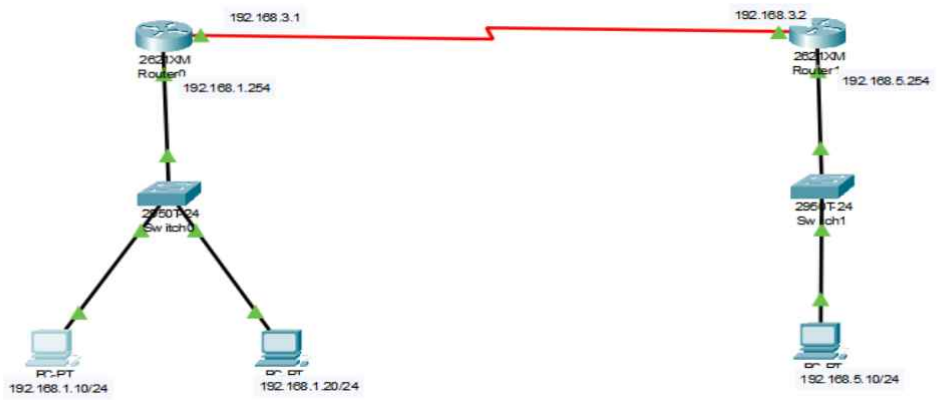
Packet Tracer 문제 해결 보고서

문제 정의

- **문제:** PC_A(192.168.1.10)에서 PC_C(192.168.5.10)로 트래픽이 전송되지 않는 현상 발생.
- **목표:** 네트워크 장비(PC, Switch, Router) 설정 점검 및 문제 원인 식별 → 최종 통신 정상화.

초기 환경 구성



- **PC_A**: 192.168.1.10 /24, Gateway: 192.168.1.254
- **PC_B**: 192.168.1.20 /24, Gateway: 192.168.1.254
- **PC_C**: 192.168.5.10 /24, Gateway: 192.168.5.254
- **R1**: 192.168.1.254, 192.168.3.1
- **R2**: 192.168.5.254, 192.168.3.2
- **라우터 간 Serial 연결**: 192.168.3.0/24

문제 원인 파악 과정

PC 및 기본 연결 점검

- PC_A, PC_C 모두 IP, Subnet Mask, Gateway 정상.
- PC_A → Gateway(R1) ping 성공.
- PC_C → Gateway(R2) ping 성공.
- → 기본 PC ↔ Router 연결 정상.

초기 Ping 및 Traceroute 결과

```
C:\>ping 192.168.5.10

Pinging 192.168.5.10 with 32 bytes of data:

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

Ping statistics for 192.168.5.10:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

C:\>tracert 192.168.5.10

Tracing route to 192.168.5.10 over a maximum of 30 hops:

  1    0 ms       0 ms       0 ms       192.168.1.254
  2    *          *          *          Request timed out.
  3    *          *          *          Request timed out.
  4    *          *          *          Request timed out.
```

- PC_A → PC_C ping: 실패.
- Traceroute 결과 192.168.1.254까지 도달, 그 이후 응답 없음.
- 원인: Router 간 라우팅 문제 추정.

라우터 라우팅 테이블 점검

```
R1>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

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

```
C 192.168.1.0/24 directly connected, FastEthernet0/0
C 192.168.3.0/24 directly connected, Serial0/0
S 192.168.5.0/24 via Serial0/0  (오류)
```

```
R2>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, FastEthernet0/0
C    192.168.3.0/24 is directly connected, Serial0/1
C    192.168.5.0/24 is directly connected, FastEthernet0/0
```

R2

```
S 192.168.1.0/24 via FastEthernet0/0  (오류)
C 192.168.3.0/24 directly connected, Serial0/1
C 192.168.5.0/24 directly connected, FastEthernet0/0
```

Static route 설정 오류 확인

- R1: exit interface로만 지정 → `via Serial0/0`, next-hop IP가 아님.
- R2: exit interface로만 지정 → `via FastEthernet0/0`.

→ 올바른 next-hop IP를 명시해야 함.

조치 내용

```
R1>enable
R1#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R1(config)#no ip route 192.168.5.0 255.255.255.0 Serial0/0
R1(config)#ip route 192.168.5.0 255.255.255.0 192.168.3.2
R1(config)#
```

R1

```
R1(config)# no ip route 192.168.5.0 255.255.255.0 Serial0/0
R1(config)# ip route 192.168.5.0 255.255.255.0 192.168.3.2
```

```
R2>enable
R2#configure terminal
Enter configuration commands, one per line.  End with CNTL/Z.
R2(config)#no ip route 192.168.1.0 255.255.255.0 FastEthernet0/0
R2(config)#ip route 192.168.1.0 255.255.255.0 192.168.3.1
```

R2

```
R2(config)# no ip route 192.168.1.0 255.255.255.0 FastEthernet0/0
R2(config)# ip route 192.168.1.0 255.255.255.0 192.168.3.1
```

라우팅 테이블 재확인

```
S    192.168.5.0/24 [1/0] via 192.168.3.2
```

R1

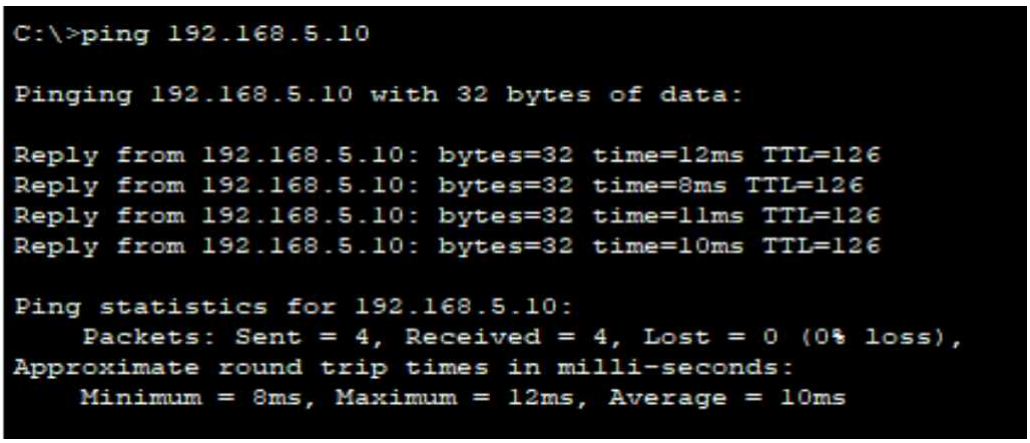
```
S 192.168.5.0/24 [1/0] via 192.168.3.2
```

```
S    192.168.1.0/24 [1/0] via 192.168.3.1
```

R2

```
S 192.168.1.0/24 [1/0] via 192.168.3.1
```

최종 결과



- PC_A → PC_C ping 성공.
- 모든 라우터 경로 정상적으로 설정.
- Switch MAC 테이블 및 ARP 테이블 정상.

결론 및 개선 방안

- Static route는 반드시 **next-hop IP**로 설정할 것.
- Packet Tracer 실습 시 기본 점검 명령어 체크리스트 사용 권장:
  - `show ip interface brief`
  - `show ip route`
  - `show running-config`
  - `show mac-address-table`
- 초기 설계 시 라우팅 다이어그램과 IP 계획 문서화 필요.