

Sieci komputerowe

Warsztaty 3

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Ponownie jako dowód rozwiązania zadania, umieszczam zrzuty ekranu historii terminala na poszczególnych maszynach, wyników programów traceroute oraz tablice routingu wyświetlone za pomocą polecenie show ip route. Konwencja przy nadawaniu adresów ip, którą przyjąłem to: 192.168.i.j/24 gdzie i jest numerem sieci local, a j jest numerem maszyny wirtualnej. Dla przykładu dla Virbian1 i interfejsu local0 jest to 192.168.0.1. Konfigurując protokół RIP (w wersji 2) na maszynach Virbian2, Virbian3, Virbian4, skorzystałem z poniższej serii poleceń (już po uruchomieniu vtysh):

1. configure terminal
2. router rip
3. version 2
4. network 192.168.i.0/24 powtórzone dla każdego interfejsu enp-loci

```
virbian# show ip rip
Codes: R - RIP, C - connected, S - Static, O - OSPF, B - BGP
Sub-codes:
  (n) - normal, (s) - static, (d) - default, (r) - redistribute,
  (i) - interface

      Network        Next Hop        Metric From        Tag Time
C(i) 192.168.0.0/24   0.0.0.0          1 self             0
C(i) 192.168.1.0/24   0.0.0.0          1 self             0
C(i) 192.168.2.0/24   0.0.0.0          1 self             0
R(n) 192.168.3.0/24   192.168.1.3      2 192.168.1.3       0 02:44
R(n) 192.168.4.0/24   192.168.2.4      2 192.168.2.4       0 02:25
virbian# _
```

Rysunek 1: Tablica routingu maszyny Virbian2 po włączeniu protokołu RIP

```

virbian# show ip rip
Codes: R - RIP, C - connected, S - Static, O - OSPF, B - BGP
Sub-codes:
    (n) - normal, (s) - static, (d) - default, (r) - redistribute,
    (i) - interface

    Network          Next Hop          Metric From          Tag Time
R(n) 192.168.0.0/24  192.168.1.2       2 192.168.1.2        0 02:59
C(i) 192.168.1.0/24  0.0.0.0           1 self               0
R(n) 192.168.2.0/24  192.168.1.2       2 192.168.1.2        0 02:59
C(i) 192.168.3.0/24  0.0.0.0           1 self               0
R(n) 192.168.4.0/24  192.168.3.4       2 192.168.3.4        0 02:37
virbian#

```

Rysunek 2: Tablica routingu maszyny Virbian3 po włączeniu protokołu RIP

```

virbian# show ip rip
Codes: R - RIP, C - connected, S - Static, O - OSPF, B - BGP
Sub-codes:
    (n) - normal, (s) - static, (d) - default, (r) - redistribute,
    (i) - interface

    Network          Next Hop          Metric From          Tag Time
R(n) 192.168.0.0/24  192.168.2.2       2 192.168.2.2        0 02:42
R(n) 192.168.1.0/24  192.168.2.2       2 192.168.2.2        0 02:42
C(i) 192.168.2.0/24  0.0.0.0           1 self               0
C(i) 192.168.3.0/24  0.0.0.0           1 self               0
C(i) 192.168.4.0/24  0.0.0.0           1 self               0
virbian# _

```

Rysunek 3: Tablica routingu maszyny Virbian4 po włączeniu protokołu RIP

```

user@virbian:~$ traceroute 192.168.4.5
traceroute to 192.168.4.5 (192.168.4.5), 30 hops max, 60 byte packets
 1 192.168.0.2 (192.168.0.2) 1.116 ms 0.784 ms 0.907 ms
 2 192.168.2.4 (192.168.2.4) 2.366 ms 2.101 ms 1.818 ms
 3 192.168.4.5 (192.168.4.5) 5.332 ms 5.054 ms 4.672 ms
user@virbian:~$ traceroute 192.168.1.3
traceroute to 192.168.1.3 (192.168.1.3), 30 hops max, 60 byte packets
 1 192.168.0.2 (192.168.0.2) 1.855 ms 1.745 ms 1.432 ms
 2 192.168.1.3 (192.168.1.3) 3.931 ms 3.656 ms 3.100 ms
user@virbian:~$ traceroute 192.168.3.3
traceroute to 192.168.3.3 (192.168.3.3), 30 hops max, 60 byte packets
 1 192.168.0.2 (192.168.0.2) 1.002 ms 0.596 ms 0.336 ms
 2 192.168.3.3 (192.168.3.3) 2.548 ms 2.627 ms 2.313 ms
user@virbian:~$ _

```

Rysunek 4: Wynik programu traceroute dla maszyny Virbian1 po wykonaniu poleceń

```

user@virbian:~$ traceroute 192.168.0.1
traceroute to 192.168.0.1 (192.168.0.1), 30 hops max, 60 byte packets
 1  192.168.1.2 (192.168.1.2)  1.072 ms  0.843 ms  0.809 ms
 2  192.168.0.1 (192.168.0.1)  2.000 ms  1.478 ms  1.604 ms
user@virbian:~$ traceroute 192.168.4.5
traceroute to 192.168.4.5 (192.168.4.5), 30 hops max, 60 byte packets
 1  192.168.3.4 (192.168.3.4)  0.888 ms  0.845 ms  0.583 ms
 2  192.168.4.5 (192.168.4.5)  2.332 ms  2.569 ms  2.267 ms
user@virbian:~$

```

Rysunek 5: Wynik programu traceroute dla maszyny Virbian3 po wykonaniu poleceń

```

user@virbian:~$ traceroute 192.168.0.1
traceroute to 192.168.0.1 (192.168.0.1), 30 hops max, 60 byte packets
 1  192.168.4.4 (192.168.4.4)  1.730 ms  1.017 ms  1.098 ms
 2  192.168.2.2 (192.168.2.2)  2.842 ms  2.607 ms  3.631 ms
 3  192.168.0.1 (192.168.0.1)  5.520 ms  10.966 ms  10.522 ms
user@virbian:~$ traceroute 192.168.1.3
traceroute to 192.168.1.3 (192.168.1.3), 30 hops max, 60 byte packets
 1  192.168.4.4 (192.168.4.4)  0.989 ms  1.100 ms  0.774 ms
 2  192.168.2.2 (192.168.2.2)  1.918 ms  2.033 ms  1.719 ms
 3  192.168.1.3 (192.168.1.3)  9.942 ms  10.099 ms  9.498 ms
user@virbian:~$ traceroute 192.168.3.3
traceroute to 192.168.3.3 (192.168.3.3), 30 hops max, 60 byte packets
 1  192.168.4.4 (192.168.4.4)  0.966 ms  0.784 ms  1.798 ms
 2  192.168.3.3 (192.168.3.3)  1.988 ms  1.373 ms *
user@virbian:~$ _

```

Rysunek 6: Wynik programu traceroute dla maszyny Virbian5 po wykonaniu poleceń

```
5 clear
6 sudo ip link set enp0s3 name enp-loc0
7 sudo ip link set up dev enp-loc0
8 sudo ip add add 192.168.0.1/24 dev enp-loc0
9 sudo ip route add default via 192.168.0.2/24
10 sudo ip route add default via 192.168.0.2
11 ping 192.168.1.3
12 ping 192.168.3.3
13 ping 192.168.4.5
14 clear
15 traceroute 192.168.4.5
16 traceroute 192.168.2.3
17 clear
18 traceroute 192.168.4.5
19 traceroute 192.168.1.3
20 traceroute 192.168.3.3
21 clear
22 history
user@virbian:~$ _
```

Rysunek 7: Historia terminala dla maszyny Virbian1

```
4 sudo ip link
5 sudo ip link set enp0s3 name enp-loc0
6 sudo ip link set enp0s8 name enp-loc1
7 sudo ip link set enp0s9 name enp-loc2
8 sudo ip link set up dev enp-loc0
9 sudo ip link set up dev enp-loc1
10 sudo ip link set up dev enp-loc2
11 sudo ip addr add 192.168.0.2/24 dev enp-loc0
12 sudo ip addr add 192.168.1.2/24 dev enp-loc1
13 sudo ip addr add 192.168.2.2/24 dev enp-loc2
14 sudo touch /etc/quagga/ripd.conf
15 sudo touch /etc/quagga/zebra.conf
16 sudo touch /etc/quagga/vtysh.conf
17 sudo systemctl start ripd
18 sudo vtysh
19 ckear
20 clear
21 history
user@virbian:~$
```

Rysunek 8: Historia terminala dla maszyny Virbian2

```
4 ip link
5 sudo ip link set enp0s3 enp-loc1
6 sudo ip link set enp0s3 name enp-loc1
7 sudo ip link set enp0s8 name enp-loc3
8 sudo ip link set up enp-loc1
9 sudo ip link set up enp-loc3
10 ip link
11 sudo ip link set up dev enp-loc1
12 sudo ip link set up dev enp-loc3
13 sudo ip addr add 192.168.1.3/24 dev enp-loc1
14 sudo ip addr add 192.168.3.3/24 dev enp-loc3
15 sudo touch /etc/quagga/ripd.conf
16 sudo touch /etc/quagga/ripd.conf
17 sudo touch /etc/quagga/zebra.conf
18 sudo touch /etc/quagga/vtysh.conf
19 sudo systemctl start ripd
20 sudo vtysh
21 ping 192.168.0.1
22 ping 192.168.4.5
23 clear
24 traceroute 192.168.0.1
25 traceroute 192.168.4.5
26 clear
27 history
user@virbian:~$
```

Rysunek 9: Historia terminala dla maszyny Virbian3

```
4 clear
5 sudo ip link set enp0s3 name enp-loc2
6 sudo ip link set enp0s8 name enp-loc3
7 sudo ip link set enp0s9 name enp-loc4
8 sudo ip link set up dev enp-loc2
9 sudo ip link set up dev enp-loc3
10 sudo ip link set up dev enp-loc4
11 sudo ip addr add 192.168.2.4/24 dev enp-loc2
12 sudo ip addr add 192.168.3.4/24 dev enp-loc3
13 sudo ip addr add 192.168.4.4/24 dev enp-loc4
14 sudo touch /etc/quagga/ripd.conf
15 sudo touch /etc/quagga/zebra.conf
16 sudo touch /etc/quagga/vtysh.conf
17 sudo systemctl start ripd
18 sudo vtysh
19 clear
20 history
user@virbian:~$
```

Rysunek 10: Historia terminala dla maszyny Virbian4

```
4 clear
5 sudo ip link set enp0s3 name enp-loc4
6 sudo ip link set up dev enp-loc4
7 sudo ip addr add 192.168.4.5/24 dev enp-loc4
8 sudo ip route add default via 192.168.4.4
9 ping 192.168.1.3
10 ping 192.168.3.3
11 ping 192.168.0.1
12 clear
13 traceroute 192.168.0.1
14 traceroute 192.168.2.3
15 clear
16 traceroute 192.168.0.1
17 traceroute 192.168.1.3
18 traceroute 192.168.3.3
19 clear
20 history
user@virbian:~$ _
```

Rysunek 11: Historia terminala dla maszyny Virbian5