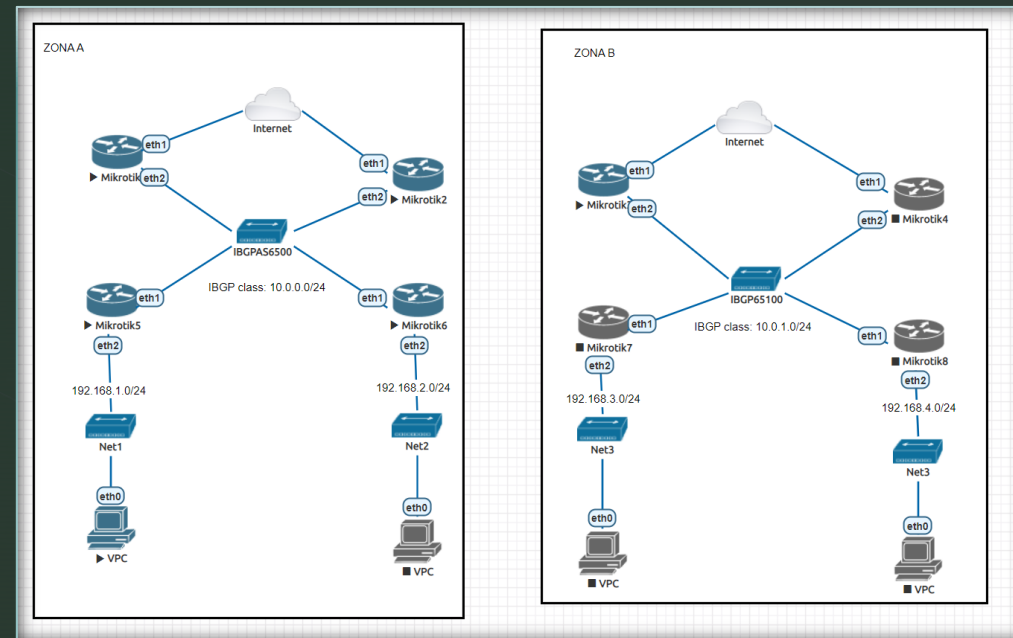


Laboratoare Retelistica

Setarea BGP-ului prin IBGP si EBGP

Topologie

- Incepem de la topologia a doua zone pe care le numim zona A si zona B fiecare conectata separate la internet.
- Routerule conectate direct la internet vor avea rolul de EBGW pe interfetele de WAN si IBGP pe interfetele interne.



Configurare MikroTik1 eBGP

- Asignam interfetei ether2 un ip din clasa de IBGP.
- In prima parte configuram EBGP-ul pe acest nod dupa care vom configura EBGP-ul pe un router din ZONA B.
- Pentru a incepe configurarea intram in Routing -> BGP -> Connection.
- La nume putem seta ceva descriptive, la AS (Autonomous System) ii setam zonei o identitate in acest caz 6500, router id setam ip-ul de extern (WAN), remote address nu setam inca pentru ca nu stim si local role ebgp.
- Puteam sa pornim routerul MikroTik3 si sa ii luam ip-ul de WAN pe care il introducem in remote address.
- In tabul "Extra" avem setari asemanatoare cu cele de la OSPF.
- Routing table: main, VRF: main si redistribuite: connected,static,bgp (in cazul in care foloseam ospf pentru internal networking bifam si ospf).

BGP Connection <ebgp-to-mk3>

General Extra Attributes Filter

Name: ebgp-to-mk3

Template:

AS: 65000

AFI: ☒ ip ☐ ipv6 ☐ l2vpn ☐ vpnv4 ☐ l2vpn cisco

Router ID: 172.29.38.145

Remote Address: 172.29.33.68/32

Remote Port:

Remote AS:

Remote Allow AS:

Local Address:

Local Port:

Local Role: ebgp

TCP MD5 Key:

Multihop:

Tx TTL:

Rx Min TTL:

Connect:

enabled

Address List

Address	Network	Interface
10.0.0.1/24	10.0.0.0	ether2
172.29.38.145/20	172.29.32.0	ether1

2 items

BGP Connection <ebgp-to-mk3>

General Extra Attributes Filter

Hold Time:

Keepalive Time:

Use BGP:

Routing Table: main

VRF: main

Cluster ID:

No Client To Client Reflection:

Outbound Reflection: ☒ connected ☐ static ☐ bgp ☐ l2vpn ☐ vpnv4 ☐ l2vpn cisco

Outbound Filter:

No Early Out:

Keep Sent Attributes:

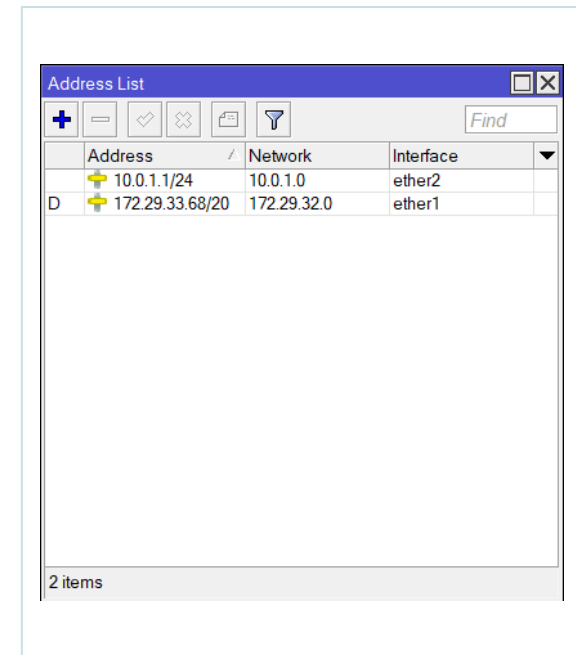
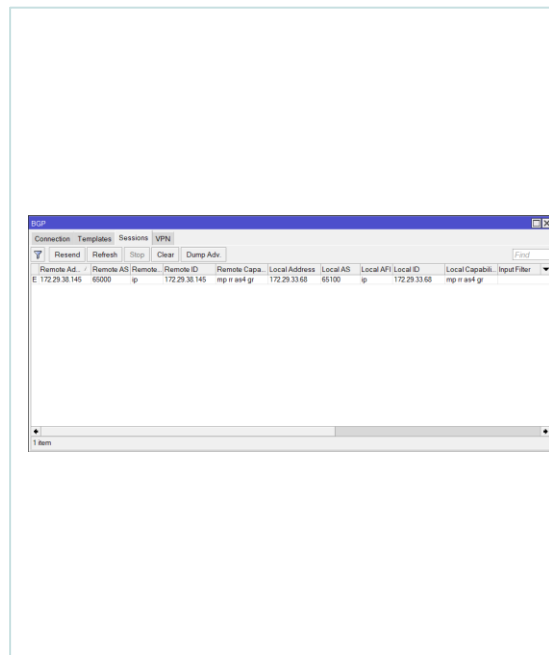
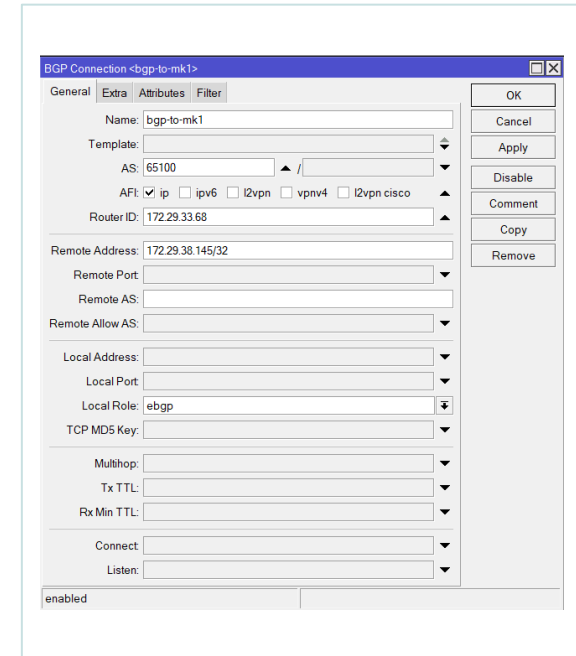
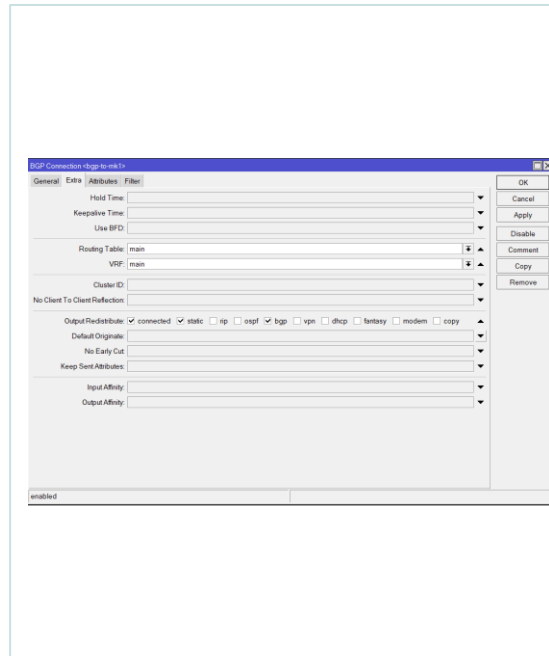
Input Filter:

Output Filter:

enabled

Configurare MikroTik3 eBGP

- Configuratia routerelor este oarecum in oglinda asa ca incepem prin a seta un ip in zona de iBGP.
- Si configuram eBGP-ul pe acesta.
- Putem verifica existenta unei sesiuni in tabul "Sessions" si putem vedea o sesiunea cu litera "E" de la established.



Setup iBGP MikroTik3

- Incepe prin a seta interfetele cea de iBGP(10.0.0.2/24) si cea de LAN(192.168.1.1/24).
- In primul rand setam un server DHCP pe interfata ether2.
- Ce avem diferit este local role care este ibgp rr si activat connect si listen.
- Urmarim acelasi setup pe MikroTik1.

The screenshot displays the MikroTik WinBox interface for configuring a BGP connection named 'ibgp-to-mk1'. The 'General' tab is active, showing various configuration fields. The 'Address List' window is open, showing two entries: 10.0.0.2/24 on ether1 and 192.168.1.1/24 on ether2. The BGP connection configuration includes fields for Name, Template, AS (65000), AFI (ip), Router ID (10.0.0.2), Remote Address (10.0.0.1/32), Remote Port, Remote AS, Remote Allow AS, Local Address (10.0.0.2), Local Port, Local Role (ibgp rr), TCP MD5 Key, Multihop, Tx TTL, Rx Min TTL, and checkboxes for Connect and Listen.

Address	Network	Interface
10.0.0.2/24	10.0.0.0	ether1
192.168.1.1/24	192.168.1.0	ether2

2 items

BGP Connection <ibgp-to-mk1>

General Extra Attributes Filter

Name: ibgp-to-mk1

Template:

AS: 65000

AFI: ☒ ip ☐ ipv6 ☐ l2vpn ☐ vpnv4 ☐ l2vpn cisco

Router ID: 10.0.0.2

Remote Address: 10.0.0.1/32

Remote Port:

Remote AS:

Remote Allow AS:

Local Address: 10.0.0.2

Local Port:

Local Role: ibgp rr

TCP MD5 Key:

Multihop:

Tx TTL:

Rx Min TTL:

Connect: ☒

Listen: ☒

OK Cancel Apply Disable Comment Copy Remove

Setup iBGP pe MikroTik1

- Urmarim acelasi setup ca pe MikroTik2 cu o diferenta pe tabul "Attributes" unde activam Nexthop Choice "force self"
- In cazul in care uitam sa activam setarea o sa vedem rute ca unavailable pe routerul MikroTik3.
- Ce nu va merge pe routerul MikroTik3 este accesul la internet, pentru a rezolva aceasta problema trebuie sa faceti setarile de src-nat ca in laboratorul OSPF.

GP Connection <ibgp-to-mk5>

General Extra Attributes Filter

Nexthop Choice: force self

AS Override:

Default Prepend:

Add Path Out:

Allow AS In:

Ignore AS Path Length:

Remove Private AS:

Cisco VPLS NLRI Length Format:

OK Cancel Apply Disable Comment Copy Remove

BGP Connection <ibgp-to-mk5>

General Extra Attributes Filter

Name: ibgp-to-mk5

Template:

AS: 65000

AFI: ☒ ip ☐ ipv6 ☐ l2vpn ☐ vpnv4 ☐ l2vpn cisco

Router ID: 10.0.0.1

Remote Address: 10.0.0.2/32

Remote Port:

Remote AS:

Remote Allow AS:

Local Address: 10.0.0.1

Local Port:

Local Role: ibgp rr

TCP MD5 Key:

Multihop:

Tx TTL:

Rx Min TTL:

Connect: ☒

Listen: ☒

OK Cancel Apply Disable Comment Copy Remove

BGP Connection <ibgp-to-mk5>

General Extra Attributes Filter

Hold Time:

Keepalive Time:

Use BFD:

Routing Table: main

VRF: main

Cluster ID:

No Client To Client Reflection:

Output Redistribute: ☒ connected ☒ static ☐ rip ☐ ospf ☒ bgp ☐ vpn ☐ dhcp ☐ fantar

Default Originate: if installed

No Early Cut:

Keep Sent Attributes:

Input Affinity:

Output Affinity:

OK Cancel Apply Disable Comment Copy Remove

Testul1 de eBGP

- Pe routerul MikroTik3 putem verifica daca a fost adaugata ruta catre 192.168.1.0/24
- Si sa incercam sa dam un ping in 192.168.1.1

```
Terminal <2>
MMM      MMM      KKK      TTTTTTTTTT      KKK
MMMM     MMMM     KKK      TTTTTTTTTT      KKK
MMM MMMM MMM III KKK KKK RRRRRR  OOOOOO  TTT   III KKK KKK
MMM MM  MMM III KKKKK RRR RRR  OOO OOO  TTT   III KKKKK
MMM     MMM III KKK KKK RRRRRR  OOO OOO  TTT   III KKK KKK
MMM     MMM III KKK KKK RRR RRR  OOOOOO  TTT   III KKK KKK

MikroTik RouterOS 7.7beta4 (c) 1999-2022      https://www.mikrotik.com/

Press F1 for help

[admin@MikroTik3] > ping 192.168.1.1
SEQ HOST                                     SIZE TTL TIME          STATUS
0 192.168.1.1                               56 63 2ms409us
1 192.168.1.1                               56 63 2ms225us
2 192.168.1.1                               56 63 2ms98us
3 192.168.1.1                               56 63 5ms639us
sent=4 received=4 packet-loss=0% min-rtt=2ms98us avg-rtt=3ms92us
max-rtt=5ms639us

[admin@MikroTik3] >
```

Route List				
	Dst Address	Gateway	Distance	Pref. Source
DAd	0.0.0.0/0	172.29.32.1	1	
DAb	10.0.0.0/24	172.29.38.145	20	
DAC	10.0.1.0/24	ether2	0	
DAC	172.29.32.0/20	ether1	0	
D b	172.29.32.0/20	172.29.38.145	20	
DAb	192.168.1.0/24	172.29.38.145	20	

6 items out of 26

Setup eBGP MikroTik2 <-> MK3

The screenshot shows the 'eBGP Connection setup to mik3' window. The 'General' tab is active. The 'Name' field is empty. The 'Template' is set to 'ebgp-to-mik3'. The 'AS' is set to '65100'. The 'AF1' checkbox is checked, and the 'ip' radio button is selected. The 'Router ID' is set to '172.29.33.68'. The 'Remote Address' is set to '172.29.35.65/32'. The 'Remote Port' is set to '179'. The 'Remote AS' is set to '65000'. The 'Local Address' is set to '172.29.35.65'. The 'Local Port' is set to '179'. The 'Local Role' is set to 'ebgp'. The 'TCP MD5 Key' is empty. The 'Multihop' checkbox is checked. The 'Tx TTL' is set to '1'. The 'Rx Min TTL' is set to '1'. The 'Connect' checkbox is checked. The 'Listen' checkbox is checked. The 'Status' at the bottom is 'enabled'.

The screenshot shows the 'eBGP Connection setup to mik3' window. The 'General' tab is active. The 'Name' field is set to 'ebgp-to-mik3'. The 'Template' is set to 'ebgp-to-mik3'. The 'AS' is set to '65100'. The 'AF1' checkbox is checked, and the 'ip' radio button is selected. The 'Router ID' is set to '172.29.33.68'. The 'Remote Address' is set to '172.29.35.65/32'. The 'Remote Port' is set to '179'. The 'Remote AS' is set to '65000'. The 'Local Address' is set to '172.29.35.65'. The 'Local Port' is set to '179'. The 'Local Role' is set to 'ebgp'. The 'TCP MD5 Key' is empty. The 'Multihop' checkbox is checked. The 'Tx TTL' is set to '1'. The 'Rx Min TTL' is set to '1'. The 'Connect' checkbox is checked. The 'Listen' checkbox is checked. The 'Status' at the bottom is 'enabled'.

The screenshot shows the 'eBGP Connection setup to mik3' window. The 'General' tab is active. The 'Name' field is empty. The 'Template' is set to 'ebgp-to-mik3'. The 'AS' is set to '65000'. The 'AF1' checkbox is checked, and the 'ip' radio button is selected. The 'Router ID' is set to '172.29.35.65'. The 'Remote Address' is set to '172.29.33.68/32'. The 'Remote Port' is set to '179'. The 'Remote AS' is set to '65100'. The 'Local Address' is set to '172.29.35.65'. The 'Local Port' is set to '179'. The 'Local Role' is set to 'ebgp'. The 'TCP MD5 Key' is empty. The 'Multihop' checkbox is checked. The 'Tx TTL' is set to '1'. The 'Rx Min TTL' is set to '1'. The 'Connect' checkbox is checked. The 'Listen' checkbox is checked. The 'Status' at the bottom is 'enabled'.

The screenshot shows the 'eBGP Connection setup to mik3' window. The 'General' tab is active. The 'Name' field is set to 'ebgp-to-mik3'. The 'Template' is set to 'ebgp-to-mik3'. The 'AS' is set to '65000'. The 'AF1' checkbox is checked, and the 'ip' radio button is selected. The 'Router ID' is set to '172.29.35.65'. The 'Remote Address' is set to '172.29.33.68/32'. The 'Remote Port' is set to '179'. The 'Remote AS' is set to '65100'. The 'Local Address' is set to '172.29.35.65'. The 'Local Port' is set to '179'. The 'Local Role' is set to 'ebgp'. The 'TCP MD5 Key' is empty. The 'Multihop' checkbox is checked. The 'Tx TTL' is set to '1'. The 'Rx Min TTL' is set to '1'. The 'Connect' checkbox is checked. The 'Listen' checkbox is checked. The 'Status' at the bottom is 'enabled'.

Setup iBGP MikroTik6 <-> MikroTik2

The screenshot shows the 'BGP Connection - iBGP to mik2' window. The 'General' tab is active. Fields include: Name (iBGP to mik2), Template (AS: 65000), AS (65000), Router ID (10.0.0.3), Remote Address (10.0.0.4/32), Remote Port (179), Remote AS (65000), Local Address (10.0.0.3), Local Port (179), Local Rule (iBGP n), TCP MD5 Key (empty), Multihop (checked), To TTL (empty), Rx Min TTL (empty), Connect (checked), and Listen (checked). The status at the bottom is 'enabled'.

The screenshot shows the 'Extra' tab of the 'BGP Connection - iBGP to mik2' window. It contains various checkboxes for advanced settings: Hold Time, Keepalive Time, Use BFD, Routing Table (max), AS (max), Cluster ID, No Client To Client Reflection, Output Redistribution (checked), Default Originate (checked), No Early Out, Keep Next Attributes, Input MIB, and Output MIB. The status at the bottom is 'enabled'.

The screenshot shows the 'Filter' tab of the 'BGP Connection - iBGP to mik2' window. It includes fields for Next Hop Choice (force self), AS Override, Default Prepend, Add Path Out, Allow AS In, Ignore AS Path Length, Remove Private AS, and Cisco VPLS NLR Length Format. The status at the bottom is 'enabled'.

The screenshot shows the 'BGP Connection - iBGP to mik6' window. The 'General' tab is active. Fields include: Name (iBGP to mik6), Template (AS: 65000), AS (65000), Router ID (10.0.0.4), Remote Address (10.0.0.3/32), Remote Port (179), Remote AS (65000), Local Address (10.0.0.4), Local Port (179), Local Rule (iBGP n), TCP MD5 Key (empty), Multihop (checked), To TTL (empty), Rx Min TTL (empty), Connect (checked), and Listen (checked). The status at the bottom is 'enabled'.

The screenshot shows the 'Extra' tab of the 'BGP Connection - iBGP to mik6' window. It contains various checkboxes for advanced settings: Hold Time, Keepalive Time, Use BFD, Routing Table (max), AS (max), Cluster ID, No Client To Client Reflection, Output Redistribution (checked), Default Originate (checked), No Early Out, Keep Next Attributes, Input MIB, and Output MIB. The status at the bottom is 'enabled'.

Setup iBGP MikroTik6<->MikroTik1

This screenshot shows the 'iBGP Connection' dialog box for a connection named 'mk1'. The 'General' tab is active. The 'Routing Table' is set to 'main' and 'VRF' is set to 'main'. The 'Cluster ID' is empty. The 'No Client To Client Reflection' checkbox is checked. The 'Output Redistribution' section has 'connected' checked, and 'static', 'ospf', 'bgp', 'vpn', 'dhcp', 'fantasy', 'modem', and 'copy' are unchecked. The 'Default Originate' is set to 'if installed'. The 'No Early Cut' checkbox is checked. The 'Keep Sent Attributes' checkbox is checked. The 'Input Affinity' and 'Output Affinity' fields are empty. The status at the bottom is 'enabled'.

This screenshot shows the 'iBGP Connection' dialog box for a connection named 'mk6'. The 'General' tab is active. The 'Routing Table' is set to 'main' and 'VRF' is set to 'main'. The 'Cluster ID' is empty. The 'No Client To Client Reflection' checkbox is checked. The 'Output Redistribution' section has 'connected' checked, and 'static', 'ospf', 'bgp', 'vpn', 'dhcp', 'fantasy', 'modem', and 'copy' are unchecked. The 'Default Originate' is set to 'if installed'. The 'No Early Cut' checkbox is checked. The 'Keep Sent Attributes' checkbox is checked. The 'Input Affinity' and 'Output Affinity' fields are empty. The status at the bottom is 'enabled'.

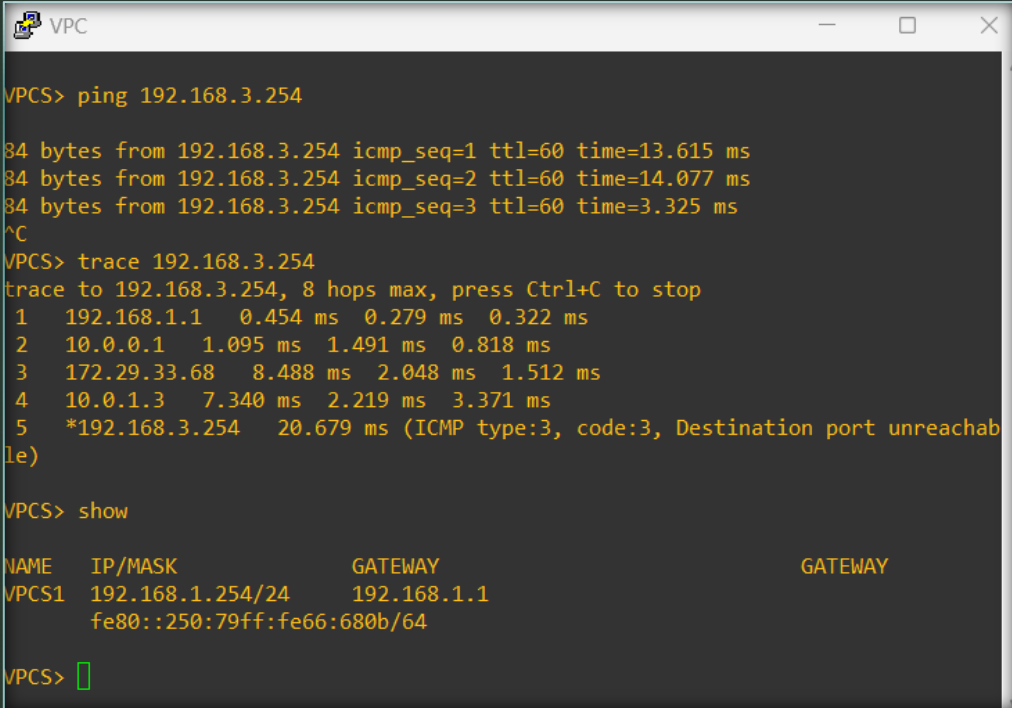
This screenshot shows the 'BGP Connection' dialog box for a connection named 'bgp-to-mk6'. The 'General' tab is active. The 'NextHop Choice' is set to 'force self'. The 'AS Override' field is empty. The 'Default Prepend' field is empty. The 'Add Path Out' field is empty. The 'Allow AS In' field is empty. The 'Ignore AS Path Length' checkbox is checked. The 'Remove Private AS' checkbox is checked. The 'Cisco VPLS NLRI Length Format' field is empty. The status at the bottom is 'enabled'.

This screenshot shows the 'iBGP Connection' dialog box for a connection named 'bgp-to-mk1'. The 'General' tab is active. The 'Name' is 'bgp-to-mk1'. The 'Template' is 'AS 65000'. The 'API' checkbox is checked, and 'ip', 'ipv6', 'bgp', 'vsnv4', and 'bgp.cisco' are unchecked. The 'Router ID' is '10.0.0.4'. The 'Remote Address' is '10.0.0.1/32'. The 'Remote Port' is empty. The 'Remote AS' is empty. The 'Remote Allow AS' is empty. The 'Local Address' is '10.0.0.4'. The 'Local Port' is empty. The 'Local Role' is 'bgp.n'. The 'TCP MD5 Key' is empty. The 'Multihop' checkbox is checked. The 'Tx TTL' is empty. The 'Rx Min TTL' is empty. The 'Connect' checkbox is checked. The 'Listen' checkbox is checked. The status at the bottom is 'enabled'.

This screenshot shows the 'iBGP Connection' dialog box for a connection named 'bgp-to-mk6'. The 'General' tab is active. The 'Name' is 'bgp-to-mk6'. The 'Template' is 'AS 65000'. The 'API' checkbox is checked, and 'ip', 'ipv6', 'bgp', 'vsnv4', and 'bgp.cisco' are unchecked. The 'Router ID' is '10.0.0.1'. The 'Remote Address' is '10.0.0.4/32'. The 'Remote Port' is empty. The 'Remote AS' is empty. The 'Remote Allow AS' is empty. The 'Local Address' is '10.0.0.1'. The 'Local Port' is empty. The 'Local Role' is 'bgp.n'. The 'TCP MD5 Key' is empty. The 'Multihop' checkbox is checked. The 'Tx TTL' is empty. The 'Rx Min TTL' is empty. The 'Connect' checkbox is checked. The 'Listen' checkbox is checked. The status at the bottom is 'enabled'.

Setup ZONA B

Facem aceleasi setari si in ZONA B si verificam din zona a un ping si un traceroute in zona b



```
VPC
VPCS> ping 192.168.3.254
34 bytes from 192.168.3.254 icmp_seq=1 ttl=60 time=13.615 ms
34 bytes from 192.168.3.254 icmp_seq=2 ttl=60 time=14.077 ms
34 bytes from 192.168.3.254 icmp_seq=3 ttl=60 time=3.325 ms
^C
VPCS> trace 192.168.3.254
trace to 192.168.3.254, 8 hops max, press Ctrl+C to stop
 1  192.168.1.1    0.454 ms  0.279 ms  0.322 ms
 2  10.0.0.1      1.095 ms  1.491 ms  0.818 ms
 3  172.29.33.68   8.488 ms  2.048 ms  1.512 ms
 4  10.0.1.3       7.340 ms  2.219 ms  3.371 ms
 5  *192.168.3.254 20.679 ms (ICMP type:3, code:3, Destination port unreachable)

VPCS> show

NAME      IP/MASK      GATEWAY      GATEWAY
VPCS1     192.168.1.254/24  192.168.1.1
          fe80::250:79ff:fe66:680b/64

VPCS> 
```