

به نام خدا

تنظیمات در router0 :

```
--- System Configuration Dialog ---
Would you like to enter the initial configuration dialog? [yes/no]: no

Press RETURN to get started!

Router>enable
Router#con
Router#config
Router#configure ter
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#interf
Router(config)#interface fas
Router(config)#interface fastEthernet 0/0
Router(config-if)#ip add
Router(config-if)#ip address 192.168.1.1 255.255.255.0
Router(config-if)#no sh
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#exit
Router(config)#inter
Router(config)#interface ser
Router(config)#interface serial 0/0
Router(config-if)#ip add
Router(config-if)#ip address 192.168.2.1 255.255.255.0
Router(config-if)#clock rate 56000
Router(config-if)#no sh
Router(config-if)#no shutdown

%LINK-5-CHANGED: Interface Serial0/0, changed state to down
Router(config-if)#
```

Ctrl+F6 to exit CLI focus

تنظیمات در router2 :

```
--- System Configuration Dialog ---

Would you like to enter the initial configuration dialog? [yes/no]: no

Press RETURN to get started!

Router>enable
Router#conf t
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#inter
Router(config)#interface fa
Router(config)#interface fastEthernet 0/0
Router(config-if)#ip ad
Router(config-if)#ip address 192.168.3.1 255.255.255.0
Router(config-if)#no sh
Router(config-if)#no shutdown

Router(config-if)#
%LINK-5-CHANGED: Interface FastEthernet0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface FastEthernet0/0, changed state to up

Router(config-if)#exit
Router(config)#int
Router(config)#interface se
Router(config)#interface serial 0/0
Router(config-if)#ip add
Router(config-if)#ip address 192.168.2.2 255.255.255.0
Router(config-if)#no
Router(config-if)#no sh
Router(config-if)#no shutdown

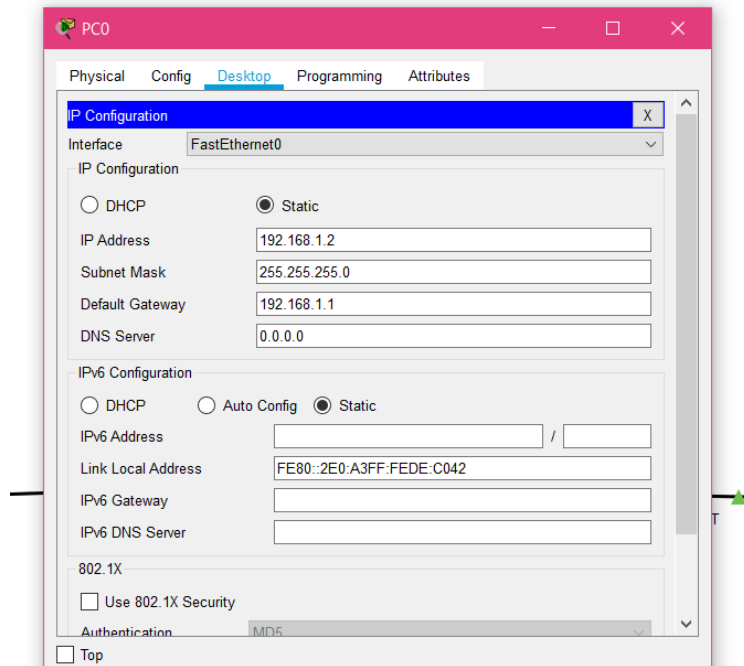
Router(config-if)#
%LINK-5-CHANGED: Interface Serial0/0, changed state to up

%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to up

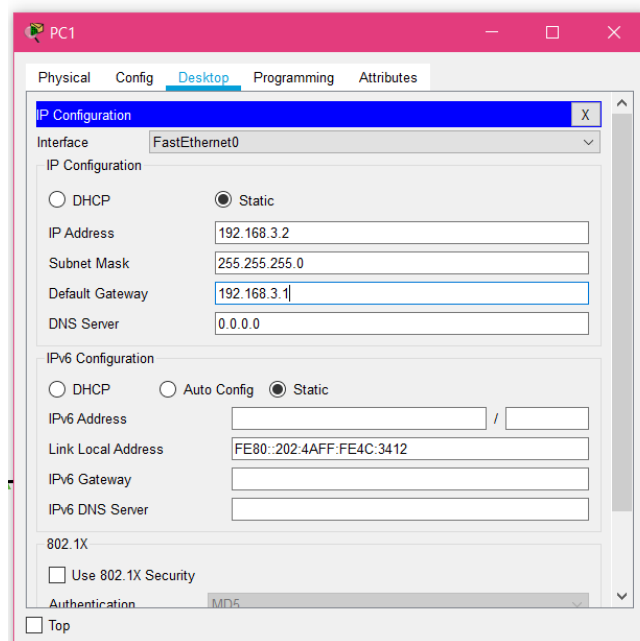
Router(config-if)#
```

Ctrl+F6 to exit CLI focus

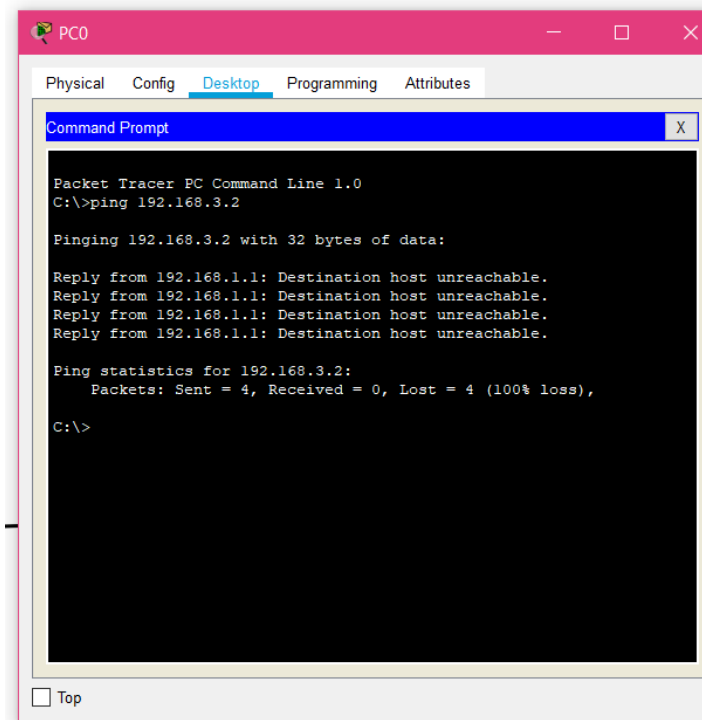
Config برای pc0 :



Config برای pc1 :



pc0 نمی تواند pc1 را ping کند:
(زیرا ما برای router ها routing ای مشخص نکردیم)



تعریف route در router0:

```
Router(config)#ip route 192.168.3.0 255.255.255.0 serial 0/0
Router(config)#
```

Ctrl+F6 to exit CLI focus

☐ Top

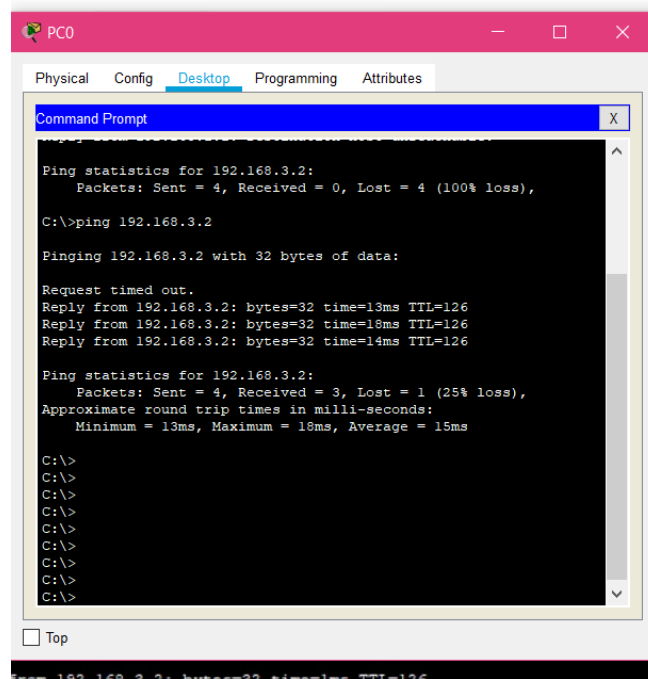
تعریف route در router2:

```
Router(config)#ip route 192.168.1.0 255.255.255.0 serial 0/0
Router(config)#
```

Ctrl+F6 to exit CLI focus

☐ Top

حالا دیگر ping انجام میشود:



```
PC0
Physical Config Desktop Programming Attributes
Command Prompt
Ping statistics for 192.168.3.2:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>ping 192.168.3.2

Pinging 192.168.3.2 with 32 bytes of data:

Request timed out.
Reply from 192.168.3.2: bytes=32 time=13ms TTL=126
Reply from 192.168.3.2: bytes=32 time=18ms TTL=126
Reply from 192.168.3.2: bytes=32 time=14ms TTL=126

Ping statistics for 192.168.3.2:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 13ms, Maximum = 18ms, Average = 15ms

C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
C:\>
```

برای router0 یک static route هم تعریف کردم:

```
Enter configuration commands, one per line. End with CTRL/Z.
Router(config)#ip route 0.0.0.0 0.0.0.0 serial 0/0
Router(config)#
```

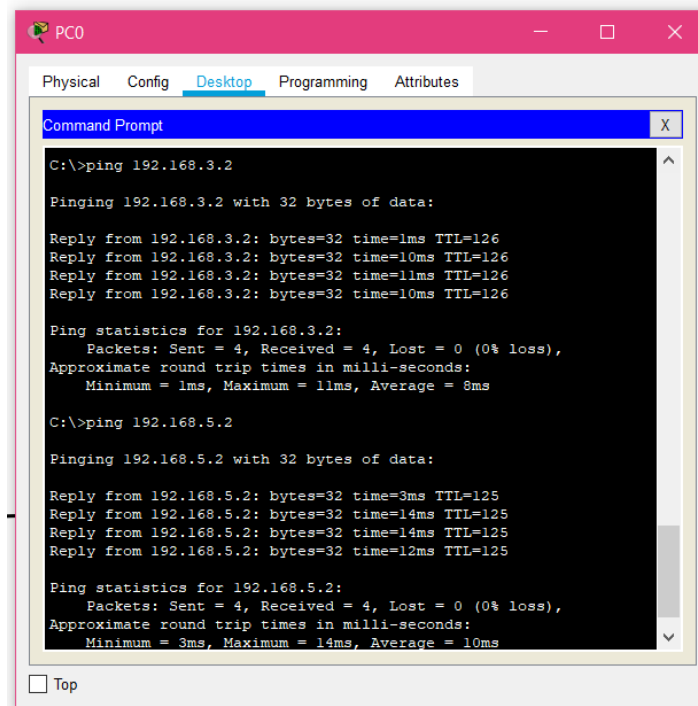
Ctrl+F6 to exit CLI focus

☐ Top

در ادامه بقیه ی قسمت های شبکه هم config کردم. و route های خواسته شده را ایجاد کردم.

Ping از pc مختلف:

از 0 به 1 و 2 :



PC0

Physical Config **Desktop** Programming Attributes

Command Prompt

```
C:\>ping 192.168.3.2

Pinging 192.168.3.2 with 32 bytes of data:

Reply from 192.168.3.2: bytes=32 time=1ms TTL=126
Reply from 192.168.3.2: bytes=32 time=10ms TTL=126
Reply from 192.168.3.2: bytes=32 time=11ms TTL=126
Reply from 192.168.3.2: bytes=32 time=10ms TTL=126

Ping statistics for 192.168.3.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 11ms, Average = 8ms

C:\>ping 192.168.5.2

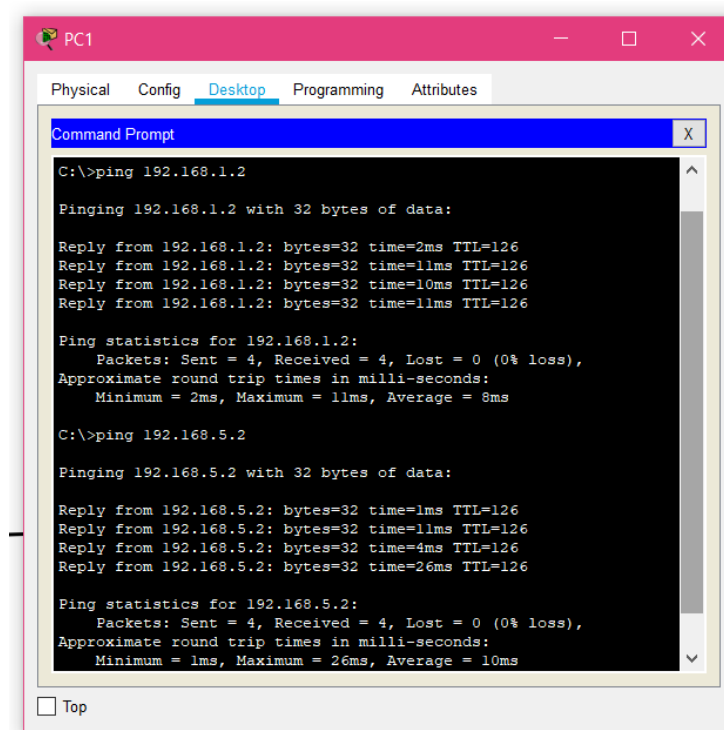
Pinging 192.168.5.2 with 32 bytes of data:

Reply from 192.168.5.2: bytes=32 time=3ms TTL=125
Reply from 192.168.5.2: bytes=32 time=14ms TTL=125
Reply from 192.168.5.2: bytes=32 time=14ms TTL=125
Reply from 192.168.5.2: bytes=32 time=12ms TTL=125

Ping statistics for 192.168.5.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 3ms, Maximum = 14ms, Average = 10ms
```

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از 1 به 0 و 2 :



PC1

Physical Config **Desktop** Programming Attributes

Command Prompt

```
C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=2ms TTL=126
Reply from 192.168.1.2: bytes=32 time=11ms TTL=126
Reply from 192.168.1.2: bytes=32 time=10ms TTL=126
Reply from 192.168.1.2: bytes=32 time=11ms TTL=126

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 2ms, Maximum = 11ms, Average = 8ms

C:\>ping 192.168.5.2

Pinging 192.168.5.2 with 32 bytes of data:

Reply from 192.168.5.2: bytes=32 time=1ms TTL=126
Reply from 192.168.5.2: bytes=32 time=11ms TTL=126
Reply from 192.168.5.2: bytes=32 time=4ms TTL=126
Reply from 192.168.5.2: bytes=32 time=26ms TTL=126

Ping statistics for 192.168.5.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 26ms, Average = 10ms
```

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از 2 به 0 و 1 :

```
PC2
Physical Config Desktop Programming Attributes
Command Prompt
C:\>ping 192.168.1.2

Pinging 192.168.1.2 with 32 bytes of data:

Reply from 192.168.1.2: bytes=32 time=8ms TTL=125
Reply from 192.168.1.2: bytes=32 time=12ms TTL=125
Reply from 192.168.1.2: bytes=32 time=11ms TTL=125
Reply from 192.168.1.2: bytes=32 time=13ms TTL=125

Ping statistics for 192.168.1.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 8ms, Maximum = 13ms, Average = 11ms

C:\>ping 192.168.3.2

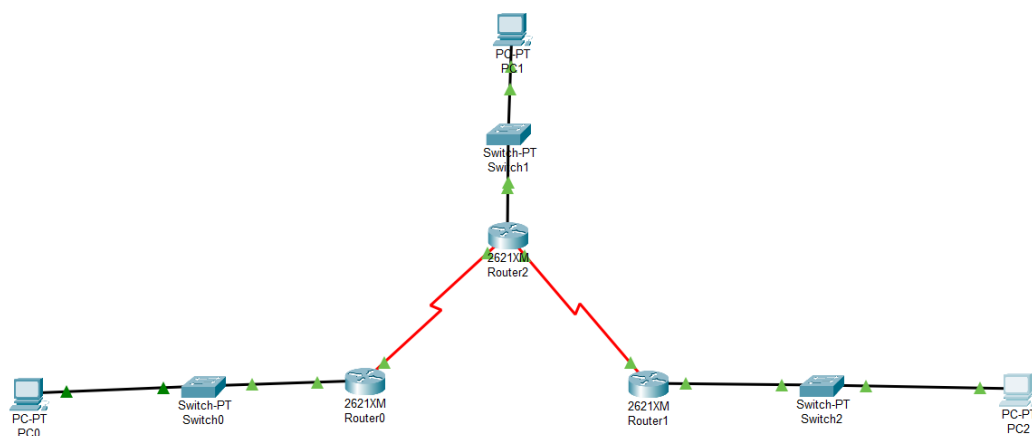
Pinging 192.168.3.2 with 32 bytes of data:

Reply from 192.168.3.2: bytes=32 time=1ms TTL=126
Reply from 192.168.3.2: bytes=32 time=10ms TTL=126
Reply from 192.168.3.2: bytes=32 time=14ms TTL=126
Reply from 192.168.3.2: bytes=32 time=11ms TTL=126

Ping statistics for 192.168.3.2:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 1ms, Maximum = 14ms, Average = 9ms

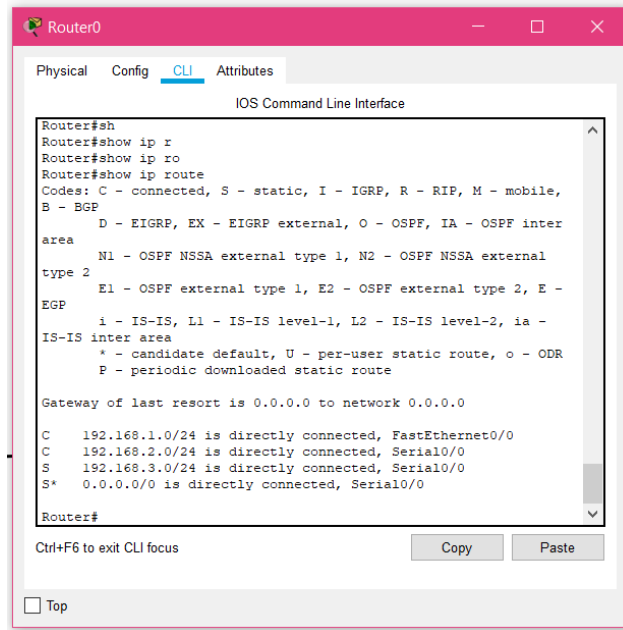
☐ Top
```

عکس کلی سناریو:
(فایل pt سناریو ضمیمه شده است.)



- اطلاعات جدول routing در router0 :

(طبق خروجی: این router به دو شبکه به طور مستقیم متصل است. به یک router از طریق اینتر فیس serial0/0 متصل است. در این router یک static route برای 192.168.3.0/24 تعریف شده است. همچنین یک default route با اینترفیس serial0/0 هم تعریف شده است.)

A screenshot of the Router0 CLI window. The window has tabs for Physical, Config, CLI, and Attributes, with CLI selected. The title bar says "Router0". The main area is titled "IOS Command Line Interface". The prompt is "Router#". The user has entered the command "show ip route". The output shows the routing table with codes for C (connected), S (static), I (IGRP), R (RIP), M (mobile), and B (BGP). It lists several routes, including 192.168.1.0/24 connected to FastEthernet0/0, 192.168.2.0/24 connected to Serial0/0, and 192.168.3.0/24 connected to Serial0/0. It also shows a default route (0.0.0.0/0) connected to Serial0/0. The prompt returns to "Router#".

```
Router#sh
Router#show ip r
Router#show ip ro
Router#show ip route
Codes: C - connected, S - static, I - IGRP, 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

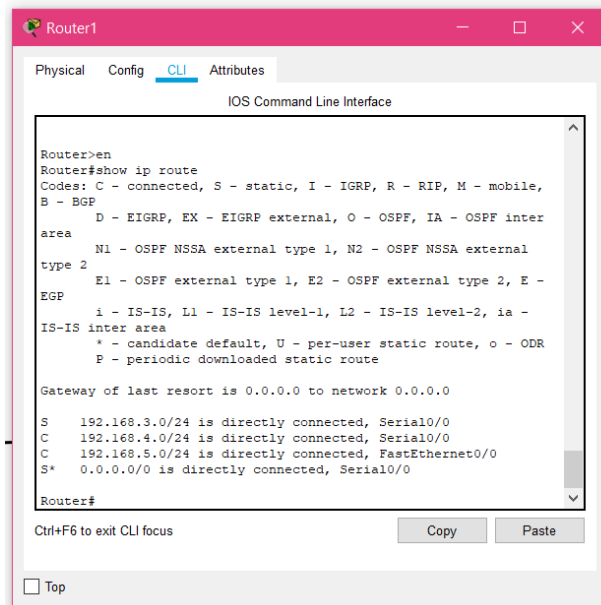
Gateway of last resort is 0.0.0.0 to network 0.0.0.0

C    192.168.1.0/24 is directly connected, FastEthernet0/0
C    192.168.2.0/24 is directly connected, Serial0/0
S    192.168.3.0/24 is directly connected, Serial0/0
S*   0.0.0.0/0 is directly connected, Serial0/0

Router#
```

- اطلاعات جدول routing در router1 :

(طبق خروجی: این router به دو شبکه به طور مستقیم متصل است. به یک router از طریق اینتر فیس serial0/0 متصل است. در این router یک static route برای 192.168.3.0/24 تعریف شده است. همچنین یک default route با اینترفیس serial0/0 هم تعریف شده است.)

A screenshot of the Router1 CLI window. The window has tabs for Physical, Config, CLI, and Attributes, with CLI selected. The title bar says "Router1". The main area is titled "IOS Command Line Interface". The prompt is "Router>". The user has entered the command "show ip route". The output shows the routing table with codes for C (connected), S (static), I (IGRP), R (RIP), M (mobile), and B (BGP). It lists several routes, including 192.168.3.0/24 connected to Serial0/0, 192.168.4.0/24 connected to Serial0/0, and 192.168.5.0/24 connected to FastEthernet0/0. It also shows a default route (0.0.0.0/0) connected to Serial0/0. The prompt returns to "Router#".

```
Router>en
Router#show ip route
Codes: C - connected, S - static, I - IGRP, 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

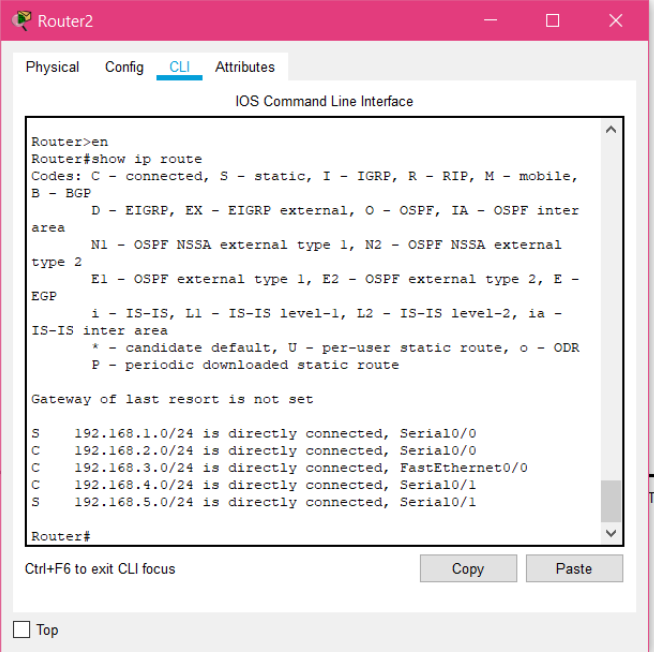
Gateway of last resort is 0.0.0.0 to network 0.0.0.0

S    192.168.3.0/24 is directly connected, Serial0/0
C    192.168.4.0/24 is directly connected, Serial0/0
C    192.168.5.0/24 is directly connected, FastEthernet0/0
S*   0.0.0.0/0 is directly connected, Serial0/0

Router#
```


- اطلاعات جدول routing در router2 :

(طبق خروجی: این router به سه شبکه به طور مستقیم متصل است. به دو router از طریق اینترفیس های serial0/0 و serial0/1 متصل است. در این router دو static route برای 192.168.5.0/24 و 192.168.1.0/24 تعریف شده است.)



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

Router>en
Router#show ip route
Codes: C - connected, S - static, I - IGRP, 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

S    192.168.1.0/24 is directly connected, Serial0/0
C    192.168.2.0/24 is directly connected, Serial0/0
C    192.168.3.0/24 is directly connected, FastEthernet0/0
C    192.168.4.0/24 is directly connected, Serial0/1
S    192.168.5.0/24 is directly connected, Serial0/1

Router#
```

در مسیریابی به صورت استاتیک، به ازای همه ی سابنت ها، یک سطر در جدول روتینگ قرار می دهیم و اینترفیس خروجی مناسب برای رسیدن به مقصد موجود در آن سابنت را در آن مشخص می کنیم.

ولی در حالت پیش فرض، تعیین میکنیم که اگر بسته به مقصدی میخواست برود که متناسب با آن هیچ سطری در جدول روتینگ وجود نداشت، طبق تعیین قبلی که در حالت پیش فرض انجام دادیم، به یک اینترفیس خروجی خاص از قبل تعیین شده برود.