TD – laboratoria 0

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1 Konfiguracja ipv4

1.1 Konfiguracja routera R1

1.2 Konfiguracja routera R2

Po połączeniu z routerem R2, ipv4 address routera nie jest ustawiony.

Output

```
R2#show interface
Ethernet0/0 is administratively down, line protocol is down
  Hardware is AmdP2, address is cc03.1a35.0000 (bia cc03.1a35.0000)
  MTU 1500 bytes, BW 10000 Kbit/sec, DLY 1000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 input packets with dribble condition detected
```

```
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 unknown protocol drops
     0 babbles, 0 late collision, 0 deferred
     0 lost carrier, 0 no carrier
```

By ustawić ipv4 wchodzimy w tryb konfiguracji i ustawiamy ipv4 adres.

Output

```
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#interface Ethernet 0/0
R2(config-if)#ip address 192.168.0.2 255.255.255.0
R2(config-if)#exit
R2(config)#^Z
R2#
*Mar  1 00:05:08.023: %SYS-5-CONFIG_I: Configured from console by
↪  console
```

Adres ipv4 routera R2 zostaje ustawiony na 192.168.0.2 z maską 255.255.255.0.

Output

```
R2#show interfaces
Ethernet0/0 is administratively down, line protocol is down
  Hardware is AmdP2, address is cc03.1a35.0000 (bia cc03.1a35.0000)
  Internet address is 192.168.0.2/24
  MTU 1500 bytes, BW 10000 Kbit/sec, DLY 1000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
  Last input never, output never, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
```

```
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 input packets with dribble condition detected
     0 packets output, 0 bytes, 0 underruns
     0 output errors, 0 collisions, 0 interface resets
     0 unknown protocol drops
     0 babbles, 0 late collision, 0 deferred
```

Pozostaje nam jeszcze ustawić *line protocol* na *up* przy pomocy *no shutdown*. W tym celu ponownie otwieramy tryb konfiguracji.

Output

```
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#interface Ethernet 0/0
R2(config-if)#no shutdown
R2(config-if)#
*Mar  1 00:06:10.539: %LINK-3-UPDOWN: Interface Ethernet0/0, changed
 ↪  state to up
*Mar  1 00:06:11.539: %LINEPROTO-5-UPDOWN: Line protocol on Interface
 ↪  Ethernet0/0, changed state to up
R2(config-if)#exit
R2(config)#^Z
R2#
*Mar  1 00:06:19.503: %SYS-5-CONFIG_I: Configured from console by
 ↪  console
```

R2 jest gotowy do łączenia z R1 przez Ethernet 0/0.

Output

```
R2#show interface Ethernet 0/0
Ethernet0/0 is up, line protocol is up
  Hardware is AmdP2, address is cc03.1a35.0000 (bia cc03.1a35.0000)
  Internet address is 192.168.0.2/24
  MTU 1500 bytes, BW 10000 Kbit/sec, DLY 1000 usec,
     reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive set (10 sec)
  ARP type: ARPA, ARP Timeout 04:00:00
```

```
  Last input never, output 00:00:01, output hang never
  Last clearing of "show interface" counters never
  Input queue: 0/75/0/0 (size/max/drops/flushes); Total output drops: 0
  Queueing strategy: fifo
  Output queue: 0/40 (size/max)
  5 minute input rate 0 bits/sec, 0 packets/sec
  5 minute output rate 0 bits/sec, 0 packets/sec
     0 packets input, 0 bytes, 0 no buffer
     Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
     0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored
     0 input packets with dribble condition detected
     9 packets output, 1365 bytes, 0 underruns
     0 output errors, 0 collisions, 1 interface resets
     0 unknown protocol drops
     0 babbles, 0 late collision, 0 deferred
```

1.3 Połączenie między routerami

Powyższa konfiguracja pozwala nam z powodzeniem kontakować się między R1 i R2.

Output

```
R2#ping 192.168.0.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.1, timeout is 2 seconds:
.!!!!
Success rate is 80 percent (4/5), round-trip min/avg/max = 24/35/60 ms
R2#ping 192.168.0.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 12/23/28 ms
R2#ping 192.168.0.1

Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 192.168.0.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 12/23/28 ms
R2#ping 192.168.0.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 192.168.0.1, timeout is 2 seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 20/24/28 ms
```

2 Konfiguracja ipv6

2.1 Konfiguracja routera R1

2.2 Konfiguracja routera R2

By skonfigurować R2 pod użycie ipv6 wchodzimy w tryb konfiguracji i ustawiamy ipv6 adres.

Output

```
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#interface Ethernet 0/0
R2(config-if)#ipv6 address
% Incomplete command.

R2(config-if)#ipv6 address 2001:DB8:0:1::1/64
R2(config-if)#ipv6 enable
R2(config-if)#exit
R2(config)#^Z
R2#
*Mar  1 00:13:15.983: %SYS-5-CONFIG_I: Configured from console by
 ↪  console
```

R2 znajduje się pod adresem 2001:DB8:0:1::1.

Output

```
R2#show ipv6 interface
Ethernet0/0 is up, line protocol is up
  IPv6 is enabled, link-local address is FE80::CE03:1AFF:FE35:0
  Global unicast address(es):
    2001:DB8:0:1::1, subnet is 2001:DB8:0:1::/64
  Joined group address(es):
    FF02::1
    FF02::2
    FF02::1:FF00:1
    FF02::1:FF35:0
  MTU is 1500 bytes
  ICMP error messages limited to one every 100 milliseconds
  ICMP redirects are enabled
  ND DAD is enabled, number of DAD attempts: 1
  ND reachable time is 30000 milliseconds
```

Usuwamy ustawiony wcześniej ipv4 adres, dodajemy unicast routing.

Output

```
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#interface Ethernet 0/0
R2(config-if)#no ip address
R2(config-if)#exit
R2(config)#^Z
```

Output

```
R2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#interface Ethernet 0/0
R2(config-if)#ipv6 unicast-routing
R2(config)#exit
R2#
*Mar  1 00:17:24.611: %SYS-5-CONFIG_I: Configured from console by
 ↪  console
```

R2 jest gotowy do łączenia przez Ethernet 0/0 korzystając z ipv6.

Output

```
R2#show ipv6 interface
Ethernet0/0 is up, line protocol is up
  IPv6 is enabled, link-local address is FE80::CE03:1AFF:FE35:0
  Global unicast address(es):
    2001:DB8:0:1::1, subnet is 2001:DB8:0:1::/64
  Joined group address(es):
    FF02::1
    FF02::2
    FF02::1:FF00:1
    FF02::1:FF35:0
  MTU is 1500 bytes
  ICMP error messages limited to one every 100 milliseconds
  ICMP redirects are enabled
  ND DAD is enabled, number of DAD attempts: 1
  ND reachable time is 30000 milliseconds
  ND advertised reachable time is 0 milliseconds
  ND advertised retransmit interval is 0 milliseconds
  ND router advertisements are sent every 200 seconds
  ND router advertisements live for 1800 seconds
  Hosts use stateless autoconfig for addresses.
```

2.3 Połączenie między routerami

Powyższa konfiguracja pozwala nam z powodzeniem kontakować się między R1 i R2.

Output

```
R2#ping ipv6 2001:DB8:0:1::2

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 2001:DB8:0:1::2, timeout is 2
 ↪  seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 12/20/28 ms
R2#ping ipv6 2001:DB8:0:1::2

Type escape sequence to abort.
```

```
Sending 5, 100-byte ICMP Echos to 2001:DB8:0:1::2, timeout is 2
 ↪  seconds:
!!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 24/27/32 ms
```