

Лабораторно упражнение 5

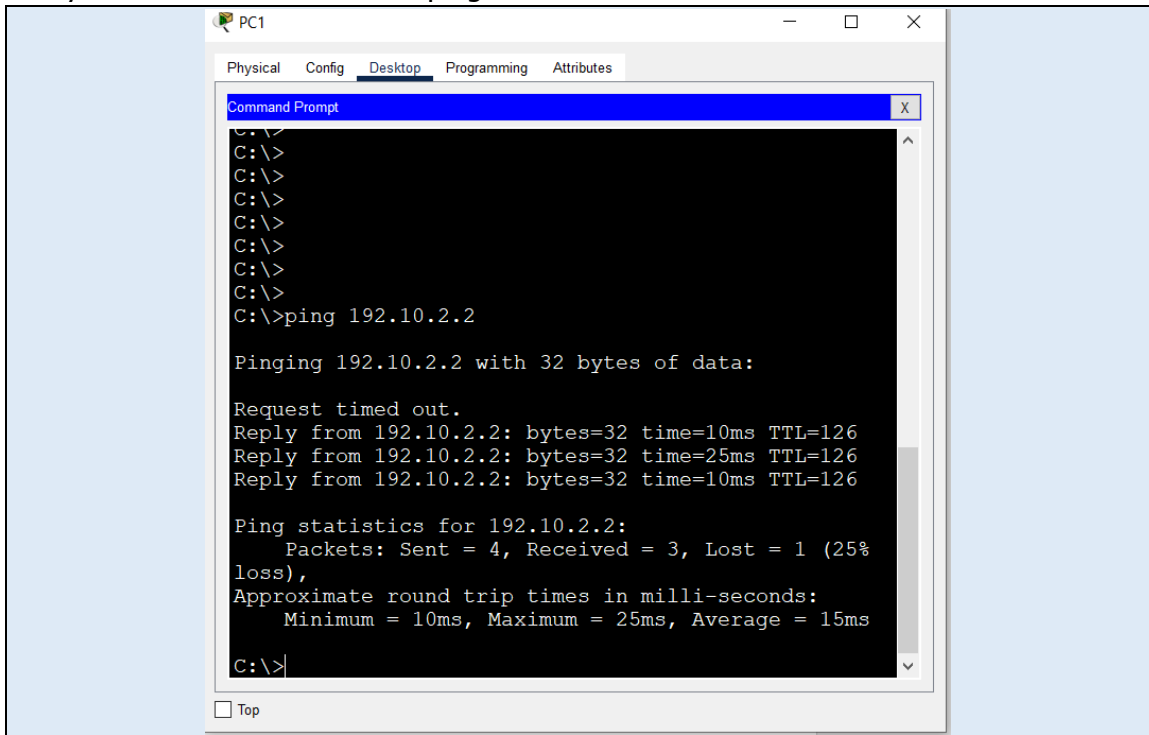
Маршрутизация чрез Border Gateway Protocol (BGP)

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Факултетен №: 21621577

Резултати към задача 2.1. Базова конфигурация на BGP в Cisco Packet Tracer

- Резултат от изпълнението на ping от PC1 към PC2:



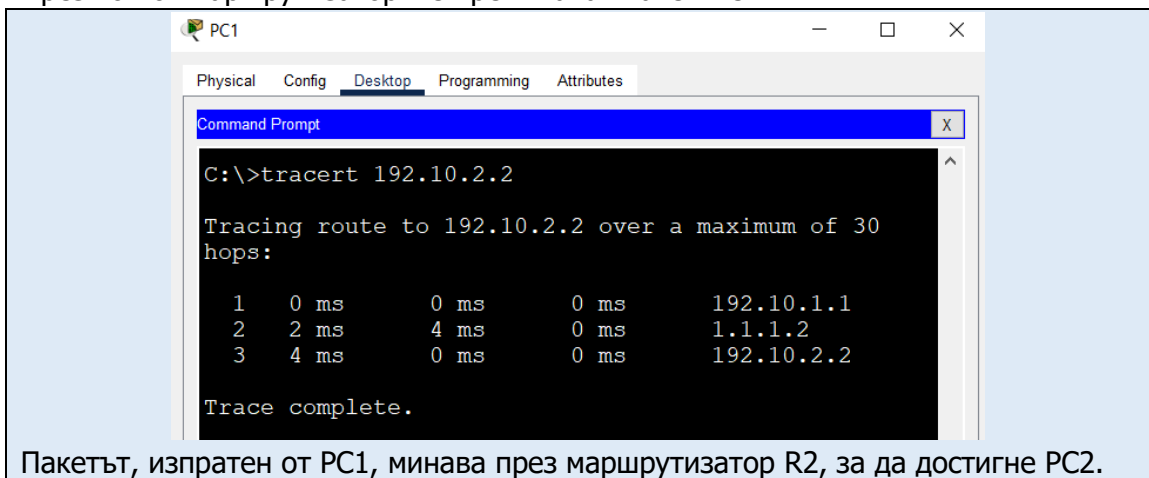
```
PC1
Physical Config Desktop Programming Attributes
Command Prompt
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>ping 192.10.2.2

Pinging 192.10.2.2 with 32 bytes of data:

Request timed out.
Reply from 192.10.2.2: bytes=32 time=10ms TTL=126
Reply from 192.10.2.2: bytes=32 time=25ms TTL=126
Reply from 192.10.2.2: bytes=32 time=10ms TTL=126

Ping statistics for 192.10.2.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
Approximate round trip times in milli-seconds:
    Minimum = 10ms, Maximum = 25ms, Average = 15ms
C:\>
```

- През кои от маршрутизаторите преминават пакетите?



```
PC1
Physical Config Desktop Programming Attributes
Command Prompt
C:\>tracert 192.10.2.2

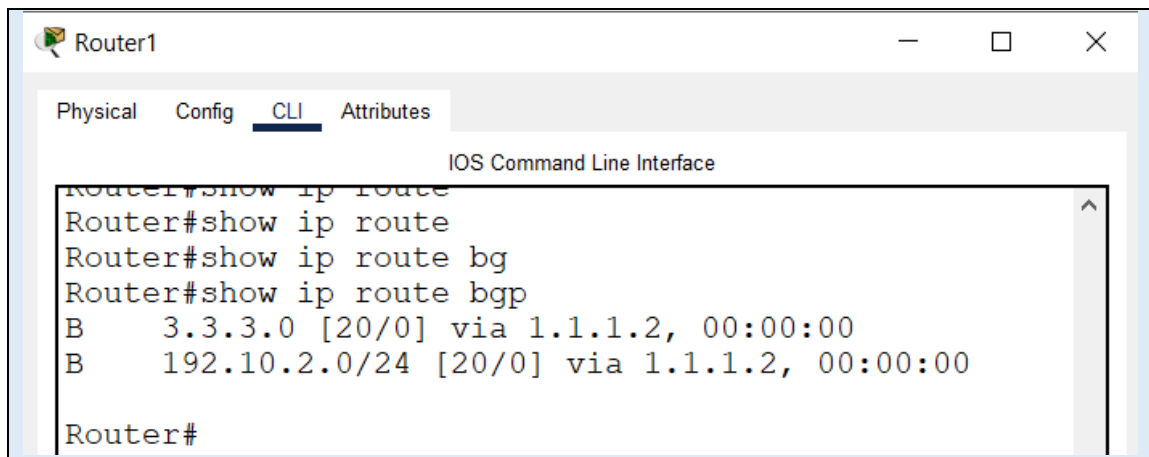
Tracing route to 192.10.2.2 over a maximum of 30 hops:

  1  0 ms      0 ms      0 ms      192.10.1.1
  2  2 ms      4 ms      0 ms      1.1.1.2
  3  4 ms      0 ms      0 ms      192.10.2.2

Trace complete.
```

Пакетът, изпратен от PC1, минава през маршрутизатор R2, за да достигне PC2.

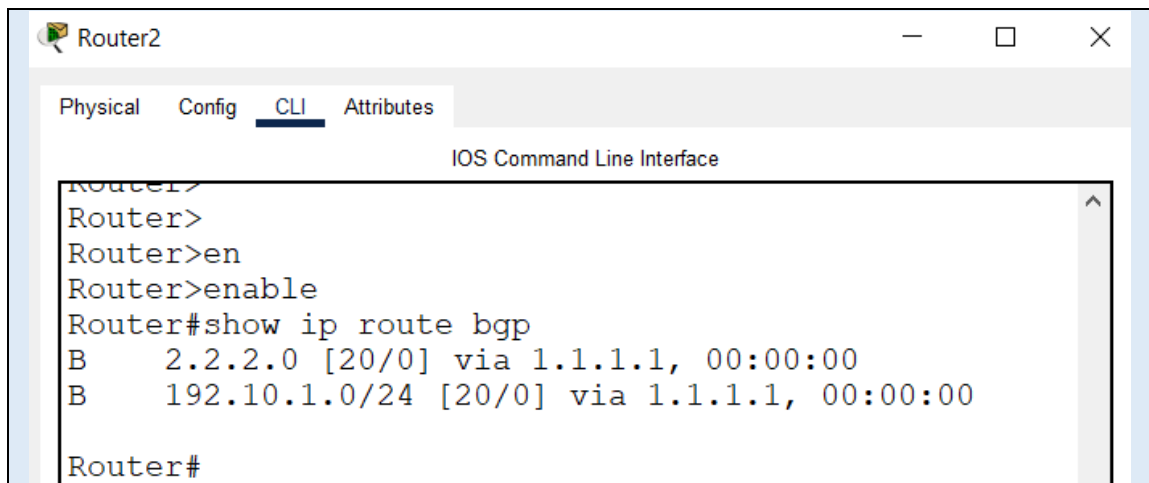
- BGP маршрути в R1 (show ip route bgp):



The screenshot shows the CLI of Router1. The 'CLI' tab is selected. The command 'show ip route bgp' has been entered, displaying two BGP routes: 'B 3.3.3.0 [20/0] via 1.1.1.2, 00:00:00' and 'B 192.10.2.0/24 [20/0] via 1.1.1.2, 00:00:00'. The prompt is 'Router#'.

```
Router1#show ip route bgp
Router#show ip route bgp
Router#show ip route bgp
B    3.3.3.0 [20/0] via 1.1.1.2, 00:00:00
B    192.10.2.0/24 [20/0] via 1.1.1.2, 00:00:00
Router#
```

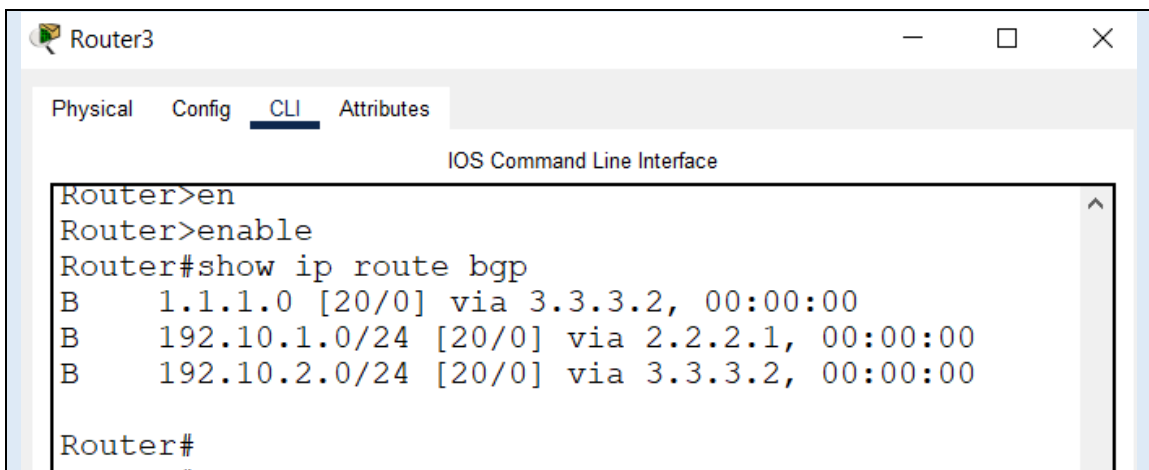
- BGP маршрути в R2 (show ip route bgp):



The screenshot shows the CLI of Router2. The 'CLI' tab is selected. The user has entered 'en' to enter enable mode. The command 'show ip route bgp' has been entered, displaying two BGP routes: 'B 2.2.2.0 [20/0] via 1.1.1.1, 00:00:00' and 'B 192.10.1.0/24 [20/0] via 1.1.1.1, 00:00:00'. The prompt is 'Router#'.

```
Router2>
Router2>en
Router2>enable
Router#show ip route bgp
B    2.2.2.0 [20/0] via 1.1.1.1, 00:00:00
B    192.10.1.0/24 [20/0] via 1.1.1.1, 00:00:00
Router#
```

- BGP маршрути в R3 (show ip route bgp):

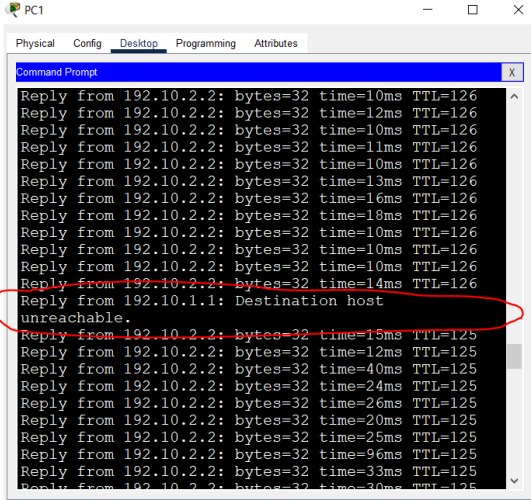


The screenshot shows the CLI of Router3. The 'CLI' tab is selected. The user has entered 'en' to enter enable mode. The command 'show ip route bgp' has been entered, displaying three BGP routes: 'B 1.1.1.0 [20/0] via 3.3.3.2, 00:00:00', 'B 192.10.1.0/24 [20/0] via 2.2.2.1, 00:00:00', and 'B 192.10.2.0/24 [20/0] via 3.3.3.2, 00:00:00'. The prompt is 'Router#'.

```
Router3>en
Router3>enable
Router#show ip route bgp
B    1.1.1.0 [20/0] via 3.3.3.2, 00:00:00
B    192.10.1.0/24 [20/0] via 2.2.2.1, 00:00:00
B    192.10.2.0/24 [20/0] via 3.3.3.2, 00:00:00
Router#
```

Резултати към задача 2.2. Симулация на отпадане на връзка и изменение на маршрут

- Брой загубени ICMP пакети при промяната на маршрута от PC1 до PC2:

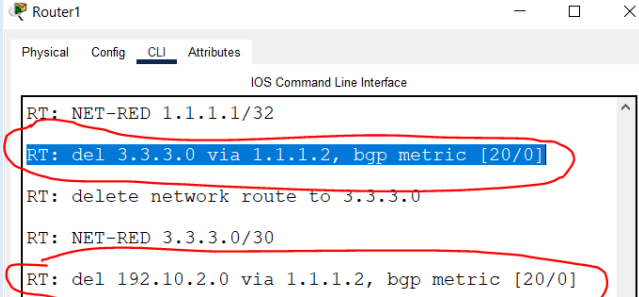


```
PC1
Physical Config Desktop Programming Attributes
Command Prompt
Reply from 192.10.2.2: bytes=32 time=10ms TTL=126
Reply from 192.10.2.2: bytes=32 time=12ms TTL=126
Reply from 192.10.2.2: bytes=32 time=10ms TTL=126
Reply from 192.10.2.2: bytes=32 time=11ms TTL=126
Reply from 192.10.2.2: bytes=32 time=10ms TTL=126
Reply from 192.10.2.2: bytes=32 time=13ms TTL=126
Reply from 192.10.2.2: bytes=32 time=16ms TTL=126
Reply from 192.10.2.2: bytes=32 time=18ms TTL=126
Reply from 192.10.2.2: bytes=32 time=10ms TTL=126
Reply from 192.10.2.2: bytes=32 time=10ms TTL=126
Reply from 192.10.2.2: bytes=32 time=10ms TTL=126
Reply from 192.10.2.2: bytes=32 time=14ms TTL=126
Reply from 192.10.1.1: Destination host unreachable.
Reply from 192.10.2.2: bytes=32 time=15ms TTL=125
Reply from 192.10.2.2: bytes=32 time=12ms TTL=125
Reply from 192.10.2.2: bytes=32 time=40ms TTL=125
Reply from 192.10.2.2: bytes=32 time=24ms TTL=125
Reply from 192.10.2.2: bytes=32 time=26ms TTL=125
Reply from 192.10.2.2: bytes=32 time=20ms TTL=125
Reply from 192.10.2.2: bytes=32 time=25ms TTL=125
Reply from 192.10.2.2: bytes=32 time=96ms TTL=125
Reply from 192.10.2.2: bytes=32 time=33ms TTL=125
Reply from 192.10.2.2: bytes=32 time=30ms TTL=125
```

Един загубен пакет.

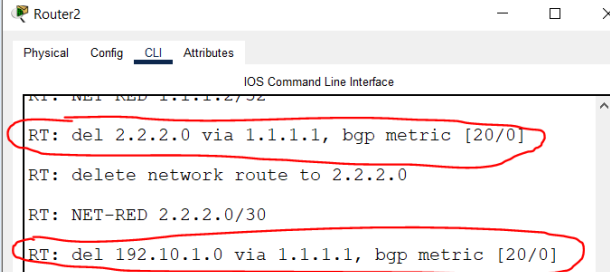
- Изтрити маршрути след прекъсване на връзката:

в R1:



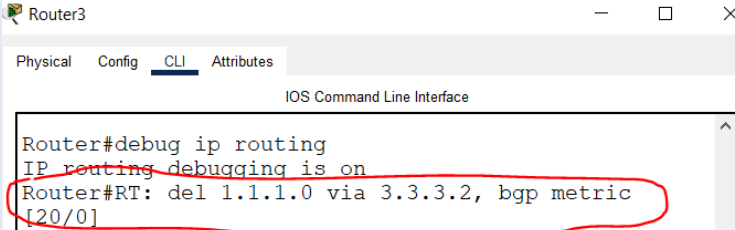
```
Router1
Physical Config CLI Attributes
IOS Command Line Interface
RT: NET-RED 1.1.1.1/32
RT: del 3.3.3.0 via 1.1.1.2, bgp metric [20/0]
RT: delete network route to 3.3.3.0
RT: NET-RED 3.3.3.0/30
RT: del 192.10.2.0 via 1.1.1.2, bgp metric [20/0]
```

в R2:



```
Router2
Physical Config CLI Attributes
IOS Command Line Interface
RT: NET-RED 1.1.1.1/32
RT: del 2.2.2.0 via 1.1.1.1, bgp metric [20/0]
RT: delete network route to 2.2.2.0
RT: NET-RED 2.2.2.0/30
RT: del 192.10.1.0 via 1.1.1.1, bgp metric [20/0]
```

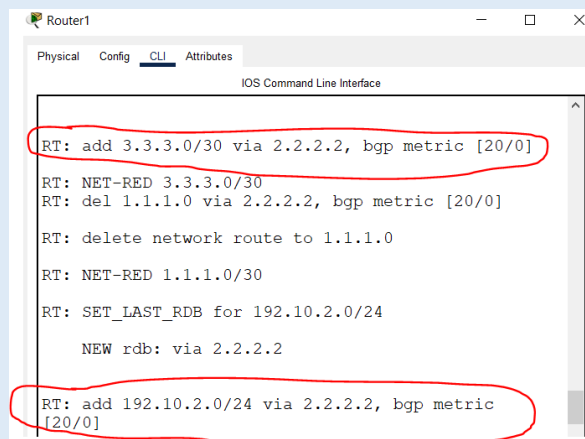
в R3:



```
Router3
Physical Config CLI Attributes
IOS Command Line Interface
Router#debug ip routing
IP routing debugging is on
Router#RT: del 1.1.1.0 via 3.3.3.2, bgp metric [20/0]
```

- Добавени маршрути след прекъсване на връзката:

в R1:

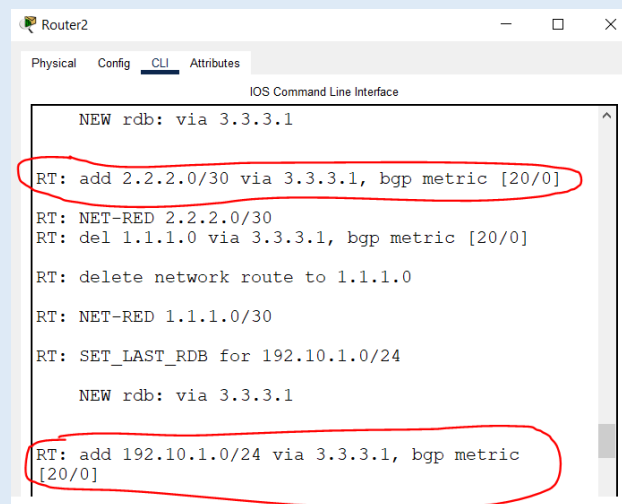


```
Router1
Physical Config CLI Attributes
IOS Command Line Interface

RT: add 3.3.3.0/30 via 2.2.2.2, bgp metric [20/0]
RT: NET-RED 3.3.3.0/30
RT: del 1.1.1.0 via 2.2.2.2, bgp metric [20/0]
RT: delete network route to 1.1.1.0
RT: NET-RED 1.1.1.0/30
RT: SET_LAST_RDB for 192.10.2.0/24
NEW rdb: via 2.2.2.2

RT: add 192.10.2.0/24 via 2.2.2.2, bgp metric [20/0]
```

в R2:

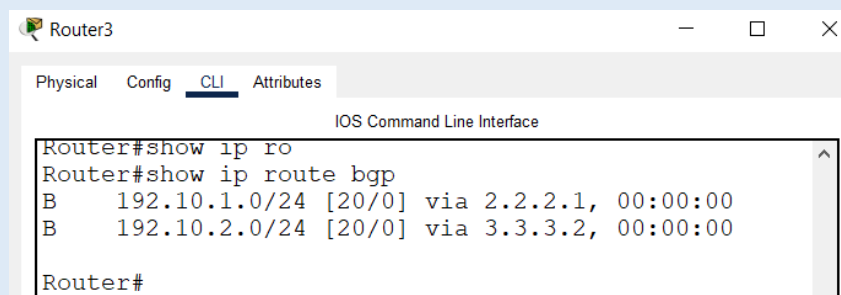


```
Router2
Physical Config CLI Attributes
IOS Command Line Interface

NEW rdb: via 3.3.3.1
RT: add 2.2.2.0/30 via 3.3.3.1, bgp metric [20/0]
RT: NET-RED 2.2.2.0/30
RT: del 1.1.1.0 via 3.3.3.1, bgp metric [20/0]
RT: delete network route to 1.1.1.0
RT: NET-RED 1.1.1.0/30
RT: SET_LAST_RDB for 192.10.1.0/24
NEW rdb: via 3.3.3.1

RT: add 192.10.1.0/24 via 3.3.3.1, bgp metric [20/0]
```

в R3:



```
Router3
Physical Config CLI Attributes
IOS Command Line Interface

Router#show ip ro
Router#show ip route bgp
B 192.10.1.0/24 [20/0] via 2.2.2.1, 00:00:00
B 192.10.2.0/24 [20/0] via 3.3.3.2, 00:00:00
Router#
```

Не се добавят нови маршрути.