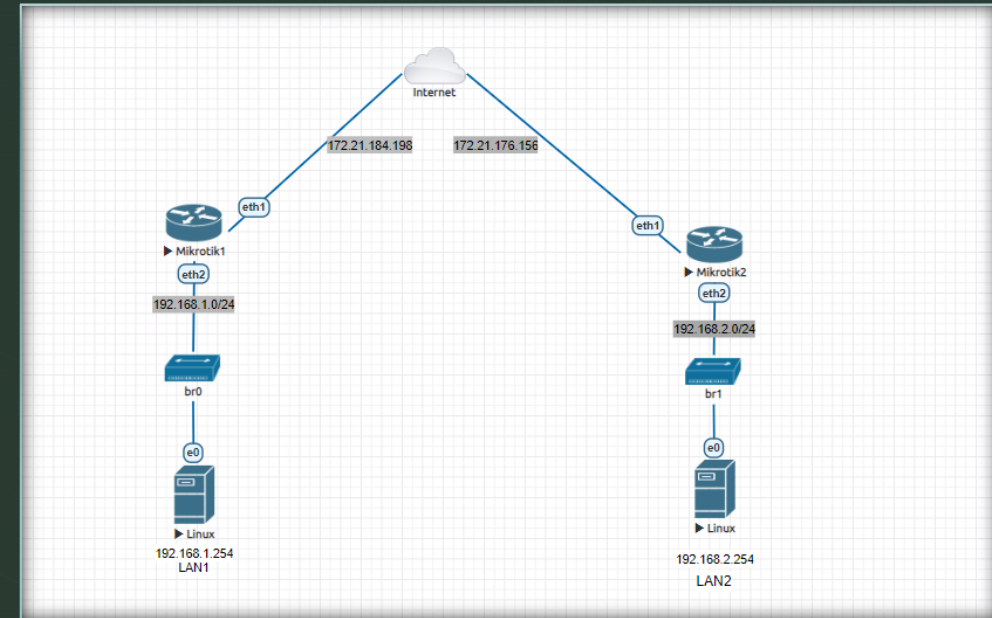


Laboratoare Retelistica

Rutare Dinamica cu Protocolul RIP si WAN Failover

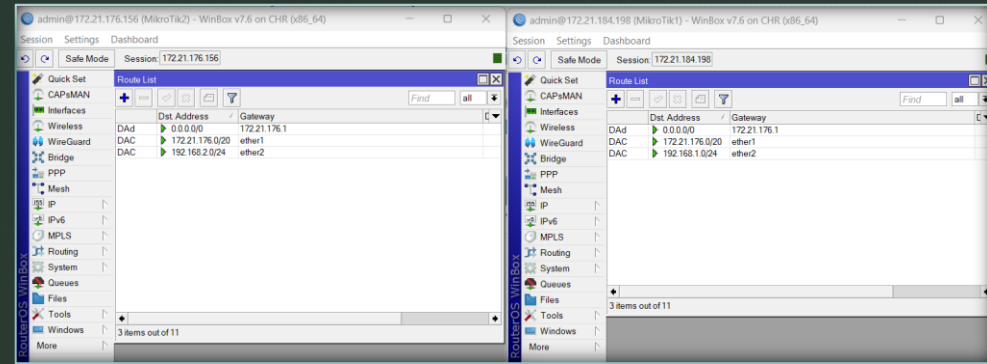
Setup-ul de Baza

- Incepem laboratorul cu setup-ul trecut in care aveam doua routere conectate la WAN si fiecare cu o retea LAN dupa care am adaugat rute statice.
- In acest laborator vom inlocui idea de rutare statica cu rutarea dinamica. Primul protocol pe care il folosim este RIP.



Setup-ul de Baza

- Primul lucru pe care trebuie sa il facem este sa stergem rutele statice create anterior.



Setup MikroTik1 si Mikrotik2

- Pentru a incepe configurarea protocolului RIP trebuie sa intram in Routing->RIP si adaugam o noua instanta RIP.
- VRF (Virtual Routing and Forwarding) il setam ca "main" pentru ca este tabela de rutare.
- AFI il setam pe IPv4 (nu folosim inca IPv6).
- Redistribute bifam static, connected si RIP (aici alegem ce trimitem mai departe catre nodurile vecine adica rute statice, conectate sau valide si cele primite prin RIP).
- Dupa ce salvam, mergem la tab-ul "Interface Template" si adaugam un template nou.
- La Instance, selectam ce instanta de RIP vrem sa folosim.
- La Interfaces selectam pe ce interfata/interfete vrem sa trimitem mesajele RIP (cazul nostru ether1).
- Mai putem seta costul, Split Horizon, Poison Revere si chiar o parola pentru mai multa Securitate.

RIP Instance <rip-instance-1>

Name: rip-instance-1

VRF: main

AFI: IPv4

Input Filter:

Output Filter:

Select Output Filter:

Redistribute: ☒ connected ☒ static ☒ rip ☐ ospf ☐ bgp ☐ vpn ☐ dhcp ☐ fantasy ☐ modem ☐ copy

Originate Default:

Routing Table:

Route Timeout:

Route GC Timeout:

Update Interval:

enabled

New RIP Interface

Name: rip-interface-1

Instance: rip-instance-1

Interfaces: ether1

Source Addresses:

Cost:

Split Horizon:

Poison Reverse:

Mode:

Key Chain:

Password:

enabled

Setup MikroTik1 si Mikrotik2

- Daca ne uitam in rute, pe ambele routere putem observa ca au fost adugate rute noi automat.

admin@172.21.184.198 (MikroTik1) - WinBox v7.6 on CHR (x86_64)

Session Settings Dashboard

Safe Mode Session: 172.21.184.198

Route List

	Dst Address	Gateway	Distance	Pref. Source
DAAd	0.0.0.0/0	172.21.176.1	1	
DAC	172.21.176.0/20	ether1	0	
DAC	192.168.1.0/24	ether2	0	
DAr	192.168.2.0/24	172.21.176.156%ether1	120	

4 items out of 12

admin@172.21.184.198 (MikroTik1) - WinBox v7.6 on CHR (x86_64)

Session Settings Dashboard

Safe Mode Session: 172.21.184.198

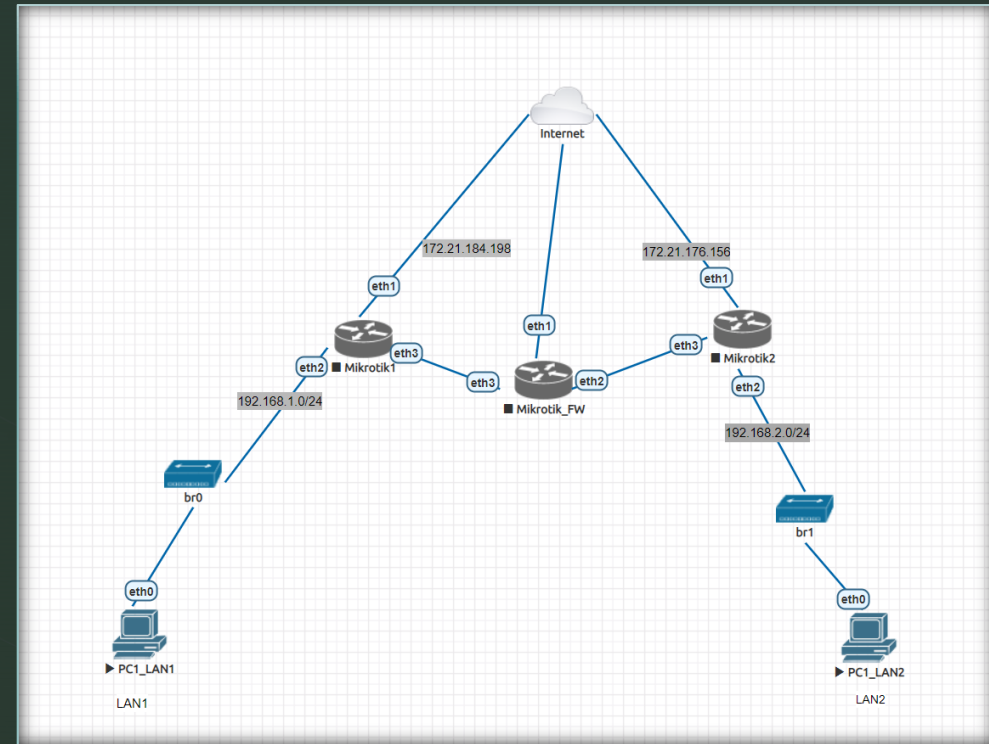
Route List

	Dst Address	Gateway	Distance	Pref. Source
DAAd	0.0.0.0/0	172.21.176.1	1	
DAC	172.21.176.0/20	ether1	0	
DAC	192.168.1.0/24	ether2	0	
DAr	192.168.2.0/24	172.21.176.156%ether1	120	

4 items out of 12

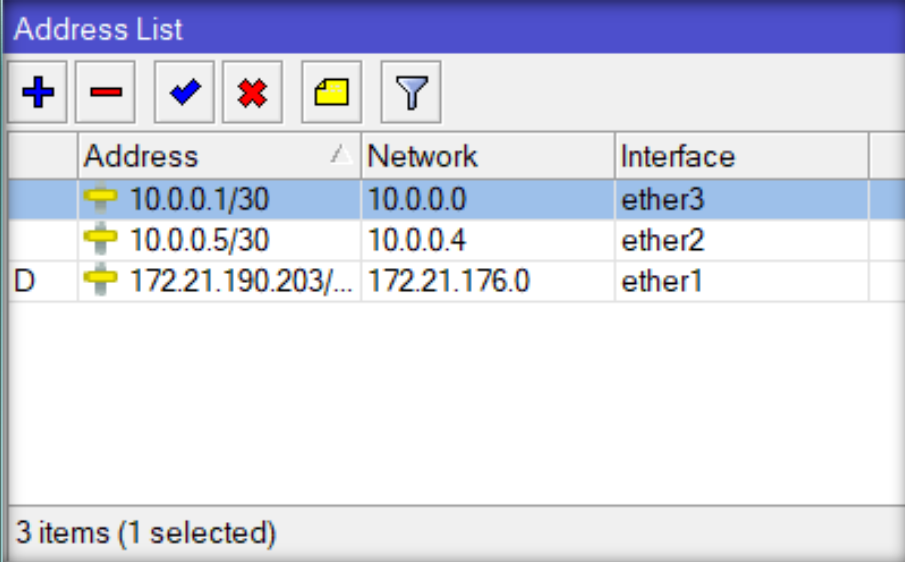
WAN Failover

- Ideea din spatele unei rutări cu WAN failover este ca în cazul în care interfața cade să se folosească o rută alternativă automat de router printr-un alt router conectat la WAN.
- În diagrama noastră vom adăuga un router nou Mikrotik_WF pe care îl vom conecta la cele două rutere existente pentru a oferi redundanță ambelor routere.



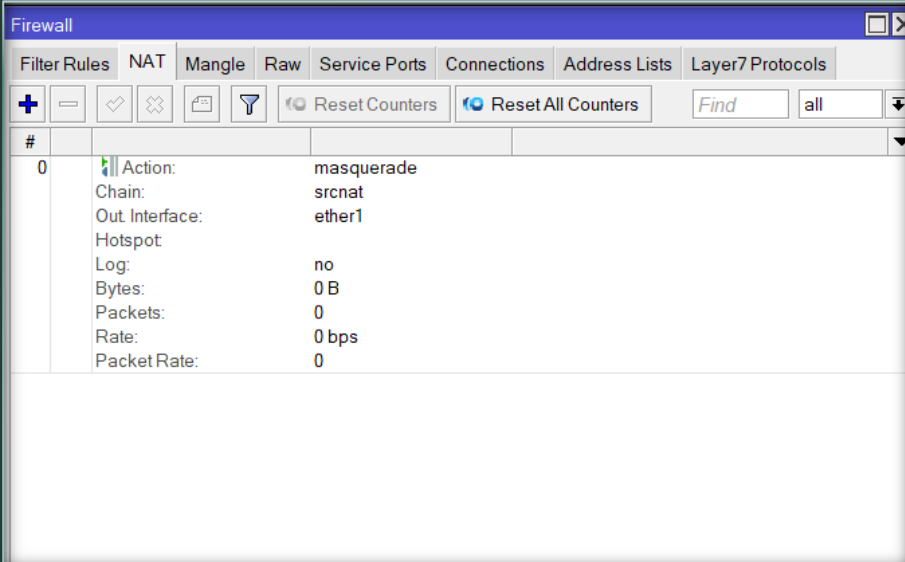
WAN Failover

- In routerul de failover avem conectate ether2 si ether3 la routerele laterale. Ele se vor conecta prin retele de /30 la routerul de failover.
- Incepem configurarea interfetelor 2 si 3 cu retele de /30 pe router.
- Dupa care setam pe el NAT-ul.



The screenshot shows the 'Address List' window in Mikrotik WinBox. It contains a table with three entries, each with a lock icon in the first column. The first entry is selected. Below the table, it says '3 items (1 selected)'.

	Address	Network	Interface
	10.0.0.1/30	10.0.0.0	ether3
	10.0.0.5/30	10.0.0.4	ether2
D	172.21.190.203/...	172.21.176.0	ether1



The screenshot shows the 'Firewall' window in Mikrotik WinBox, with the 'NAT' tab selected. It displays a single rule configuration for NAT.

#	Action	Chain	Out. Interface	Hotspot	Log	Bytes	Packets	Rate	Packet Rate
0	masquerade	srcnat	ether1		no	0 B	0	0 bps	0

WAN Failover

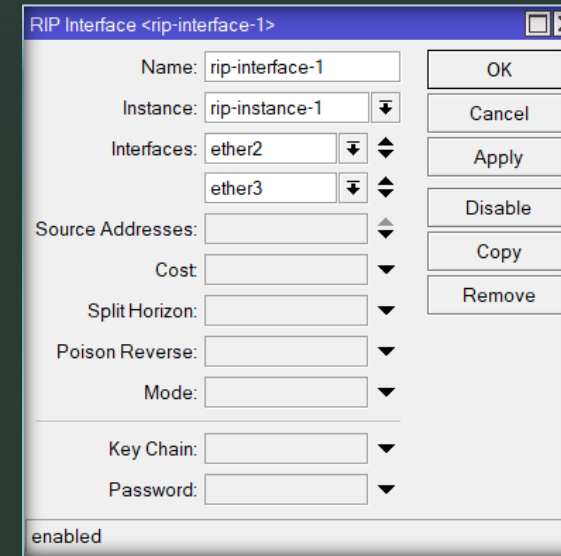
- Pe routerul 1 setam pentru ether3 prima retea (10.0.0.0/30).
- La fel procedam si pe routerul 2 unde ii setam retea (10.0.0.4/30).

This screenshot shows the configuration window for the first IP address on router 1. The title bar reads 'Address <10.0.0.2/30>'. The 'Address' field contains '10.0.0.2/30', the 'Network' field contains '10.0.0.0', and the 'Interface' dropdown is set to 'ether3'. On the right side, there are buttons for 'OK', 'Cancel', 'Apply', 'Disable', 'Comment', 'Copy', and 'Remove'. At the bottom left, there is a status indicator that says 'enabled'.

This screenshot shows the configuration window for the first IP address on router 2. The title bar reads 'Address <10.0.0.6/30>'. The 'Address' field contains '10.0.0.6/30', the 'Network' field contains '10.0.0.4', and the 'Interface' dropdown is set to 'ether3'. On the right side, there are buttons for 'OK', 'Cancel', 'Apply', 'Disable', 'Comment', 'Copy', and 'Remove'. At the bottom left, there is a status indicator that says 'enabled'.

WAN Failover

- Pe routerul de failover setam RIP-ul.
- Setup-ul este asemanator doar ca la “Originate Default” il setam ca “if installed”. Asta inseamna ca daca exista ruta catre WAN (0.0.0.0) sa transfere conexiunea prin RIP (sa faca advertise) la acea ruta.



RIP Interface <rip-interface-1>

Name: rip-interface-1

Instance: rip-instance-1

Interfaces: ether2, ether3

Source Addresses:

Cost:

Split Horizon:

Poison Reverse:

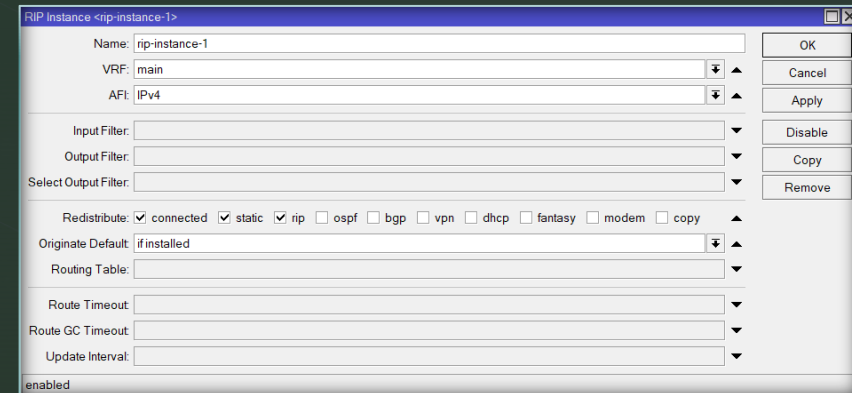
Mode:

Key Chain:

Password:

OK, Cancel, Apply, Disable, Copy, Remove

enabled



RIP Instance <rip-instance-1>

Name: rip-instance-1

VRF: main

AFI: IPv4

Input Filter:

Output Filter:

Select Output Filter:

Redistribute: ☒ connected ☒ static ☒ rip ☐ ospf ☐ bgp ☐ vpn ☐ dhcp ☐ fantasy ☐ modem ☐ copy

Originate Default: if installed

Routing Table:

Route Timeout:

Route GC Timeout:

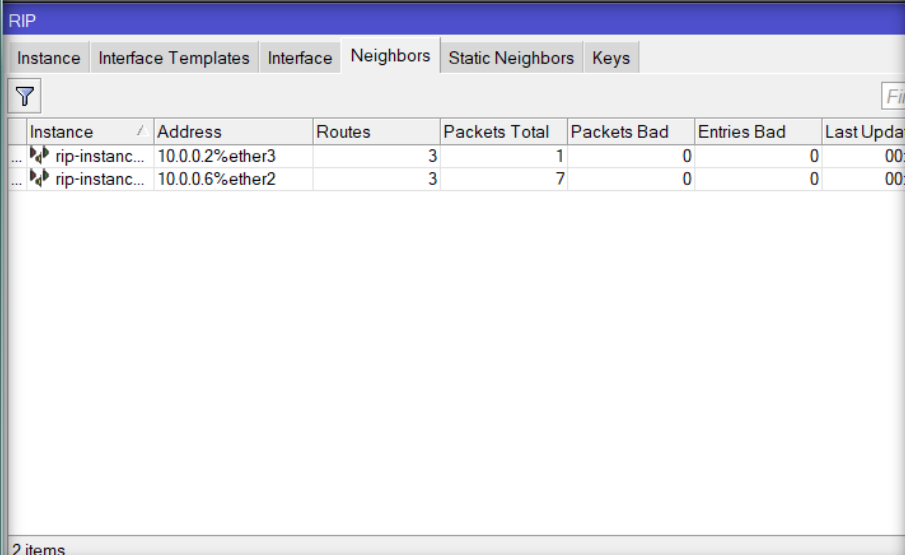
Update Interval:

OK, Cancel, Apply, Disable, Copy, Remove

enabled

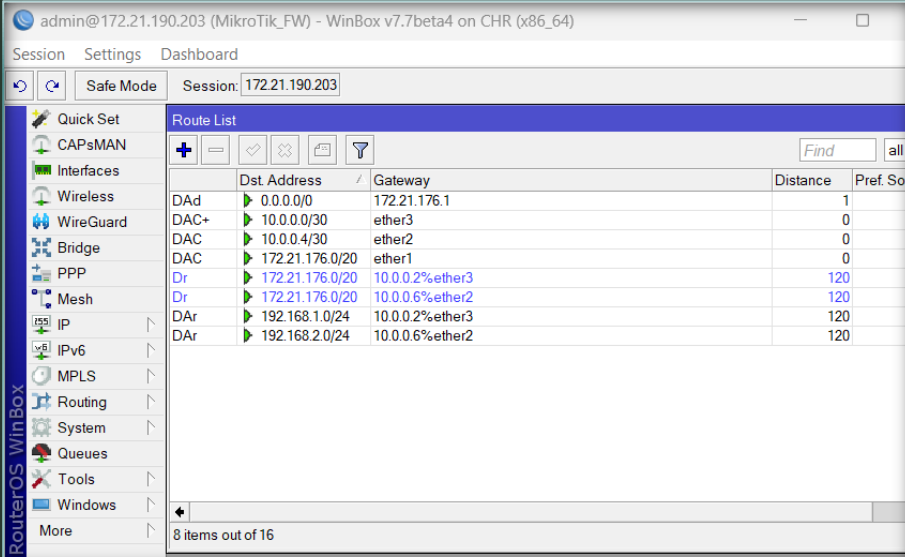
WAN Failover

- Putem observa in tab-ul de “Neighbors” cele doua routere.
- Acum putem verifica in rute ce am primit de la vecini.



Instance	Address	Routes	Packets Total	Packets Bad	Entries Bad	Last Update
rip-10.0.0.2%ether3	10.0.0.2%ether3	3	1	0	0	00:00:00
rip-10.0.0.6%ether2	10.0.0.6%ether2	3	7	0	0	00:00:00

2 items



	Dst Address	Gateway	Distance	Pref Source
DAd	0.0.0.0/0	172.21.176.1	1	
DAC+	10.0.0.0/30	ether3	0	
DAC	10.0.0.4/30	ether2	0	
DAC	172.21.176.0/20	ether1	0	
Dr	172.21.176.0/20	10.0.0.2%ether3	120	
Dr	172.21.176.0/20	10.0.0.6%ether2	120	
DAr	192.168.1.0/24	10.0.0.2%ether3	120	
DAr	192.168.2.0/24	10.0.0.6%ether2	120	

8 items out of 16

194.198 (MikroTik1) - WinBox v7.6 on CHR (x86_64)

Dashboard

Session: 172.21.184.198

Route List

	Dst. Address	Gateway	Distance
DAd	0.0.0.0/0	172.21.176.1	
Dr	0.0.0.0/0	10.0.0.1%ether3	
DAr	10.0.0.4/30	10.0.0.1%ether3	
Dr	172.21.176.0/20	10.0.0.1%ether3	
DAr	192.168.2.0/24	10.0.0.1%ether3	
DAC	10.0.0.0/30	ether3	
DAC	192.168.1.0/24	ether2	
DAC	172.21.176.0/20	ether1	

8 items out of 16

(MikroTik2) - WinBox v7.6 on CHR (x86_64)

Dashboard

Session: 172.21.176.156

Route List

Dst. Address	Gateway	Distance	Pref. Source
0.0.0.0/0	10.0.0.5%ether3	120	
0.0.0.0/0	172.21.176.1	1	
10.0.0.0/30	10.0.0.5%ether3	120	
10.0.0.4/30	ether3	0	
172.21.176.0/20	ether1	0	
172.21.176.0/20	10.0.0.5%ether3	120	
192.168.1.0/24	10.0.0.5%ether3	120	
192.168.2.0/24	ether2	0	

15 items out of 16

Putem sa verificam si pe routerul 1 si 2

WAN Failover

WAN Failover

- Acum putem sa facem cateva teste.
- Primul test este de a vedea daca este si pe unde este accesibila reteaua 2 din reteaua 1.
- Dupa care putem sa verificam ruta catre 8.8.8.8

```
PC1_LAN1
```

```
VPCS is free software, distributed under the terms of the "BSD" licence.  
Source code and license can be found at vpcs.sf.net.  
For more information, please visit wiki.freecode.com.cn.  
Modified version for EVE-NG.  
  
Press '?' to get help.  
  
VPCS> dhcp  
DORA IP 192.168.1.252/24 GW 192.168.1.1  
  
VPCS> ping 192.168.2.253  
  
84 bytes from 192.168.2.253 icmp_seq=1 ttl=61 time=5.908 ms  
84 bytes from 192.168.2.253 icmp_seq=2 ttl=61 time=8.629 ms  
^C  
VPCS> trace 192.168.2.253  
trace to 192.168.2.253, 8 hops max, press Ctrl+C to stop  
1 192.168.1.1 0.450 ms 0.371 ms 0.261 ms  
2 10.0.0.1 1.717 ms 0.801 ms 0.770 ms  
3 10.0.0.6 1.794 ms 1.301 ms 1.655 ms  
4 *192.168.2.253 2.171 ms (ICMP type:3, code:3, Destination port unreachable)  
e)
```

```
C1_LAN1
>
>
>
>
>
>
>
>
>
>
> trace 8.8.8.8
e to 8.8.8.8, 8 hops max, press Ctrl+C to stop
192.168.1.1    0.863 ms  0.735 ms  0.395 ms
172.21.176.1   0.956 ms  0.747 ms  0.759 ms
10.28.128.1    47.637 ms  47.185 ms  46.812 ms
138.199.63.125 48.068 ms  47.059 ms  47.579 ms
138.199.0.76   48.297 ms  47.462 ms  48.540 ms
62.115.187.1   47.525 ms  47.760 ms  48.171 ms
62.115.138.168 49.776 ms  48.855 ms  48.542 ms
62.115.122.189 48.136 ms  49.017 ms  50.186 ms
> █
```

WAN Failover

- Pe router 1 putem sa oprim interfata ether1 (WAN).
- Putem observa ca trece prin routerul de failover cu hopul 10.0.0.1.

