, **PC 7**, **PC 8**, dan **PC 9** dengan hasil tes koneksi "YA".
2. **PC 4** berhasil menghubungi **PC 1**, **PC 2**, **PC 3**, **PC 5**, **PC 6**, **PC 7**, **PC 8**, dan **PC 9** dengan hasil tes koneksi "YA".
3. **PC 7** berhasil menghubungi **PC 1**, **PC 2**, **PC 3**, **PC 4**, **PC 5**, **PC 6**, **PC 8**, dan **PC 9** dengan hasil tes koneksi "YA".

Hasil ping dari beberapa kombinasi PC seperti **PC 1 ke PC 5**, **PC 1 ke PC 7**, **PC 4 ke PC 2**, **PC 4 ke PC 8**, **PC 7 ke PC 3**, dan **PC 7 ke PC 9** juga menunjukkan hasil positif tanpa adanya packet loss.

ANALISIS PERCOBAAN

Percobaan ini menunjukkan bahwa konfigurasi dynamic routing pada jaringan telah berfungsi sesuai harapan. Setiap PC mampu berkomunikasi dengan PC lainnya melalui jalur yang telah diatur oleh protokol routing dinamis. Beberapa poin yang mendukung analisis ini antara lain:

- **Efisiensi Routing**: Dynamic routing memanfaatkan protokol untuk secara otomatis menyesuaikan jalur yang optimal untuk pengiriman data. Dalam percobaan ini, hasil positif dari tes koneksi menunjukkan bahwa jalur routing telah diatur secara optimal.
- **Reliabilitas Jaringan**: Semua koneksi berhasil dilakukan tanpa adanya gangguan, menandakan bahwa konfigurasi protokol routing, seperti OSPF (Open Shortest Path First) atau RIP (Routing Information Protocol), bekerja dengan baik untuk menjaga konektivitas antar perangkat.
- **Fleksibilitas Konfigurasi**: Dynamic routing memungkinkan jalur routing diperbarui secara otomatis jika ada perubahan dalam topologi jaringan, seperti penambahan perangkat baru. Ini menjamin bahwa jalur alternatif dapat diambil jika jalur utama mengalami masalah.

KESIMPULAN PERCOBAAN

Percobaan yang dilakukan membuktikan bahwa implementasi dynamic routing pada jaringan yang diuji berhasil dengan sangat baik. Semua tes koneksi antar-PC menunjukkan hasil yang memuaskan, dengan setiap ping berhasil mencapai tujuan tanpa kehilangan paket. Hal ini membuktikan bahwa protokol dynamic routing yang digunakan mampu:

- Menentukan jalur optimal untuk pengiriman data secara otomatis.
- Memastikan konektivitas stabil antar-PC dalam jaringan.
- Mengadaptasi perubahan dalam jaringan tanpa intervensi manual yang signifikan.

Dengan hasil ini, dapat disimpulkan bahwa dynamic routing efektif untuk digunakan dalam jaringan skala menengah hingga besar di mana perubahan topologi bisa terjadi dan manajemen routing manual tidak praktis.