POLITECHNIKA WROCŁAWSKA
WYDZIAŁ INFORMATYKI I
TELEKOMUNIKACJI

Technologie sieciowe - routing

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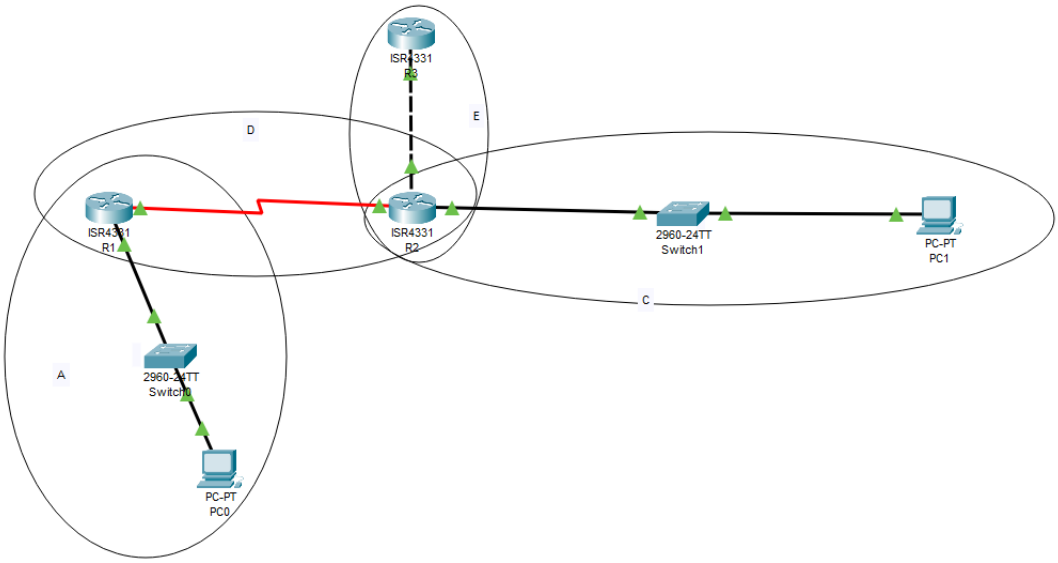
1 Zestawienie sieci



Rysunek 1: Schemat sieci

1.1 Adresacja sieci

Sieć	Liczba adresów	Adres	Maska
A	237	10.0.194.0	/24
B	48	10.0.195.0	/26
C	330	10.0.192.0	/23
D	2	10.0.195.64	/30
E	2	10.0.195.68	/30
F	2	10.0.195.72	/30

1.2 Weryfikacja łączności

```
C:\>ping 10.0.194.2

Pinging 10.0.194.2 with 32 bytes of data:

Reply from 10.0.192.1: Destination host unreachable.
Reply from 10.0.192.1: Destination host unreachable.
Reply from 10.0.192.1: Destination host unreachable.
Reply from 10.0.192.1: Destination host unreachable.

Ping statistics for 10.0.194.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

Rysunek 2: Ping z PC1 do PC0

```
C:\>ping 10.0.192.1

Pinging 10.0.192.1 with 32 bytes of data:

Reply from 10.0.192.1: bytes=32 time<1ms TTL=255
Reply from 10.0.192.1: bytes=32 time=1ms TTL=255
Reply from 10.0.192.1: bytes=32 time=1ms TTL=255
Reply from 10.0.192.1: bytes=32 time=1ms TTL=255

Ping statistics for 10.0.192.1:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 0ms, Maximum = 1ms, Average = 0ms
```

Rysunek 3: Ping z PC1 do R2

2 Konfiguracja routingu statycznego

2.1 Routing statyczny na routerach

```
R1-Sawicki(config)#ip route 10.0.192.0 255.255.254.0 10.0.195.66
```

Rysunek 4: Routing statyczny na R1

```
R2-Sawicki(config)#ip route 10.0.194.0 255.255.255.0 10.0.195.65
```

Rysunek 5: Routing statyczny na R2

2.2 Weryfikacja łączności

```
Pinging 10.0.194.2 with 32 bytes of data:

Request timed out.
Reply from 10.0.194.2: bytes=32 time=10ms TTL=126
Reply from 10.0.194.2: bytes=32 time=10ms TTL=126
Reply from 10.0.194.2: bytes=32 time=10ms TTL=126

Ping statistics for 10.0.194.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 10ms, Maximum = 10ms, Average = 10ms
```

Rysunek 6: Ping z PC1 do PC0

2.3 Tabele routingu

```
R1-Sawicki#show ip route
Codes: L - local, 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, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

     10.0.0.0/8 is variably subnetted, 5 subnets, 4 masks
S       10.0.192.0/23 [1/0] via 10.0.195.66
C       10.0.194.0/24 is directly connected, GigabitEthernet0/0/0
L       10.0.194.1/32 is directly connected, GigabitEthernet0/0/0
C       10.0.195.64/30 is directly connected, Serial0/1/0
L       10.0.195.65/32 is directly connected, Serial0/1/0
```

Rysunek 7: Tabela routingu dla R1

```
R2-Sawicki#show ip route
Codes: L - local, 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, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

     10.0.0.0/8 is variably subnetted, 7 subnets, 4 masks
C       10.0.192.0/23 is directly connected, GigabitEthernet0/0/0
L       10.0.192.1/32 is directly connected, GigabitEthernet0/0/0
S       10.0.194.0/24 [1/0] via 10.0.195.65
C       10.0.195.64/30 is directly connected, Serial0/1/0
L       10.0.195.66/32 is directly connected, Serial0/1/0
C       10.0.195.68/30 is directly connected, GigabitEthernet0/0/1
L       10.0.195.69/32 is directly connected, GigabitEthernet0/0/1
```

Rysunek 8: Tabela routingu dla R2

```
C:\>ping 10.0.194.2

Pinging 10.0.194.2 with 32 bytes of data:

Reply from 10.0.194.2: bytes=32 time=12ms TTL=126
Reply from 10.0.194.2: bytes=32 time=10ms TTL=126
Reply from 10.0.194.2: bytes=32 time=10ms TTL=126
Reply from 10.0.194.2: bytes=32 time=1ms TTL=126

Ping statistics for 10.0.194.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 1ms, Maximum = 12ms, Average = 8ms
```

Rysunek 11: Caption

3 Konfiguracja routingu dynamicznego

3.1 Routing dynamiczny na routerach

```
R1-Sawicki(config-router)#network 10.0.194.0
R1-Sawicki(config-router)#network 10.0.195.64
```

Rysunek 9: Ustawienie routingu dynamicznego na R1

```
R2-Sawicki(config-router)#network 10.0.192.0
R2-Sawicki(config-router)#network 10.0.195.64
R2-Sawicki(config-router)#network 10.0.195.68
```

Rysunek 10: Ustawienie routingu dynamicznego na R2

3.2 Weryfikacja łączności

3.3 Tabele routingu

```
R2-Sawicki#show ip route
Codes: L - local, 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, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

     10.0.0.0/8 is variably subnetted, 7 subnets, 4 masks
C       10.0.192.0/23 is directly connected, GigabitEthernet0/0/0
L       10.0.192.1/32 is directly connected, GigabitEthernet0/0/0
R       10.0.194.0/24 [120/1] via 10.0.195.65, 00:00:03, Serial0/1/0
C       10.0.195.64/30 is directly connected, Serial0/1/0
L       10.0.195.66/32 is directly connected, Serial0/1/0
C       10.0.195.68/30 is directly connected, GigabitEthernet0/0/1
L       10.0.195.69/32 is directly connected, GigabitEthernet0/0/1
```

Rysunek 12: Tabela routingu dla R1

```
R1-Sawicki#show ip route
Codes: L - local, 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, E - EGP
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, ia - IS-IS inter area
       * - candidate default, U - per-user static route, o - ODR
       P - periodic downloaded static route

Gateway of last resort is not set

     10.0.0.0/8 is variably subnetted, 6 subnets, 4 masks
R       10.0.192.0/23 [120/1] via 10.0.195.66, 00:00:22, Serial0/1/0
C       10.0.194.0/24 is directly connected, GigabitEthernet0/0/0
L       10.0.194.1/32 is directly connected, GigabitEthernet0/0/0
C       10.0.195.64/30 is directly connected, Serial0/1/0
L       10.0.195.65/32 is directly connected, Serial0/1/0
R       10.0.195.68/30 [120/1] via 10.0.195.66, 00:00:22, Serial0/1/0
```

Rysunek 13: Tabela routingu dla R2