Internet Peering

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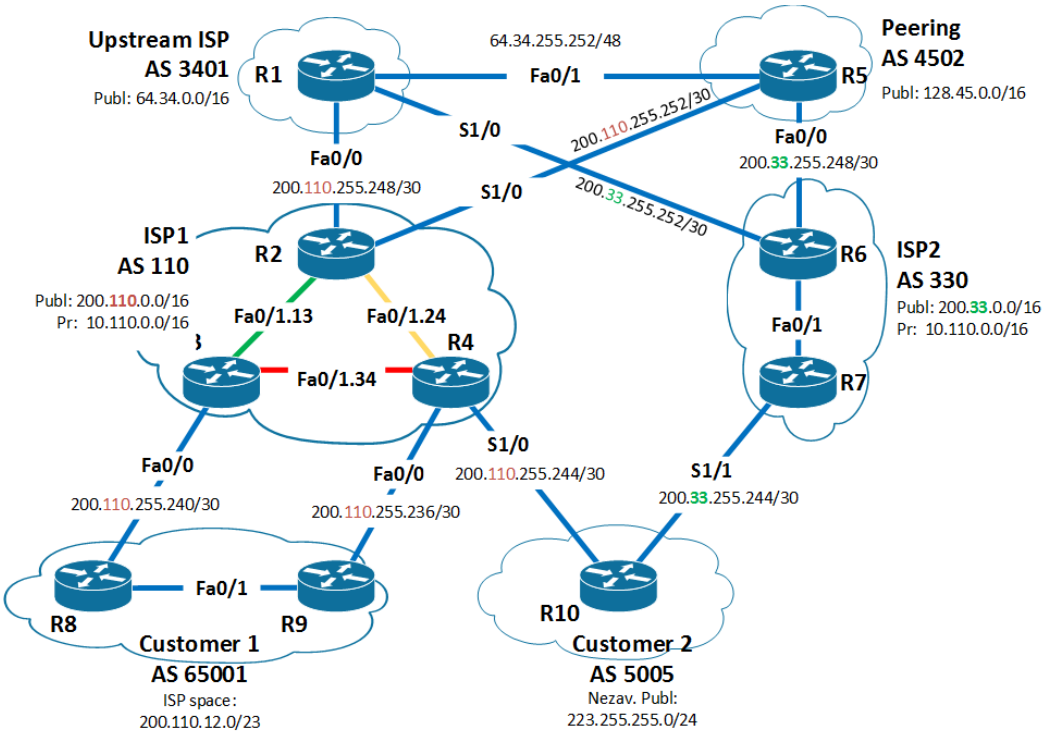
Obsah

1.1 Topológia

Budeme konfigurovať smerovacie protokoly BGP a IS-IS na topológií, ktorá je znázornená na obrázku 1. Vrámci autonómnych systémov sme konfigurovali smerovacie protokoly IS-IS a BGP (iBGP). Medzi autonómnymi systémami sme konfigurovali len BGP (eBGP). IP adresácia je uvedená v tabuľke 1 a dopĺňa grafické znázornenie topológie na obrázku 1. Sieť medzi smerovačmi R1 a R5 nemá mať masku "/48" ale "/30".



Obr. 1: Topológia BGP

Tabuľka 1: IP adresácia

Smerovač	Rozhranie	IP adresa	Maska
R1	Fa0/0	200.110.255.249	255.255.255.252
	Fa0/1	64.34.255.253	255.255.255.252
	S1/0	200.33.255.253	255.255.255.252
	Lo0	10.255.255.1	255.255.255.0
	Lo1	64.34.1.1	255.255.255.128
R2	Fa0/0	200.110.255.250	255.255.255.252
	Fa0/1.23	10.110.23.2	255.255.255.0
	Fa0/1.24	10.110.24.2	255.255.255.0
	S1/0	200.110.255.253	255.255.255.252
	Lo0	10.255.255.2	255.255.255.0
	Lo1	200.110.0.2	255.255.255.128
R3	Fa0/0	200.110.255.241	255.255.255.252
	Fa0/1.23	10.110.23.3	255.255.255.0
	Fa0/1.34	10.110.34.3	255.255.255.0
	Lo0	10.255.255.3	255.255.255.0
	Lo1	200.110.0.133	255.255.255.128
R4	Fa0/0	200.110.255.237	255.255.255.252
	Fa0/1.24	10.110.24.4	255.255.255.0
	Fa0/1.34	10.110.34.4	255.255.255.0
	S1/0	200.110.255.245	255.255.255.252
	Lo0	10.255.255.4	255.255.255.0
	Lo1	200.110.1.4	255.255.255.128
R5	Fa0/0	200.33.255.249	255.255.255.252
	Fa0/1	10.100.15.2	255.255.255.252
	S1/0	200.110.255.254	255.255.255.252
	Lo0	10.255.255.5	255.255.255.0
	Lo1	128.45.5.5	255.255.255.128
R6	Fa0/0	200.33.255.250	255.255.255.252
	Fa0/1	10.110.67.6	255.255.255.0
	S1/0	200.33.255.254	255.255.255.252
	Lo0	10.255.255.6	255.255.255.0
	Lo1	200.33.6.6	255.255.255.128
R7	Fa0/1	10.110.67.7	255.255.255.0
	S1/1	200.33.255.245	255.255.255.252
	Lo0	10.255.255.7	255.255.255.0
	Lo1	200.33.7.7	255.255.255.128
R8	Fa0/0	200.110.255.242	255.255.255.252
	Fa0/1	10.110.89.8	255.255.255.0
	Lo0	10.255.255.8	255.255.255.0
	Lo1	200.110.12.8	255.255.255.128
R9	Fa0/0	200.110.255.238	255.255.255.252
	Fa0/1	10.110.89.9	255.255.255.0
	Lo0	10.255.255.9	255.255.255.0
	Lo1	200.110.13.9	255.255.255.128
R10	S1/0	200.110.255.246	255.255.255.252
	S1/1	200.33.255.246	255.255.255.252
	Lo0	10.255.255.10	255.255.255.0
	Lo1	223.255.255.10	255.255.255.128

1.2 Úlohy

1.2.1 Použiť IGP IS−IS (L2 only) single area dizajn, priame p2p prepojenia

1.2.2 Zabezpečiť plnú konektivitu prostredníctvom iBGP alebo eBGP protokolov pre zákaznícké a internetové smerovacie záznamy

1.2.3 Distribúcia internetových statických smerovacích záznamov z AS3401, AS4502 a zákaznických smerovacích záznamov z AS65001, AS5005, AS330

1.2.4 Prepísať privátne AS65001 − DOROBIŤ!!!

1.2.5 Sumarizácia

Popis

Dohodli sme sa, že vnútri autonómneho systému budeme používať iba smerovací protokol IS-IS. Medzi autonómnymi systémami používame smerovací protokol BGP. Subrozhranie ".13" a VLAN 13 sme premenovali na ".23" a VLAN 23, lebo sieť je medzi smerovačmi R2 a R3 (23), a nie medzi R1 a R3 (13).

predtym boli linky medzi providermi sirene aj cez ISIS -¿ toto bolo odstranene; interfejsy boli odstranene z ISIS

inerne siete v ramci AS: "neighbor (lebo je to nas sused)", "update-source (aby BGP nenadaval na iny interface, ktorym to sirime)". Pokial bolo v AS viac ako dva smerovače, este sme pridali príkaz "next-hop-self". Router ID sme najprv nenastavovali, ale potom sa nam to vypomstilo, lebo po pridani loopbacku1 sa router ID nastavil prave nan, lebo mal vacsiu IPcku. Po zmene Router ID prikazom "bgp router-id 10.255.255.X" (X symbolizuje cislo smerovača) spôsobí rozpad BGP spojenia, ktoré sa po chvíli (rádovo v desiatkach sekúnd) obnoví.

pridane loopback100 interfejsy s verejnymi rozsahmi a /25 maskami.

V trojuholniku sme adresy loopback100 interfejsov sumarizovali a sirili "network" prikazom v BGP.

11001000.01101110.00000000.00000010 (200.110.0.2)
11001000.01101110.00000000.10000101 (200.110.0.133)
11001000.01101110.00000001.00000100 (200.110.1.4)

sumárne:
200.110.0.0/23

```
int <nazov_interfaceu>
  no ip router isis
router isis
  no passive-interface <nazov_interfaceu>
  no redistribute-connected
```

Privatne siete operatorov ohlasujeme prikazom “network”.

Konfigurácia

```
R1
ena
conf t
hostname R1
no ip domain-lookup
username admin privil 15 secret admin
line con 0
  login local
  logging syn
  exec-time 120
line vty 0 15
  privilege level 15
  no login
int f0/0
  ip addr 200.110.255.249 255.255.255.252
  no shut
int f0/1
  ip addr 64.34.255.253 255.255.255.252
  no shut
int s1/0
  ip addr 200.33.255.253 255.255.255.252
  no shut
int lo0
  ip addr 10.255.255.1 255.255.255.255
  no shut
int lo1
  ip addr 64.34.1.1 255.255.255.0
  no shut
router bgp 3401
  bgp router-id 10.255.255.1
  neighbor 64.34.255.254 remote-as 4502
  neighbor 200.33.255.254 remote-as 330
  neighbor 200.110.255.250 remote-as 110
  network 10.255.255.1 mask 255.255.255.255
  network 64.34.1.0 mask 255.255.255.0
  aggregate-address 64.34.0.0 255.255.0.0 summary-only
  no auto-summary
  no sync
  bgp log-neighbor-changes
```

```
R2
ena
conf t
hostname R2
no ip domain-lookup
username admin privil 15 secret admin
line con 0
  login local
  logging syn
  exec-time 120
line vty 0 15
  privilege level 15
  no login
int f0/0
  ip addr 200.110.255.250 255.255.255.252
  no shut
int f0/1
  no ip add
  isis network point-to-point
  no sh
int f0/1.23
  encap dot1q 23
  ip addr 10.110.23.2 255.255.255.0
  ip router isis
int f0/1.24
  encap dot1q 24
  ip addr 10.110.24.2 255.255.255.0
  ip router isis
int s1/0
  ip addr 200.110.255.253 255.255.255.252
  no shut
int lo0
  ip addr 10.255.255.2 255.255.255.255
  ip router isis
  no shut
int lo1
  ip addr 200.110.0.2 255.255.255.128
  ip router isis
  no shut
router isis
  net 49.0001.0102.5525.5002.00
  passive-interface lo0
  passive-interface lo1
  redistribute static
  is-type level-2
  metric-style wide
  exit
router bgp 110
  bgp router-id 10.255.255.2
```

```
  neighbor 10.255.255.3 remote-as 110
  neighbor 10.255.255.3 update-source lo0
  neighbor 10.255.255.3 next-hop-self
  neighbor 10.255.255.4 remote-as 110
  neighbor 10.255.255.4 update-source lo0
  neighbor 10.255.255.4 next-hop-self
  neighbor 200.110.255.249 remote-as 3401
  neighbor 200.110.255.254 remote-as 4502
  network 10.255.255.2 mask 255.255.255.255
  network 200.110.0.0 mask 255.255.255.128
  aggregate-address 200.110.0.0 255.255.0.0 summary-only
  no auto-summary
  no sync
  bgp log-neighbor-changes



R3
ena
conf t
hostname R3
no ip domain-lookup
username admin privil 15 secret admin
line con 0
  login local
  logging syn
  exec-time 120
line vty 0 15
  privilege level 15
  no login
int f0/0
  ip addr 200.110.255.241 255.255.255.252
  no shut
int f0/1
  no ip addr
  isis network point-to-point
  no shut
int f0/1.23
  encap dot1q 23
  ip addr 10.110.23.3 255.255.255.0
  ip router isis
int f0/1.34
  encap dot1q 34
  ip addr 10.110.34.3 255.255.255.0
  ip router isis
int lo0
  ip addr 10.255.255.3 255.255.255.255
  ip router isis
  no shut
int lo1
  ip addr 200.110.0.133 255.255.255.128
```

```
  ip router isis
  no shut
router isis
  net 49.0001.0102.5525.5003.00
  passive-interface lo0
  passive-interface lo1
  redistribute static
  is-type level-2
  metric-style wide
  exit
router bgp 110
  bgp router-id 10.255.255.3
  neighbor 10.255.255.2 remote-as 110
  neighbor 10.255.255.2 update-source lo0
  neighbor 10.255.255.2 next-hop-self
  neighbor 10.255.255.4 remote-as 110
  neighbor 10.255.255.4 update-source lo0
  neighbor 10.255.255.4 next-hop-self
  neighbor 200.110.255.242 remote-as 65001
  network 10.255.255.3 mask 255.255.255.255
  network 200.110.0.128 mask 255.255.255.128
  no auto-summary
  no sync
  bgp log-neighbor-changes
```

```
R4
ena
conf t
hostname R4
no ip domain-lookup
username admin privil 15 secret admin
line con 0
  login local
  logging syn
  exec-time 120
line vty 0 15
  privilege level 15
  no login
int f0/0
  ip addr 200.110.255.237 255.255.255.252
  no shut
int f0/1
  no ip addr
  isis network point-to-point
  no sh
int f0/1.24
  encap dot1q 24
  ip addr 10.110.24.4 255.255.255.0
```

```
  ip router isis
int f0/1.34
  encap dot1q 34
  ip addr 10.110.34.4 255.255.255.0
  ip router isis
int s1/0
  ip addr 200.110.255.245 255.255.255.252
  no shut
int lo0
  ip addr 10.255.255.4 255.255.255.255
  ip router isis
  no shut
int lo1
  ip addr 200.110.1.0 255.255.255.128
  ip router isis
  no shut
router isis
  net 49.0001.0102.5525.5004.00
  passive-interface lo0
  passive-interface lo1
  redistribute static
  is-type level-2
  metric-style wide
  exit
router bgp 110
  bgp router-id 10.255.255.4
  neighbor 10.255.255.2 remote-as 110
  neighbor 10.255.255.2 update-source lo0
  neighbor 10.255.255.2 next-hop-self
  neighbor 10.255.255.3 remote-as 110
  neighbor 10.255.255.3 update-source lo0
  neighbor 10.255.255.3 next-hop-self
  neighbor 200.110.255.238 remote-as 65001
  neighbor 200.110.255.246 remote-as 5005
  network 10.255.255.4 mask 255.255.255.255
  network 200.110.1.0 mask 255.255.255.128
  no auto-summary
  no sync
  bgp log-neighbor-changes


R5
ena
conf t
hostname R5
no ip domain-lookup
username admin privil 15 secret admin
line con 0
  login local
  logging syn
  exec-time 120
```

```
line vty 0 15
  privilege level 15
  no login
int f0/0
  ip addr 200.33.255.249 255.255.255.252
  no shut
int f0/1
  ip addr 64.34.255.254 255.255.255.252
  no shut
int s1/0
  ip addr 200.110.255.254 255.255.255.252
  no shut
int lo0
  ip addr 10.255.255.5 255.255.255.255
  no shut
int lo1
  ip addr 128.45.5.5 255.255.255.128
  no shut
router bgp 4502
  bgp router-id 10.255.255.5
  neighbor 200.33.255.250 remote-as 330
  neighbor 200.110.255.253 remote-as 110
  neighbor 64.34.255.253 remote-as 3401
  network 10.255.255.5 mask 255.255.255.255
  network 128.45.5.0 mask 255.255.255.128
  aggregate-address 128.45.0.0 255.255.0.0 summary-only
  no auto-summary
  no sync
  bgp log-neighbor-changes
```

```
R6
ena
conf t
hostname R6
no ip domain-lookup
username admin privil 15 secret admin
line con 0
  login local
  logging syn
  exec-time 120
line vty 0 15
  privilege level 15
  no login
int f0/0
  ip addr 200.33.255.250 255.255.255.252
  no shut
int f0/1
  ip addr 10.110.67.6 255.255.255.0
```

```
  ip router isis
  isis network point-to-point
  no shut
int s1/0
  ip addr 200.33.255.254 255.255.255.252
  no shut
int lo0
  ip addr 10.255.255.6 255.255.255.255
  ip router isis
  no shut
int lo1
  ip add 200.33.6.6 255.255.255.128
  ip router isis
router isis
  net 49.0001.0102.5525.5006.00
  passive-interface lo0
  passive-interface lo1
  redistribute static
  is-type level-2
  metric-style wide
  exit
router bgp 330
  bgp router-id 10.255.255.6
  neighbor 10.255.255.7 remote-as 330
  neighbor 10.255.255.7 update-source lo0
  neighbor 10.255.255.7 next-hop-self
  neighbor 200.33.255.253 remote-as 3401
  neighbor 200.33.255.249 remote-as 4502
  network 10.255.255.6 mask 255.255.255.255
  network 200.33.6.0 mask 255.255.255.128
  aggregate-address 200.33.0.0 255.255.0.0 summary-only
  no auto-summary
  no sync
  bgp log-neighbor-changes



R7
ena
conf t
hostname R7
no ip domain-lookup
username admin privil 15 secret admin
line con 0
  login local
  logging syn
  exec-time 120
line vty 0 15
  privilege level 15
  no login
int f0/1
```

```
  ip addr 10.110.67.7 255.255.255.0
  ip router isis
  isis network point-to-point
  no shut
int s1/1
  ip addr 200.33.255.245 255.255.255.252
  no shut
int lo0
  ip addr 10.255.255.7 255.255.255.255
  ip router isis
  no shut
int lo1
  ip addr 200.33.7.7 255.255.255.128
  ip router isis
  no shut
router isis
  net 49.0001.0102.5525.5007.00
  passive-interface lo0
  passive-interface lo1
  redistribute static
  is-type level-2
  metric-style wide
  exit
router bgp 330
  bgp router-id 10.255.255.7
  neighbor 10.255.255.6 remote-as 330
  neighbor 10.255.255.6 update-source lo0
  neighbor 10.255.255.6 next-hop-self
  neighbor 200.33.255.246 remote-as 5005
  network 10.255.255.7 mask 255.255.255.255
  network 200.33.7.0 255.255.255.128
  aggregate-address 200.33.0.0 255.255.0.0 summary-only
  no auto-summary
  no sync
  bgp log-neighbor-changes
```

```
R8
ena
conf t
hostname R8
no ip domain-lookup
username admin privil 15 secret admin
line con 0
  login local
  logging syn
  exec-time 120
line vty 0 15
  privilege level 15
```

```
  no login
int f0/0
  ip addr 200.110.255.242 255.255.255.252
  no shut
int f0/1
  ip addr 10.110.89.8 255.255.255.0
  ip router isis
  isis network point-to-point
  no shut
int lo0
  ip addr 10.255.255.8 255.255.255.255
  ip router isis
  no shut
int lo1
  ip add 200.110.12.8 255.255.255.128
  ip router isis
router isis
  net 49.0001.0102.5525.5008.00
  passive-interface lo0
  passive-interface lo1
  redistribute static
  is-type level-2
  metric-style wide
  exit
router bgp 65001
  bgp router-id 10.255.255.8
  neighbor 10.255.255.9 remote-as 65001
  neighbor 10.255.255.9 update-source lo0
  neighbor 200.110.255.241 remote-as 110
  network 10.255.255.8 mask 255.255.255.255
  network 200.110.12.0 mask 255.255.255.128
  aggregate-address 200.110.12.0 255.255.254.0 summary-only
  no auto-summary
  no sync
  bgp log-neighbor-changes
```

```
R9
ena
conf t
hostname R9
no ip domain-lookup
username admin privil 15 secret admin
line con 0
  login local
  logging syn
  exec-time 120
line vty 0 15
```

```
  privilege level 15
  no login
int f0/0
  ip addr 200.110.255.238 255.255.255.252
  no sh
int f0/1
  ip addr 10.110.89.9 255.255.255.0
  ip router isis
  isis network point-to-point
  no shut
int lo0
  ip addr 10.255.255.9 255.255.255.255
  ip router isis
  no shut
int lo1
  ip addr 200.110.13.9 255.255.255.128
  ip router isis
  no shut
router isis
  net 49.0001.0102.5525.5009.00
  passive-interface lo0
  passive-interface lo1
  redistribute static
  is-type level-2
  metric-style wide
  exit
router bgp 65001
  bgp router-id 10.255.255.9
  neighbor 10.255.255.8 remote-as 65001
  neighbor 10.255.255.8 update-source lo0
  neighbor 200.110.255.237 remote-as 110
  network 10.255.255.9 mask 255.255.255.255
  network 200.110.13.0 mask 255.255.255.128
  aggregate-address 200.110.12.0 255.255.254.0 summary-only
  no auto-summary
  no sync
  bgp log-neighbor-changes
```

```
R10
ena
conf t
hostname R10
no ip domain-lookup
username admin privil 15 secret admin
line con 0
  login local
  logging syn
  exec-time 120
```

```
line vty 0 15
  privilege level 15
  no login
int s1/0
  ip addr 200.110.255.246 255.255.255.252
  no shut
int s1/1
  ip addr 200.33.255.246 255.255.255.252
  no shut
int lo0
  ip addr 10.255.255.10 255.255.255.255
  no shut
int lo1
  ip addr 223.255.255.10 255.255.255.128
  no shut
router bgp 5005
  bgp router-id 10.255.255.10
  neighbor 200.110.255.245 remote-as 110
  neighbor 200.33.255.245 remote-as 330
  network 10.255.255.10 mask 255.255.255.255
  network 223.255.255.0 mask 255.255.255.128
  aggregate-address 223.255.255.0 255.255.255.0 summary-only
  no auto-summary
  no sync
  bgp log-neighbor-changes
```

Overenie

Kontrola, ze vnutorny smerovaci protokol ISIS neohlasuje ziadne siete medzi providermi.

Najprv sme ich ohlasovali cez IS-IS ...

```
R1#sh ip bgp
BGP table version is 23, local router ID is 64.34.1.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - interna
              r RIB-failure, S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete

   Network          Next Hop            Metric LocPrf Weight Path
*> 10.255.255.1/32  0.0.0.0                  0         32768 i
*  10.255.255.2/32  64.34.255.254                          0 4502 110 i
*>                  200.110.255.250         0               0 110 i
*  10.255.255.3/32  64.34.255.254                          0 4502 110 i
*>                  200.110.255.250                         0 110 i
*  10.255.255.4/32  64.34.255.254                          0 4502 110 i
*>                  200.110.255.250                         0 110 i
*  10.255.255.5/32  200.110.255.250                        0 110 4502 i
*                   200.33.255.254                          0 330 4502 i
*>                  64.34.255.254           0               0 4502 i
```

```
*  10.255.255.6/32  200.110.255.250                       0 110 4502 330 i
*                   64.34.255.254                         0 4502 330 i
*>                  200.33.255.254           0            0 330 i
*  10.255.255.7/32  200.110.255.250                       0 110 4502 330 i
*                   64.34.255.254                         0 4502 330 i
*>                  200.33.255.254                        0 330 i
*  10.255.255.8/32  64.34.255.254                         0 4502 110 65001 i
   Network          Next Hop            Metric LocPrf Weight Path
*                   200.33.255.254                        0 330 4502 110 65001
*>                  200.110.255.250                       0 110 65001 i
*  10.255.255.9/32  64.34.255.254                         0 4502 110 65001 i
*                   200.33.255.254                        0 330 4502 110 65001
*>                  200.110.255.250                       0 110 65001 i
*  10.255.255.10/32 64.34.255.254                         0 4502 110 5005 i
*                   200.110.255.250                       0 110 5005 i
*>                  200.33.255.254                        0 330 5005 i
*> 64.34.1.0/25     0.0.0.0                  0         32768 i
*  128.45.5.0/25    200.110.255.250                       0 110 4502 i
*                   200.33.255.254                        0 330 4502 i
*>                  64.34.255.254            0            0 4502 i
*  200.33.6.0/25    64.34.255.254                         0 4502 330 i
*>                  200.33.255.254           0            0 330 i
*  200.33.7.0/25    64.34.255.254                         0 4502 330 i
*>                  200.33.255.254                        0 330 i
*  200.110.2.0/25   200.33.255.254                        0 330 4502 110 i
*                   64.34.255.254                         0 4502 110 i
*>                  200.110.255.250          0            0 110 i
*  200.110.3.0/25   200.33.255.254                        0 330 4502 110 i
   Network          Next Hop            Metric LocPrf Weight Path
*                   64.34.255.254                         0 4502 110 i
*>                  200.110.255.250                       0 110 i
*> 200.110.4.0/25   200.110.255.250                       0 110 i
*                   64.34.255.254                         0 4502 110 i
*                   200.33.255.254                        0 330 4502 110 i
*  200.110.12.0/25  200.33.255.254                        0 330 4502 110 65001
*                   64.34.255.254                         0 4502 110 65001 i
*>                  200.110.255.250                       0 110 65001 i
*  200.110.13.0/25  200.33.255.254                        0 330 4502 110 65001
*                   64.34.255.254                         0 4502 110 65001 i
*>                  200.110.255.250                       0 110 65001 i
*  223.255.255.0/25 64.34.255.254                         0 4502 330 5005 i
*                   200.110.255.250                       0 110 5005 i
*>                  200.33.255.254                        0 330 5005 i
```

```
R1#sh 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 rout
       o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

     200.110.4.0/25 is subnetted, 1 subnets
B       200.110.4.0 [20/0] via 200.110.255.250, 00:06:48
     200.33.6.0/25 is subnetted, 1 subnets
B       200.33.6.0 [20/0] via 200.33.255.254, 00:08:41
     223.255.255.0/25 is subnetted, 1 subnets
B       223.255.255.0 [20/0] via 200.33.255.254, 00:11:55
     200.33.7.0/25 is subnetted, 1 subnets
B       200.33.7.0 [20/0] via 200.33.255.254, 00:09:14
     64.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C       64.34.255.252/30 is directly connected, FastEthernet0/1
C       64.34.1.0/25 is directly connected, Loopback1
     200.110.255.0/30 is subnetted, 1 subnets
C       200.110.255.248 is directly connected, FastEthernet0/0
     200.33.255.0/30 is subnetted, 1 subnets
C       200.33.255.252 is directly connected, Serial1/0
     200.110.2.0/25 is subnetted, 1 subnets
B       200.110.2.0 [20/0] via 200.110.255.250, 00:10:45
     200.110.3.0/25 is subnetted, 1 subnets
B       200.110.3.0 [20/0] via 200.110.255.250, 00:07:52
     200.110.12.0/25 is subnetted, 1 subnets
B       200.110.12.0 [20/0] via 200.110.255.250, 00:10:14
     128.45.0.0/25 is subnetted, 1 subnets
B       128.45.5.0 [20/0] via 64.34.255.254, 00:07:22
     200.110.13.0/25 is subnetted, 1 subnets
B       200.110.13.0 [20/0] via 200.110.255.250, 00:11:15
     10.0.0.0/32 is subnetted, 10 subnets
B       10.255.255.10 [20/0] via 200.33.255.254, 00:18:19
B       10.255.255.8 [20/0] via 200.110.255.250, 00:18:19
B       10.255.255.9 [20/0] via 200.110.255.250, 00:18:19
B       10.255.255.2 [20/0] via 200.110.255.250, 00:21:55
B       10.255.255.3 [20/0] via 200.110.255.250, 00:20:22
C       10.255.255.1 is directly connected, Loopback0
B       10.255.255.6 [20/0] via 200.33.255.254, 00:19:22
B       10.255.255.7 [20/0] via 200.33.255.254, 00:18:52
B       10.255.255.4 [20/0] via 200.110.255.250, 00:19:53
B       10.255.255.5 [20/0] via 64.34.255.254, 00:19:36
```

Ale potom sa uz neohlasovali. Z IS-IS sme ich odstranili prikazmi uvdedenymi v casti “Popis”.

```
R1#show ip bgp
BGP table version is 63, local router ID is 64.34.1.1
Status codes: s suppressed, d damped, h history, * valid, > best, i - interna
```

```
              r RIB-failure, S Stale
Origin codes: i - IGP, e - EGP, ? - incomplete

   Network          Next Hop            Metric LocPrf Weight Path
*> 10.255.255.1/32  0.0.0.0                  0         32768 i
*  10.255.255.2/32  64.34.255.254                         0 4502 110 i
*>                  200.110.255.250         0              0 110 i
*  10.255.255.3/32  64.34.255.254                         0 4502 110 i
*>                  200.110.255.250                        0 110 i
*  10.255.255.4/32  64.34.255.254                         0 4502 110 i
*>                  200.110.255.250                        0 110 i
*  10.255.255.5/32  200.110.255.250                       0 110 4502 i
*                   200.33.255.254                         0 330 4502 i
*>                  64.34.255.254           0              0 4502 i
*  10.255.255.6/32  200.110.255.250                       0 110 4502 330 i
*                   64.34.255.254                          0 4502 330 i
*>                  200.33.255.254          0              0 330 i
*  10.255.255.7/32  200.110.255.250                       0 110 4502 330 i
*                   64.34.255.254                          0 4502 330 i
*>                  200.33.255.254                         0 330 i
*  10.255.255.8/32  64.34.255.254                         0 4502 110 65001 i
   Network          Next Hop            Metric LocPrf Weight Path
*                   200.33.255.254                         0 330 4502 110 65001
*>                  200.110.255.250                        0 110 65001 i
*  10.255.255.9/32  64.34.255.254                         0 4502 110 65001 i
*                   200.33.255.254                         0 330 4502 110 65001
*>                  200.110.255.250                        0 110 65001 i
*  10.255.255.10/32 64.34.255.254                         0 4502 110 5005 i
*                   200.110.255.250                        0 110 5005 i
*>                  200.33.255.254                         0 330 5005 i
*> 64.34.0.0/16     0.0.0.0                           32768 i
s> 64.34.1.0/25     0.0.0.0                      0    32768 i
*  128.45.0.0       200.110.255.250                        0 110 4502 i
*                   200.33.255.254                         0 330 4502 i
*>                  64.34.255.254           0              0 4502 i
*  200.33.0.0/16    64.34.255.254                          0 4502 330 i
*>                  200.33.255.254          0              0 330 i
*  200.110.0.0/16   200.33.255.254                        0 330 4502 110 i
*                   64.34.255.254                          0 4502 110 i
*>                  200.110.255.250         0              0 110 i
*  223.255.255.0    64.34.255.254                          0 4502 330 5005 i
*                   200.110.255.250                        0 110 5005 i
   Network          Next Hop            Metric LocPrf Weight Path
*>                  200.33.255.254                         0 330 5005 i
```

```
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 rout
       o - ODR, P - periodic downloaded static route

Gateway of last resort is not set

B    223.255.255.0/24 [20/0] via 200.33.255.254, 00:32:37
     64.0.0.0/8 is variably subnetted, 3 subnets, 3 masks
C       64.34.255.252/30 is directly connected, FastEthernet0/1
B       64.34.0.0/16 [200/0] via 0.0.0.0, 00:28:12, Null0
C       64.34.1.0/25 is directly connected, Loopback1
     200.110.255.0/30 is subnetted, 1 subnets
C       200.110.255.248 is directly connected, FastEthernet0/0
     200.33.255.0/30 is subnetted, 1 subnets
C       200.33.255.252 is directly connected, Serial1/0
B    128.45.0.0/16 [20/0] via 64.34.255.254, 00:27:42
     10.0.0.0/32 is subnetted, 10 subnets
B       10.255.255.10 [20/0] via 200.33.255.254, 00:54:15
B       10.255.255.8 [20/0] via 200.110.255.250, 00:54:15
B       10.255.255.9 [20/0] via 200.110.255.250, 00:54:16
B       10.255.255.2 [20/0] via 200.110.255.250, 00:57:51
B       10.255.255.3 [20/0] via 200.110.255.250, 00:56:19
C       10.255.255.1 is directly connected, Loopback0
B       10.255.255.6 [20/0] via 200.33.255.254, 00:55:18
B       10.255.255.7 [20/0] via 200.33.255.254, 00:54:47
B       10.255.255.4 [20/0] via 200.110.255.250, 00:55:48
B       10.255.255.5 [20/0] via 64.34.255.254, 00:55:32
B    200.33.0.0/16 [20/0] via 200.33.255.254, 00:28:44
B    200.110.0.0/16 [20/0] via 200.110.255.250, 00:27:13
```

Aj BGP tabulka, aj smerovacia tabulka sa trochu scvrkli.

Kontrola, či interné ISP adresy nie sú propagované

Kontrola konektivity medzi zákazníckymi a internetovými smerovacími záznamami

1.2.6 ISP politika

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Definovať vlastnú politiku – použiť community, community alter LP, AS–PATH filtering, prepending, atď

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1.2.7 Primárne linky R3−R8, R4−R10

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1.2.8 Distribuovať iba default, AS5005 a peering prefixy do AS65001

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1.2.9 AS5005 nesme byť nikdy transit

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1.2.10 Peering iba pre ISP1 a ISP2, nie pre prefixy naučené z Upstream ISP

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1.2.11 Overiť funkčnosť nastavenia politiky vhodnými výpadkami liniek a smerovačov

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1.2.12 Overiť, či je možné odkloniť celú prevádzku (upstream, downstream) na linke R4−R10 v prípade plánovanej údržby (linka musí byť plne funkčna a BGP spojenie propaguje všetky prefixy)

Popis

Konfigurácia

Overenie