PRAKTIKUM
DESAIN DAN MANAJEMEN JARINGAN KOMPUTER

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1. Konfigurasi single-area:

```
BTC(config)#router ospf 1
BTC(config-router)#router
BTC(config-router)#router-id 1.1.1.1
BTC(config-router)#net 10.4.5.0 0.0.0.3 area 0
BTC(config-router)#net 10.45.45.4 0.0.0.3 area 0
BTC(config-router)#net 10.45.54.4 0.0.0.3 area 0
BTC(config-router)#net 192.45.45.0 0.0.0.255 area 0

ETH(config)#router ospf 1
ETH(config-router)#router
ETH(config-router)#router-id 2.2.2.2
ETH(config-router)#net 10.5.4.0 0.0.0.3 area 0
ETH(config-router)#net 10.45.45.4 0.0.0.3 area 0
ETH(config-router)#net 10
00:07:18: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on
Loading Done
.
                        ^
% Invalid input detected at '^' marker.

ETH(config-router)#net 10.54.45.4 0.0.0.3 area 0
ETH(config-router)#net 192.45.54.0 0.0.0.255 area 0

SOL(config)#router ospf 1
SOL(config-router)#router
SOL(config-router)#router-id 3.3.3.3
SOL(config-router)#net 10.4.4.0 0.0.0.3 area 0
SOL(config-router)#net 10.45.54.4 0.0.0.3 area 0
SOL(config-router)#
00:09:10: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on
Loading Done

SOL(config-router)#net 192.54.45.0 0.0.0.255 area 0

ATOM(config)#router ospf 1
ATOM(config-router)#router
ATOM(config-router)#router-id 4.4.4.4
ATOM(config-router)#net 10.5.5.0 0.0.0.3 area 0
ATOM(config-router)#net 10.54.45.4 0.0.0.3 area 0
ATOM(config-router)#
00:12:38: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on S
Loading Done

ATOM(config-router)#net 192.54.54.0 0.0.0.255 area 0
```

```
ICP(config)#router ospf 1
ICP(config-router)#route
ICP(config-router)#router-id 5.5.5.5
ICP(config-router)#net 10.4.5.0 0.0.0.3 area 0
ICP(config-router)#
00:13:39: %OSPF-5-ADJCHG: Process 1, Nbr 1.1.1.1 on
Loading Done

ICP(config-router)#net 10.4.4.0 0.0.0.3 area 0
ICP(config-router)#
00:13:55: %OSPF-5-ADJCHG: Process 1, Nbr 3.3.3.3 on
Loading Done

ICP(config-router)#net 10.44.55.0 0.0.0.3 area 0
ICP(config-router)#net 192.44.55.0 0.0.0.255 area 0

AVAX(config)#router ospf 1
AVAX(config-router)#route
AVAX(config-router)#router-id 6.6.6.6
AVAX(config-router)#net 10.5.4.0 0.0.0.3 area 0
AVAX(config-router)#
00:15:08: %OSPF-5-ADJCHG: Process 1, Nbr 2.2.2.2 on Se
Loading Done

AVAX(config-router)#net 10.5.5.0 0.0.0.3 area 0
AVAX(config-router)#
00:15:28: %OSPF-5-ADJCHG: Process 1, Nbr 4.4.4.4 on Se
Loading Done

AVAX(config-router)#net 10.44.55.0 0.0.0.3 area 0
AVAX(config-router)#
00:15:46: %OSPF-5-ADJCHG: Process 1, Nbr 5.5.5.5 on Se
Loading Done

AVAX(config-router)#net 192.55.44.0 0.0.0.255 area 0
```

2. Mengatur passive-interface.

```
BTC(config-router)#passive-interface g0/0

ETH(config-router)#passive-interface g0/0

SOL(config-router)#passive-interface g0/0

ATOM(config-router)#passive-interface g0/0

ICP(config-router)#passive-interface g0/0

AVAX(config-router)#passive-interface g0/0
```

3. Tes koneksi.

Last Status	Source	Destination
Successful	Chainlink	Jupiter
Successful	Arbitrum	Ordinals

PDU yang dilakukan antara PC-PC diatas berhasil dilakukan. Meskipun keempatnya berada di jaringan yang berbeda, namun tetap dapat membangun koneksi karena routing dengan OSPF telah

diterapkan dalam topologi. OSPF memungkinkan perangkat-perangkat yang berada di jaringan berbeda dapat saling berkomunikasi.

4. Perintah show ip ospf database.

```
BTC#sh ip ospf data
            OSPF Router with ID (1.1.1.1) (Process ID 1)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
1.1.1.1         1.1.1.1         545         0x80000007 0x005ff3 7
3.3.3.3         3.3.3.3         529         0x80000005 0x009525 5
2.2.2.2         2.2.2.2         456         0x80000007 0x0083b9 7
4.4.4.4         4.4.4.4         436         0x80000005 0x00217c 5
5.5.5.5         5.5.5.5         418         0x80000007 0x007468 7
6.6.6.6         6.6.6.6         385         0x80000007 0x00bd0e 7

ETH#sh ip ospf data
            OSPF Router with ID (2.2.2.2) (Process ID 1)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
1.1.1.1         1.1.1.1         572         0x80000007 0x005ff3 7
3.3.3.3         3.3.3.3         555         0x80000005 0x009525 5
2.2.2.2         2.2.2.2         483         0x80000007 0x0083b9 7
4.4.4.4         4.4.4.4         463         0x80000005 0x00217c 5
5.5.5.5         5.5.5.5         445         0x80000007 0x007468 7
6.6.6.6         6.6.6.6         412         0x80000007 0x00bd0e 7

SOL#sh ip ospf data
            OSPF Router with ID (3.3.3.3) (Process ID 1)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
1.1.1.1         1.1.1.1         595         0x80000007 0x005ff3 7
3.3.3.3         3.3.3.3         578         0x80000005 0x009525 5
2.2.2.2         2.2.2.2         506         0x80000007 0x0083b9 7
4.4.4.4         4.4.4.4         486         0x80000005 0x00217c 5
5.5.5.5         5.5.5.5         468         0x80000007 0x007468 7
6.6.6.6         6.6.6.6         435         0x80000007 0x00bd0e 7

ATOM#sh ip ospf data
            OSPF Router with ID (4.4.4.4) (Process ID 1)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
1.1.1.1         1.1.1.1         611         0x80000007 0x005ff3 7
3.3.3.3         3.3.3.3         595         0x80000005 0x009525 5
2.2.2.2         2.2.2.2         522         0x80000007 0x0083b9 7
4.4.4.4         4.4.4.4         502         0x80000005 0x00217c 5
5.5.5.5         5.5.5.5         484         0x80000007 0x007468 7
6.6.6.6         6.6.6.6         451         0x80000007 0x00bd0e 7
```

```
ICP#sh ip ospf data
            OSPF Router with ID (5.5.5.5) (Process ID 1)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
1.1.1.1         1.1.1.1         627         0x80000007 0x005ff3 7
3.3.3.3         3.3.3.3         610         0x80000005 0x009525 5
2.2.2.2         2.2.2.2         538         0x80000007 0x0083b9 7
4.4.4.4         4.4.4.4         518         0x80000005 0x00217c 5
5.5.5.5         5.5.5.5         500         0x80000007 0x007468 7
6.6.6.6         6.6.6.6         467         0x80000007 0x00bd0e 7

AVAX#sh ip ospf data
            OSPF Router with ID (6.6.6.6) (Process ID 1)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
1.1.1.1         1.1.1.1         643         0x80000007 0x005ff3 7
3.3.3.3         3.3.3.3         626         0x80000005 0x009525 5
2.2.2.2         2.2.2.2         554         0x80000007 0x0083b9 7
4.4.4.4         4.4.4.4         534         0x80000005 0x00217c 5
5.5.5.5         5.5.5.5         516         0x80000007 0x007468 7
6.6.6.6         6.6.6.6         483         0x80000007 0x00bd0e 7
```

5. Perintah show ip route ospf.

```
BTC#sh ip route ospf
     10.0.0.0/8 is variably subnetted, 11 subnets, 2 masks
O       10.4.4.0 [110/128] via 10.4.5.2, 00:11:15, Serial0/0/0
                 [110/128] via 10.45.54.6, 00:11:15, Serial0/1/0
O       10.5.4.0 [110/128] via 10.45.45.6, 00:17:52, Serial0/0/1
O       10.5.5.0 [110/192] via 10.4.5.2, 00:09:24, Serial0/0/0
                 [110/192] via 10.45.45.6, 00:09:24, Serial0/0/1
O       10.44.55.0 [110/128] via 10.4.5.2, 00:11:04, Serial0/0/0
O       10.54.45.4 [110/128] via 10.45.45.6, 00:17:22, Serial0/0/1
O    192.44.55.0 [110/65] via 10.4.5.2, 00:10:53, Serial0/0/0
O    192.45.54.0 [110/65] via 10.45.45.6, 00:17:08, Serial0/0/1
O    192.54.45.0 [110/65] via 10.45.54.6, 00:15:41, Serial0/1/0
O    192.54.54.0 [110/129] via 10.45.45.6, 00:12:22, Serial0/0/1
O    192.55.44.0 [110/129] via 10.4.5.2, 00:08:50, Serial0/0/0
                 [110/129] via 10.45.45.6, 00:08:50, Serial0/0/1

ETH#sh ip route ospf
     10.0.0.0/8 is variably subnetted, 11 subnets, 2 masks
O       10.4.4.0 [110/192] via 10.5.4.2, 00:09:35, Serial0/0/0
                 [110/192] via 10.45.45.5, 00:09:35, Serial0/0/1
O       10.4.5.0 [110/128] via 10.45.45.5, 00:18:03, Serial0/0/1
O       10.5.5.0 [110/128] via 10.5.4.2, 00:10:02, Serial0/0/0
                 [110/128] via 10.54.45.6, 00:10:02, Serial0/1/0
O       10.44.55.0 [110/128] via 10.5.4.2, 00:09:35, Serial0/0/0
O       10.45.54.4 [110/128] via 10.45.45.5, 00:18:03, Serial0/0/1
O    192.44.55.0 [110/129] via 10.5.4.2, 00:09:35, Serial0/0/0
                 [110/129] via 10.45.45.5, 00:09:35, Serial0/0/1
O    192.45.45.0 [110/65] via 10.45.45.5, 00:18:03, Serial0/0/1
O    192.54.45.0 [110/129] via 10.45.45.5, 00:15:51, Serial0/0/1
O    192.54.54.0 [110/65] via 10.54.45.6, 00:12:32, Serial0/1/0
O    192.55.44.0 [110/65] via 10.5.4.2, 00:09:01, Serial0/0/0
```

```
SOL#sh ip route ospf
     10.0.0.0/8 is variably subnetted, 10 subnets, 2 masks
O       10.4.5.0 [110/128] via 10.4.4.2, 00:11:35, Serial0/0/1
                 [110/128] via 10.45.54.5, 00:11:35, Serial0/1/0
O       10.5.4.0 [110/192] via 10.4.4.2, 00:09:48, Serial0/0/1
                 [110/192] via 10.45.54.5, 00:09:48, Serial0/1/0
O       10.5.5.0 [110/192] via 10.4.4.2, 00:09:48, Serial0/0/1
O       10.44.55.0 [110/128] via 10.4.4.2, 00:11:25, Serial0/0/1
O       10.45.45.4 [110/128] via 10.45.54.5, 00:16:24, Serial0/1/0
O       10.54.45.4 [110/192] via 10.45.54.5, 00:16:24, Serial0/1/0
O    192.44.55.0 [110/65] via 10.4.4.2, 00:11:15, Serial0/0/1
O    192.45.45.0 [110/65] via 10.45.54.5, 00:16:24, Serial0/1/0
O    192.45.54.0 [110/129] via 10.45.54.5, 00:16:24, Serial0/1/0
O    192.54.54.0 [110/193] via 10.4.4.2, 00:09:48, Serial0/0/1
                 [110/193] via 10.45.54.5, 00:09:48, Serial0/1/0
O    192.55.44.0 [110/129] via 10.4.4.2, 00:09:14, Serial0/0/1

ATOM#sh ip route ospf
     10.0.0.0/8 is variably subnetted, 10 subnets, 2 masks
O       10.4.4.0 [110/192] via 10.5.5.2, 00:09:53, Serial0/0/1
O       10.4.5.0 [110/192] via 10.5.5.2, 00:09:53, Serial0/0/1
                 [110/192] via 10.54.45.5, 00:09:53, Serial0/1/0
O       10.5.4.0 [110/128] via 10.5.5.2, 00:10:11, Serial0/0/1
                 [110/128] via 10.54.45.5, 00:10:11, Serial0/1/0
O       10.44.55.0 [110/128] via 10.5.5.2, 00:09:53, Serial0/0/1
O       10.45.45.4 [110/128] via 10.54.45.5, 00:13:01, Serial0/1/0
O       10.45.54.4 [110/192] via 10.54.45.5, 00:13:01, Serial0/1/0
O    192.44.55.0 [110/129] via 10.5.5.2, 00:09:53, Serial0/0/1
O    192.45.45.0 [110/129] via 10.54.45.5, 00:13:01, Serial0/1/0
O    192.45.54.0 [110/65] via 10.54.45.5, 00:13:01, Serial0/1/0
O    192.54.45.0 [110/193] via 10.5.5.2, 00:09:53, Serial0/0/1
                 [110/193] via 10.54.45.5, 00:09:53, Serial0/1/0
O    192.55.44.0 [110/65] via 10.5.5.2, 00:09:19, Serial0/0/1

ICP#sh ip route ospf
     10.0.0.0/8 is variably subnetted, 11 subnets, 2 masks
O       10.5.4.0 [110/128] via 10.44.55.2, 00:09:57, Serial0/1/0
O       10.5.5.0 [110/128] via 10.44.55.2, 00:09:57, Serial0/1/0
O       10.45.45.4 [110/128] via 10.4.5.1, 00:12:02, Serial0/0/0
O       10.45.54.4 [110/128] via 10.4.5.1, 00:11:48, Serial0/0/0
                   [110/128] via 10.4.4.1, 00:11:48, Serial0/0/1
O       10.54.45.4 [110/192] via 10.4.5.1, 00:09:57, Serial0/0/0
                   [110/192] via 10.44.55.2, 00:09:57, Serial0/1/0
O    192.45.45.0 [110/65] via 10.4.5.1, 00:12:02, Serial0/0/0
O    192.45.54.0 [110/129] via 10.4.5.1, 00:09:57, Serial0/0/0
                 [110/129] via 10.44.55.2, 00:09:57, Serial0/1/0
O    192.54.45.0 [110/65] via 10.4.4.1, 00:11:48, Serial0/0/1
O    192.54.54.0 [110/129] via 10.44.55.2, 00:09:57, Serial0/1/0
O    192.55.44.0 [110/65] via 10.44.55.2, 00:09:23, Serial0/1/0

AVAX#sh ip route ospf
     10.0.0.0/8 is variably subnetted, 11 subnets, 2 masks
O       10.4.4.0 [110/128] via 10.44.55.1, 00:10:03, Serial0/1/0
O       10.4.5.0 [110/128] via 10.44.55.1, 00:10:03, Serial0/1/0
O       10.45.45.4 [110/128] via 10.5.4.1, 00:10:41, Serial0/0/0
O       10.45.54.4 [110/192] via 10.5.4.1, 00:10:03, Serial0/0/0
                   [110/192] via 10.44.55.1, 00:10:03, Serial0/1/0
O       10.54.45.4 [110/128] via 10.5.4.1, 00:10:20, Serial0/0/0
                   [110/128] via 10.5.5.1, 00:10:20, Serial0/0/1
O    192.44.55.0 [110/65] via 10.44.55.1, 00:10:03, Serial0/1/0
O    192.45.45.0 [110/129] via 10.5.4.1, 00:10:03, Serial0/0/0
                 [110/129] via 10.44.55.1, 00:10:03, Serial0/1/0
O    192.45.54.0 [110/65] via 10.5.4.1, 00:10:41, Serial0/0/0
O    192.54.45.0 [110/129] via 10.44.55.1, 00:10:03, Serial0/1/0
O    192.54.54.0 [110/65] via 10.5.5.1, 00:10:20, Serial0/0/1
```

Penjelasan isi routing table:

- Routing table dari setiap router hanya berisi rute yang di-routing dengan OSPF. Hal ini karena specific command yang digunakan.
- Dalam tabel tersebut terdapat berbagai jaringan yang terhubung ke router.
- Via [alamat ip] merupakan alamat IP dari next-hop router.
- Interface yang disebutkan menandakan interface tersebut akan menjadi tempat paket untuk keluar.
- [110/128] menunjukkan *administrative distance* (AD) dan cost dari tiap rute. AD untuk OSPF secara default adalah 110.
- Juga terdapat waktu terakhir kali routing table diperbarui.

6. Menghapus konfigurasi router ospf 1.

```
BTC(config)#no router ospf 1 ETH(config)#no router ospf 1 SOL(config)#no router ospf 1
ATOM(config)#no router ospf 1 ICP(config)#no router ospf 1 AVAX(config)#no router ospf 1
```

7. Konfigurasi OSPF multi-area.
   - Area 0: ICP dan AVAX.

```
ICP(config)#router ospf 10
ICP(config-router)#router-id 5.5.5.5
ICP(config-router)#net 10.4.5.0 0.0.0.3 area 0
ICP(config-router)#net 10.4.4.0 0.0.0.3 area 0
ICP(config-router)#net 10.44.55.0 0.0.0.3 area 0
ICP(config-router)#net 192.44.55.0 0.0.0.255 area 0
ICP(config-router)#passive-interface g0/0
```

```
AVAX(config)#router ospf 10
AVAX(config-router)#router-id 6.6.6.6
AVAX(config-router)#net 10.5.4.0 0.0.0.3 area 0
AVAX(config-router)#net 10.5.5.0 0.0.0.3 area 0
AVAX(config-router)#net 10.44.55.0 0.0.0.3 area 0
AVAX(config-router)#
00:47:02: %OSPF-5-ADJCHG: Process 10, Nbr 5.5.5.5 on
Loading Done

AVAX(config-router)#net 192.55.44.0 0.0.0.255 area 0
AVAX(config-router)#passive-interface g0/0
```

   - Area 1: SOL.

```
SOL(config)#router ospf 10
SOL(config-router)#router-id 3.3.3.3
SOL(config-router)#net 10.4.4.0 0.0.0.3 area 1
SOL(config-router)#net 10.45.54.4 0.0.0.3 area 0
SOL(config-router)#net 192.54.45.0 0.0.0.255 area 1
SOL(config-router)#passive-int g0/0
```

   - Area 2: BTC dan ETH.

```
BTC(config)#router ospf 10
BTC(config-router)#router-id 1.1.1.1
BTC(config-router)#net 10.4.5.0 0.0.0.3 area 2
BTC(config-router)#net 10.45.45.4 0.0.0.3 area 2
BTC(config-router)#net 10.45.54.4 0.0.0.3 area 2
BTC(config-router)#net 192.45.45.0 0.0.0.255 area 2
BTC(config-router)#passive-interface g0/0
```

Ralat BTC:

```
no net 10.45.54.4 0.0.0.3 area 2
BTC(config-router)#no net 10.4.5.0 0.0.0.3 area 2
BTC(config-router)#net 10.45.54.4 0.0.0.3 area 0
BTC(config-router)#net 10.4.5.0 0.0.0.3 area 1

ETH(config)#router ospf 10
ETH(config-router)#router-id 2.2.2.2
ETH(config-router)#net 10.5.4.0 0.0.0.3 area 2
ETH(config-router)#net 10.45.45.4 0.0.0.3 area 2
ETH(config-router)#net 10.54.45.4 0.0.0.3 area 2
ETH(config-router)#net 192.45.54.0 0.0.0.255 area 2
ETH(config-router)#passive-interface g0/0
```

Ralat ETH:

```
ETH(config-router)#no net 10.5.4.0 0.0.0.3 area 2
ETH(config-router)#no net 10.54.45.4 0.0.0.3 area 2
ETH(config-router)#net 10.5.4.0 0.0.0.3 area 0
ETH(config-router)#net 10.54.45.4 0.0.0.3 area 3
```

- Area 3: ATOM.

```
ATOM(config)#router ospf 10
ATOM(config-router)#router-id 4.4.4.4
ATOM(config-router)#net 10.5.5.0 0.0.0.3 area 3
ATOM(config-router)#net 10.54.45.4 0.0.0.3 area 3
ATOM(config-router)#net 192.54.54.0 0.0.0.255 area 3
ATOM(config-router)#passive-interface g0/0
```

Ralat ATOM:

```
ATOM(config-router)#no net 10.5.5.0 0.0.0.3 area 3
ATOM(config-router)#net 10.5.5.0 0.0.0.3 area 0
```

8. Tes koneksi.

Last Status	Source	Destination
Successful	Jupiter	Chainlink
Successful	Uniswap	Celestia
Successful	Jupiter	Ordinals
Successful	Arbitrum	Uniswap
Successful	Arbitrum	Celestia

Setiap perangkat berhasil berkomunikasi meskipun memiliki area OSPF yang berbeda hal ini kareana telah ditetap kan router yang berfungsi sebagai ABR, dan memiliki tugas untuk menghubungkan router di area yang berbeda.

9. Perintah show ip ospf database.

```
BTC#sh ip ospf data
            OSPF Router with ID (1.1.1.1) (Process ID 10)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
2.2.2.2         2.2.2.2         1236        0x80000002 0x0091e6 2
6.6.6.6         6.6.6.6         1054        0x80000007 0x00bd0e 7
4.4.4.4         4.4.4.4         1051        0x80000002 0x001b4b 2
3.3.3.3         3.3.3.3         308         0x80000003 0x000174 2
1.1.1.1         1.1.1.1         99          0x80000002 0x00bdc6 2
5.5.5.5         5.5.5.5         99          0x80000008 0x007269 7

                Summary Net Link States (Area 0)
Link ID         ADV Router      Age         Seq#       Checksum
10.45.45.4      2.2.2.2         1236        0x80000001 0x0004ad
192.45.54.0     2.2.2.2         1236        0x80000002 0x001918
192.45.45.0     2.2.2.2         1236        0x80000003 0x00fdfa
10.54.45.4      2.2.2.2         1226        0x80000004 0x009114
192.54.54.0     2.2.2.2         1226        0x80000006 0x0027bc
10.54.45.4      4.4.4.4         1052        0x80000001 0x005b45

ETH#sh ip ospf data
            OSPF Router with ID (2.2.2.2) (Process ID 10)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
2.2.2.2         2.2.2.2         1256        0x80000002 0x0091e6 2
6.6.6.6         6.6.6.6         1072        0x80000007 0x00bd0e 7
4.4.4.4         4.4.4.4         1070        0x80000002 0x001b4b 2
3.3.3.3         3.3.3.3         322         0x80000003 0x000174 2
5.5.5.5         5.5.5.5         118         0x80000008 0x007269 7
1.1.1.1         1.1.1.1         114         0x80000002 0x00bdc6 2

                Summary Net Link States (Area 0)
Link ID         ADV Router      Age         Seq#       Checksum
10.45.45.4      2.2.2.2         1254        0x80000001 0x0004ad
192.45.54.0     2.2.2.2         1254        0x80000002 0x001918
192.45.45.0     2.2.2.2         1254        0x80000003 0x00fdfa
10.54.45.4      2.2.2.2         1244        0x80000004 0x009114
SOL#sh ip ospf data
            OSPF Router with ID (3.3.3.3) (Process ID 10)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
2.2.2.2         2.2.2.2         1271        0x80000002 0x0091e6 2
6.6.6.6         6.6.6.6         1089        0x80000007 0x00bd0e 7
4.4.4.4         4.4.4.4         1086        0x80000002 0x001b4b 2
3.3.3.3         3.3.3.3         343         0x80000003 0x000174 2
5.5.5.5         5.5.5.5         135         0x80000008 0x007269 7
1.1.1.1         1.1.1.1         131         0x80000002 0x00bdc6 2

                Summary Net Link States (Area 0)
Link ID         ADV Router      Age         Seq#       Checksum
10.45.45.4      2.2.2.2         1271        0x80000001 0x0004ad
192.45.54.0     2.2.2.2         1271        0x80000002 0x001918
192.45.45.0     2.2.2.2         1271        0x80000003 0x00fdfa
10.54.45.4      2.2.2.2         1261        0x80000004 0x009114
192.54.54.0     2.2.2.2         1261        0x80000006 0x0027bc
```

```
ATOM#sh ip os data
            OSPF Router with ID (4.4.4.4) (Process ID 10)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
2.2.2.2         2.2.2.2         1292        0x80000002 0x0091e6 2
4.4.4.4         4.4.4.4         1107        0x80000002 0x001b4b 2
6.6.6.6         6.6.6.6         1107        0x80000007 0x00bd0e 7
3.3.3.3         3.3.3.3         357         0x80000003 0x000174 2
5.5.5.5         5.5.5.5         153         0x80000008 0x007269 7
1.1.1.1         1.1.1.1         149         0x80000002 0x00bdc6 2

                Summary Net Link States (Area 0)
Link ID         ADV Router      Age         Seq#       Checksum
10.45.45.4      2.2.2.2         1289        0x80000001 0x0004ad
192.45.54.0     2.2.2.2         1289        0x80000002 0x001918
192.45.45.0     2.2.2.2         1289        0x80000003 0x00fdfa

ICP#sh ip os data
            OSPF Router with ID (5.5.5.5) (Process ID 10)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
2.2.2.2         2.2.2.2         1301        0x80000002 0x0091e6 2
6.6.6.6         6.6.6.6         1119        0x80000007 0x00bd0e 7
4.4.4.4         4.4.4.4         1116        0x80000002 0x001b4b 2
3.3.3.3         3.3.3.3         373         0x80000003 0x000174 2
5.5.5.5         5.5.5.5         164         0x80000008 0x007269 7
1.1.1.1         1.1.1.1         164         0x80000002 0x00bdc6 2

                Summary Net Link States (Area 0)
Link ID         ADV Router      Age         Seq#       Checksum
10.45.45.4      2.2.2.2         1301        0x80000001 0x0004ad
192.45.54.0     2.2.2.2         1301        0x80000002 0x001918
192.45.45.0     2.2.2.2         1301        0x80000003 0x00fdfa
10.54.45.4      2.2.2.2         1291        0x80000004 0x009114
AVAX#sh ip os data
            OSPF Router with ID (6.6.6.6) (Process ID 10)

                Router Link States (Area 0)

Link ID         ADV Router      Age         Seq#       Checksum Link count
2.2.2.2         2.2.2.2         1317        0x80000002 0x0091e6 2
6.6.6.6         6.6.6.6         1132        0x80000007 0x00bd0e 7
4.4.4.4         4.4.4.4         1132        0x80000002 0x001b4b 2
3.3.3.3         3.3.3.3         382         0x80000003 0x000174 2
5.5.5.5         5.5.5.5         178         0x80000008 0x007269 7
1.1.1.1         1.1.1.1         174         0x80000002 0x00bdc6 2

                Summary Net Link States (Area 0)
Link ID         ADV Router      Age         Seq#       Checksum
10.45.45.4      2.2.2.2         1314        0x80000001 0x0004ad
192.45.54.0     2.2.2.2         1314        0x80000002 0x001918
```

10. Hasil show ip ospf database berbeda untuk single area dan multi area. Hal ini disebabkan kareana pada multi area terdapat lebih dari 1 area, sehingga tabel database terbagi sesuai area masing-masing. Di tiap tabel database area terdapat semua summary dari jaringan-jaringan yang ada. Checksum digunakan untuk memastikan bahwa informasi yang dipertukarkan antar router tetap utuh. Link count menunjukkan seberapa kompleks suatu jaringan.

11. Kesimpulan:
    - OSPF digunakan untuk menghubungkan perangkat yang berada di jaringan berbeda dengan prinsip link-state.

- Terdapat dua jenis OSPF yaitu singlearea dan multiarea. Pada singlearea hanya terdapat 1 area (area backbone) dan biasanya disebut sebagai area 0. Semua router akan terhubung di dalam ara 0 ini. Sedangkan pada multiarea terdapat banyak area, namun area 0 harus digunakan sebagai araea backbone yang berfungsi untuk menghubungkan area-area lainnya.
- Digunakan router ABR (area border router) yang digunakan untuk menghubungkan area satu dengan lainnya. pada praktikum ini ABR adalah SOL, BTC, ETH, dan ATOM. Tanpa ABR, area tidak dapat saling terhubung sehingga koneksi gagal dibentuk.