

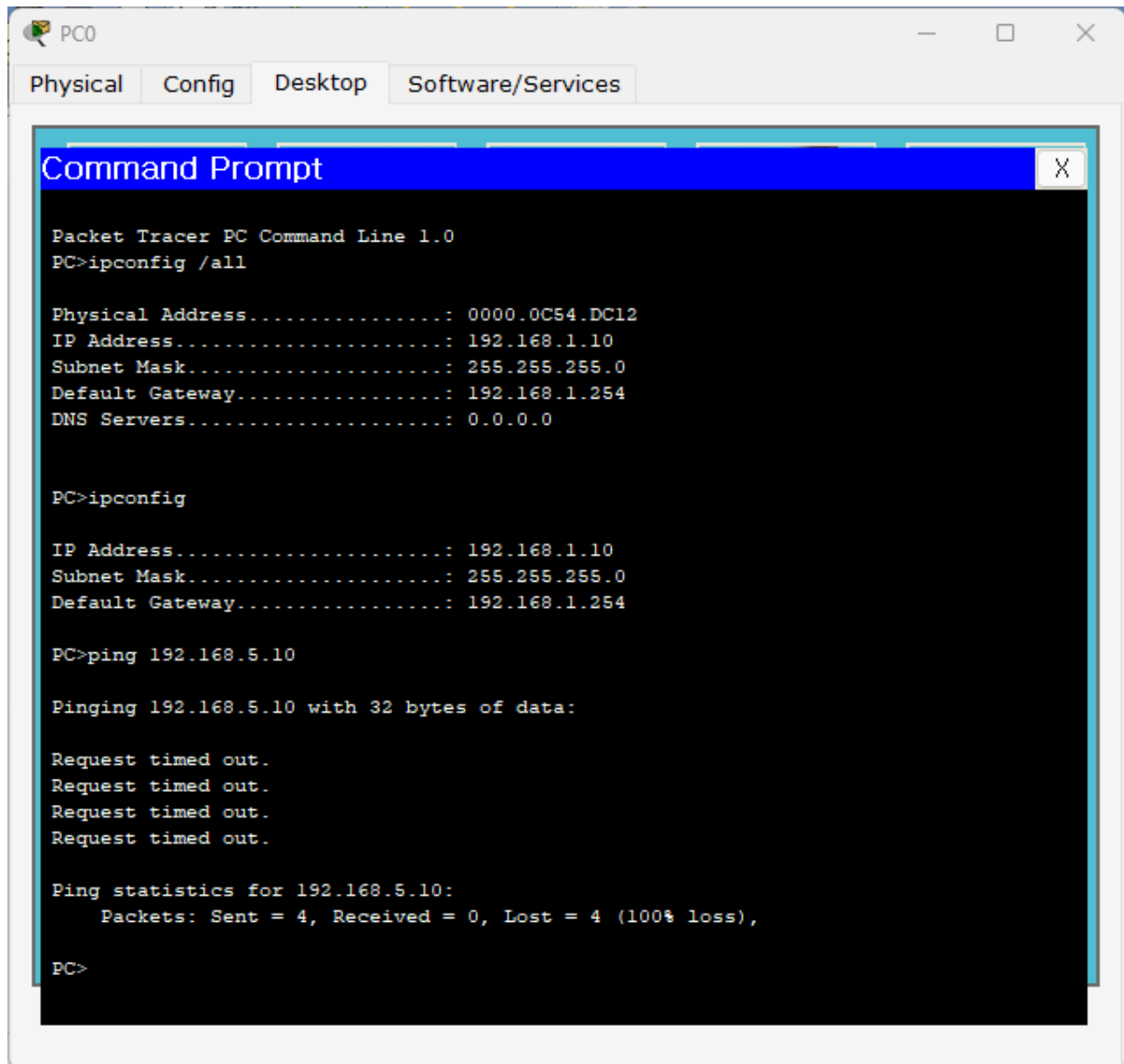
PBL 1. 네트워크 트래픽 전송 장애 원인 분석

문제점: PC_0(192.168.1.10/24)에서 PC_3(192.168.5.10/24)로 트래픽이 전송되지 않는 문제.

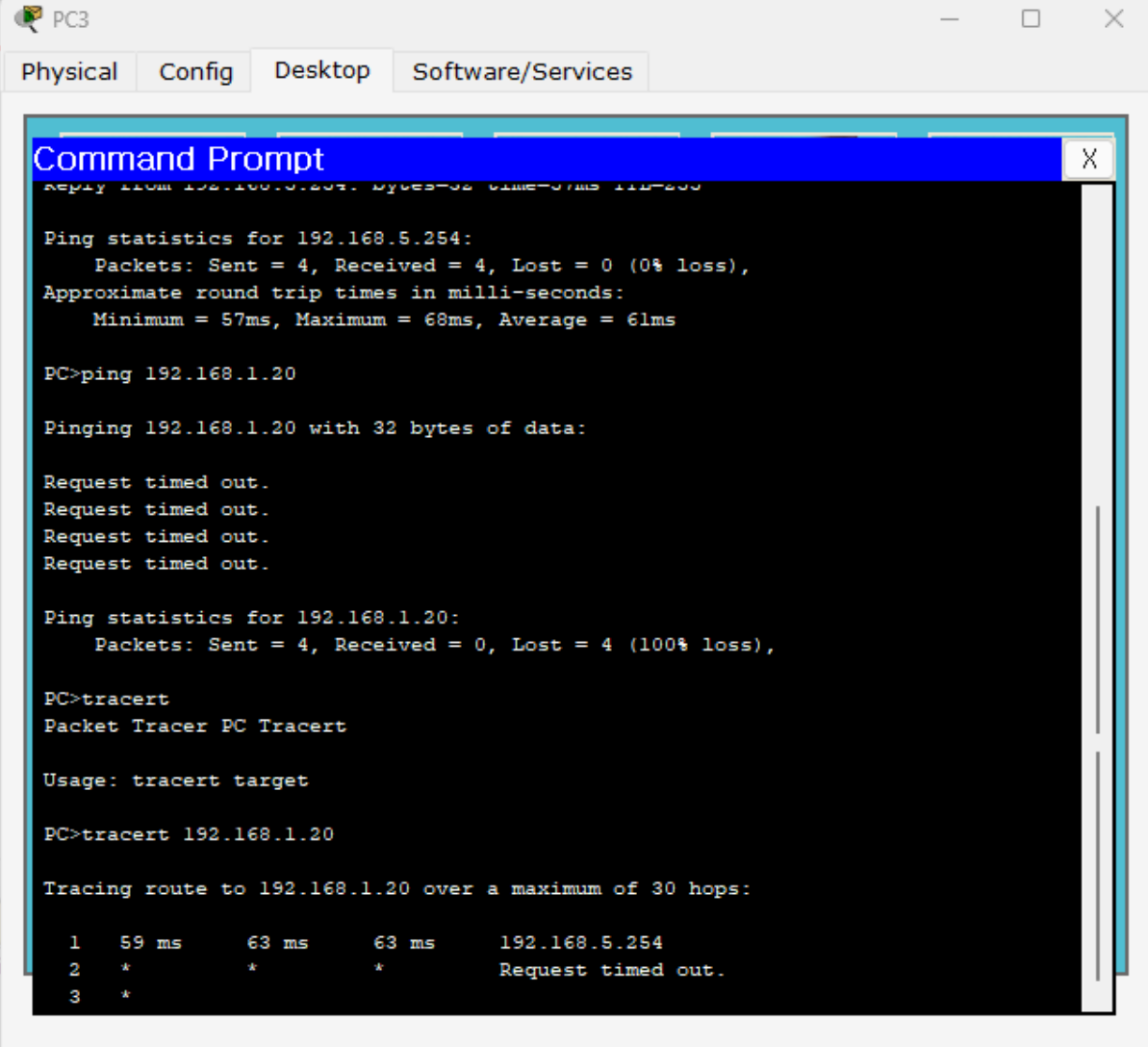
해결 방법

1. PC0에서 PC3으로 ping을 보낸 후 tracert로 장애 발생 부분을 찾는다.
2. 장애가 발생한 부분에서 원인을 찾아본 후, 대응 방안을 제안한다.
3. 추가로 장애 원인이 될 부분을 찾아본다.

1.pc0의 TCP/IP 등록 정보 확인 및 오류 확인



2.tracert 명령어로 패킷 전송 추적



The screenshot shows a Packet Tracer PC3 interface with a Command Prompt window open. The window title is "Command Prompt". The output shows the results of a ping command to 192.168.5.254 and a subsequent ping to 192.168.1.20, which failed. Finally, a tracert command is executed to trace the route to 192.168.1.20.

```
Reply from 192.168.5.254: bytes=32 time=57ms TTL=255

Ping statistics for 192.168.5.254:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 57ms, Maximum = 68ms, Average = 61ms

PC>ping 192.168.1.20

Pinging 192.168.1.20 with 32 bytes of data:

Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 192.168.1.20:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

PC>tracert
Packet Tracer PC Tracert

Usage: tracert target

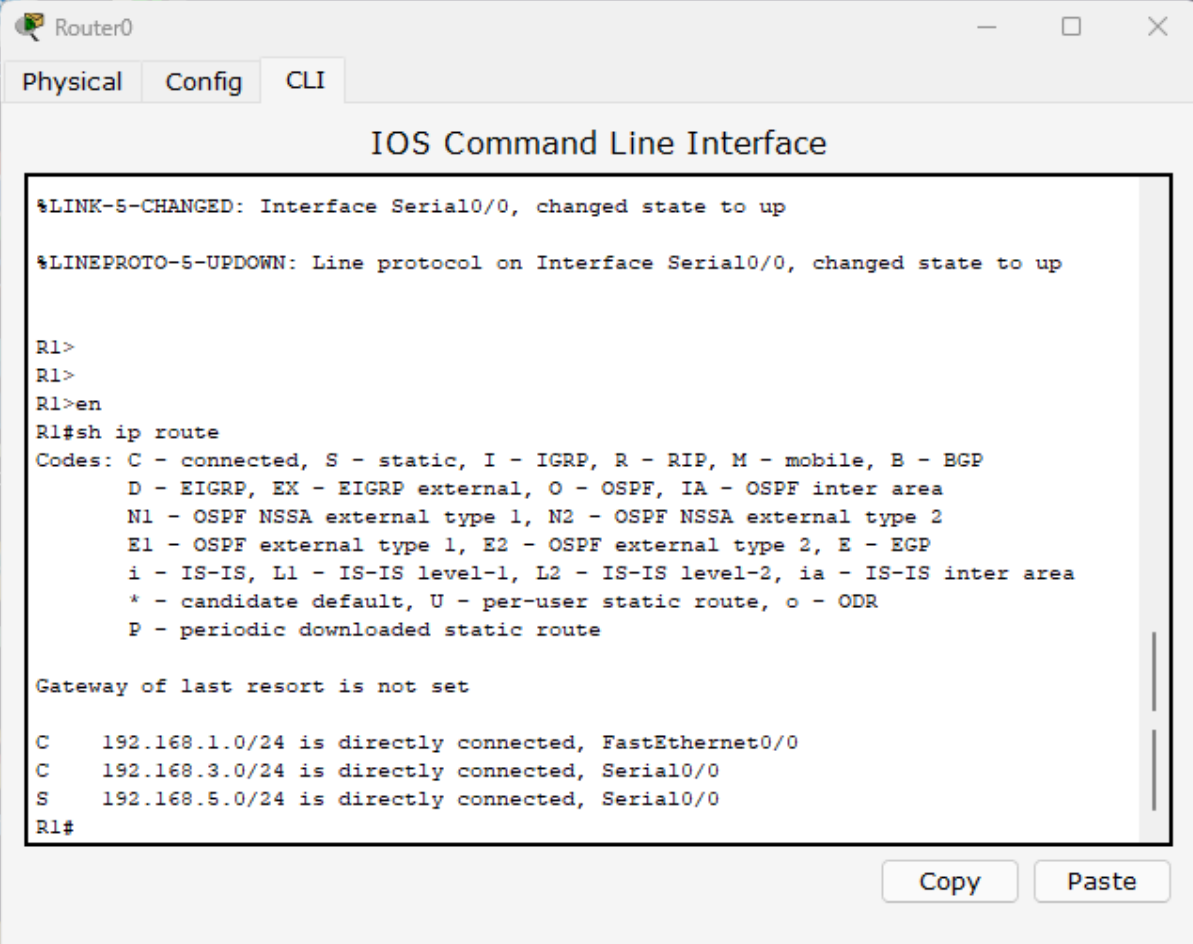
PC>tracert 192.168.1.20

Tracing route to 192.168.1.20 over a maximum of 30 hops:

  0  59 ms    63 ms    63 ms    192.168.5.254
  1  *         *         *         Request timed out.
  2  *         *         *         Request timed out.
```

위의 이미지를 통해 패킷이 라우터0까지는 무사히 도달한 것을 알 수 있다. 따라서
다음으로 라우터 0과 라우터1을 확인한다.

3. 라우터0과 라우터1 정보 확인



The screenshot shows a window titled 'Router0' with three tabs: 'Physical', 'Config', and 'CLI'. The 'CLI' tab is active, displaying the 'IOS Command Line Interface'. The terminal output shows the following commands and results:

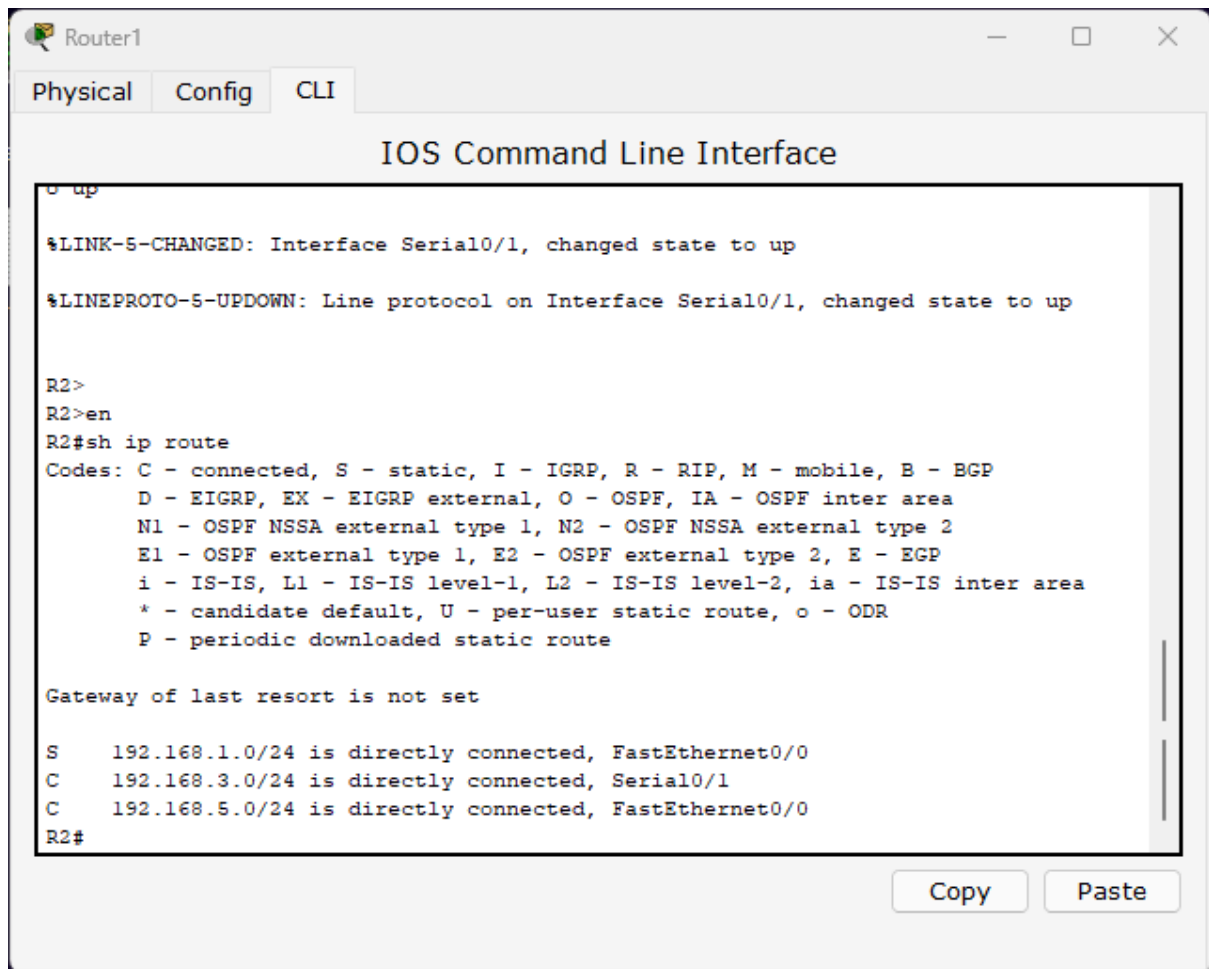
```
%LINK-5-CHANGED: Interface Serial0/0, changed state to up
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial0/0, changed state to up

R1>
R1>
R1>en
R1#sh 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

C    192.168.1.0/24 is directly connected, FastEthernet0/0
C    192.168.3.0/24 is directly connected, Serial0/0
S    192.168.5.0/24 is directly connected, Serial0/0
R1#
```

At the bottom right of the CLI window, there are 'Copy' and 'Paste' buttons.

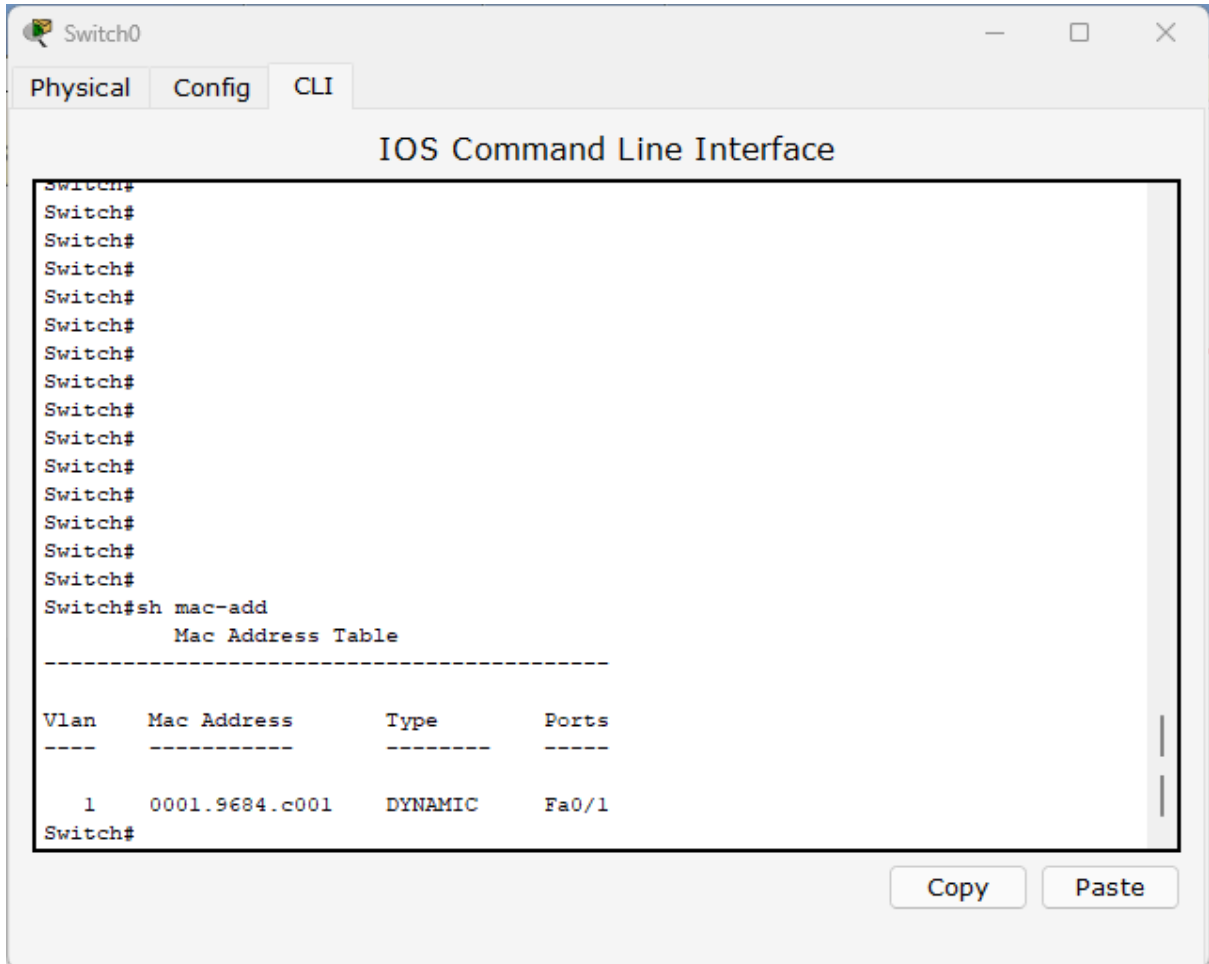


(문제점 발견)

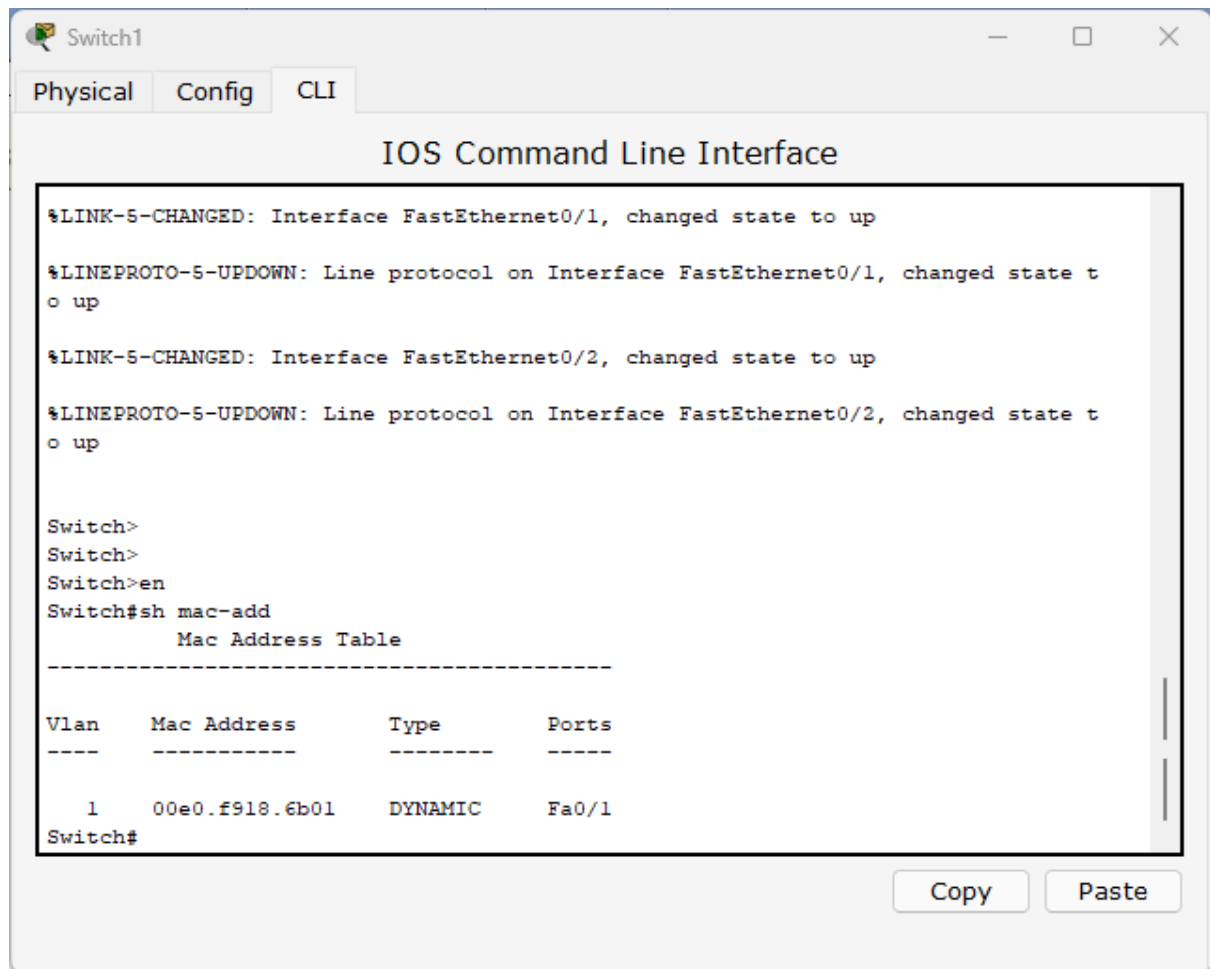
위의 두 장의 이미지를 비교해보면, 라우터0은 1.0망은 FastEthernet0/0, 3.0망과 5.0망은 Serial 0/0을 통해 나가는 것을 알 수 있다. 그러나, 라우터1을 보면 3.0망과 5.0망에 대해서는 정상적으로 경로가 설정되어 있지만 1.0망이 5.0망과 같은 FastEthernet0/0으로 나가는 것을 볼 수 있다.

4. 추가 장애 발생 요인 찾기

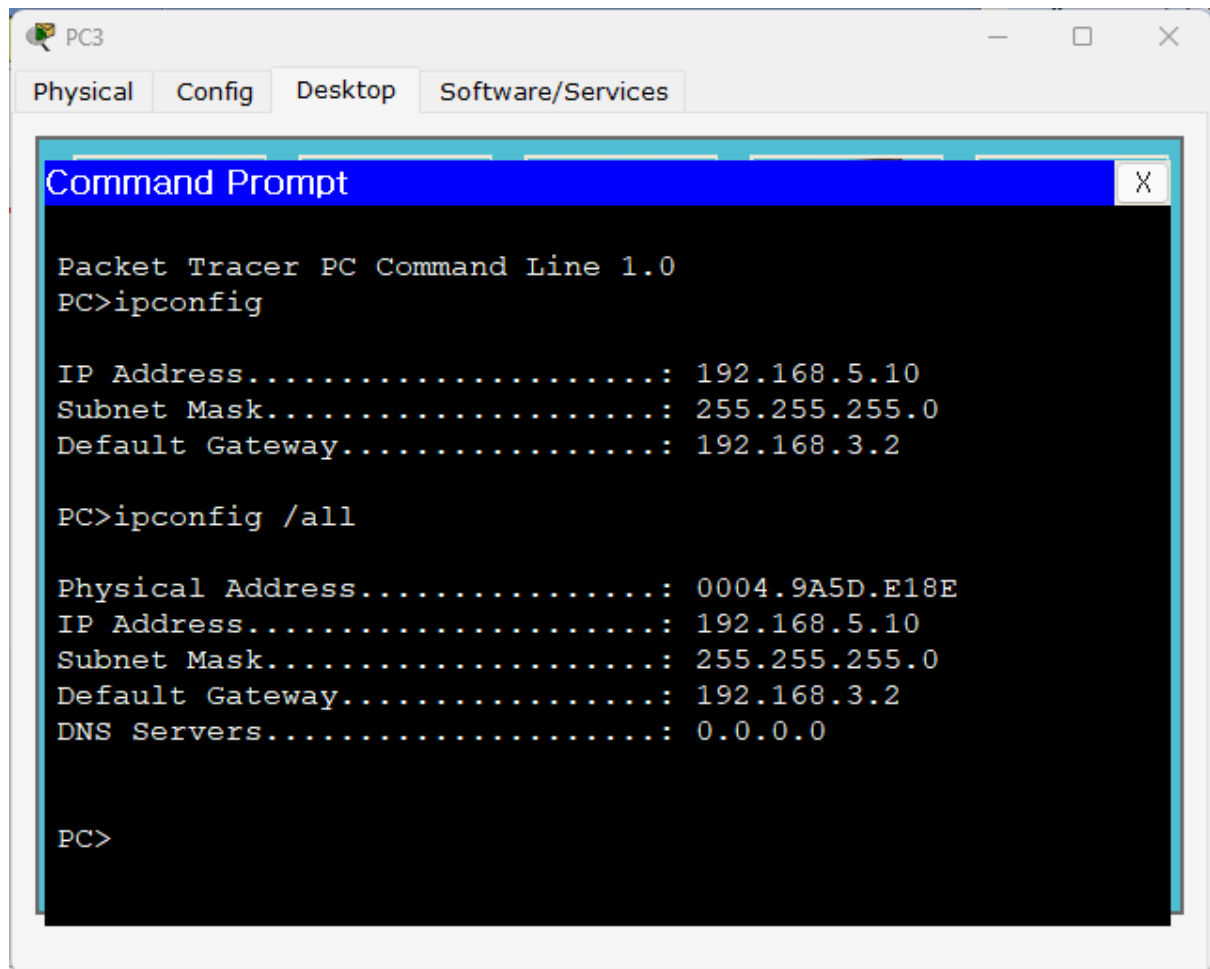
- 스위치, PC3의 정보도 확인해보기



스위치0 - 문제 없음

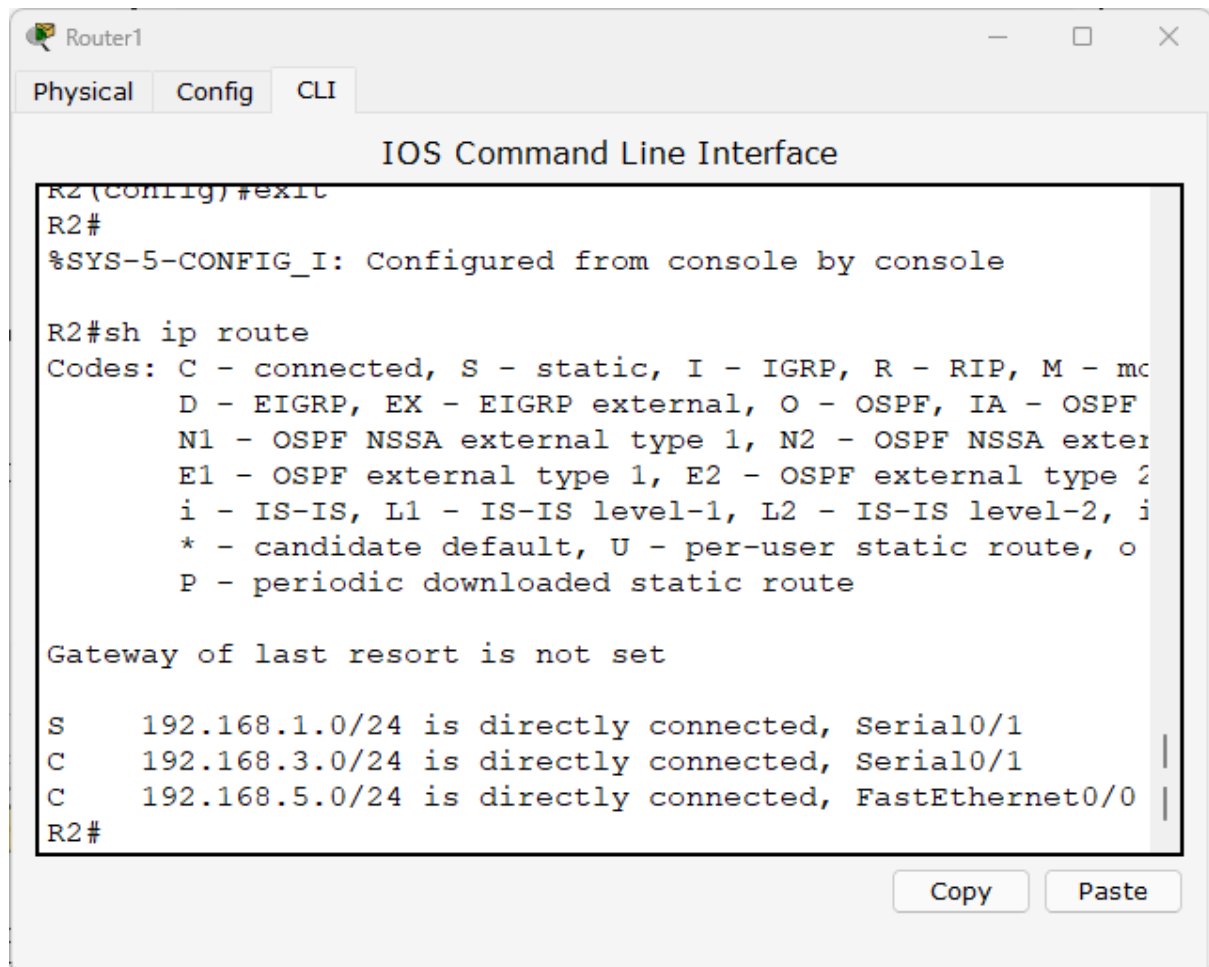


스위치1 - 문제 없음



PC3의 Default Gateway가 5.0망이 아닌 3.0망으로 설정되어 있다. → ping 결과 문제가 되지는 않았다.

- 라우터 경로 변경



The screenshot shows a Cisco Router CLI window titled "Router1" with tabs for "Physical", "Config", and "CLI". The main title is "IOS Command Line Interface". The command history shows the user exiting configuration mode and running the 'show ip route' command. The output lists three directly connected routes: 192.168.1.0/24 on Serial0/1, 192.168.3.0/24 on Serial0/1, and 192.168.5.0/24 on FastEthernet0/0. A legend explains the route codes (C, S, I, R, M, D, EX, O, IA, N1, N2, E1, E2, i, L1, L2, *, U, P).

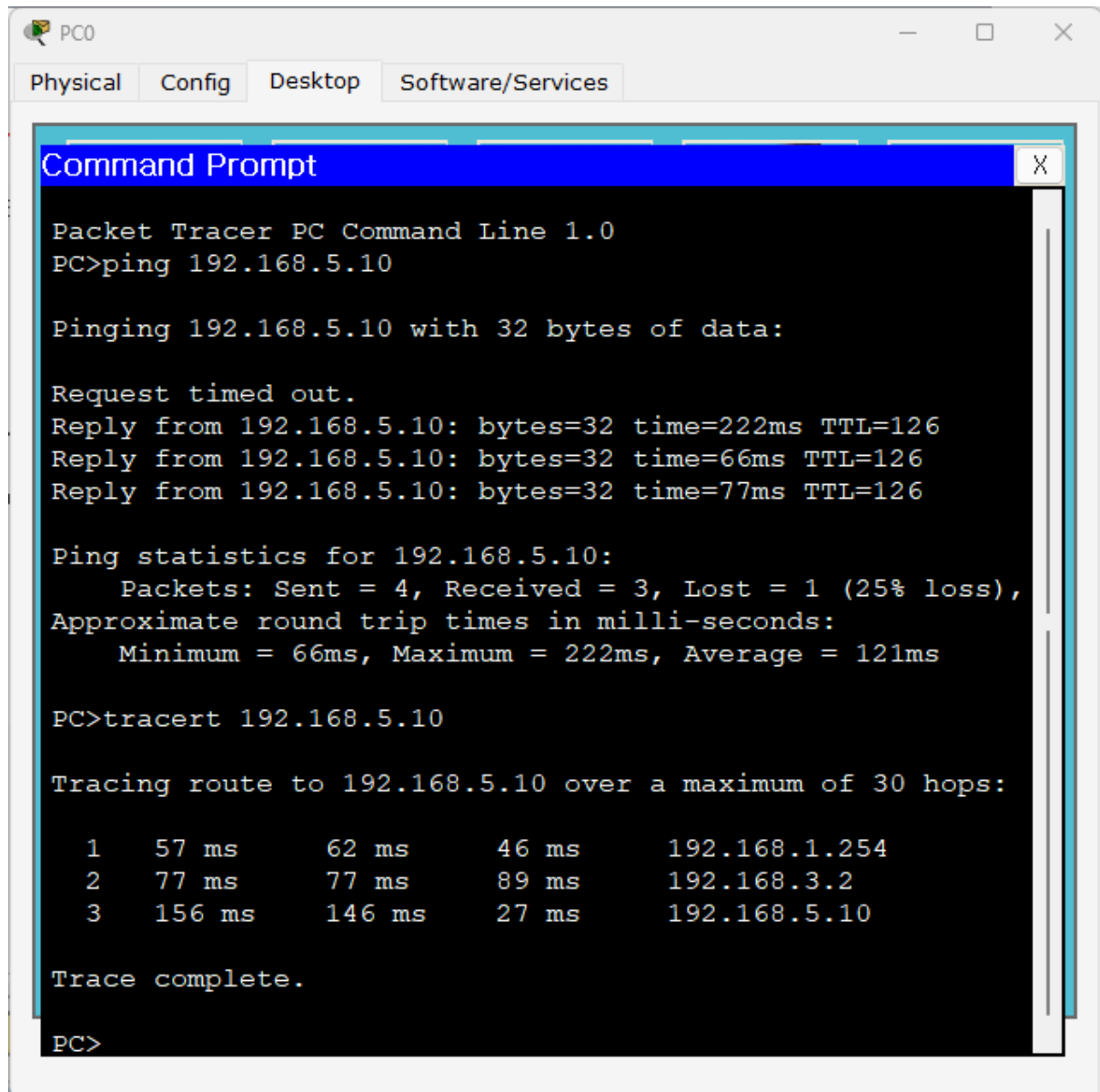
```
R2(Config)#exit
R2#
%SYS-5-CONFIG_I: Configured from console by console

R2#sh ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - m
       D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF
       N1 - OSPF NSSA external type 1, N2 - OSPF NSSA exter
       E1 - OSPF external type 1, E2 - OSPF external type 2
       i - IS-IS, L1 - IS-IS level-1, L2 - IS-IS level-2, i
       * - candidate default, U - per-user static route, o
       P - periodic downloaded static route

Gateway of last resort is not set

S    192.168.1.0/24 is directly connected, Serial0/1
C    192.168.3.0/24 is directly connected, Serial0/1
C    192.168.5.0/24 is directly connected, FastEthernet0/0
R2#
```

- ping 결과 확인



The screenshot shows a Packet Tracer PC Command Line window for PC0. The window has tabs for Physical, Config, Desktop, and Software/Services. The Command Prompt window is open, displaying the results of a ping and a traceroute command.

```
Packet Tracer PC Command Line 1.0
PC>ping 192.168.5.10

Pinging 192.168.5.10 with 32 bytes of data:

Request timed out.
Reply from 192.168.5.10: bytes=32 time=222ms TTL=126
Reply from 192.168.5.10: bytes=32 time=66ms TTL=126
Reply from 192.168.5.10: bytes=32 time=77ms TTL=126

Ping statistics for 192.168.5.10:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 66ms, Maximum = 222ms, Average = 121ms

PC>tracert 192.168.5.10

Tracing route to 192.168.5.10 over a maximum of 30 hops:

  0  57 ms    62 ms    46 ms    192.168.1.254
  1  77 ms    77 ms    89 ms    192.168.3.2
  2  156 ms   146 ms   27 ms    192.168.5.10

Trace complete.

PC>
```

결론

- 문제점
 - Router1에서 192.168.1.0망에 대한 경로 제어가 192.168.3.0망과 같은 Serial0/1이 아닌 FastEthernet0/0으로 설정되어 있다. 그 결과 Router 1에서 Router 0으로 트래픽을 전달하지 못한다.
- 대응 방안: 192.168.1.0에 대한 경로 설정을 192.168.3.0망과 동일하게 Serial0/1로 변경하였더니 정상적으로 트래픽이 전송되는 것을 확인할 수 있었다.