Žilinská univerzita v Žiline
Fakulta riadenia a informatiky

Projektovanie sietí 1

Draft Rosen

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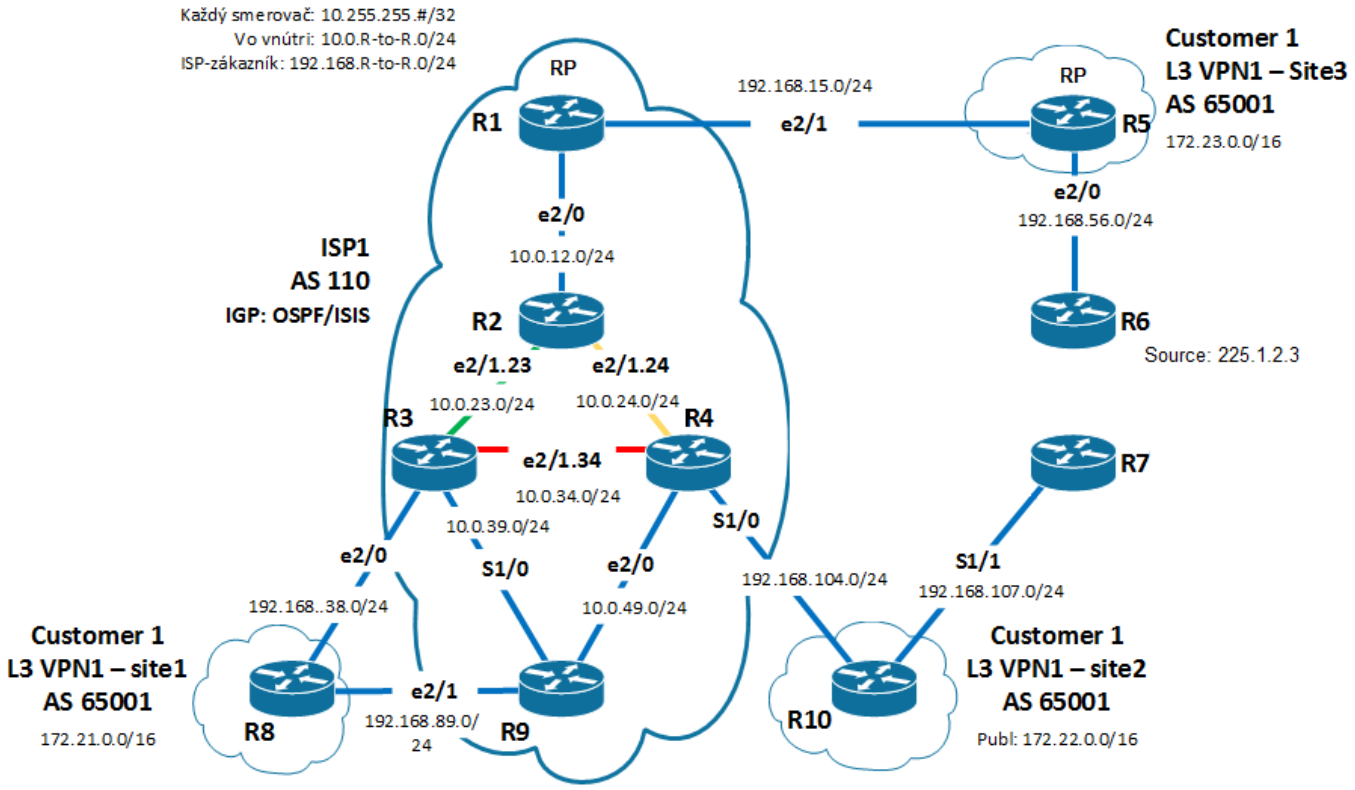
2. Topológia


Každý smerovač: 10.255.255.#/32
Vo vnútri: 10.0.R-to-R.0/24
ISP-zákazník: 192.168.R-to-R.0/24
RP
R1
192.168.15.0/24
e2/1
RP
R5
Customer 1
L3 VPN1 – Site3
AS 65001
172.23.0.0/16
e2/0
192.168.56.0/24
R6
Source: 225.1.2.3
e2/0
10.0.12.0/24
ISP1
AS 110
IGP: OSPF/ISIS
R2
e2/1.23
e2/1.24
10.0.23.0/24
10.0.24.0/24
R3
R4
e2/1.34
10.0.34.0/24
R7
10.0.39.0/24
S1/0
e2/0
S1/0
e2/0
192.168.104.0/24
S1/1
192.168.107.0/24
192.168..38.0/24
10.0.49.0/24
Customer 1
L3 VPN1 – site1
AS 65001
172.21.0.0/16
R8
e2/1
192.168.89.0/
24
R9
R10
Customer 1
L3 VPN1 – site2
AS 65001
Publ: 172.22.0.0/16

3. Adresovanie

Router	Interface	IP+Maska
R1	Lo0	10.255.255.1/32
	Fa0/0	10.0.12.1/24
	Fa0/1	192.168.15.1/24
R2	Lo0	10.255.255.2/32
	Fa0/0	10.0.12.2/24
	Fa0/1.23	10.0.23.2/24
	Fa0/1.24	10.0.24.2/24
R3	Lo0	10.110.255.3/32
	Fa0/0	192.168.38.1/24
	S1/0	10.0.39.1/24
	Fa0/1.23	10.0.23.3/24
	Fa0/1.34	10.0.34.3/24
R4	Lo0	10.110.255.4/30
	Fa0/0	10.0.49.1/24
	Fa0/1.24	10.0.24.4/24
	Fa0/1.34	10.0.34.4/24
	S1/0	192.168.104.1/24
R5	Lo0	10.255.255.5/32
	Lo1	172.23.1.1/32
	Fa0/0	192.168.15.5/24
	Fa0/1	192.168.56.5/24
R6	Fa0/0	172.23.56.2/24
R7	S1/1	172.22.107.7/24
R8	Lo1	172.21.1.1/32
	Lo2	172.21.2.1/32
	Fa0/0	192.168.38.2/24
	Fa0/1	192.168.89.1/24
R9	Lo0	10.255.255.9/32
	S1/0	10.0.39.2/24
	Fa0/0	10.0.49.2/24
	Fa0/1	192.168.89.2/24

R10	Lo0	10.255.255.10/32
	S1/0	192.168.104.2/24
	S1/1	192.168.107.10/24

4. Vypracovanie

V tomto cvičení sme vychádzali z pôvodnej konfigurácie, ktorú sme použili na MPLS, len z drobnými zmenami. Rozdiel bol v tom, že medzi routrami R8-R9 a routrami R6-R7. Router R5 bol zdrojom vysielania a routre R8 a R7 predstavovali zákazníkov
Router R1 sme zvolili ako RP a BSR router.

Konfigurácia R1:

```
ip multicast-routing
int fa0/0
ip pim sparse-mode
int lo0
ip pim sparse-mode
ip pim bsr-candidate loopback0
ip pim rp-candidate lo0
ip multicast-routing vrf Z1
```

Na všetkých routroch okrem R6,R7,R8 sme spustili ip multicast-routing a na rozhraniach týchto routrov sme spustili sparse-mode.

```
ip multicast-routing
```

sparse-mode konfigurácia napr. na R9:

```
int s1/0
ip pim sparse-mode
exit
int fa0/0
ip pim sparse-mode
exit
int lo0
ip pim sparse-mode
```

Výpis pim rozhraní na R1:

```
R1#sh ip pim int

Address          Interface                Ver/   Nbr    Query  DR     DR
                                          Mode   Count  Intvl  Prior
10.255.255.1     Loopback0                v2/S   0      30     1      10.255.255.1
10.0.12.1        FastEthernet0/0          v2/S   0      30     1      10.0.12.1
```

Ďalej sme na routroch R1,R3,R4,R9 zapli vrf multicast.

Konfigurácia:

```
vrf definition Z1
address-family ipv4
mdt default 239.1.1.1
```

Po tomto kroku sme podobne ako R1 nastavili R5 ako BR a BSR.

```
ip pim bsr-candidate lo0
ip pim rp-candidate lo0
```

konfigurácia multicastov pre VRF na všetkých routroch v AS110:

```
ip multicast-routing vrf Z1
```

Výpis pim rp mappings na R10:

```
R10#sh ip pim rp map
PIM Group-to-RP Mappings

Group(s) 224.0.0.0/4
  RP 172.23.1.1(?), v2
    Info source: 172.23.1.1 (?), via bootstrap, priority 0, holdtime 150
         Uptime: 01:22:25, expires: 00:01:55
```

Na routri R6 sme museli nastaviť ešte defaultnú cestu:

```
ip router 0.0.0.0 172.22.107.10
```

Na routroch R7 a R8 sme zadali príkazy pre prihlásenie na odber z IGMP skupiny. Prihlásenie do skupiny sa zadávalo cez do rozhraní na routroch.

R7:

```
int s1/1
ip igmp join-group 225.1.2.3
```

R8:

```
int fa0/0
ip igmp join-group 225.1.2.3
```

Overenie sh ip igmp group na routri R10:

```
R10#sh ip igmp group
IGMP Connected Group Membership
Group Address    Interface                Uptime    Expires   Last Reporter
Group Accounted
225.1.2.3        Serial1/1                01:07:45  00:02:11  172.22.107.7
224.0.1.40       Serial1/1                01:08:28  00:02:14  172.22.107.10
```