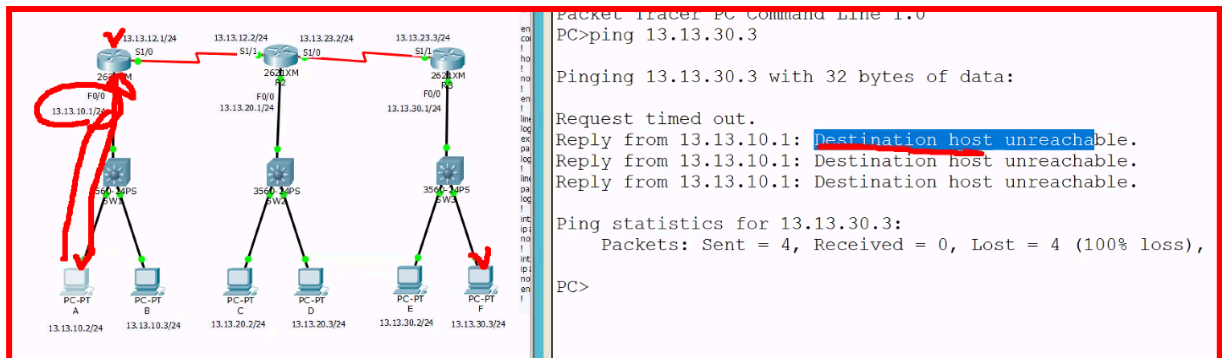


## 제2장 정적 경로 및 기본 경로 구성

### 1. 정적 경로 구성

- '10-1.정적 경로 및 기본 경로 구성.pkt' 파일을 실행하여 기본 설정을 실시하고 정적 경로를 설정한다

#### 13.13.30.3으로 핑을 보낼경우:



The network diagram shows three routers (R1, R2, R3) connected in a chain. R1 is connected to R2 via Serial1/0/24 (13.13.12.2/24) and Serial1/0/24 (13.13.22.2/24). R2 is connected to R3 via Serial1/0/24 (13.13.23.3/24). R1 has a FastEthernet0/0 interface connected to a switch (SW1) and a PC (PC-A). R2 has a FastEthernet0/0 interface connected to a switch (SW2) and a PC (PC-C). R3 has a FastEthernet0/0 interface connected to a switch (SW3) and a PC (PC-E). The PC addresses are 13.13.10.2/24, 13.13.10.3/24, 13.13.20.2/24, 13.13.20.3/24, 13.13.30.2/24, and 13.13.30.3/24. A red circle highlights the PC-A interface. The Packet Tracer command window shows the following output:

```
Packet Tracer PC Command Line 1.0
PC>ping 13.13.30.3

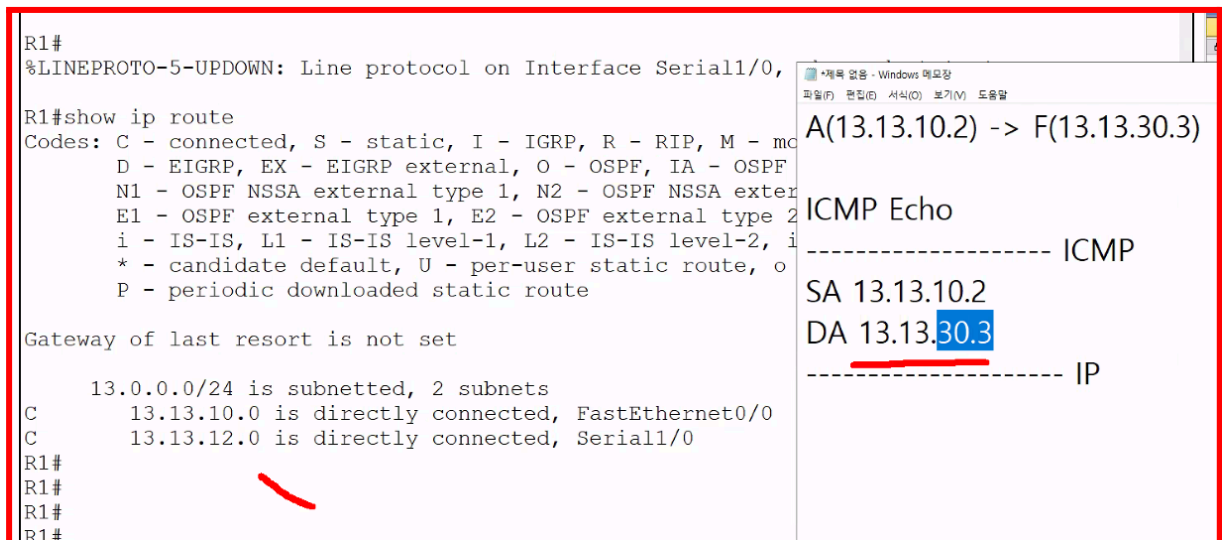
Pinging 13.13.30.3 with 32 bytes of data:

Request timed out.
Reply from 13.13.10.1: Destination host unreachable.
Reply from 13.13.10.1: Destination host unreachable.
Reply from 13.13.10.1: Destination host unreachable.

Ping statistics for 13.13.30.3:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),

PC>
```

- R1에서 받아서 다시 돌려준다.



The router R1 configuration shows the following output:

```
R1#
%LINEPROTO-5-UPDOWN: Line protocol on Interface Serial1/0,
R1#show 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 exte
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

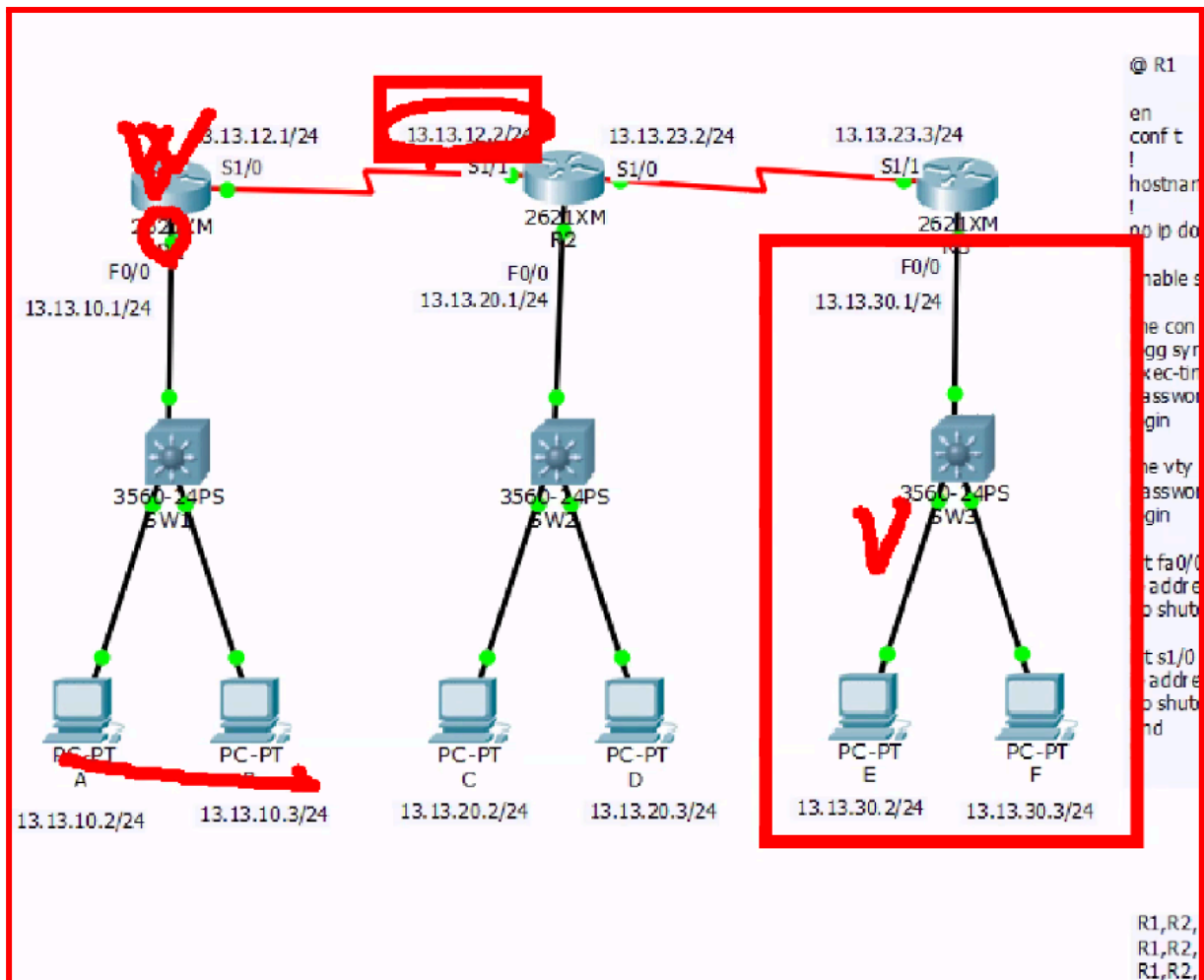
Gateway of last resort is not set

13.0.0.0/24 is subnetted, 2 subnets
C    13.13.10.0 is directly connected, FastEthernet0/0
C    13.13.12.0 is directly connected, Serial1/0
R1#
R1#
R1#
R1#
```

The ICMP Echo test results show the following output:

```
A(13.13.10.2) -> F(13.13.30.3)
ICMP Echo
----- ICMP
SA 13.13.10.2
DA 13.13.30.3
----- IP
```

- 라우터에대한 목적지 정보가 없기 때문에 드랍처리 해버린다.
- R1라우터에 목적지 30.3에대한 경로가 없기때문에 처리가 안된다.



R1 → Nexthop(Gateway) → 13.13.30.2  
 루트를 정해줘야 한다.

```
R1#
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#
R1(config)#ip route ?
  A.B.C.D Destination prefix
R1(config)#ip route 13.13.30.0 ?
  A.B.C.D Destination prefix mask
R1(config)#ip route 13.13.30.0 255.255.255.0 ?
  A.B.C.D Forwarding router's address
  Ethernet IEEE 802.3
  FastEthernet FastEthernet IEEE 802.3
  GigabitEthernet GigabitEthernet IEEE 802.3z
  Loopback Loopback interface
  Null Null interface
  Serial Serial interface
R1(config)#ip route 13.13.30.0 255.255.255.0 13.13.12.2
R1(config)#
```

Nexthop: 13.13.12.2

R1 → 13.13.30.0(네트워크 이름) 으로 보내려 하는데 Nexthop13.13.12.2이다.

**show run** 으로 설정확인:

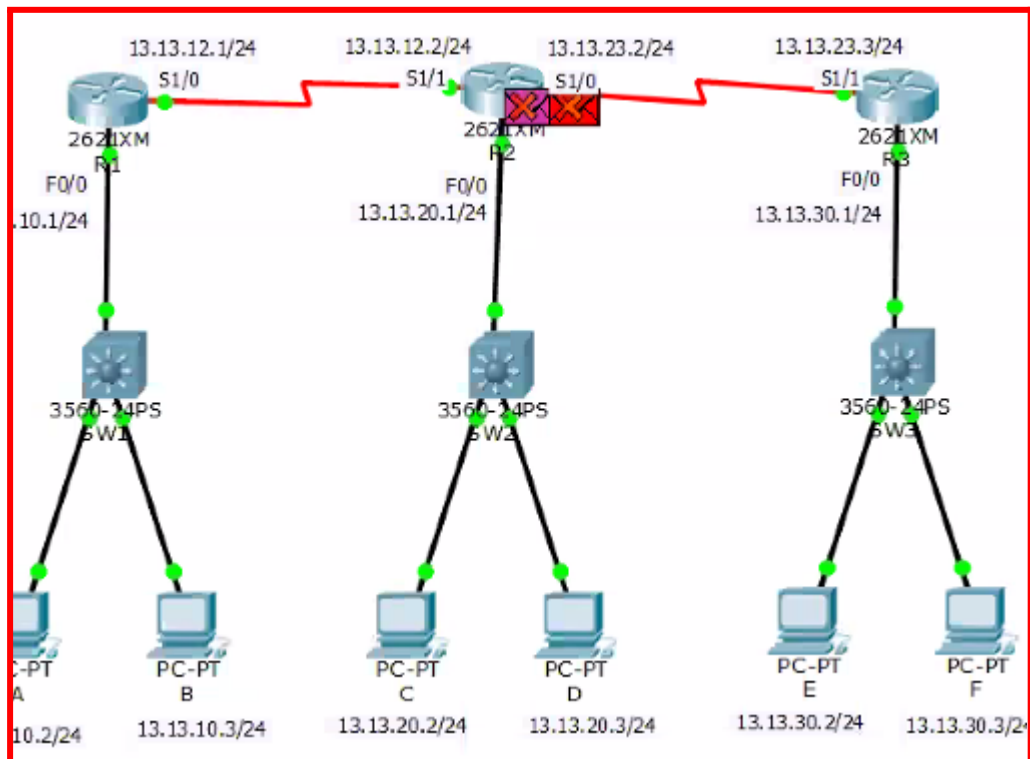
```
!  
interface Serial1/2  
  no ip address  
  shutdown  
!  
interface Serial1/3  
  no ip address  
  shutdown  
!  
ip classless  
ip route 13.13.30.0 255.255.255.0 13.13.12.2  
!  
ip flow-export version 9  
!  
!
```

**show ip route** 확인:

```
Gateway of last resort is not set  
  
  13.0.0.0/24 is subnetted, 3 subnets  
C       13.13.10.0 is directly connected, FastEthernet0/0  
C       13.13.12.0 is directly connected, Serial1/0  
S       13.13.30.0 [1/0] via 13.13.12.2  
R1#
```

- 게이트웨이 추가 완료.
- 패킷을 출력하는 인터페이스 정보가 안나온다.
  - 13.13.30.0 (목적지) 13.13.12.0 (경유지)를 통해서 나간다.

그러나 A PC부터 13.13.30.2까지 핑이 안나간다:



R2도 똑같이 설정을 해줘야 한다.

```
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#ip route 13.13.30.0 255.255.255.0 13.13.23.3
R2(config)#end
R2#
%SYS-5-CONFIG_I: Configured from console by console
R2#
```

show run

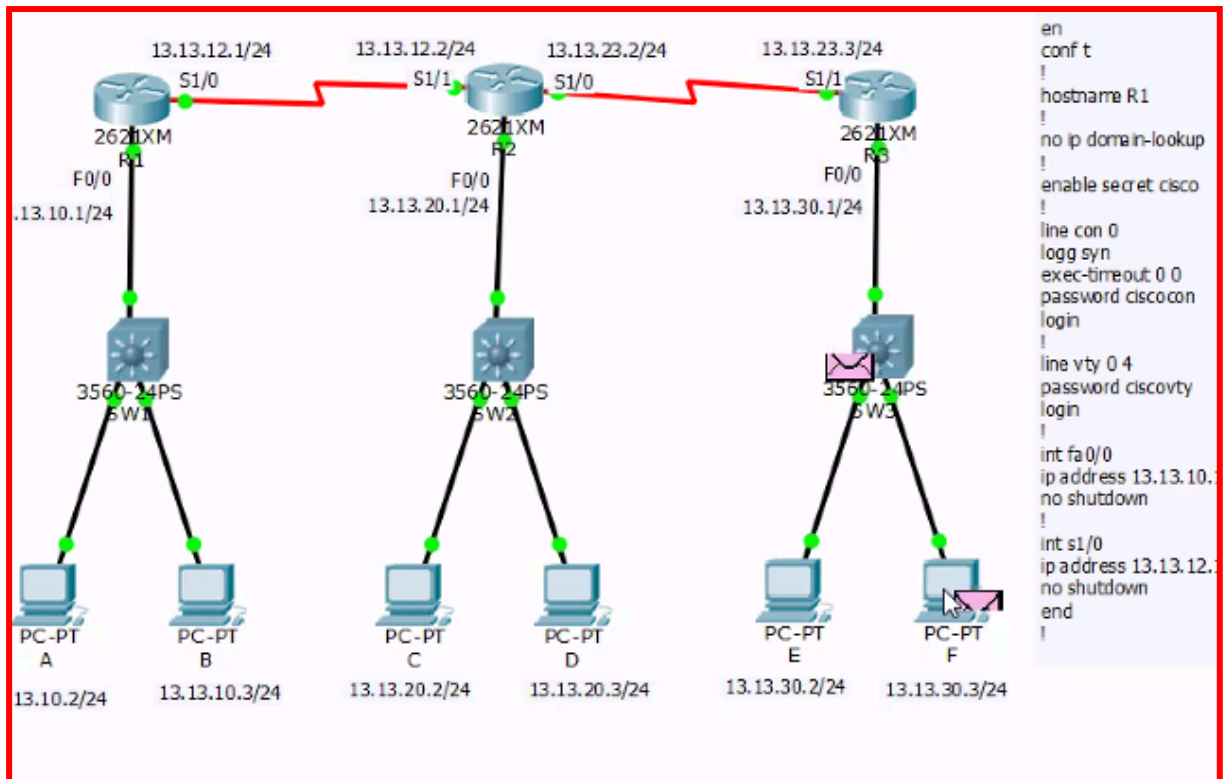
```
!
ip classless
ip route 13.13.30.0 255.255.255.0 13.13.23.3
!
ip flow-export version 9
!
```

show ip route

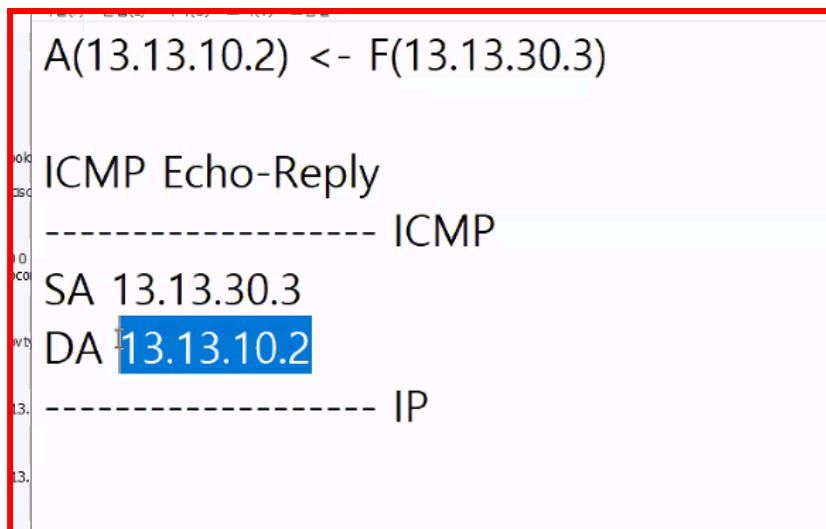
```
Gateway of last resort is not set

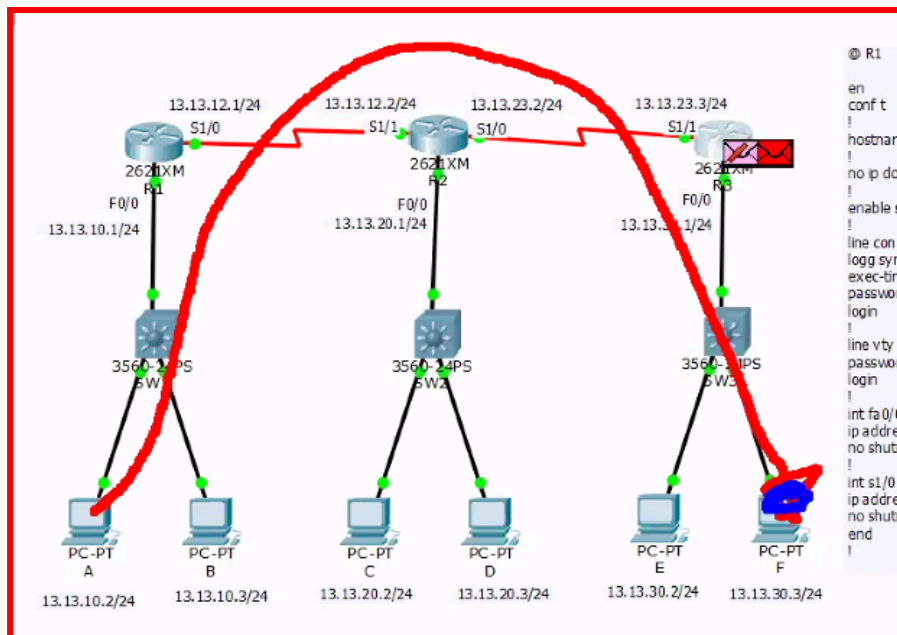
13.0.0.0/24 is subnetted, 4 subnets
C    13.13.12.0 is directly connected, Serial1/1
C    13.13.20.0 is directly connected, FastEthernet0/0
C    13.13.23.0 is directly connected, Serial1/0
S    13.13.30.0 [1/0] via 13.13.23.3
R2#
```

그러나 아직도 안된다.



F PC까지는 나가지만 echo reply를 주지 않는다 (A까지 안준다)





여기까지는 이상이 없지만 돌아가는 경로가 없다.

- R3에서 경로를 추가해야한다.

### R3 → R2

```
R3#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R3(config)#ip route 13.13.10.0 255.255.255.0 13.13.23.2
R3(config)#end
R3#
%SYS-5-CONFIG_I: Configured from console by console
```

show ip route

```
Gateway of last resort is not set

13.0.0.0/24 is subnetted, 3 subnets
S    13.13.10.0 [1/0] via 13.13.23.2
C    13.13.23.0 is directly connected, Serial1/1
C    13.13.30.0 is directly connected, FastEthernet0/0
R3#
```

### R2 → R1

```
R2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R2(config)#ip route 13.13.10.0 255.255.255.0 13.13.12.1
```

show run

```
ip classless
ip route 13.13.30.0 255.255.255.0 13.13.23.3
ip route 13.13.10.0 255.255.255.0 13.13.12.1
!
```

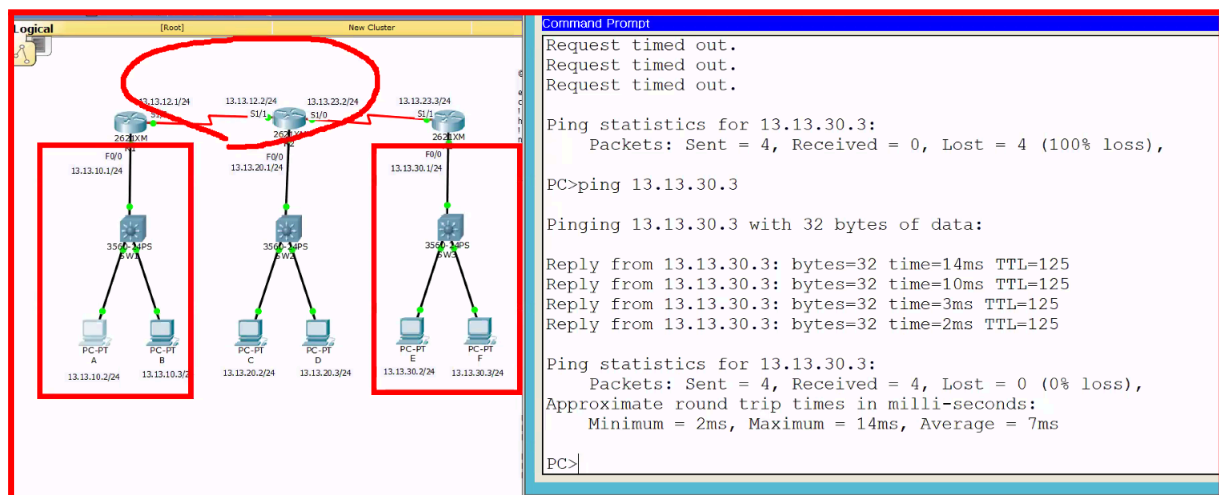
show ip route

```
Gateway of last resort is not set

13.0.0.0/24 is subnetted, 5 subnets
S    13.13.10.0 [1/0] via 13.13.12.1
C    13.13.12.0 is directly connected, Serial1/1
C    13.13.20.0 is directly connected, FastEthernet0/0
C    13.13.23.0 is directly connected, Serial1/0
S    13.13.30.0 [1/0] via 13.13.23.3
```

같은방식으로 추가해준다.

이제 외부망을 통해서 통신이 가능하다:



R1 → R2

R2 → R3

까지 해주면 모든 네트워크가 사용 가능하다.

```
A>ping 13.13.23.3
```

안되는 이유?

```
R1,R2,R3#show ip route
```

```
PC>ping 13.13.23.3

Pinging 13.13.23.3 with 32 bytes of data:

Reply from 13.13.10.1: Destination host unreachable.
Reply from 13.13.10.1: Destination host unreachable.
Reply from 13.13.10.1: Destination host unreachable.
Reply from 13.13.10.1: Destination host unreachable.

Ping statistics for 13.13.23.3:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

R1에서 경로가 없다.

```
Gateway of last resort is not set
|
|      13.0.0.0/24 is subnetted, 4 subnets
C      13.13.10.0 is directly connected, FastEthernet0/0
C      13.13.12.0 is directly connected, Serial1/0
S      13.13.20.0 [1/0] via 13.13.12.2
S      13.13.30.0 [1/0] via 13.13.12.2
R1#
```

23.3에 대한 경로가 없다.

```
R1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
R1(config)#ip route 13.13.23.0 255.255.255.0 13.13.12.2
```

- 경로추가

```
!
ip classless
ip route 13.13.30.0 255.255.255.0 13.13.12.2
ip route 13.13.20.0 255.255.255.0 13.13.12.2
ip route 13.13.23.0 255.255.255.0 13.13.12.2
!
ip flow-export version 9
!
```

- 라우팅 테이블 확인



잘 나간다:

```
PC>ping 13.13.23.3

Pinging 13.13.23.3 with 32 bytes of data:

Reply from 13.13.23.3: bytes=32 time=2ms TTL=253
Reply from 13.13.23.3: bytes=32 time=4ms TTL=253
Reply from 13.13.23.3: bytes=32 time=6ms TTL=253
```

### 13.13.12.1

안되는 이유?

R1,R2,R3#show ip route

```
PC>ping 13.13.12.1

Pinging 13.13.12.1 with 32 bytes of data:

Reply from 13.13.30.1: Destination host unreachable.
Reply from 13.13.30.1: Destination host unreachable.
Reply from 13.13.30.1: Destination host unreachable.
Reply from 13.13.30.1: Destination host unreachable.

Ping statistics for 13.13.12.1:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

R3에 12.1로 보내는 패킷이 없다.

```
R3#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
R3(config)#ip route 13.13.12.0 255.255.255.0 13.13.23.2
R3(config)#
```

```
ip classless
ip route 13.13.10.0 255.255.255.0 13.13.23.2
ip route 13.13.20.0 255.255.255.0 13.13.23.2
ip route 13.13.12.0 255.255.255.0 13.13.23.2
!
```

```
Gateway of last resort is not set
```

```
13.0.0.0/24 is subnetted, 5 subnets
```

```
S    13.13.10.0 [1/0] via 13.13.23.2
```

```
S    13.13.12.0 [1/0] via 13.13.23.2
```

```
S    13.13.20.0 [1/0] via 13.13.23.2
```

```
C    13.13.23.0 is directly connected, Serial1/1
```

```
C    13.13.30.0 is directly connected, FastEthernet0/0
```

```
R3#
```

R3	R1	R2
<pre>Physical Config CLI IOS Command Line Interface  ! line aux 0 ! line vty 0 4 password ciscovty login ! ! ! end  R3#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 i - IS-IS, LI - 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  13.0.0.0/24 is subnetted, 5 subnets S    13.13.10.0 [1/0] via 13.13.23.2 S    13.13.12.0 [1/0] via 13.13.23.2 S    13.13.20.0 [1/0] via 13.13.23.2 C    13.13.23.0 is directly connected, Serial1/1 C    13.13.30.0 is directly connected, FastEthernet0/0 R3#</pre>	<pre>Physical Config CLI IOS Command Line Interface  ! line aux 0 ! line vty 0 4 password ciscovty login ! ! ! end  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 i - IS-IS, LI - 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  13.0.0.0/24 is subnetted, 5 subnets C    13.13.10.0 is directly connected, FastEthernet0/0 C    13.13.12.0 is directly connected, Serial1/1 S    13.13.20.0 [1/0] via 13.13.23.2 S    13.13.23.0 [1/0] via 13.13.23.2 S    13.13.30.0 [1/0] via 13.13.23.2 R1#</pre>	<pre>Physical Config CLI IOS Command Line Interface  ! line aux 0 ! line vty 0 4 password ciscovty login ! ! ! end  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 i - IS-IS, LI - 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  13.0.0.0/24 is subnetted, 5 subnets S    13.13.10.0 [1/0] via 13.13.23.1 C    13.13.12.0 is directly connected, Serial1/1 C    13.13.20.0 is directly connected, FastEthernet0/0 C    13.13.23.0 is directly connected, Serial1/0 S    13.13.30.0 [1/0] via 13.13.23.3 R2#</pre>

- 각 라우터마다 5개의 네트워크가 다 등록되어 있다.
- 모든 네트워크끼리 통신이 가능해졌다.

## LoopBack

- 가상 인터페이스 (테스트용)

@ R3

conf t

!

int lo 1

ip address 168.126.63.1 255.255.255.0

!

int lo 2

ip address 8.8.8.8 255.255.255.0

!

int lo 3

ip address 121.160.42.1 255.255.255.0

!

int lo 4

ip address 61.42.100.1 255.255.255.0

end

```
interface Loopback1
 ip address 168.126.63.1 255.255.255.0
!
interface Loopback2
 ip address 8.8.8.8 255.255.255.0
!
interface Loopback3
 ip address 121.160.42.1 255.255.255.0
!
interface Loopback4
 ip address 61.42.100.1 255.255.255.0
!
```

R3# 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

8.0.0.0/24 is subnetted, 1 subnets

C 8.8.8.0 is directly connected, Loopback2

13.0.0.0/24 is subnetted, 5 subnets

S 13.13.10.0 [1/0] via 13.13.23.2

S 13.13.12.0 [1/0] via 13.13.23.2

S 13.13.20.0 [1/0] via 13.13.23.2

C 13.13.23.0 is directly connected, Serial1/1

C 13.13.30.0 is directly connected, FastEthernet0/0

61.0.0.0/24 is subnetted, 1 subnets

C 61.42.100.0 is directly connected, Loopback4

121.0.0.0/24 is subnetted, 1 subnets

C 121.160.42.0 is directly connected, Loopback3

--More--

추가해준다

```
R2(config)#ip route 168.126.63.0 255.255.255.0 13.13.23.3
R2(config)#ip route 8.8.8.0 255.255.255.0 13.13.23.3
R2(config)#ip route 121.160.42.0 255.255.255.0 13.13.23.3
R2(config)#ip route 61.42.100.0 255.255.255.0 13.13.23.3
```

show run

```
ip classless
ip route 13.13.30.0 255.255.255.0 13.13.23.3
ip route 13.13.10.0 255.255.255.0 13.13.12.1
ip route 168.126.63.0 255.255.255.0 13.13.23.3
ip route 8.8.8.0 255.255.255.0 13.13.23.3
ip route 121.160.42.0 255.255.255.0 13.13.23.3
ip route 61.42.100.0 255.255.255.0 13.13.23.3
!
ip flow-export version 9
!
```

show ip route

```
R2#
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

      8.0.0.0/24 is subnetted, 1 subnets
S        8.8.8.0 [1/0] via 13.13.23.3
      13.0.0.0/24 is subnetted, 5 subnets
S        13.13.10.0 [1/0] via 13.13.12.1
C        13.13.12.0 is directly connected, Serial1/1
C        13.13.20.0 is directly connected, FastEthernet0/0
C        13.13.23.0 is directly connected, Serial1/0
S        13.13.30.0 [1/0] via 13.13.23.3
      61.0.0.0/24 is subnetted, 1 subnets
S        61.42.100.0 [1/0] via 13.13.23.3
      121.0.0.0/24 is subnetted, 1 subnets
S        121.160.42.0 [1/0] via 13.13.23.3
--More--
```

- 경로 등록완료

```

R2#ping 8.8.8.8'
Translating "8.8.8.8'"
% Unrecognized host or address or protocol not running.

R2#ping 8.8.8.8

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 8.8.8.8, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 4/11/18 ms

R2#ping 121.160.42.1

Type escape sequence to abort.
Sending 5, 100-byte ICMP Echos to 121.160.42.1, timeout is 2 seconds:
!!!!
Success rate is 100 percent (5/5), round-trip min/avg/max = 1/9/17 ms

```

핑테스트 성공

## 기본경로 설정

```

R1(config)#ip route 0.0.0.0 0.0.0.0 13.13.12.2
R1(config)#end
R1#
%SYS-5-CONFIG_I: Configured from console by console

R1#

```

- 목적지가 뭐가되든간에 12.2한테 보내라
- 0.0.0.0은 모든 IP를 이야기한다.

```

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 13.13.12.2 to network 0.0.0.0

    13.0.0.0/24 is subnetted, 5 subnets
C      13.13.10.0 is directly connected, FastEthernet0/0
C      13.13.12.0 is directly connected, Serial1/0
S      13.13.20.0 [1/0] via 13.13.12.2
S      13.13.23.0 [1/0] via 13.13.12.2
S      13.13.30.0 [1/0] via 13.13.12.2
S*    0.0.0.0/0 [1/0] via 13.13.12.2
R1#

```

- \* 이 붙어있다
- 기본경로로 설정됨.

```

Gateway of last resort is 13.13.12.2 to network 0.0.0.0

```

- 만약 경로가 없을시, 최후의 수단으로 사용하도록 설정된다.

```

PC>netstat -r

Route Table
=====
Interface List
0x1 ..... PT TCP Loopback interface
0x2 ...00 16 6f 0d 88 ec ..... PT Ethernet interface
=====

Active Routes:
Network Destination        Netmask          Gateway          Interface  Metric
0.0.0.0                    0.0.0.0          13.13.10.1       13.13.10.2    1
Default Gateway:          13.13.10.1
=====

Persistent Routes:
None

PC>ipconfig

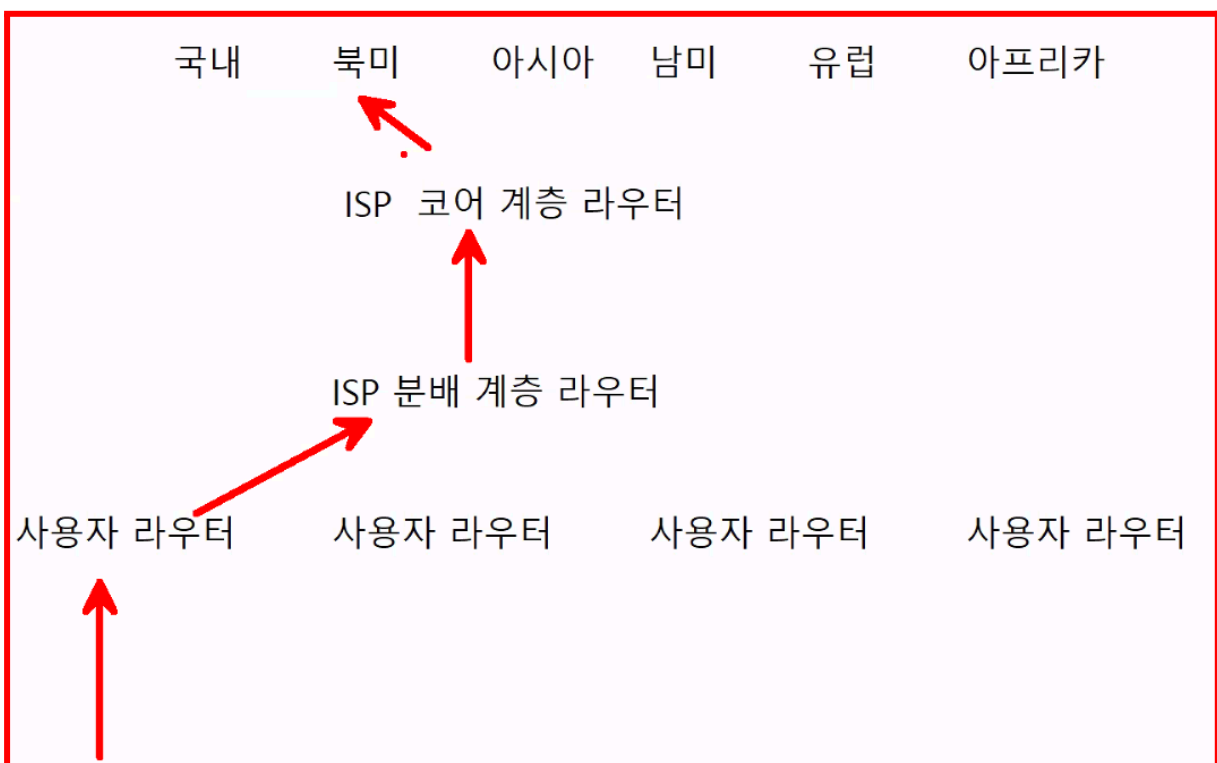
FastEthernet0 Connection: (default port)

Link-local IPv6 Address . . . . . : FE80::201:96FF:FEE4:7109
IP Address. . . . . : 13.13.10.2
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 13.13.10.1

PC>

```

- PC에서도 기본경로가 똑같이 적용된다.



인터넷

- 코어 계층

사용자 라우터

- 기본경로

## 2. 정적 경로 설정 유형

### 1) 넥스트 홉 지정 방식

정적 경로는 관리자가 목적지 네트워크 정보와 넥스트-홉 정보를 파악하여 직접 설정하는 방식이다. 또한 요청 패킷을 전송하는 경로 뿐만 아니라 응답 패킷이 돌아올수 있도록 경로를 설정해야 한다.

#### 1) 넥스트-홉 지정 방식

```
R1#conf t
```

```
R1(config)#ip route 13.13.30.0 255.255.255.0 13.13.12.2
```

Gateway of last resort is not set

13.0.0.0/24 is subnetted, 5 subnets

C 13.13.10.0 is directly connected, FastEthernet0/0

C 13.13.12.0 is directly connected, Serial1/0

S 13.13.20.0 [1/0] via 13.13.12.2

S 13.13.23.0 [1/0] via 13.13.12.2

S 13.13.30.0 [1/0] via 13.13.12.2

- via - ~~를 통해서 나간다.
- 만약 13.13.12.0 이 없어진다면 (Connected 경로) 라우팅 테이블이 등록이 되지 않는다.

```
R1#show ip route
```

Gateway of last resort is not set

13.0.0.0/24 is subnetted, 5 subnets

C 13.13.10.0 is directly connected, FastEthernet0/0

C 13.13.12.0 is directly connected, Serial1/0

S 13.13.20.0 [1/0] via 13.13.12.2

S 13.13.23.0 [1/0] via 13.13.12.2

S 13.13.30.0 [1/0] via 13.13.12.2

S	: Static 경로
13.13.30.0	: 목적지 네트워크
[1/	: 정적 경로의 신뢰도(0~255)
/0]	: 메트릭
via	: 넥스트-홉 라우터 표시
13.13.12.2	: 넥스트-홉 IP 주소

- 신뢰도 0은 직접연결이다
- 메트릭이란
  - 지정된 경로까지 갈때 드는 비용 (cost)이다.

## 2) 인터페이스 지정 방식

```
@ R1
conf t
ip route 13.13.30.0 255.255.255.0 s1/0
!

ip route 13.13.30.0 255.255.255.0 13.13.12.2
!
```

- 설정할때는 위에꺼가 편하지만 공부할때는 밑에꺼가 더 편하다.

```
R1#conf t
R1(config)#no ip route 13.13.30.0 255.255.255.0 13.13.12.2
R1(config)#ip route 13.13.30.0 255.255.255.0 s1/0
R1(config)#end
R1#show ip route
```

Gateway of last resort is not set

```
13.0.0.0/24 is subnetted, 5 subnets
C    13.13.10.0 is directly connected, FastEthernet0/0
C    13.13.12.0 is directly connected, Serial1/0
S    13.13.20.0 [1/0] via 13.13.12.2
S    13.13.23.0 [1/0] via 13.13.12.2
S    13.13.30.0 is directly connected, Serial1/0
```

```
S                : Static 경로
13.13.30.0        : 목적지 네트워크
directly connected : Connected 경로처럼 출력
Serial1/0         : 패킷을 전송하는 인터페이스
```



### 3. 정적 기본 경로

- 패킷을 전송하기 위한 경로가 라우팅 테이블에 없을 경우, 가장 마지막에 사용하는 경로이다. 그렇기 때문에
- 사용자 라우터에는 기본 경로를 설정하여 ISP 라우터로 패킷을 전송할 수 있도록 구성하고 있다.
- 또한 시스템에서 기본 게이트웨이 IP 주소를 지정하면 시스템 라우팅 테이블에 기본 경로가 등록된다.
- R1 에서 기존에 설정한 정적 경로를 삭제하고 정적 기본 경로를 설정한다.

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 13.13.12.2 to network 0.0.0.0

13.0.0.0/24 is subnetted, 2 subnets

C 13.13.10.0 is directly connected, FastEthernet0/0

C 13.13.12.0 is directly connected, Serial1/0

S\* 0.0.0.0/0 [1/0] via 13.13.12.2

### 0.0.0.0/0 정적경로 (다 보낸다)

Ex) 기본 경로를 주로 사용하는 라우터는 어떤 라우터인가?

(사용자)

(ISP)

(ISP Backbone)

Access 라우터-----Distribution 라우터-----Core 라우터-----인터넷(다른 지역/국가)

#### 4. 라우팅 테이블 경로 검색 순서

##### 1) 롱기스트 매치를

- a) 라우팅 테이블에 경로를 검색할때 가장 먼저 검사하며 패킷의 목적지 IP 주소에 대한 상세 경로를 먼저 사용하는 규칙이다.

Ex) 목적지 주소가 '192.168.30.1'인 패킷을 라우팅할 때 어떤 경로를 사용하는가?

- ① S      192.168.30.0/24 [1/0] via 13.13.12.2
- ② S      192.168.30.0/26 [1/0] via 13.13.102.2

192.168.30.    00000000

192.168.30.00 000000 <- 192.168.30.0

~

192.168.30.00 111111 <- 192.168.30.63

- 아래꺼가 아이피 범위가 더 상세하다 (0~255 vs 0~63).

##### 2) 신뢰도 (Administrative Distance)

라우팅 테이블에 등록할 경로의 신뢰도를 의미한다. 범위는 '0~255'까지이며 신뢰도 값이 작은 경로가 라우팅 테이블에 우선적으로 등록된다. 다음은 경로에 대한 신뢰도 기본값이다.

Connected	0
Static	1
EIGRP	90
OSPF	110
RIP	120

Ex) '13.13.30.0/24' 네트워크에 대해서 Static 경로와 RIP 경로가 있다면, 라우팅 테이블에 등록되는 경로는?

- Static

### 3) 메트릭 (신뢰도, 롱기스트가 같을때)

로컬 라우터에서 목적지까지 도달하는데 필요한 비용이다. 경로를 선출할 때 사용하며 값이 작을 수록 최적 경로로 선출되어 라우팅 테이블에 등록된다.

Ex) 다음 중 라우팅 테이블에 등록되는 경로는 무엇인가?

- ① R 13.13.30.0 [120/2] via 13.13.12.2, Serial1/0
- ② R 13.13.30.0 [120/5] via 13.13.14.4, Serial1/1

1번

- 롱기스트 매치율 [신뢰도 / 메트릭]