Лабораториска вежба бр. 8	**OSPF**		
Име и презиме	Индекс	Група	Датум
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01. Напишете ја пораката која ја добивате откако ќе конфигурирате OSPFv3 процес на некој рутер. Каков тип на адреса е ID-то на секој рутер и зошто?

```
R1#config t
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#router ospf 1
R1(config-router)#router-id
*Mar  1 00:02:06.819: %OSPF-4-NORTRID: OSPF process 1 cannot pick a router-id.
  Please configure manually or bring up an interface with an ip address.
R1(config-router)#router-id 192.168.30.1
R1(config-router)#exit
R1(config)#interface f1/0
R1(config-if)#ip address 192.168.30.1 255.255.255.252

% IP addresses may not be configured on L2 links.

R1(config-if)#no switchport
R1(config-if)#ip address 192.168.30.1 255.255.255.252
R1(config-if)#
*Mar  1 00:06:13.959: %LINEPROTO-5-UPDOWN: Line protocol on Interface Vlan1, changed state to down
R1(config-if)#
*Mar  1 00:06:15.975: %LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet1/0, changed state to up
R1(config-if)#no shutdown
R1(config-if)#ip ospf 1 area 10
R1(config-if)#exit
R1(config)#interface s0/0
R1(config-if)#ip address 192.168.30.5 255.255.255.252
R1(config-if)#no shutdown
R1(config-if)#ip ospf 1 area 10
R1(config-if)#
*Mar  1 00:07:40.039: %LINK-3-UPDOWN: Interface Serial0/0, changed state to up
R1(config-if)#
*Mar  1 00:07:41.043: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to up
R1(config-if)#exit
R1(config)#
*Mar  1 00:08:01.755: %LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to down
R1(config)#
```

ID-то е IPv4 адреса. Така бара OPSFv3 протоколот.

02. Дали се видливи статичките патеки?

Не.

03. Колку OSPFv3 патеки имаме во рутирачката табела? Кои букви стојат пред патеките додадени од OSPFv3 протоколот и кое е нивното значење? Напишете еден OSPFv3 запис од рутирачката табела.

```
R1#show ip route
Codes: 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
       i - IS-IS, su - IS-IS summary, 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

     192.168.30.0/30 is subnetted, 5 subnets
O IA    192.168.30.16 [110/193] via 192.168.30.6, 00:03:04, Serial0/0
C       192.168.30.4 is directly connected, Serial0/0
C       192.168.30.0 is directly connected, FastEthernet1/0
O IA    192.168.30.12 [110/192] via 192.168.30.6, 00:05:12, Serial0/0
O IA    192.168.30.8 [110/128] via 192.168.30.6, 00:10:22, Serial0/0
R1#
```

Во рутирачката табела на R1 има 3 OSPF записи.
OSPF записите се идентификувани според буквата O пред нив и го содржат следниот скок во патеката кон дестинациската IP адреса.

04. Дали информациите за мрежата на Gigabit интерфејсот на R1(лево) ги добиваме од локална/интра област (area 10 или area 0) или ни се дадени од некоја друга оддалечена/интер област? Преку кој интерфејс можеме да ја пристапиме таа мрежа и каков тип на адреса е наведена како next hop адреса? Искористете ја командата за прикажување на OSPF соседите кај R2.

```
R2#show ip route
Codes: 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
       i - IS-IS, su - IS-IS summary, 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

     192.168.30.0/30 is subnetted, 5 subnets
O IA    192.168.30.16 [110/129] via 192.168.30.10, 00:05:48, Serial0/1
C       192.168.30.4 is directly connected, Serial0/0
O       192.168.30.0 [110/65] via 192.168.30.5, 00:13:06, Serial0/0
O IA    192.168.30.12 [110/128] via 192.168.30.10, 00:07:56, Serial0/1
C       192.168.30.8 is directly connected, Serial0/1
R2#show ip ospf neighbor

Neighbor ID     Pri   State           Dead Time   Address         Interface
192.168.30.3      0   FULL/  -        00:00:31    192.168.30.10   Serial0/1
192.168.30.1      0   FULL/  -        00:00:34    192.168.30.5    Serial0/0
R2#
```

Информациите се добиваат од интра област Area 10.
Мрежата се пристапува низ интерфејсот S0/0 на рутерот R1. Дадена е IPv4 адреса.

05. Колку OSPF соседи има наведено за овој рутер? Напишете ги адресите кои се наведени како Neighbor ID и кажете од каков тип се тие?

```
R1#show ip ospf neighbor

Neighbor ID     Pri   State           Dead Time   Address         Interface
192.168.30.2      0   FULL/  -        00:00:31    192.168.30.6    Serial0/0
R1#
```

```
R2#show ip ospf neighbor

Neighbor ID     Pri   State           Dead Time   Address         Interface
192.168.30.3      0   FULL/  -        00:00:34    192.168.30.10   Serial0/1
192.168.30.1      0   FULL/  -        00:00:37    192.168.30.5    Serial0/0
R2#
```

```
R3#show ip ospf neighbor

Neighbor ID     Pri   State           Dead Time   Address         Interface
192.168.30.2      0   FULL/  -        00:00:32    192.168.30.9    Serial0/0
192.168.30.4      0   FULL/  -        00:00:31    192.168.30.14   Serial0/1
R3#
```

```
R4#show ip ospf neighbor

Neighbor ID     Pri   State           Dead Time   Address         Interface
192.168.30.3      0   FULL/  -        00:00:36    192.168.30.13   Serial0/0
R4#
```

06. Проверете кои протоколи се во работа кај R2 со помош на show ip protocols

```
R2#show ip protocols
Routing Protocol is "ospf 1"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 192.168.30.2
  It is an area border router
  Number of areas in this router is 2. 2 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
  Routing on Interfaces Configured Explicitly (Area 0):
    Serial0/1
  Routing on Interfaces Configured Explicitly (Area 10):
    Serial0/0
 Reference bandwidth unit is 100 mbps
  Routing Information Sources:
    Gateway         Distance      Last Update
    192.168.30.3         110      00:13:10
    192.168.30.1         110      00:20:28
  Distance: (default is 110)

R2#
```

07. Отворете ја рутирачката табела и видете дали има некакви промени, односно дали е додадена патека до оваа мрежа? Напишете го тој запис од рутирачката табела.

```
R1#show ip route
Codes: 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
       i - IS-IS, su - IS-IS summary, 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

     192.168.30.0/30 is subnetted, 5 subnets
O IA    192.168.30.16 [110/193] via 192.168.30.6, 00:21:02, Serial0/0
C       192.168.30.4 is directly connected, Serial0/0
C       192.168.30.0 is directly connected, FastEthernet1/0
O IA    192.168.30.12 [110/192] via 192.168.30.6, 00:23:10, Serial0/0
O IA    192.168.30.8 [110/128] via 192.168.30.6, 00:28:20, Serial0/0
O IA 192.168.20.0/24 [110/65] via 192.168.30.6, 00:02:30, Serial0/0
R1#
```

Новата мрежа е 192.168.20.0 која се покажува во рутирачката табела на рутерот R1.

08. Направете го тоа за R3 и напишете од кои рутери добива пораки?

```
R3#debug ip ospf events
OSPF events debugging is on
R3#
*Mar  1 00:50:58.623: OSPF: Send hello to 224.0.0.5 area 0 on Serial0/0 from 192.168.30.10
R3#
*Mar  1 00:51:01.411: OSPF: Rcv hello from 192.168.30.4 area 20 from Serial0/1 192.168.30.14
*Mar  1 00:51:01.411: OSPF: End of hello processing
*Mar  1 00:51:01.487: OSPF: Send hello to 224.0.0.5 area 20 on Serial0/1 from 192.168.30.13
*Mar  1 00:51:02.259: OSPF: Rcv hello from 192.168.30.2 area 0 from Serial0/0 192.168.30.9
*Mar  1 00:51:02.259: OSPF: End of hello processing
R3#
*Mar  1 00:51:08.623: OSPF: Send hello to 224.0.0.5 area 0 on Serial0/0 from 192.168.30.10
R3#
*Mar  1 00:51:11.415: OSPF: Rcv hello from 192.168.30.4 area 20 from Serial0/1 192.168.30.14
*Mar  1 00:51:11.415: OSPF: End of hello processing
*Mar  1 00:51:11.487: OSPF: Send hello to 224.0.0.5 area 20 on Serial0/1 from 192.168.30.13
*Mar  1 00:51:12.247: OSPF: Rcv hello from 192.168.30.2 area 0 from Serial0/0 192.168.30.9
*Mar  1 00:51:12.247: OSPF: End of hello processing
R3#
```

```
H1> ping 192.168.30.18
84 bytes from 192.168.30.18 icmp_seq=1 ttl=60 time=167.699 ms
84 bytes from 192.168.30.18 icmp_seq=2 ttl=60 time=166.657 ms
84 bytes from 192.168.30.18 icmp_seq=3 ttl=60 time=166.645 ms
84 bytes from 192.168.30.18 icmp_seq=4 ttl=60 time=166.975 ms
84 bytes from 192.168.30.18 icmp_seq=5 ttl=60 time=165.926 ms
```

```
H2> ping 192.168.30.2
84 bytes from 192.168.30.2 icmp_seq=1 ttl=60 time=166.245 ms
84 bytes from 192.168.30.2 icmp_seq=2 ttl=60 time=166.883 ms
84 bytes from 192.168.30.2 icmp_seq=3 ttl=60 time=167.797 ms
84 bytes from 192.168.30.2 icmp_seq=4 ttl=60 time=166.525 ms
84 bytes from 192.168.30.2 icmp_seq=5 ttl=60 time=151.559 ms

H2>
```