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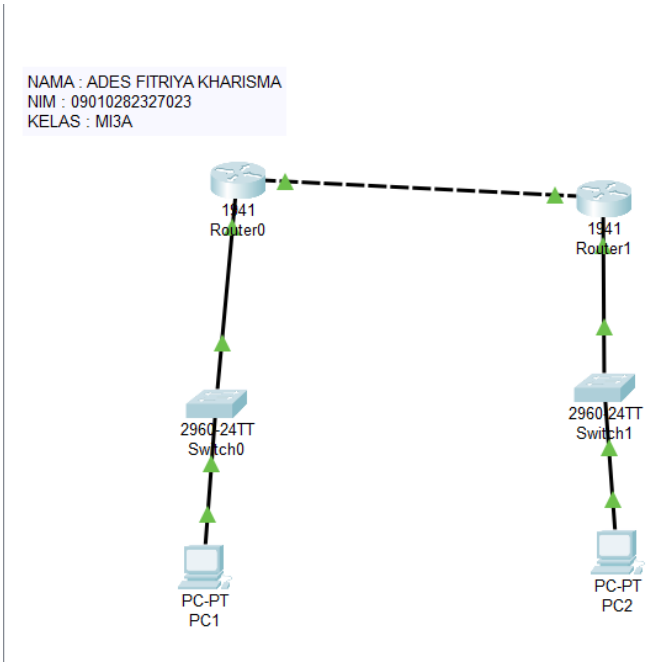
KELAS : MI3A

A. PERCOBAAN

1. OSPF



Gambar 14.1 Topologi Percobaan OSPF

No	Nama Device	Alamat	Gateway	Netmask
1	PC1	192.168.10.2	192.168.10.1	255.255.255.0
2	PC2	192.168.20.2	192.168.20.1	255.255.255.0

1. Ping ke masing-masing PC untuk memeriksa koneksi

```
Cisco Packet Tracer PC Command Line 1.0
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=126
Reply from 192.168.10.2: bytes=32 time=1ms TTL=126
Reply from 192.168.10.2: bytes=32 time<1ms TTL=126
Reply from 192.168.10.2: bytes=32 time<1ms TTL=126

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 = 1ms, Average = 0ms

C:\>
```

```
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<1ms TTL=126
Reply from 192.168.20.2: bytes=32 time<1ms TTL=126
Reply from 192.168.20.2: bytes=32 time=14ms 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 = 0ms, Maximum = 14ms, Average = 3ms
```

Gambar 14.2 Hasil Ping PC1 ke PC2

2. Show IP Route OSPF

```
Router0_09010282327023>enable
Router0_09010282327023#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, 2 subnets, 2 masks
C       10.10.10.0/24 is directly connected, GigabitEthernet0/0
L       10.10.10.1/32 is directly connected, GigabitEthernet0/0
     192.168.10.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.10.0/24 is directly connected, GigabitEthernet0/1
L       192.168.10.1/32 is directly connected, GigabitEthernet0/1
O    192.168.20.0/24 [110/2] via 10.10.10.2, 00:07:46, GigabitEthernet0/0
```

```
Router1_09010282327023>enable
Router1_09010282327023#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, 2 subnets, 2 masks
C       10.10.10.0/24 is directly connected, GigabitEthernet0/0
L       10.10.10.2/32 is directly connected, GigabitEthernet0/0
O    192.168.10.0/24 [110/2] via 10.10.10.1, 00:11:58, GigabitEthernet0/0
     192.168.20.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.20.0/24 is directly connected, GigabitEthernet0/1
L       192.168.20.1/32 is directly connected, GigabitEthernet0/1
```

- Berikan penjelasan terkait hasil dari praktikum kali ini.

  Dengan menerapkan OSPF pada topologi yang diberikan, saya bisa melihat bagaimana router saling bertukar informasi untuk menyusun jalur optimal bagi pengiriman data. Protokol ini bekerja dengan cara menemukan jalur terpendek berdasarkan perhitungan cost, yang didapat dari kapasitas atau bandwidth setiap jalur

- Buat Analisa terkait praktikum yang dikerjakan.

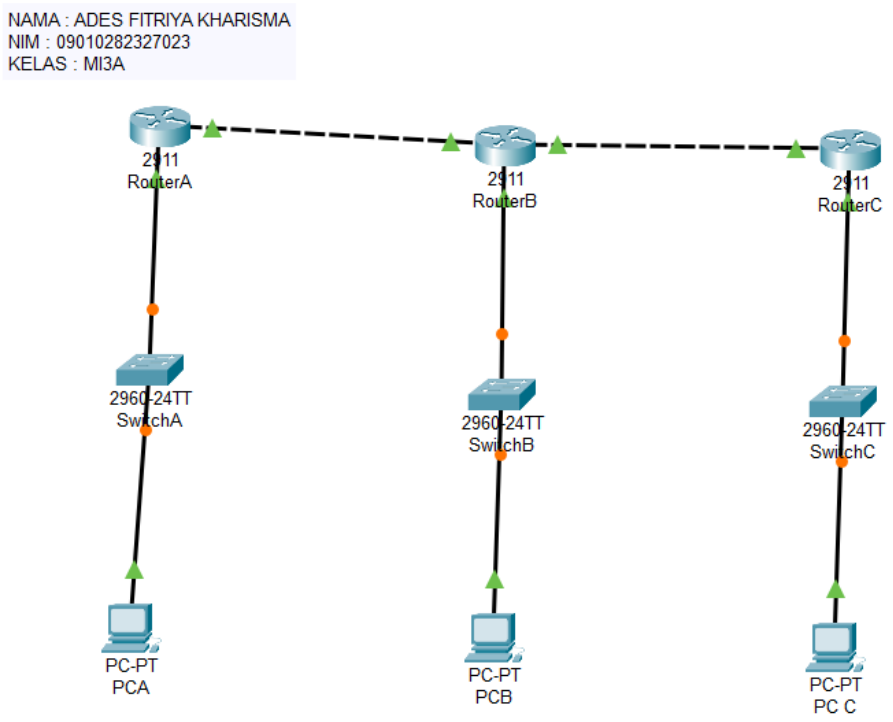
  1. Konfigurasi Topologi dan Alamat IP dalam praktik OSPF, penentuan jaringan dan subnet yang tepat menjadi dasar agar OSPF dapat berjalan efektif dalam menghitung jalur terpendek antar perangkat.

  2. Konfigurasi IP pada Router memastikan OSPF dapat berfungsi dengan baik, karena router harus mengetahui jaringan mana yang akan digunakan untuk membangun topologi.

  3. Konfigurasi Routing OSPF pada Router Konfigurasi OSPF yang dilakukan mengharuskan router untuk mengenali dan berkomunikasi satu sama lain.

- Kesimpulan.
  OSPF adalah pilihan terbaik untuk jaringan internal yang besar, dengan kemampuan konvergensi yang cepat dan fleksibilitas dalam pengelolaan topologi melalui area-area yang disusun secara hierarkis.

3. PERCOBAAN 2



Gambar 14.3 Topologi BGP

1. Buat Topologi Seperti Gambar diatas
2. Buat Pengalamat di PC

No	Nama Device	Alamat	Gateway	Netmask
1	PC1	192.168.10.2	192.168.10.1	255.255.255.0
2	PC2	192.168.20.2	192.168.20.1	255.255.255.0
3	PC3	192.168.30.2	192.168.20.1	255.255.255.0

3. Ping ke masing -masing PC untuk memeriksa koneksi

```
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=1ms TTL=126
Reply from 192.168.20.2: bytes=32 time<1ms TTL=126
Reply from 192.168.20.2: bytes=32 time<1ms 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 = 0ms, Maximum = 1ms, Average = 0ms
```

```
Cisco Packet Tracer PC Command Line 1.0
C:\>ping 192.168.30.2

Pinging 192.168.30.2 with 32 bytes of data:

Reply from 192.168.30.2: bytes=32 time<1ms TTL=126
Reply from 192.168.30.2: bytes=32 time<1ms TTL=126
Reply from 192.168.30.2: bytes=32 time<1ms TTL=126
Reply from 192.168.30.2: bytes=32 time<1ms TTL=126

Ping statistics for 192.168.30.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

```
C:\>ping 192.168.10.2

Pinging 192.168.10.2 with 32 bytes of data:

Reply from 192.168.10.2: bytes=32 time<1ms TTL=126
Reply from 192.168.10.2: bytes=32 time<1ms TTL=126
Reply from 192.168.10.2: bytes=32 time=1ms TTL=126
Reply from 192.168.10.2: bytes=32 time<1ms TTL=126

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 = 1ms, Average = 0ms
```

1. SS hasil perintah #show ip route BGP.

```
RouterA_09010282327023>enable
RouterA_09010282327023#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       10.10.10.0/24 is directly connected, GigabitEthernet0/0
L       10.10.10.1/32 is directly connected, GigabitEthernet0/0
B       10.10.20.0/24 [20/0] via 10.10.10.2, 00:00:00
     192.168.10.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.10.0/24 is directly connected, GigabitEthernet0/1
L       192.168.10.1/32 is directly connected, GigabitEthernet0/1
B    192.168.20.0/24 [20/0] via 10.10.10.2, 00:00:00
B    192.168.30.0/24 [20/0] via 10.10.10.2, 00:00:00
```

```
RouterB_09010282327023#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       10.10.10.0/24 is directly connected, GigabitEthernet0/0
L       10.10.10.2/32 is directly connected, GigabitEthernet0/0
C       10.10.20.0/24 is directly connected, GigabitEthernet0/1
L       10.10.20.1/32 is directly connected, GigabitEthernet0/1
B    192.168.10.0/24 [20/0] via 10.10.10.1, 00:00:00
     192.168.20.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.20.0/24 is directly connected, GigabitEthernet0/2
L       192.168.20.1/32 is directly connected, GigabitEthernet0/2
B    192.168.30.0/24 [20/0] via 10.10.20.2, 00:00:00
```

```
RouterC_09010282327023>enable
RouterC_09010282327023#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
B       10.10.10.0/24 [20/0] via 10.10.20.1, 00:00:00
C       10.10.20.0/24 is directly connected, GigabitEthernet0/0
L       10.10.20.2/32 is directly connected, GigabitEthernet0/0
B    192.168.10.0/24 [20/0] via 10.10.20.1, 00:00:00
B    192.168.20.0/24 [20/0] via 10.10.20.1, 00:00:00
     192.168.30.0/24 is variably subnetted, 2 subnets, 2 masks
C       192.168.30.0/24 is directly connected, GigabitEthernet0/1
L       192.168.30.1/32 is directly connected, GigabitEthernet0/1
```

- Berikan penjelasan terkait hasil dari praktikum kali ini.

  Melalui praktikum ini, bahwa BGP adalah protokol routing yang sangat efektif dalam mengelola jalur antar jaringan yang lebih luas dan kompleks. Meskipun proses konvergensinya lebih lambat dibandingkan OSPF, BGP lebih unggul dalam memberikan kontrol atas jalur mana yang dipilih dan dipromosikan antar Autonomous Systems (AS).

- Buat Analisa terkait praktikum yang dikerjakan.

  1. Konfigurasi Topologi dan alamat IP sama seperti OSPF, praktikum BGP dimulai dengan membangun topologi jaringan dan konfigurasi alamat IP pada router dan PC sesuai dengan tabel pengalamatan yang telah disediakan.

  2. Konfigurasi IP pada Router setelah menetapkan alamat IP pada setiap router, langkah selanjutnya adalah mengonfigurasi IP di antarmuka router untuk menghubungkan antar router dan jaringan lokal.

  3. Konfigurasi Routing BGP pada Router konfigurasi BGP yang dilakukan mengharuskan setiap router untuk memiliki nomor AS yang unik. Nomor AS ini sangat penting karena BGP bekerja antar AS, jadi setiap router perlu diberi identitas AS untuk dapat berkomunikasi dengan tetangganya. Konfigurasi neighbor pada BGP adalah kunci dalam membangun hubungan antara router yang berada dalam AS yang berbeda. Ketika hubungan ini terbentuk, BGP dapat bertukar informasi tentang jalur yang ada antara router-router tersebut.

- Kesimpulan.
  BGP sangat cocok untuk jaringan luas yang mencakup banyak AS, karena keunggulannya dalam kestabilan dan kontrol rute yang lebih selektif dan presisi.