

Vježba: LV8 - Konfiguracija protokola OSPF

Jan Šotić, David Rudar3.c

PRIPREMA

1. Koje su karakteristike protokola OSPF?

OSPF (Open Shortest Path First) usmjerivački protokol je otvoren, što znači da su njegove specifikacije javne. Definiran je RFC-om 2328 (OSPFv2). Koristi Dijkstra SPF algoritam za pronalaženje najkraćeg puta. Pripada grupi protokola stanja veza.

2. Što je Wildcard maska? Zamjenska maska je maska bitova koja označava koji dijelovi IP adrese su dostupni za ispitivanje.

Wildcard maska pobliže definira mrežu o kojoj se radi i predstavlja inverziju subnet maske. Primjer Mreža 172.16.1.4/28 ima subnet masku: 255.255.255.240 ili 11111111.11111111.11111111.11110000 Invertirana subnet maska je: 00000000.00000000.00000000.00001111 ili u dekadskom zapisu: 0.0.0.15

ZADATCI

1. U PT-u spoji uređaje prema zadanoj topologiji i izvrši temeljnu konfiguraciju usmjernika, koristeći tab CLI u Packet Traceru
2. Konfiguriraj sučelja na usmjernicima R1, R2 i R3, koristeći priloženu tablicu adresa i zabilješke s prethodnih vježbi, pri čemu voditi računa da su IP adrese izmijenjene.
- 3.

```
C:\>ping 192.168.10.10

Pinging 192.168.10.10 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.
```

Ne postoji, jer nismo konfigurirali OSPF između mreža.

4.

Pinganje je dostupno do serijskog porta rutera na kojeg je PC1 povezan (R1). Ne može se pingati dalje zato što usmjernik ne zna kako treba poslati paket.

```
C:\>ping 10.10.10.1

Pinging 10.10.10.1 with 32 bytes of data:

Reply from 10.10.10.1: bytes=32 time<lms TTL=255
Reply from 10.10.10.1: bytes=32 time<lms TTL=255
Reply from 10.10.10.1: bytes=32 time<lms TTL=255
Reply from 10.10.10.1: bytes=32 time<lms TTL=255

Ping statistics for 10.10.10.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 0ms, Average = 0ms
```

5.

```
Router#show ip route
Codes: C - connected, S - static, I - IGRP, 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

    10.0.0.0/28 is subnetted, 1 subnets
C       10.10.10.0 is directly connected, FastEthernet0/0
    172.16.0.0/30 is subnetted, 2 subnets
C       172.16.1.0 is directly connected, Serial2/0
C       172.16.1.4 is directly connected, Serial3/0
```

6.

```
R1> enable
```

```
R1# configure terminal
```

```
R1(config)# interface Serial2/0
```

```
R1(config-if)# ip address 172.16.1.1 255.255.255.252
```

```
R1(config-if)# no shutdown
```

```
R1(config-if)# exit
```

```
R1(config)# interface Serial3/0
```

```
R1(config-if)# ip address 172.16.1.5 255.255.255.252
```

```
R1(config-if)# no shutdown
```

R1(config-if)# exit

R1(config)# interface FastEthernet0/0

R1(config-if)# ip address 10.10.10.1 255.255.255.240

R1(config-if)# no shutdown

R1(config-if)# exit

R1(config)# router ospf 1

R1(config-router)# network 10.10.10.0 0.0.0.15 area 0

R1(config-router)# network 172.16.1.0 0.0.0.3 area 0

R1(config-router)# network 172.16.1.4 0.0.0.3 area 0

R1(config-router)# end

R1# copy running-config startup-config

R2> enable

R2# configure terminal

R2(config)# interface Serial2/0

R2(config-if)# ip address 172.16.1.2 255.255.255.252

R2(config-if)# no shutdown

R2(config-if)# exit

R2(config)# interface Serial3/0

R2(config-if)# ip address 172.16.1.9 255.255.255.252

R2(config-if)# no shutdown

R2(config-if)# exit

R2(config)# interface FastEthernet0/0

R2(config-if)# ip address 192.168.10.1 255.255.255.0

R2(config-if)# no shutdown

R2(config-if)# exit

```
R2(config)# router ospf 1
R2(config-router)# network 192.168.10.0 0.0.0.255 area 0
R2(config-router)# network 172.16.1.0 0.0.0.3 area 0
R2(config-router)# network 172.16.1.8 0.0.0.3 area 0
R2(config-router)# end
R2# copy running-config startup-config
```

```
R3> enable
```

```
R3# configure terminal
```

```
R3(config)# interface Serial2/0
R3(config-if)# ip address 172.16.1.6 255.255.255.252
R3(config-if)# no shutdown
R3(config-if)# exit
```

```
R3(config)# interface Serial3/0
R3(config-if)# ip address 172.16.1.10 255.255.255.252
R3(config-if)# no shutdown
R3(config-if)# exit
```

```
R3(config)# interface FastEthernet0/0
R3(config-if)# ip address 10.10.20.1 255.255.255.248
R3(config-if)# no shutdown
R3(config-if)# exit
```

```
R3(config)# router ospf 1
R3(config-router)# network 10.10.20.0 0.0.0.7 area 0
R3(config-router)# network 172.16.1.4 0.0.0.3 area 0
R3(config-router)# network 172.16.1.8 0.0.0.3 area 0
```

R3(config-router)# end

R3# copy running-config startup-config

7.

```
Router#show ip route
Codes: C - connected, S - static, I - IGRP, 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

```
10.0.0.0/28 is subnetted, 1 subnets
C    10.10.10.0 is directly connected, FastEthernet0/0
172.16.0.0/30 is subnetted, 3 subnets
C    172.16.1.0 is directly connected, Serial2/0
C    172.16.1.4 is directly connected, Serial3/0
O    172.16.1.8 [110/128] via 172.16.1.2, 00:04:11, Serial2/0
O    192.168.10.0/24 [110/65] via 172.16.1.2, 00:04:22, Serial2/0
```

```
Router#show ip route
Codes: C - connected, S - static, I - IGRP, 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

```
10.0.0.0/28 is subnetted, 1 subnets
O    10.10.10.0 [110/65] via 172.16.1.1, 00:36:53, Serial2/0
172.16.0.0/30 is subnetted, 3 subnets
C    172.16.1.0 is directly connected, Serial2/0
O    172.16.1.4 [110/128] via 172.16.1.1, 00:36:53, Serial2/0
C    172.16.1.8 is directly connected, Serial3/0
C    192.168.10.0/24 is directly connected, FastEthernet0/0
```

```
Router#
Router#show ip route
Codes: C - connected, S - static, I - IGRP, 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
O    10.10.10.0/28 [110/65] via 172.16.1.6, 00:37:17, Serial2/0
C    10.10.20.0/29 is directly connected, FastEthernet0/0
172.16.0.0/30 is subnetted, 3 subnets
O    172.16.1.0 [110/128] via 172.16.1.6, 00:37:17, Serial2/0
C    172.16.1.4 is directly connected, Serial2/0
C    172.16.1.8 is directly connected, Serial3/0
O    192.168.10.0/24 [110/129] via 172.16.1.6, 00:05:17, Serial2/0
```

8.

```
C:\>ping 192.168.10.10

Pinging 192.168.10.10 with 32 bytes of data:

Request timed out.
Reply from 192.168.10.10: bytes=32 time=6ms TTL=126
Reply from 192.168.10.10: bytes=32 time=13ms TTL=126
Reply from 192.168.10.10: bytes=32 time=10ms TTL=126

Ping statistics for 192.168.10.10:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 6ms, Maximum = 13ms, Average = 9ms
```

```
C:\>ping 10.10.20.2

Pinging 10.10.20.2 with 32 bytes of data:

Request timed out.
Reply from 10.10.20.2: bytes=32 time=14ms TTL=126
Reply from 10.10.20.2: bytes=32 time=11ms TTL=126
Reply from 10.10.20.2: bytes=32 time=14ms TTL=126

Ping statistics for 10.10.20.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 11ms, Maximum = 14ms, Average = 13ms
```