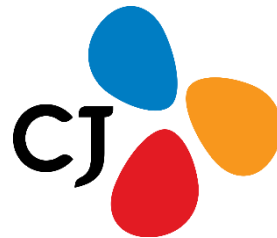




CJ로 알아보는 가상의 네트워크

9 1 7 2 0 4 8 9 반 정
원
9 1 7 2 0 5 3 2 사 인
재

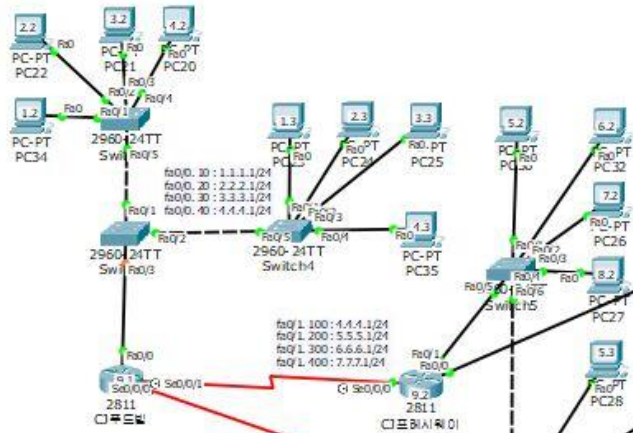


목차

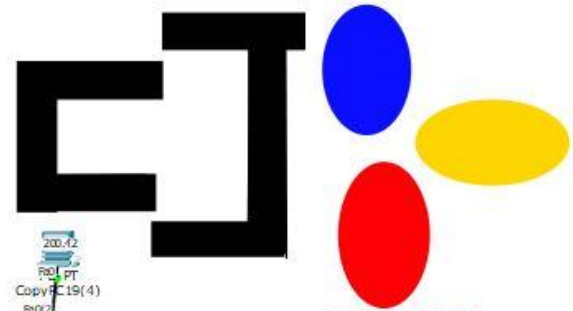
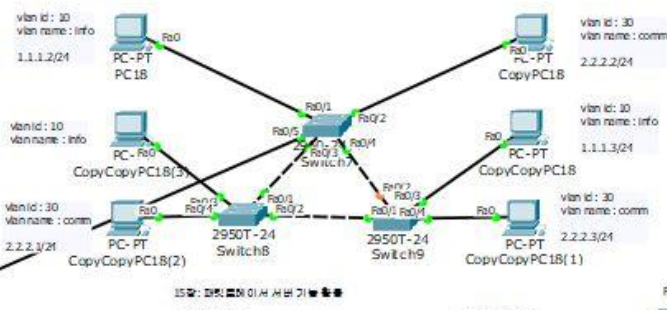


1. 전체 토폴로지
2. 시나리오 소개
3. 무선 LAN & DHCP
4. NAT
5. WAN
6. VPN
7. 재분배
8. VLAN 과 VTP,STP
9. HTTP

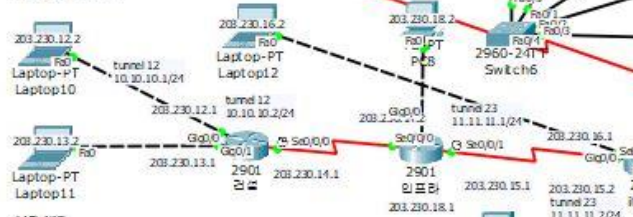
8: MAN, Inter-MAN



9: VTEB



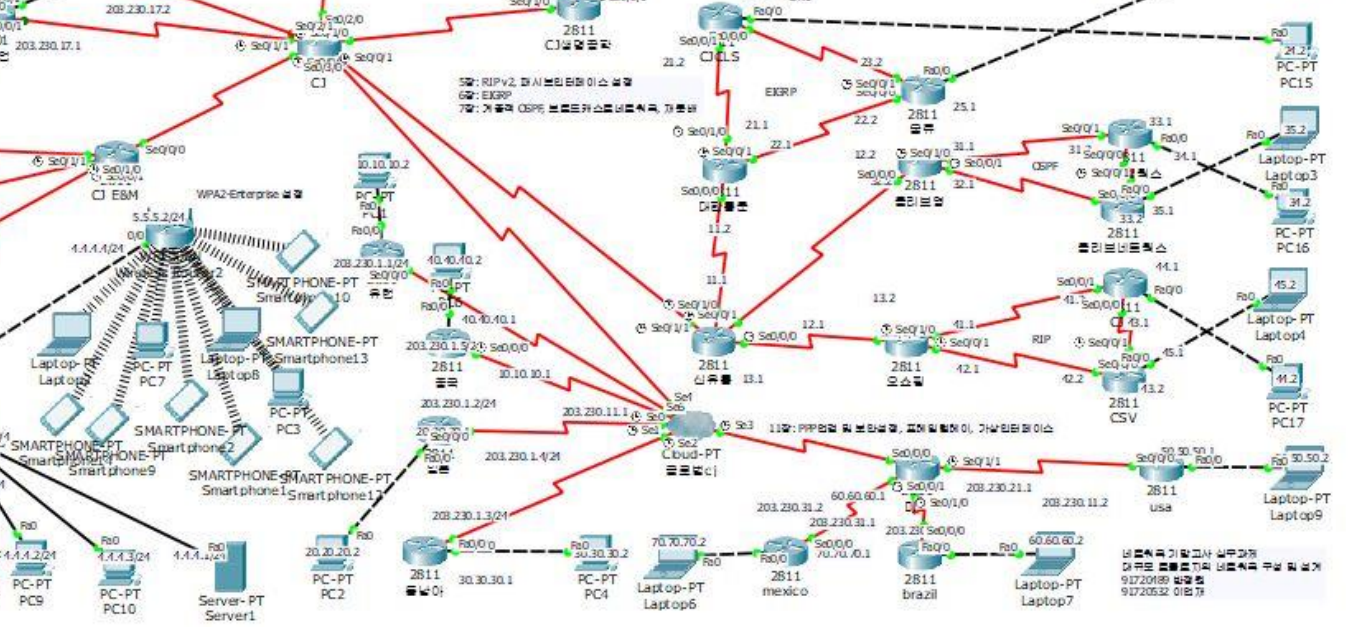
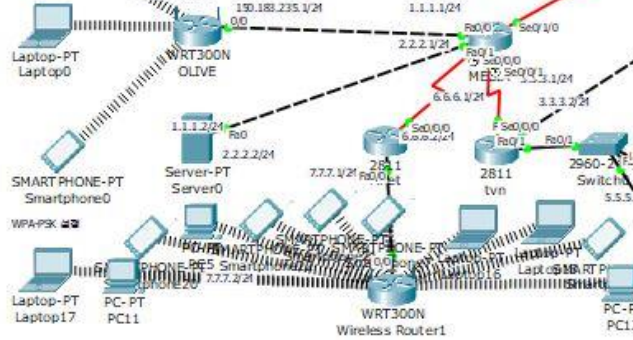
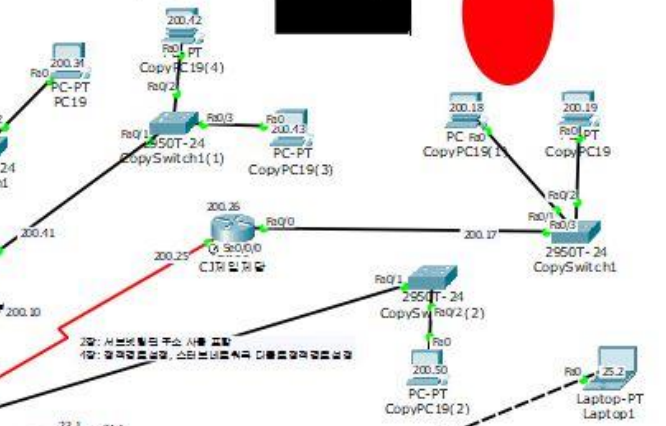
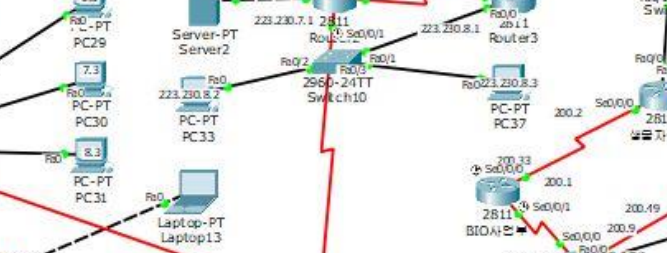
13: GRE+IPSec VPN

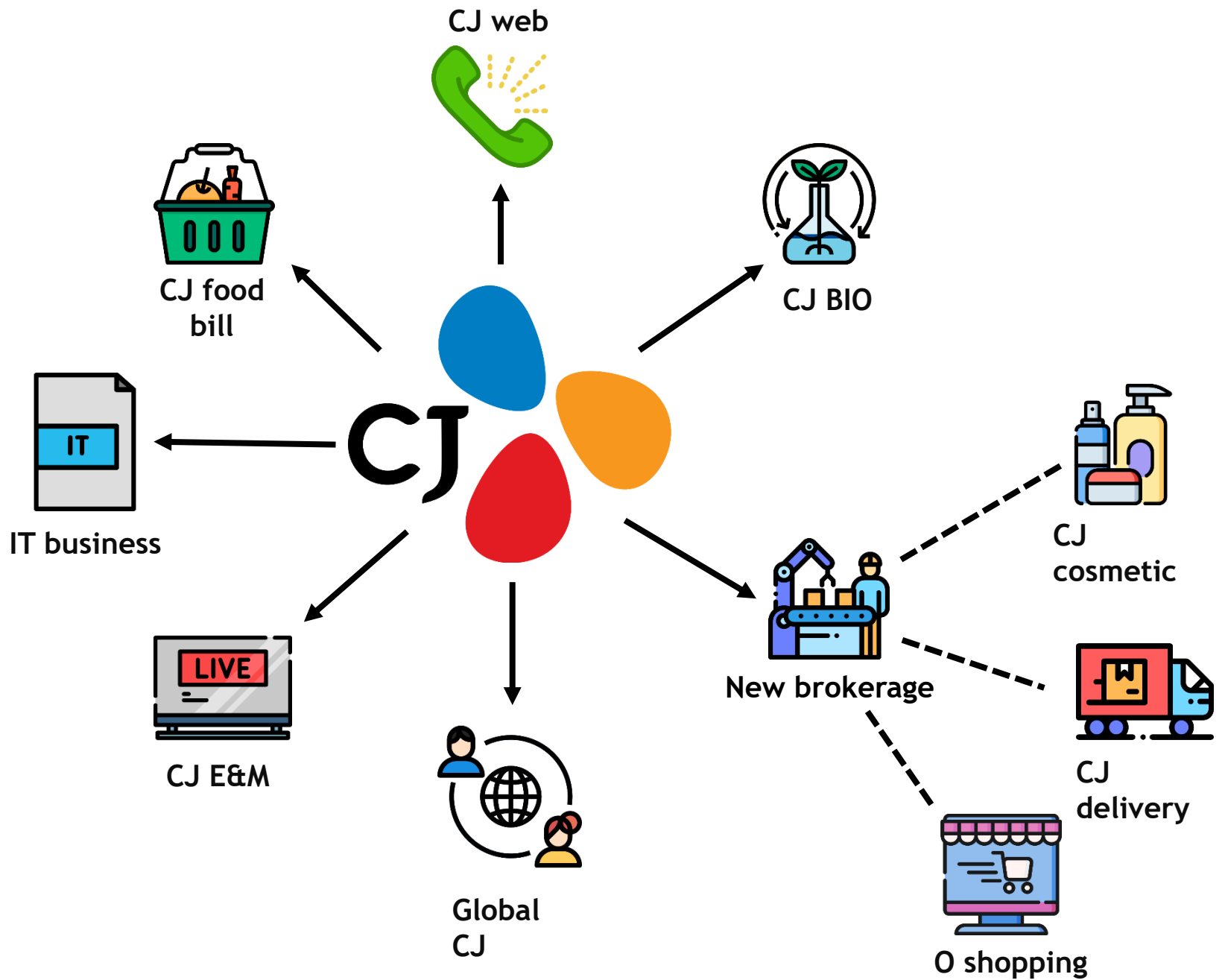


14: NAT



15: IS-IS





delicious TV
Olive

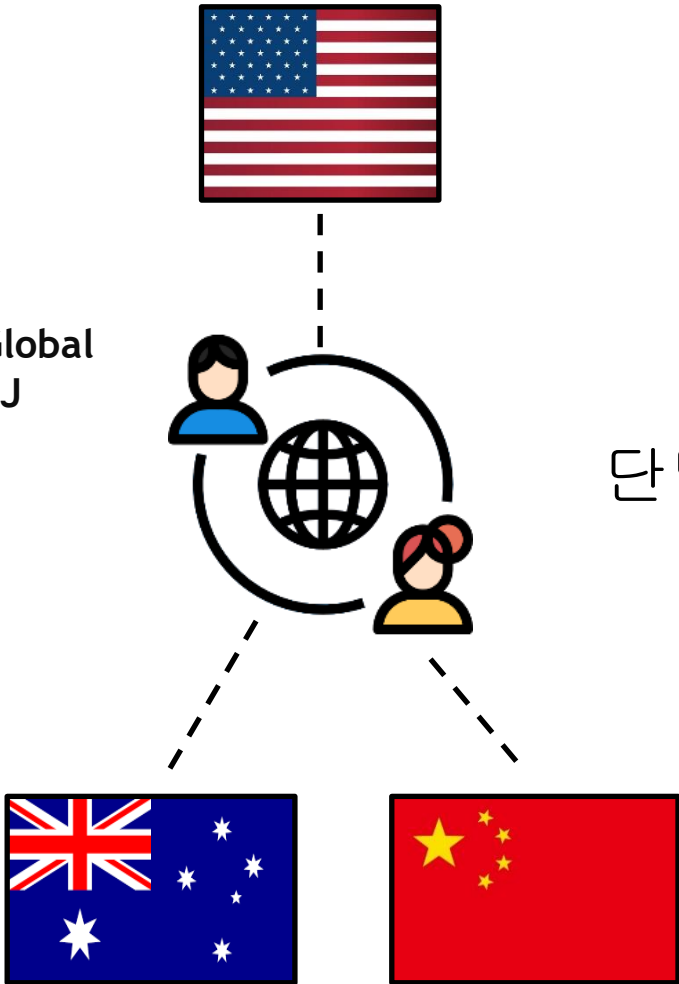
tvN



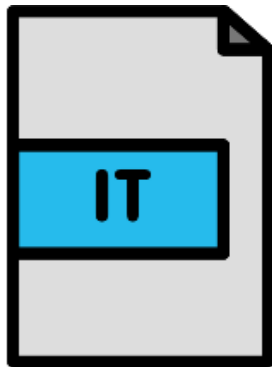
무선 신호 전달 방식을 이용하여
두 대 이상의 장치를 연결



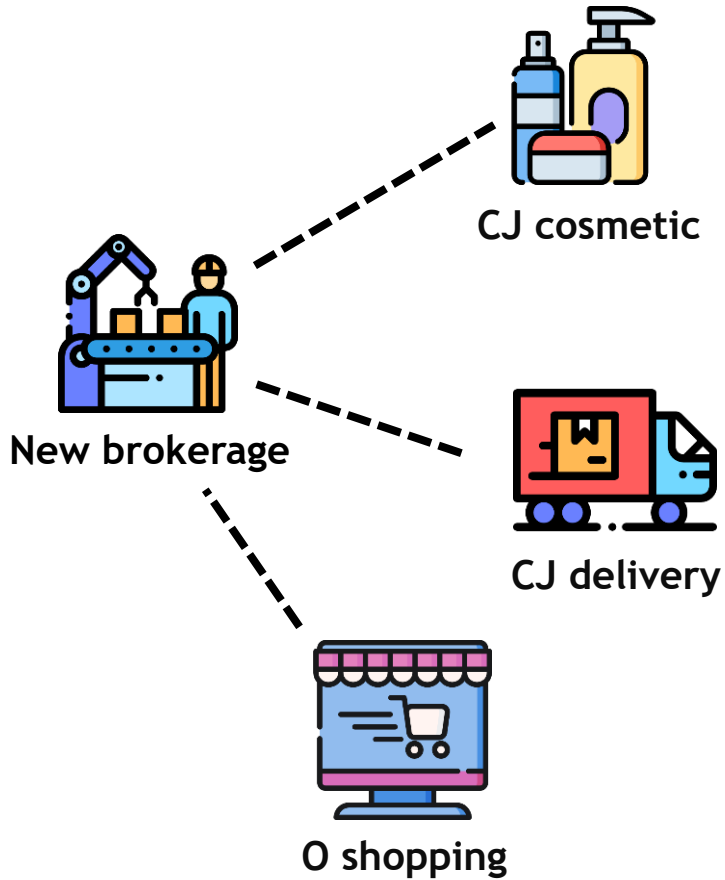
Global
CJ



광역통신망(WAN)내
단말 지점 간의 비용-효율적인 데이터를
전송하기 위해 프레임릴레이 사용



본사 CJ ↔ 지사 인프라 간의 안전한 네트워크
연결을 위해 **Ipsec VPN**을 **GRE**와 함께 사용

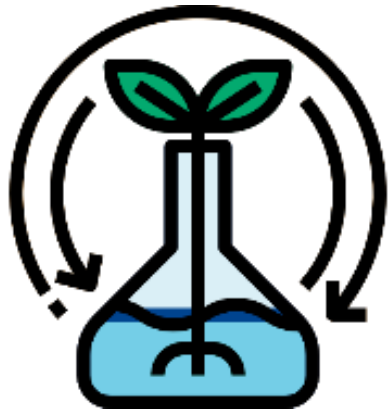


화장품 가게와 배달사와 온라인 쇼핑을

서로 통신하기 위해 사용
이 셋을 연결 시켜주는 신유통 존재



네트워크 통제와
의사소통을 빠르게 하기 위해 사용



목적지로 가는 경로를
바이오에 고정하기 위해 사용



회사를 알리기 위한 웹사이트 관리 위해 사용



무선 LAN & DHCP



무선 LAN 이란 ?

무선 신호 방식을 이용하여 두 대 이상의 장치를 연결하는 기술

장점

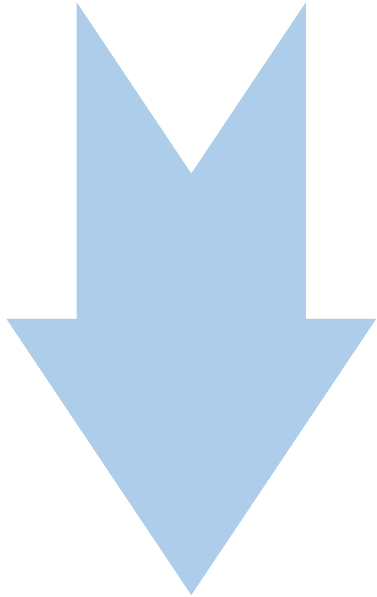
- 편리함 (무선 연결)
- 이동 제약이 없음
- 사용의 유연성 제공

단점

- 정보 누출 가능성 높음.
- 암호화 키 값의 추출 가능성

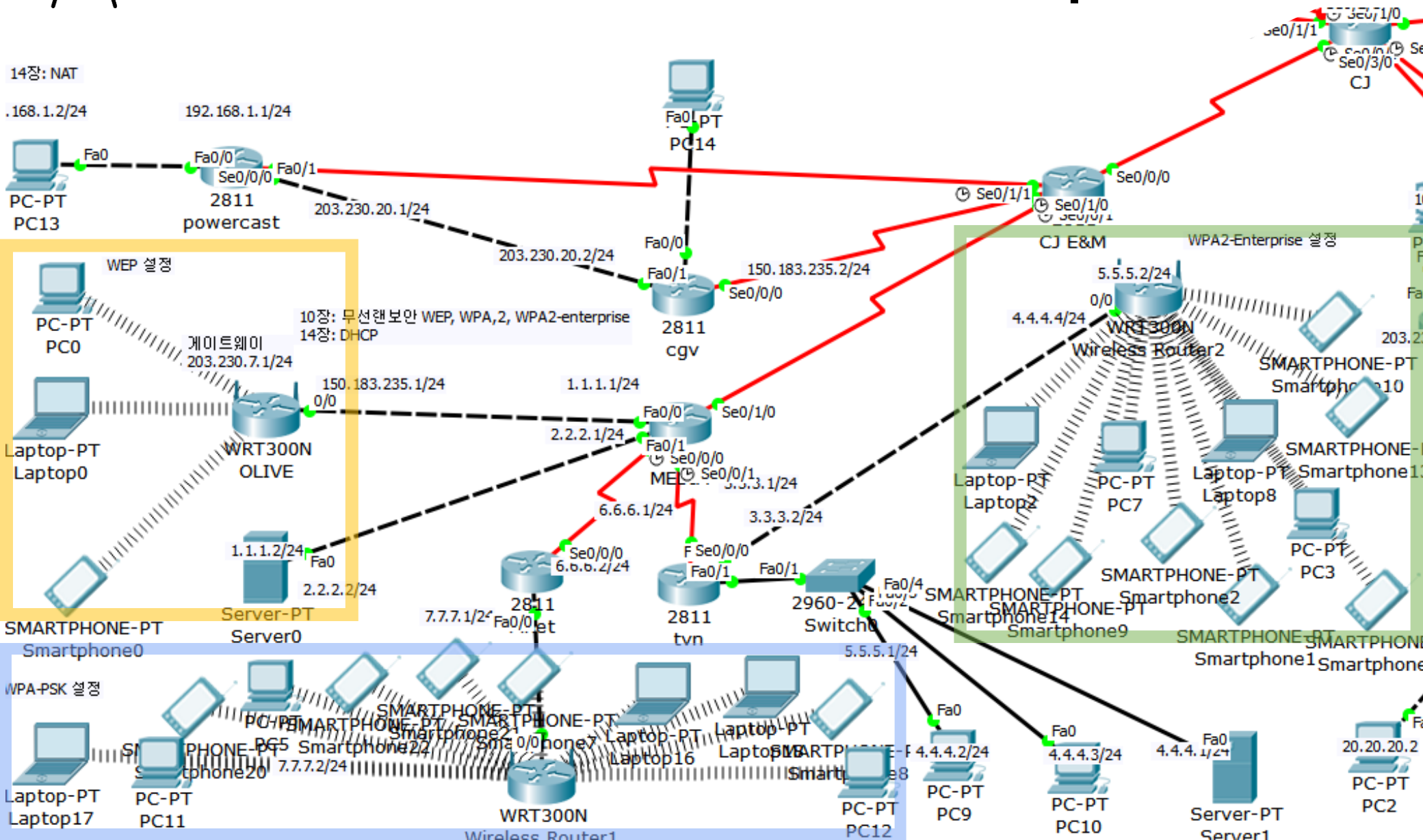
DHCP 서버란 ?

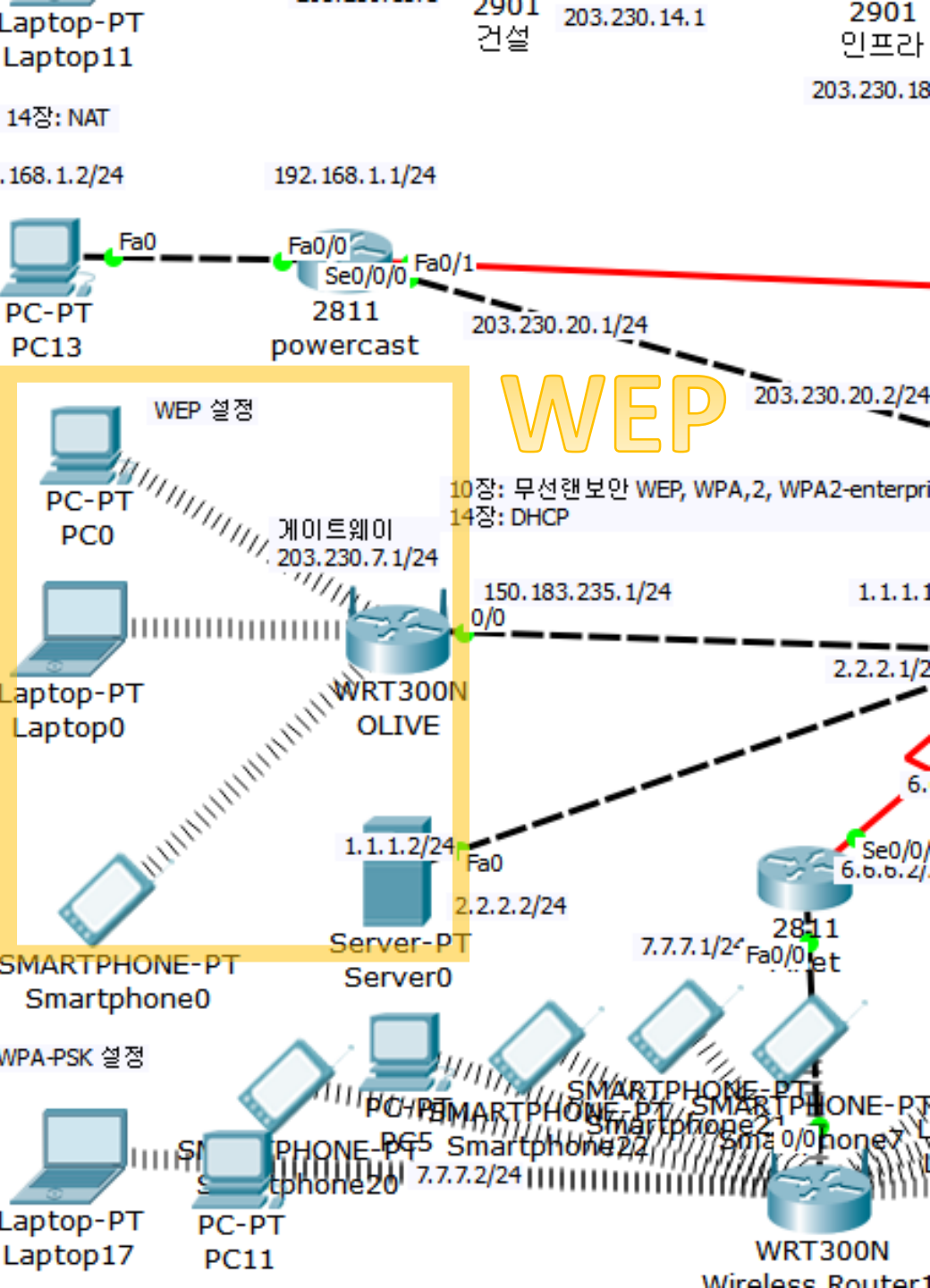
IP 자동 할당과 분배 기능





WEP, WAP, WAP2-enterprise





OLIVE GUI Screenshot: Wireless Security Configuration

Wireless Security Settings:

- Security Mode: WEP
- Encryption: 40/64-Bits (10 H)
- Passphrase: [Generate]
- Key1: 1234567890
- Key2: []
- Key3: []
- Key4: []
- TX Key: 1

Wireless0 Interface Settings:

- Port Status: On
- Bandwidth: 300 Mbps
- MAC Address: 00E0.A354.6D7B
- SSID: Default
- Authentication:
 - Disabled
 - WEP (WEP Key: 1234567890)
 - WPA-PSK
 - WPA2-PSK
 - WPA
 - WPA2
- Encryption Type: 40/64-Bits (10 Hex digits)
- IP Configuration:
 - DHCP
 - Static
- IP Address: 203.230.7.101
- Subnet Mask: 255.255.255.0
- IPv6 Configuration:
 - DHCP
 - Auto Config
 - Static
- IPv6 Address: []
- Link Local Address: FE80::2E0:A3FF:FE54:6D7B

Wireless Router1

Physical Config GUI

Wireless-N Broadband Router

Firmware Version: Wireless-N Broadband

Wireless Setup Wireless Security Access Applications Restrictions & Gaming Admin

Basic Wireless Settings Wireless Security Wireless MAC Filter Advance

Security Mode: WPA Person: [v]

Encryption: AES [v]

Passphrase: 1234567890

Key Renew: 600 second

PC5

Physical Config Desktop Custom Interface

GLOBAL Settings

Algorithm Settings

INTERFACE Wireless0

Port Status: On

Bandwidth: 300 Mbps

MAC Address: 0007.EC41.199E

SSID: Default

Authentication: Disabled WEP WEP Key: []

WPA-PSK WPA2-PSK PSK Pass Phrase: 1234567890

WPA WPA2 User ID: [] Password: []

Encryption Type: AES [v]

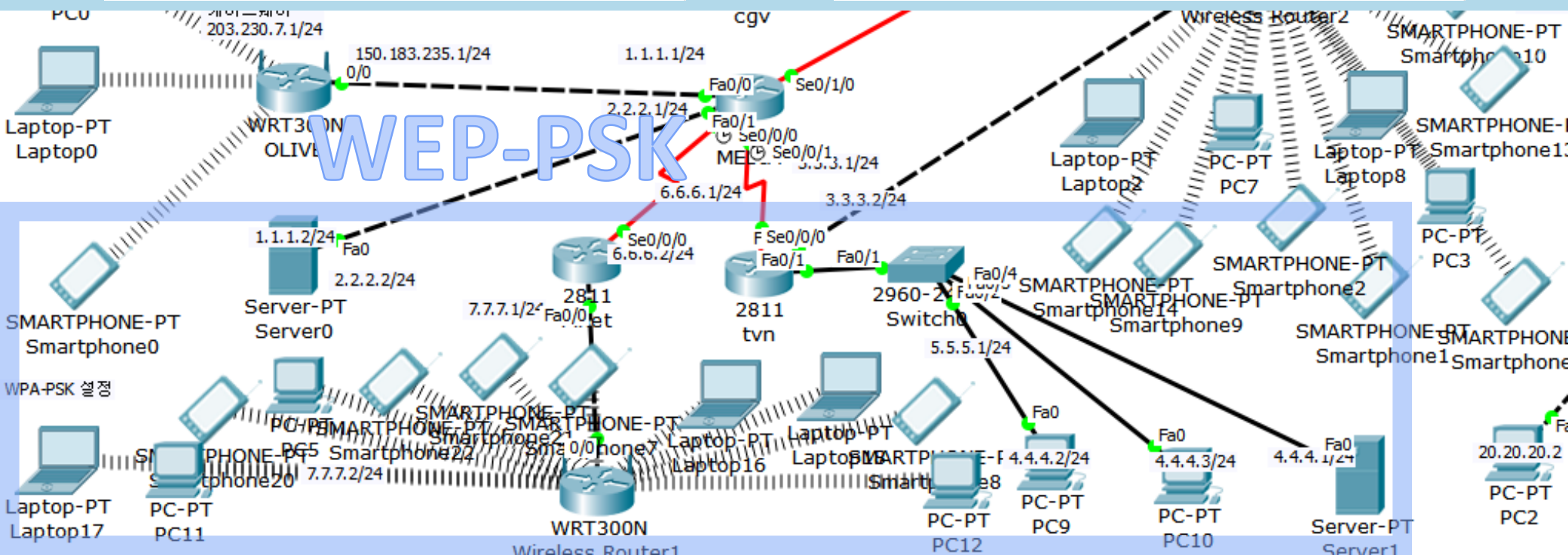
IP Configuration: DHCP Static

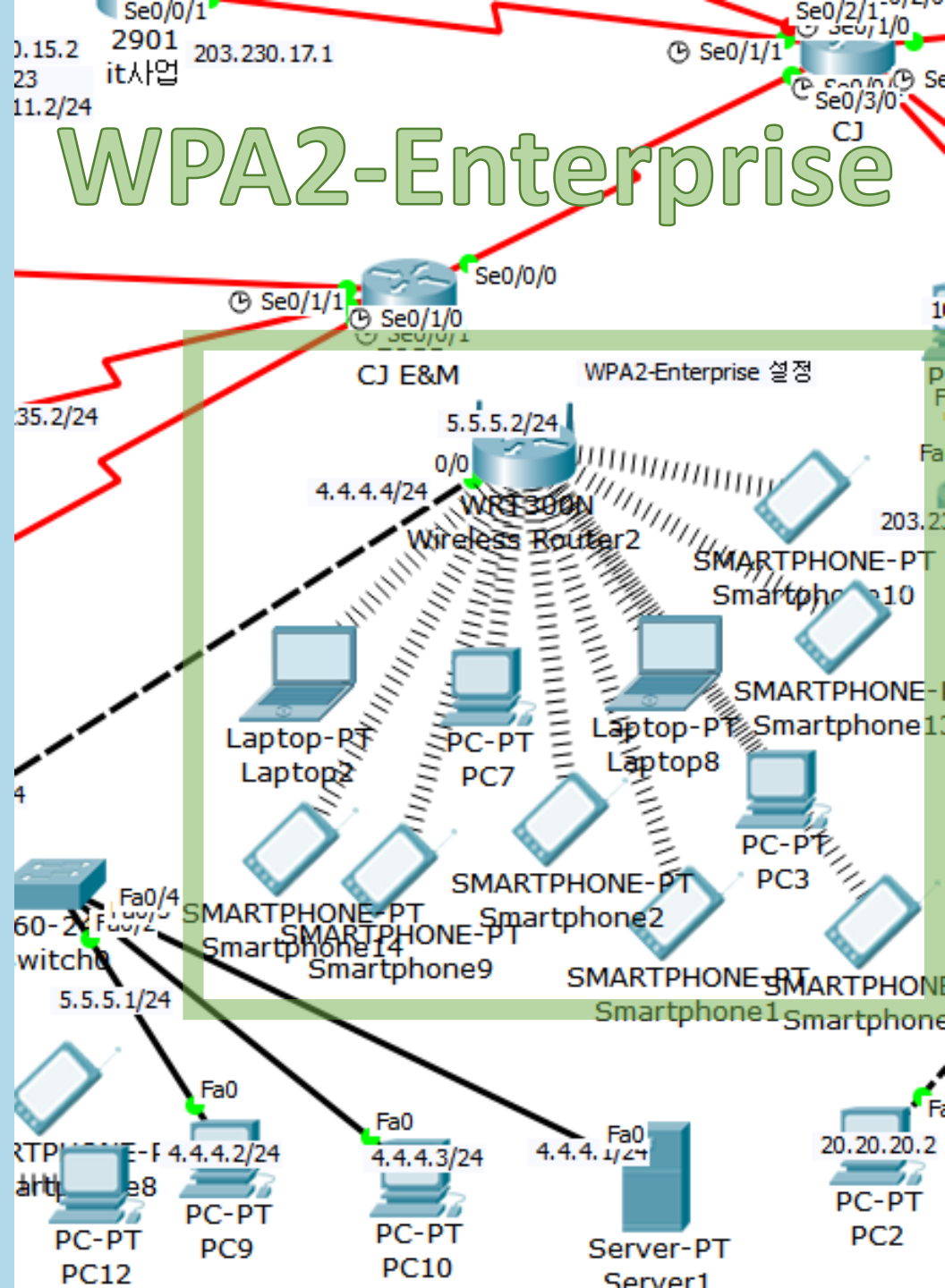
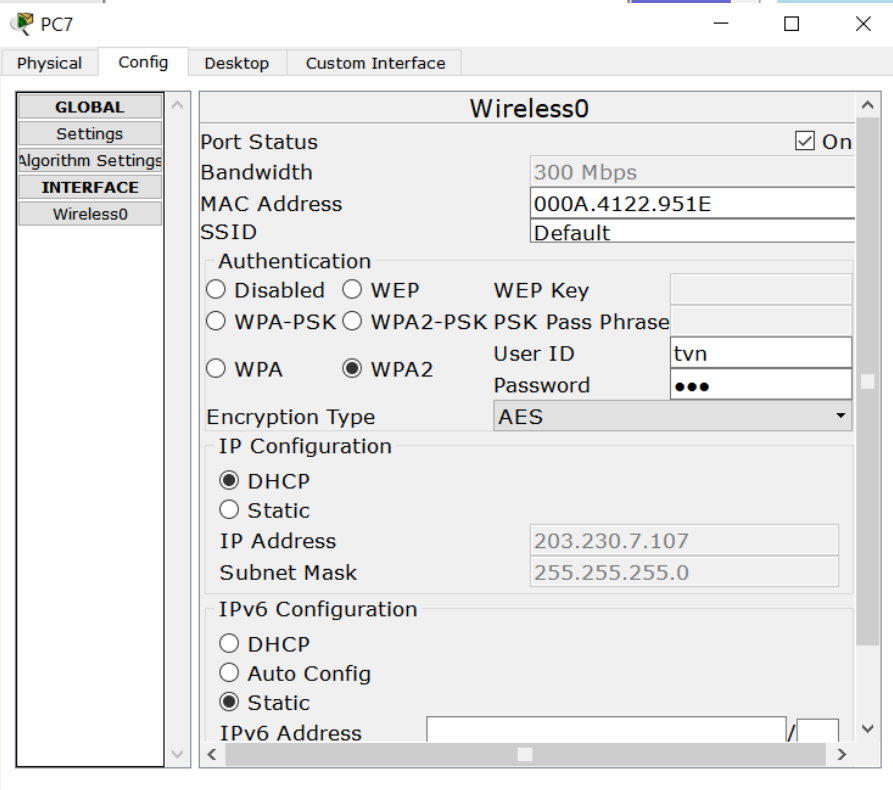
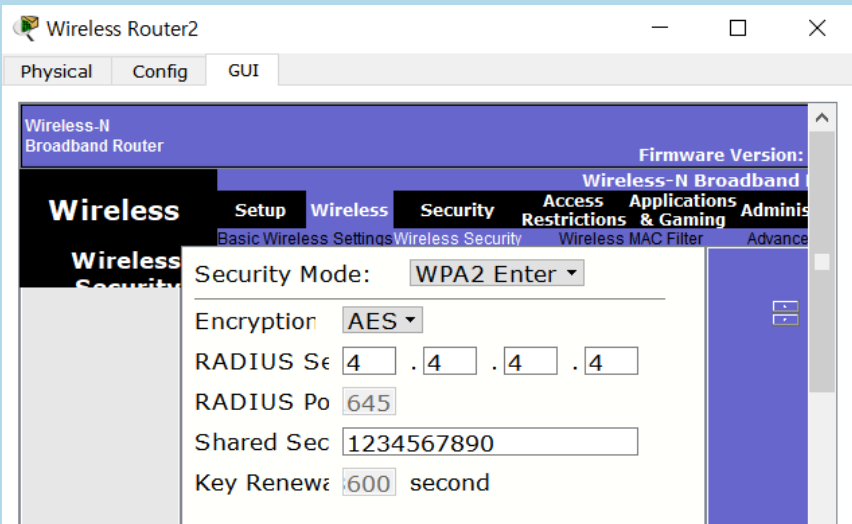
IP Address: 203.230.7.104

Subnet Mask: 255.255.255.0

IPv6 Configuration: DHCP Auto Config Static

IPv6 Address: []





AAA 서버 설정

Server1 Config Services Desktop Custom Interface

SERVICES

- HTTP
- DHCP
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP

AAA

Service On Off Radius Port

Network Configuration

Client Name Client IP

Secret ServerType Radius

Client Name	Client IP	Server Type	
1 WRT300N	5.5.5.2	Radius	12

AAA서비스를 사용할 무선라우터 등록

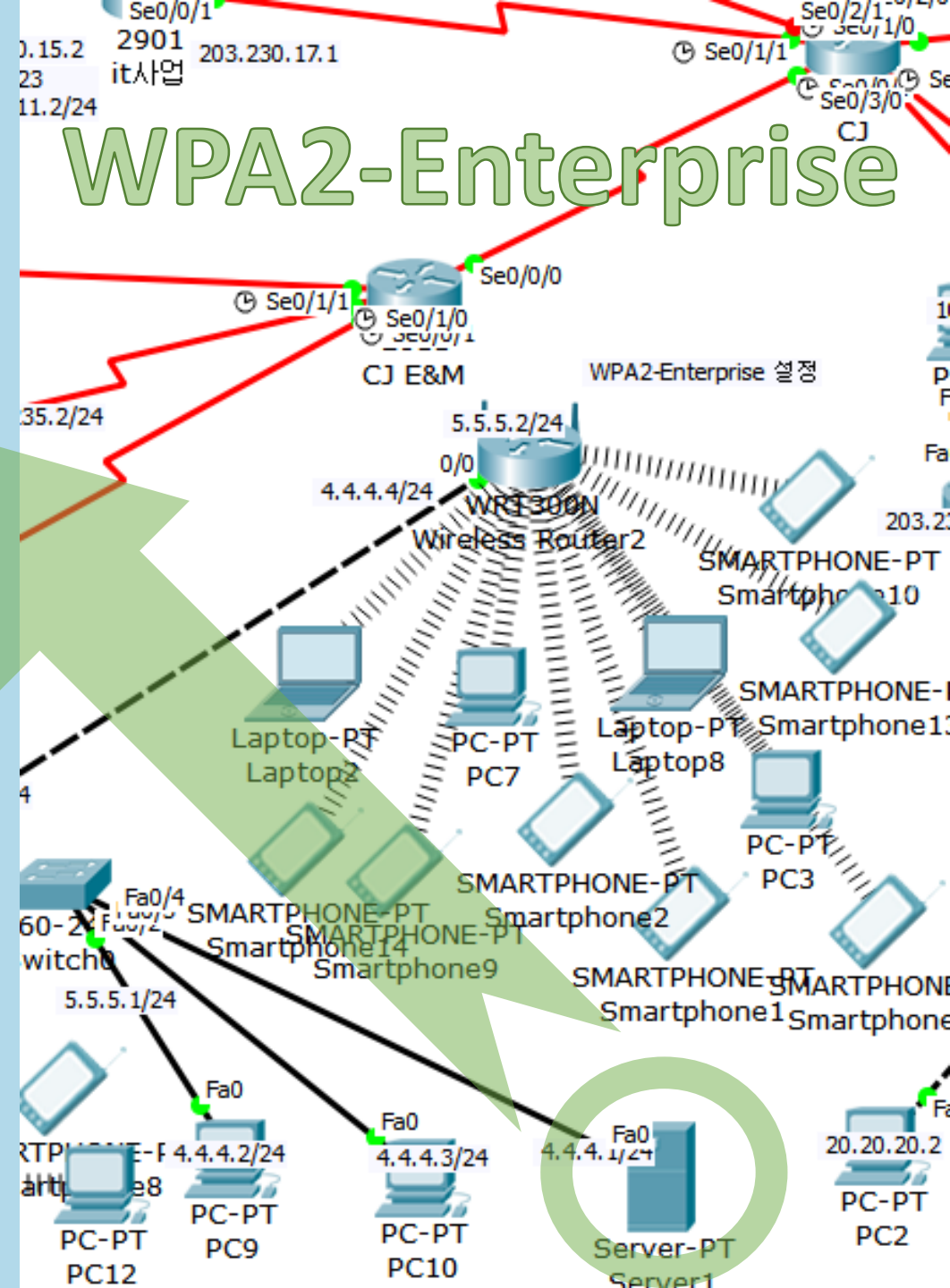
User Setup

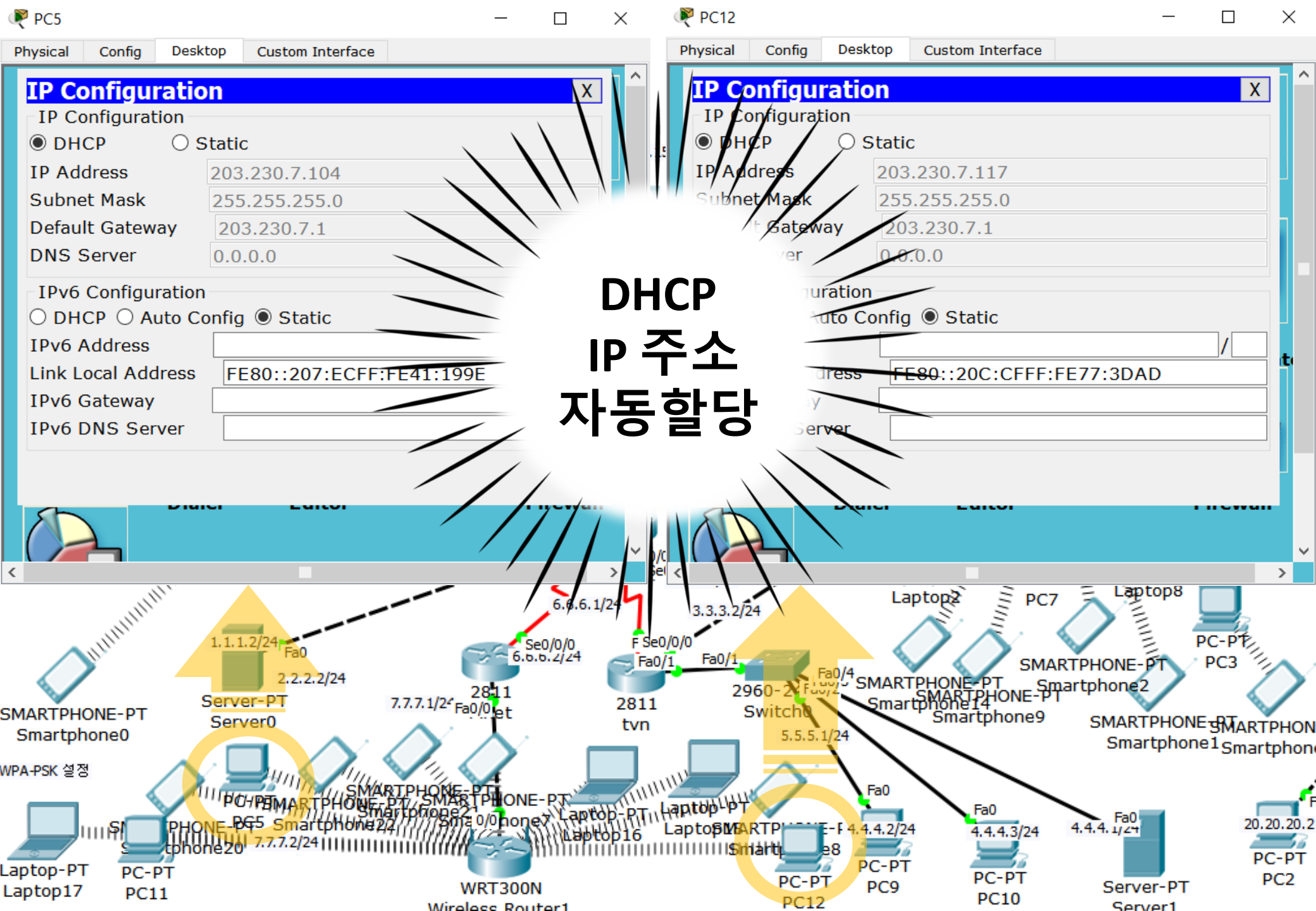
Username Password

Username	Password	
1 tvn	tvn	

사용자 등록

WPA2-Enterprise





DHCP IP 주소 자동할당

IP Configuration

IP Configuration

DHCP Static

IP Address 203.230.7.104

Subnet Mask 255.255.255.0

Default Gateway 203.230.7.1

DNS Server 0.0.0.0

IPv6 Configuration

DHCP Auto Config Static

IPv6 Address

Link Local Address FE80::207:ECFF:FE41:199E

IPv6 Gateway

IPv6 DNS Server

IP Configuration

IP Configuration

DHCP Static

IP Address 203.230.7.117

Subnet Mask 255.255.255.0

Default Gateway 203.230.7.1

DNS Server 0.0.0.0

IPv6 Configuration

DHCP Auto Config Static

IPv6 Address

Link Local Address FE80::20C:CFFF:FE77:3DAD

IPv6 Gateway

IPv6 DNS Server



NAT

NAT란 ?

사설주소를 사용하는 장치가 공중네트워크와 통신하고자 할 때
사설 IP주소 → 공인 IP주소로 변환해 주는 기술

```
powercast
Physical Config CLI
IOS Command Line Interface
powercast#show ip nat translations
Pro Inside global Inside local Outside local Outside global
--- 203.230.20.3 192.168.1.2 --- ---

powercast#
powercast#show ip nat translations
% Invalid input detected at '^' marker.

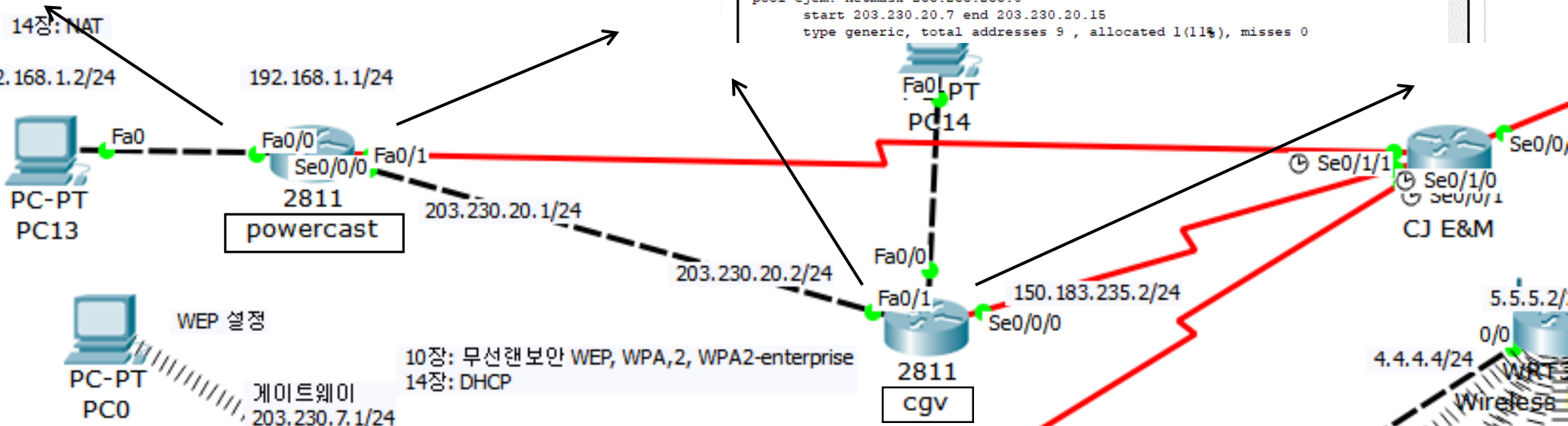
powercast#show ip nat translations
Pro Inside global Inside local Outside local Outside global
icmp 203.230.20.3:1 192.168.1.2:1 150.183.235.2:1 150.183.235.2:1
icmp 203.230.20.3:2 192.168.1.2:2 150.183.235.2:2 150.183.235.2:2
icmp 203.230.20.3:3 192.168.1.2:3 150.183.235.2:3 150.183.235.2:3
icmp 203.230.20.3:4 192.168.1.2:4 150.183.235.2:4 150.183.235.2:4
icmp 203.230.20.3:5 192.168.1.2:5 150.183.235.2:5 150.183.235.2:5
icmp 203.230.20.3:6 192.168.1.2:6 150.183.235.2:6 150.183.235.2:6
icmp 203.230.20.3:7 192.168.1.2:7 150.183.235.2:7 150.183.235.2:7
icmp 203.230.20.3:8 192.168.1.2:8 150.183.235.2:8 150.183.235.2:8
--- 203.230.20.3 192.168.1.2 --- ---

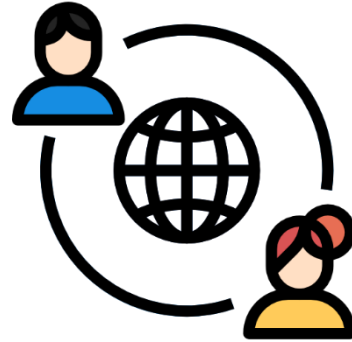
powercast#
```

▲ 정적 NAT

```
cgv
Physical Config CLI
IOS Command Line Interface
cgv#show ip nat statistics
Total translations: 0 (0 static, 0 dynamic, 0 extended)
Outside Interfaces: FastEthernet0/1
Inside Interfaces: FastEthernet0/0
Hits: 1 Misses: 0
Expired translations: 0
Dynamic mappings:
-- Inside Source
access-list 100 pool cjem refCount 0
pool cjem: netmask 255.255.255.0
start 203.230.20.7 end 203.230.20.15
type generic, total addresses 9 , allocated 1(11%), misses 0
```

▼ 동적 NAT





WAN



WAN 이란 ?

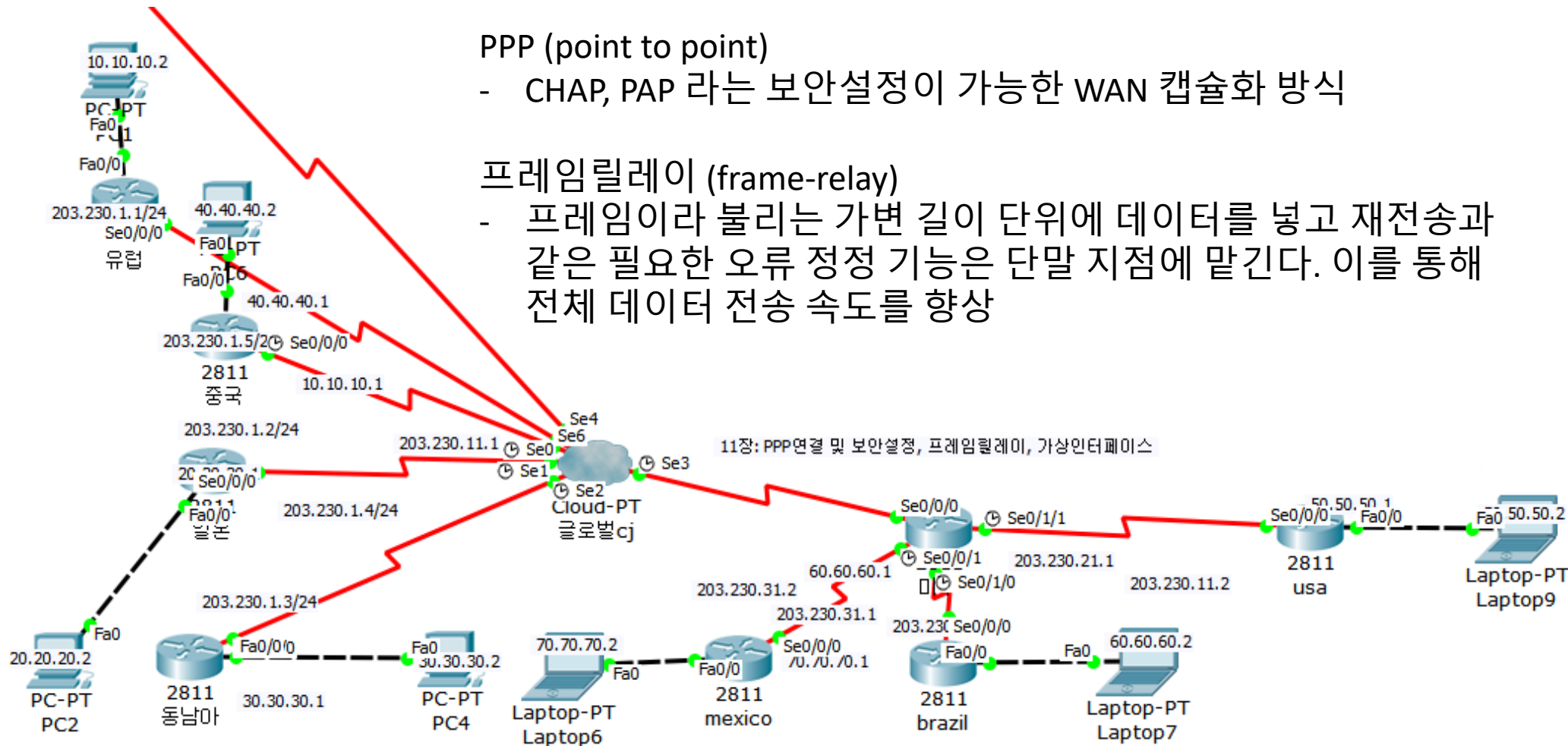
LAN과 MAN을 포괄하는 광역 네트워크로 다양한 접속기술과 접속장치들을 통해 네트워크를 구성

PPP (point to point)

- CHAP, PAP 라는 보안설정이 가능한 WAN 캡슐화 방식

프레임릴레이 (frame-relay)

- 프레임이라 불리는 가변 길이 단위에 데이터를 넣고 재전송과 같은 필요한 오류 정정 기능은 단말 지점에 맡긴다. 이를 통해 전체 데이터 전송 속도를 향상



IOS Command Line Interface

```

usa(config-if)#
usa(config-if)#
usa(config-if)#do show int s0/0/0
Serial0/0/0 is up, line protocol is up (connected)
Hardware is HD64570
Internet address is 203.230.11.2/24
MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
  reliability 255/255, txload 1/255, rxload 1/255
Encapsulation PPP, loopback not set, keepalive set (10 sec)
LCP Open
Open: IPCP, CDPCP
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0 (size/max/drops); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/1000/64/0 (size/max total/threshold/drops)
Conversations 0/0/256 (active/max active/max total)
Reserved Conversations 0/0 (allocated/max allocated)
Available Bandwidth 1158 kilobits/sec
5 minute input rate 51 bits/sec, 0 packets/sec
5 minute output rate 13 bits/sec, 0 packets/sec
16 packets input, 2060 bytes, 0 no buffer errors
Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
11 packets output, 500 bytes, 0 output errors, 0 collisions, 1 interface resets
0 output buffer failures, 0 output buffers swapped out
DCD=up DSR=up DTR=up RTS=up CTS=up
usa(config-if)#
  
```

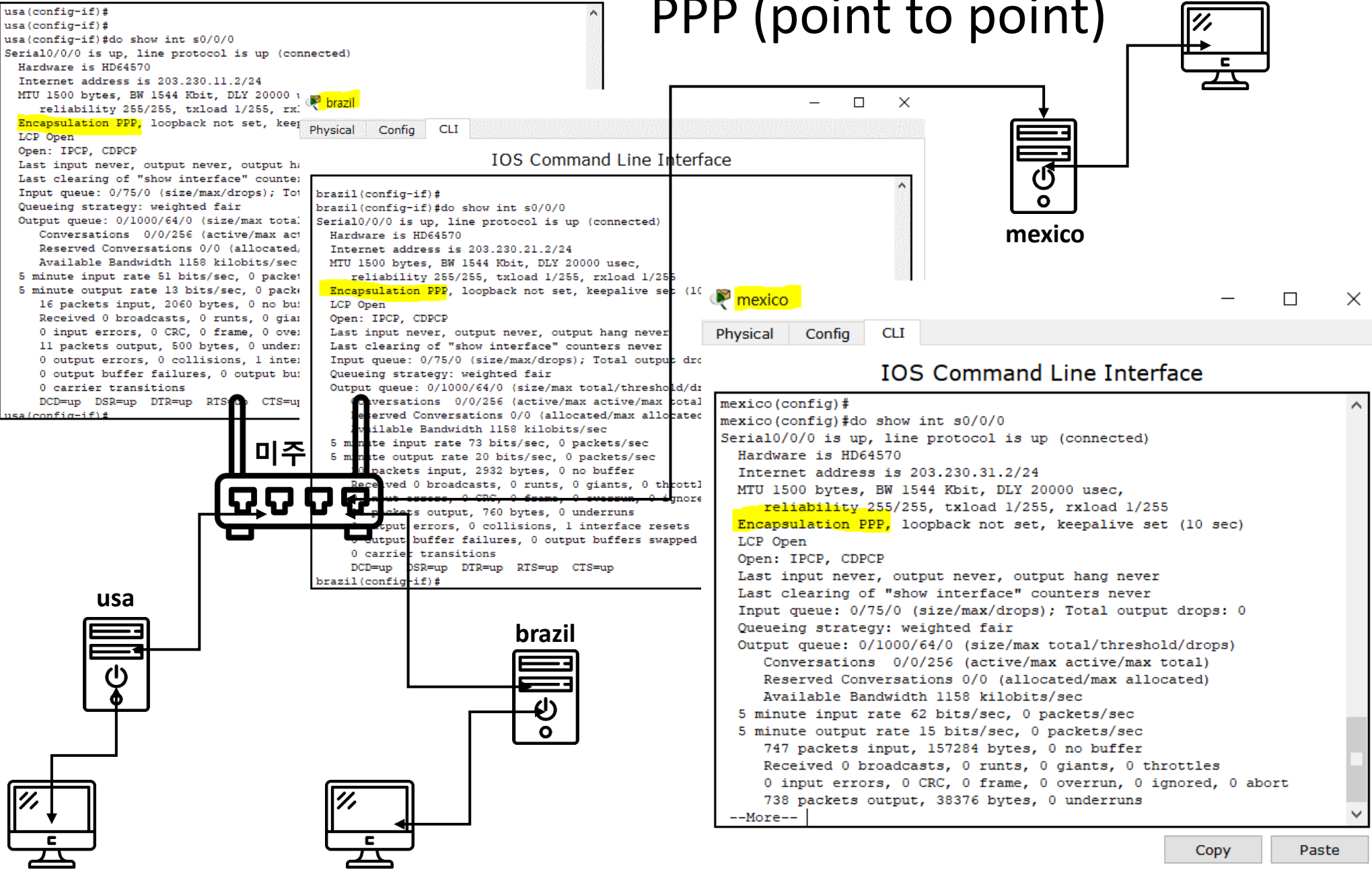
PPP (point to point)

```

brazil(config-if)#
brazil(config-if)#do show int s0/0/0
Serial0/0/0 is up, line protocol is up (connected)
Hardware is HD64570
Internet address is 203.230.21.2/24
MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
  reliability 255/255, txload 1/255, rxload 1/255
Encapsulation PPP, loopback not set, keepalive set (10 sec)
LCP Open
Open: IPCP, CDPCP
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0 (size/max/drops); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/1000/64/0 (size/max total/threshold/drops)
Conversations 0/0/256 (active/max active/max total)
Reserved Conversations 0/0 (allocated/max allocated)
Available Bandwidth 1158 kilobits/sec
5 minute input rate 73 bits/sec, 0 packets/sec
5 minute output rate 20 bits/sec, 0 packets/sec
10 packets input, 2932 bytes, 0 no buffer errors
Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
7 packets output, 760 bytes, 0 underruns
0 output errors, 0 collisions, 1 interface resets
0 output buffer failures, 0 output buffers swapped out
DCD=up DSR=up DTR=up RTS=up CTS=up
brazil(config-if)#
  
```

```

mexico(config)#
mexico(config)#do show int s0/0/0
Serial0/0/0 is up, line protocol is up (connected)
Hardware is HD64570
Internet address is 203.230.31.2/24
MTU 1500 bytes, BW 1544 Kbit, DLY 20000 usec,
  reliability 255/255, txload 1/255, rxload 1/255
Encapsulation PPP, loopback not set, keepalive set (10 sec)
LCP Open
Open: IPCP, CDPCP
Last input never, output never, output hang never
Last clearing of "show interface" counters never
Input queue: 0/75/0 (size/max/drops); Total output drops: 0
Queueing strategy: weighted fair
Output queue: 0/1000/64/0 (size/max total/threshold/drops)
Conversations 0/0/256 (active/max active/max total)
Reserved Conversations 0/0 (allocated/max allocated)
Available Bandwidth 1158 kilobits/sec
5 minute input rate 62 bits/sec, 0 packets/sec
5 minute output rate 15 bits/sec, 0 packets/sec
747 packets input, 157284 bytes, 0 no buffer errors
Received 0 broadcasts, 0 runts, 0 giants, 0 throttles
0 input errors, 0 CRC, 0 frame, 0 overrun, 0 ignored, 0 abort
738 packets output, 38376 bytes, 0 underruns
--More--
  
```



가상인터페이스를 이용한 프레임릴레이 전체 연결

글로벌

Physical Config

GLOBAL

Settings

TV Settings

CONNECTIONS

Frame Relay

Serial0 r1-r2 <-> Serial0 r1-r2

Port	Sublink	Port	Sublink	
	From Port	Sublink	To Port	Sublink
1	Serial0	r1-r2	Serial1	r2-r1
2	Serial0	r1-r3	Serial2	r3-r1
3	Serial0	r1-r4	Serial3	r4-r1
4	Serial0	r1-r5	Serial6	r5-r1
5	Serial1	r2-r3	Serial2	r3-r2
6	Serial1	r2-r4	Serial3	r4-r2
7	Serial1	r2-r5	Serial6	r5-r2
8	Serial2	r3-r4	Serial3	r4-r3
9	Serial2	r3-r5	Serial6	r5-r3
10	Serial3	r4-r5	Serial6	r5-r4

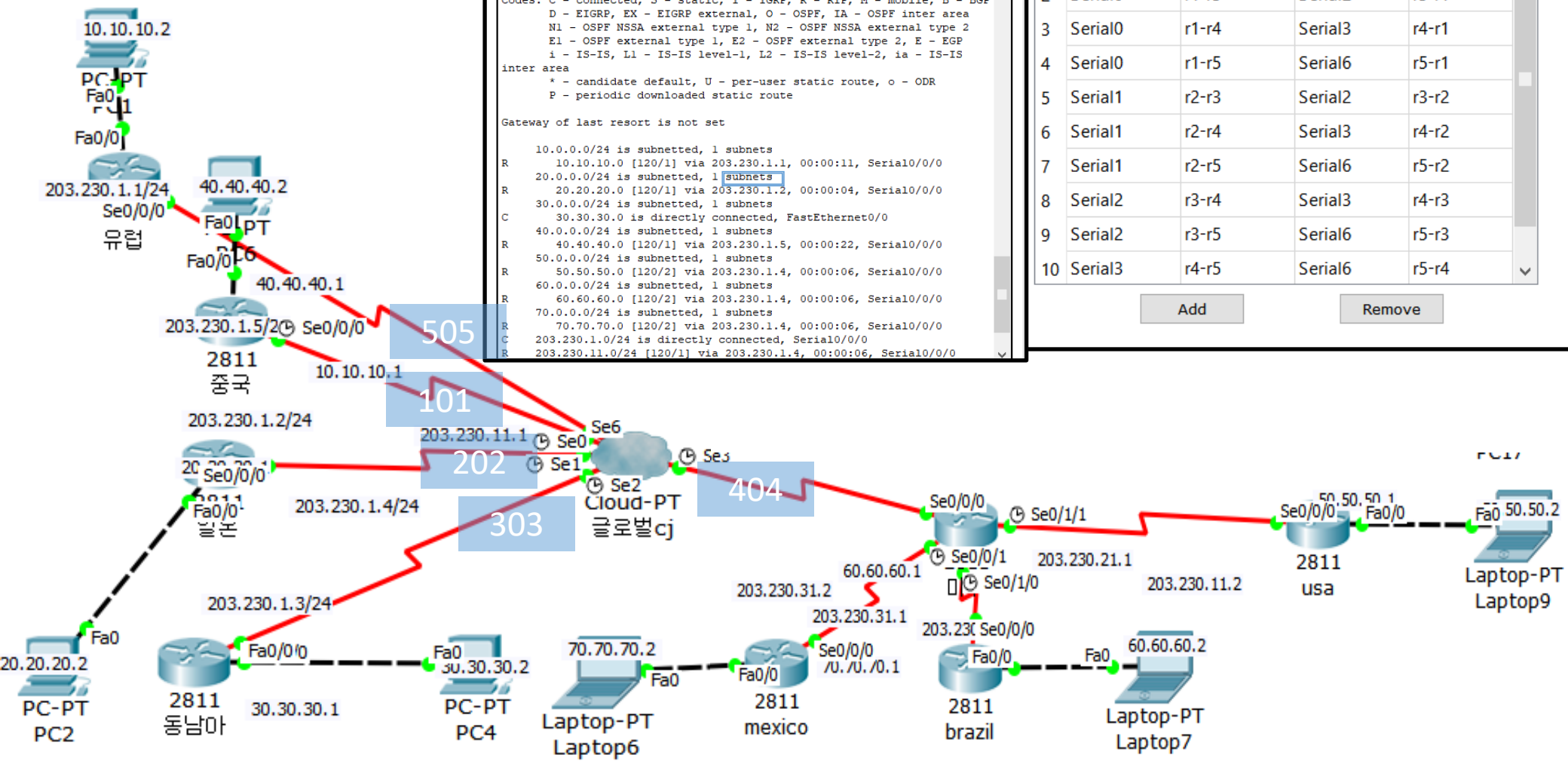
Add Remove

```

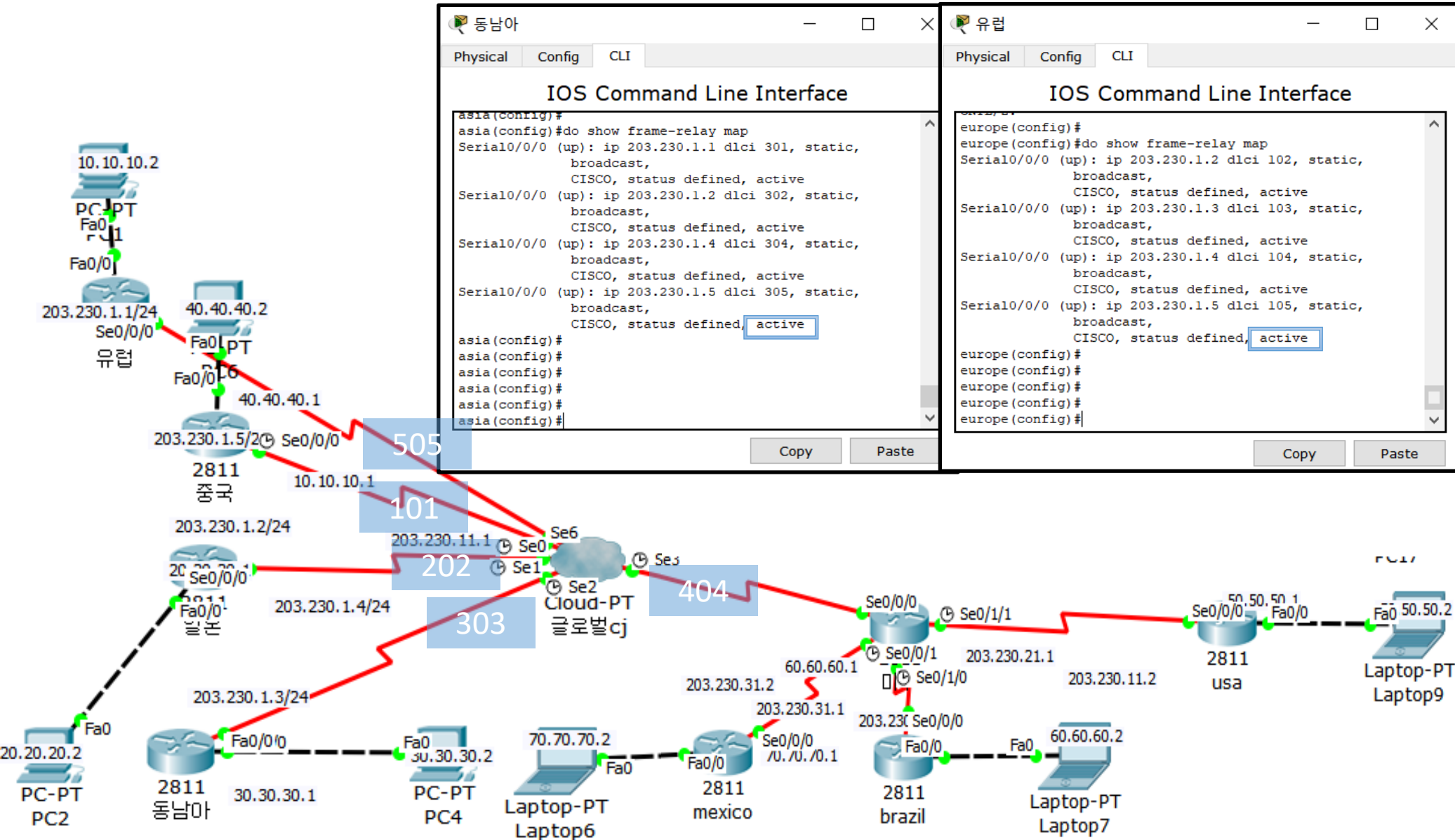
IOS Command Line Interface
asia(config)#do show ip route
Codes: C - connected, S - static, I - IGRP, R - RIP, M - mobile, B - BGP
D - EIGRP, EX - EIGRP external, O - OSPF, IA - OSPF inter area
N1 - OSPF NSSA external type 1, N2 - OSPF NSSA external type 2
E1 - OSPF external type 1, E2 - OSPF external 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

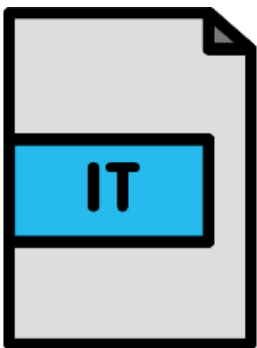
Gateway of last resort is not set

10.0.0.0/24 is subnetted, 1 subnets
R 10.10.10.0 [120/1] via 203.230.1.1, 00:00:11, Serial0/0/0
20.0.0.0/24 is subnetted, 1 subnets
R 20.20.20.0 [120/1] via 203.230.1.2, 00:00:04, Serial0/0/0
30.0.0.0/24 is subnetted, 1 subnets
C 30.30.30.0 is directly connected, FastEthernet0/0
40.0.0.0/24 is subnetted, 1 subnets
R 40.40.40.0 [120/1] via 203.230.1.5, 00:00:22, Serial0/0/0
50.0.0.0/24 is subnetted, 1 subnets
R 50.50.50.0 [120/2] via 203.230.1.4, 00:00:06, Serial0/0/0
60.0.0.0/24 is subnetted, 1 subnets
R 60.60.60.0 [120/2] via 203.230.1.4, 00:00:06, Serial0/0/0
70.0.0.0/24 is subnetted, 1 subnets
R 70.70.70.0 [120/2] via 203.230.1.4, 00:00:06, Serial0/0/0
203.230.1.0/24 is directly connected, Serial0/0/0
C 203.230.11.0/24 [120/1] via 203.230.1.4, 00:00:06, Serial0/0/0
    
```



프레임릴레이 동작 확인





VPN

GRE + IPsec VPN

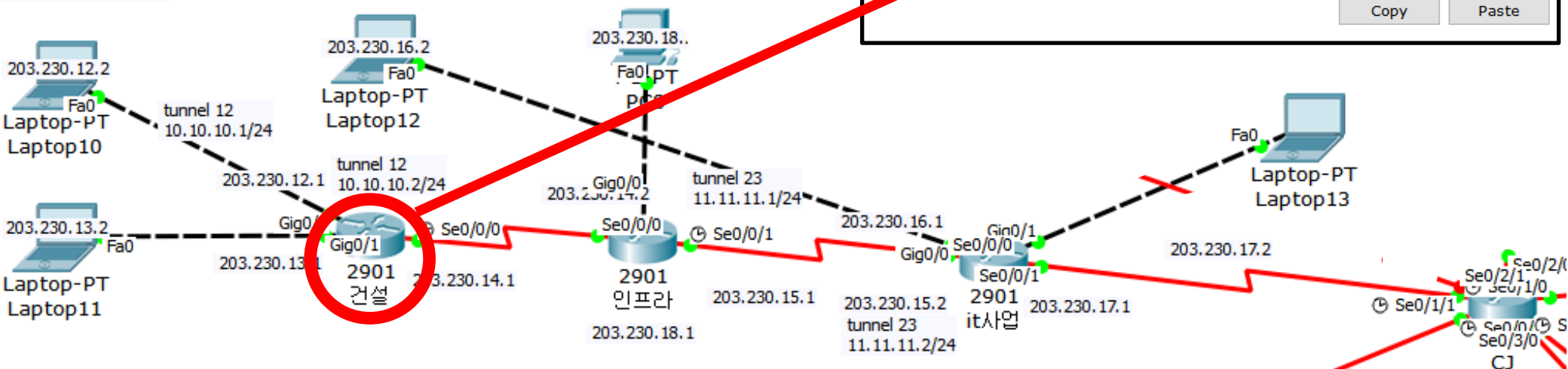
: 안전한 기업 업무환경 구축

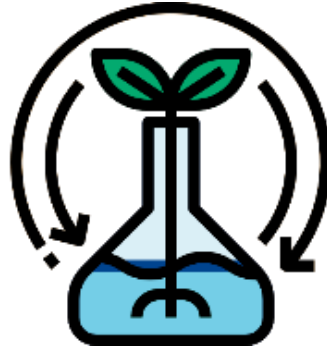
본사 CJ ↔ 지사 인프라 간의 안전한 네트워크 연결을
위해 Ipvsec VPN을 GRE와 함께 사용

```
건설
Physical Config CLI
IOS Command Line Interface
construction(config)#do show ip route
Codes: L - local, C - connected, S - static, 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

10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C 10.10.10.0/24 is directly connected, Tunnell12
L 10.10.10.1/32 is directly connected, Tunnell12
11.0.0.0/24 is subnetted, 1 subnet
O 11.11.11.0/24 [110/1064] via 203.230.14.1, Serial0/0/0
203.230.12.0/24 is variably subnetted, 2 subnets, 2 masks
C 203.230.12.0/24 is directly connected, GigabitEthernet0/0
L 203.230.12.1/32 is directly connected, GigabitEthernet0/0
203.230.13.0/24 is variably subnetted, 2 subnets, 2 masks
C 203.230.13.0/24 is directly connected, GigabitEthernet0/1
L 203.230.13.1/32 is directly connected, GigabitEthernet0/1
203.230.14.0/24 is variably subnetted, 2 subnets, 2 masks
```

13장: GRE+IPsec VPN

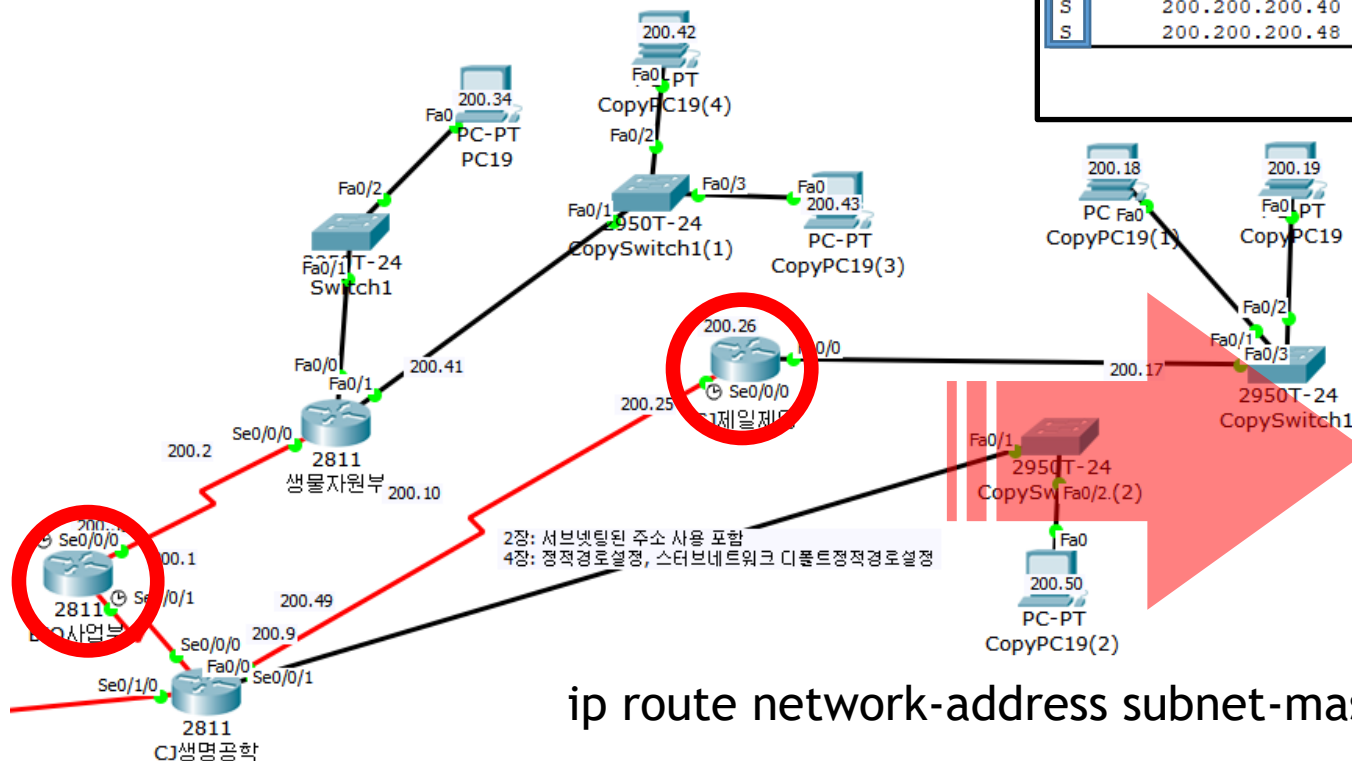
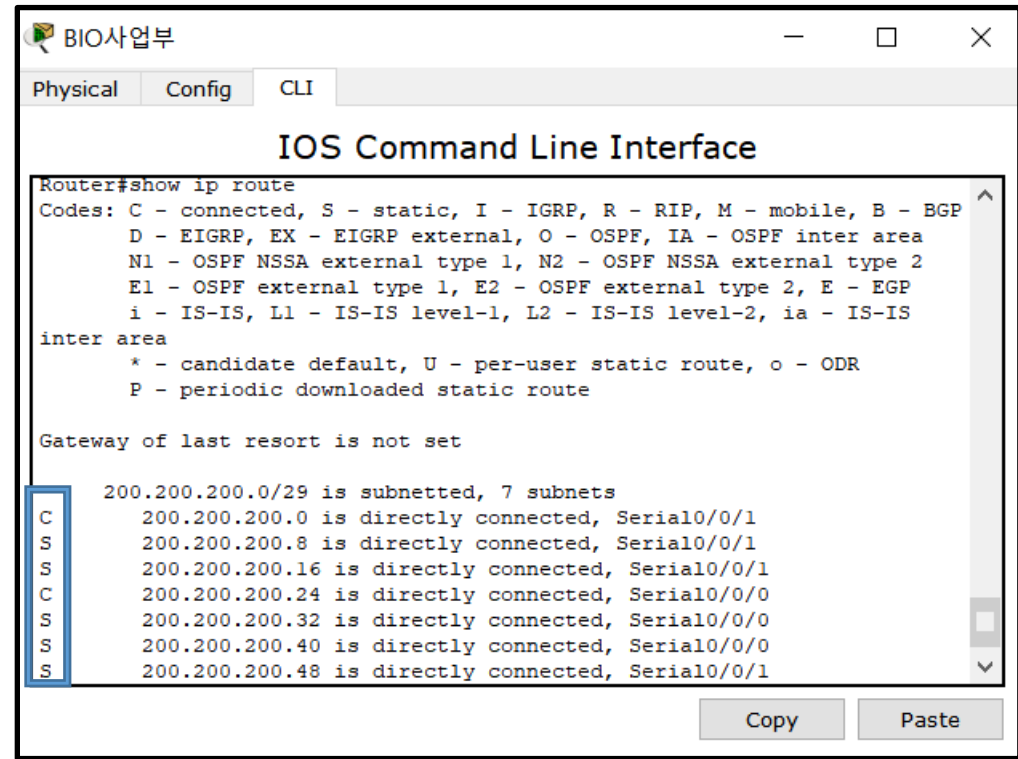




STATIC

- 관리자가 경로를 직접 지정
- 설정 간단
- 토폴로지가 변경되면 관리자가 직접 변경해야 함

정적경로설정



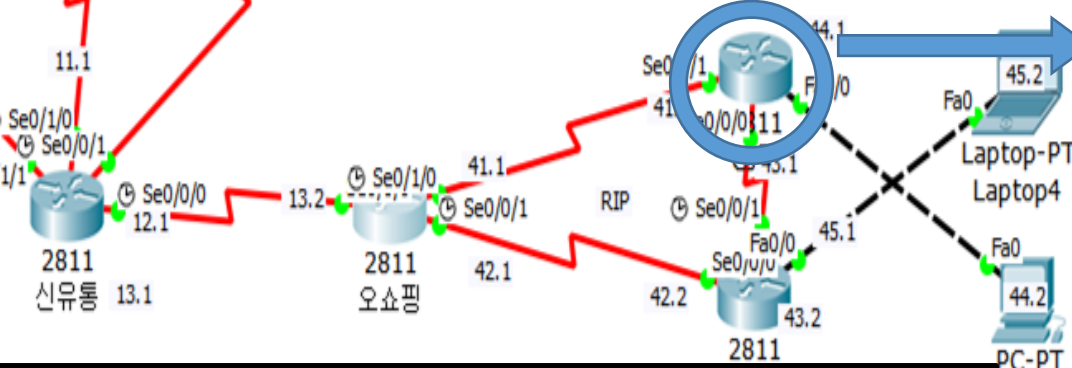
패킷의 출입경로
디폴트 정적경로 설정
Ex) 0.0.0.0 0.0.0.0 s0/0/0

ip route network-address subnet-mask [ip-address|exit-interface]



RIPv2

- 클래스리스 라우팅 프로토콜
- 라우팅 업데이트시 서브넷마스크 정보 전달
- RIPv2는 라우팅 정보 전달시 멀티캐스트 주소 사용



```

IOS Command Line Interface
R 11.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
R 11.0.0.0/8 [120/4] via 13.13.13.1, 00:00:13, Serial0/0/0
R 11.11.11.0/24 [120/1] via 13.13.13.1, 00:00:13, Serial0/0/0
R 12.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
R 12.0.0.0/8 [120/4] via 13.13.13.1, 00:00:13, Serial0/0/0
R 12.12.12.0/24 [120/1] via 13.13.13.1, 00:00:13, Serial0/0/0
R 13.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
R 13.0.0.0/8 [120/4] via 13.13.13.1, 00:00:13, Serial0/0/0
C 13.13.13.0/24 is directly connected, Serial0/0/0
R 21.0.0.0/24 is subnetted, 1 subnets
R 21.21.21.0 [120/4] via 13.13.13.1, 00:00:13, Serial0/0/0
R 22.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
R 22.0.0.0/8 [120/4] via 13.13.13.1, 00:00:13, Serial0/0/0
R 22.22.22.0/24 [120/4] via 13.13.13.1, 00:00:13, Serial0/0/0
R 23.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
R 23.0.0.0/8 [120/4] via 13.13.13.1, 00:00:13, Serial0/0/0
R 23.23.23.0/24 [120/4] via 13.13.13.1, 00:00:13, Serial0/0/0
R 24.0.0.0/24 is subnetted, 1 subnets
R 24.24.24.0 [120/4] via 13.13.13.1, 00:00:13, Serial0/0/0
R 25.0.0.0/8 [120/4] via 13.13.13.1, 00:00:13, Serial0/0/0
R 31.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
R 31.0.0.0/8 [120/4] via 13.13.13.1, 00:00:13, Serial0/0/0
R 31.31.31.0/24 [120/4] via 13.13.13.1, 00:00:13, Serial0/0/0
R 32.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
R 32.0.0.0/8 [120/4] via 13.13.13.1, 00:00:13, Serial0/0/0
R 32.32.32.0/24 [120/4] via 13.13.13.1, 00:00:13, Serial0/0/0
R 33.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
R 33.0.0.0/8 [120/4] via 13.13.13.1, 00:00:13, Serial0/0/0
R 33.33.33.0/24 [120/4] via 13.13.13.1, 00:00:13, Serial0/0/0
R 34.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
R 34.0.0.0/8 [120/4] via 13.13.13.1, 00:00:13, Serial0/0/0
R 34.34.34.0/24 [120/4] via 13.13.13.1, 00:00:13, Serial0/0/0
R 35.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
R 35.0.0.0/8 [120/4] via 13.13.13.1, 00:00:13, Serial0/0/0
R 35.35.35.0/24 [120/4] via 13.13.13.1, 00:00:13, Serial0/0/0
C 41.0.0.0/24 is subnetted, 1 subnets
C 41.41.41.0 is directly connected, Serial0/1/0
R 42.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
R 42.0.0.0/8 [120/4] via 13.13.13.1, 00:00:13, Serial0/0/0
C 42.42.42.0/24 is directly connected, Serial0/0/1
R 43.0.0.0/24 is subnetted, 1 subnets
R 43.43.43.0 [120/1] via 42.42.42.2, 00:00:00, Serial0/0/1
R 43.43.43.0 [120/1] via 41.41.41.2, 00:00:21, Serial0/1/0
R 44.0.0.0/24 is subnetted, 1 subnets
R 44.44.44.0 [120/1] via 41.41.41.2, 00:00:21, Serial0/1/0
R 45.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
R 45.0.0.0/8 [120/4] via 13.13.13.1, 00:00:13, Serial0/0/0
R 45.45.45.0/24 [120/1] via 42.42.42.2, 00:00:00, Serial0/0/1

```

```

IOS Command Line Interface
Incoming update filter list for all interfaces is not set
Redistributing: rip
Default version control: send version 2, receive 2
Interface          Send Recv Triggered RIP Key-chain
Serial0/0/0         2       2
Serial0/0/1         2       2
Automatic network summarization is not in effect
Maximum path: 4
Routing for Networks:
 41.0.0.0
 43.0.0.0
 44.0.0.0
Passive Interface(s):
 FastEthernet0/0
Routing Information Sources:
 Gateway      Distance    Last Update
 41.41.41.1   120         00:00:01
 43.43.43.2   120         00:00:20
Distance: (default is 120)
Router(config-router)#
Router(config-router)#
Router(config-router)#
Router(config-router)#
Router(config-router)#
Router(config-router)#end
Router#configure terminal
Enter configuration commands, one per line. End with CNTL/Z.
Router(config)#
%SYS-5-CONFIG_I: Configured from console by console

```

패시브 인터페이스

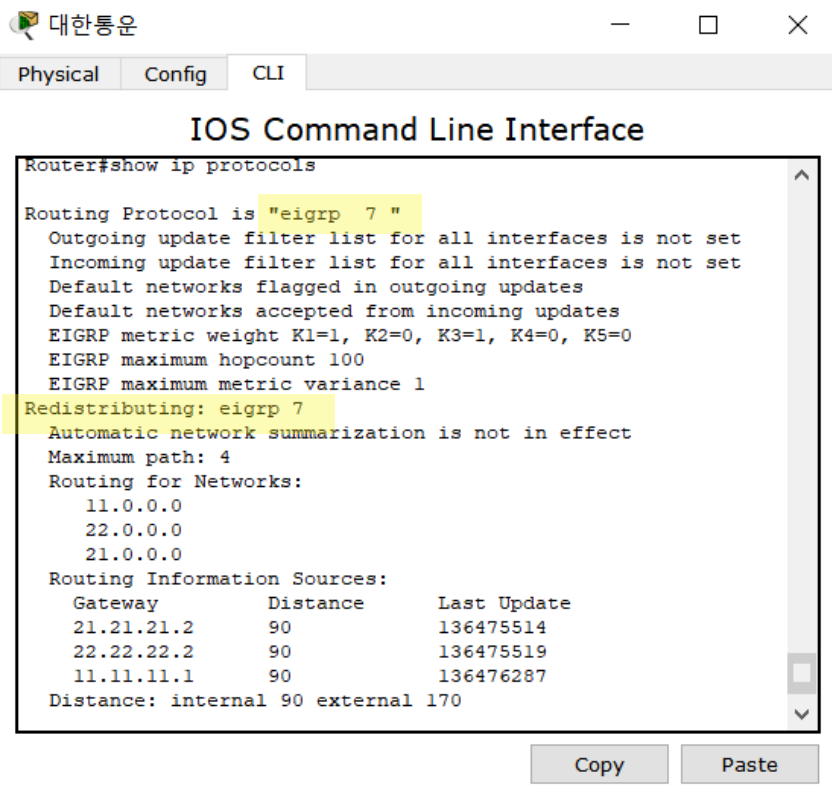
RIPv2 설정

- R1(config)#router rip
- R1(config-router)#version 2
- R1(config-router)#no auto-summary
- R1(config-router)#network 203.230.7.0
- R1(config-router)#network 1.1.1.0



EIGRP

- 거리 벡터 라우팅 프로토콜
- 자동요약(auto-summary) 기능 수행
- 토폴로지 테이블을 가지고 있어서 **DUAL** 알고리즘을 수행하여 특정 네트워크에 도달하기 위한 우선 경로 선출 후 등록



대한통운 (config-if)#router eigrp 7
 대한통운 (config-router)#network 11.11.11.0
 대한통운 (config-router)#network 21.21.21.0
 대한통운 (config-router)#network 22.22.22.0
 대한통운 (config-router)#network 1.0.0.0
 대한통운 (config-router)#no auto-summary

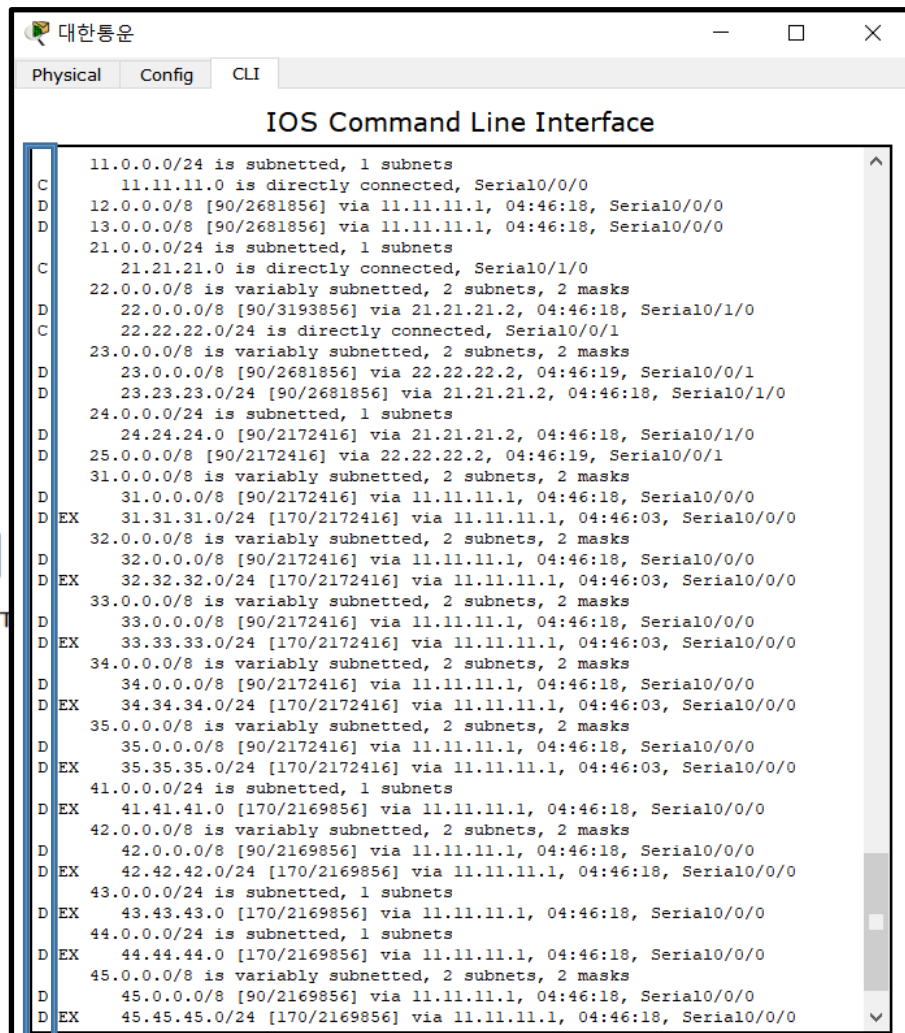
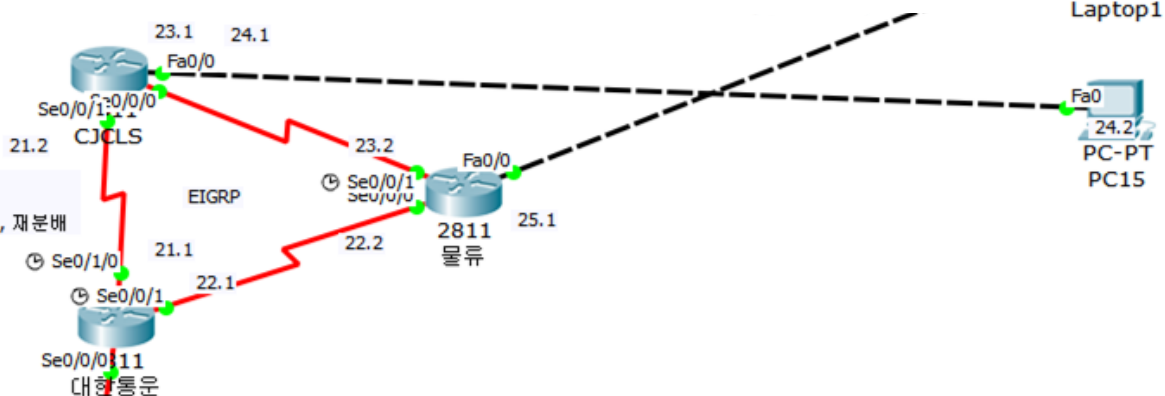
```

Router#show ip eigrp neighbors
IP-EIGRP neighbors for process 7

```

H	Address	Interface	Hold (sec)	Uptime	SRTT (ms)	RTO	Q Cnt	Seq Num
0	21.21.21.2	Se0/1/0	10	04:49:46	40	1000	0	433
1	22.22.22.2	Se0/0/1	12	04:49:46	40	1000	0	371
2	11.11.11.1	Se0/0/0	10	04:49:45	40	1000	0	9919

▼ 이웃 관계

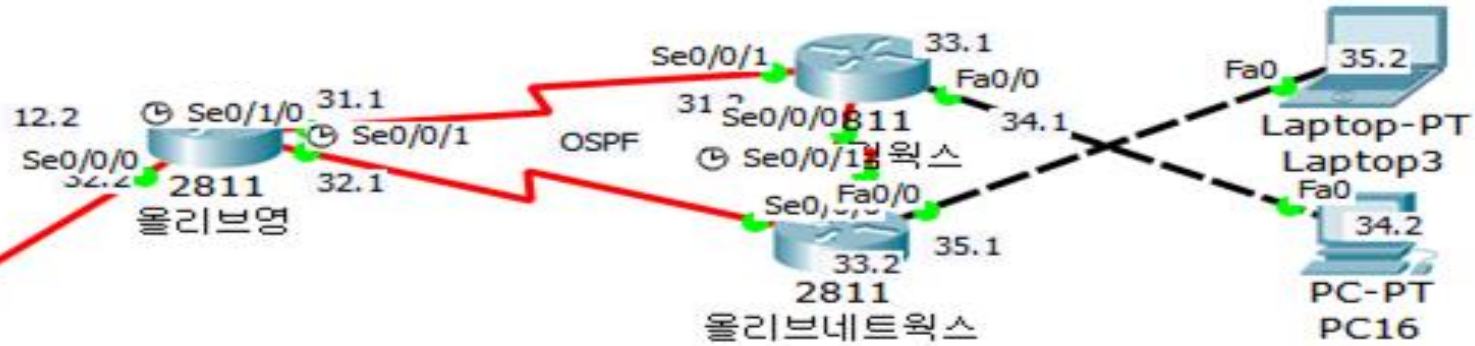




OSPF

- 계층화 된 라우팅 동작 수행
- 중대규모 네트워크에 가장 많이 사용
- 네트워크 라우터에 변화가 생기는 즉시 전달
- 멀티캐스트 주소를 이용하여 정보 업데이트

OSPF



```

IOS Command Line Interface
Router(config)#do show ip protocols

Routing Protocol is "ospf 10"
  Outgoing update filter list for all interfaces is not set
  Incoming update filter list for all interfaces is not set
  Router ID 32.32.32.1
  Number of areas in this router is 2. 2 normal 0 stub 0 nssa
  Maximum path: 4
  Routing for Networks:
    31.31.31.0 0.0.0.255 area 1
    32.32.32.0 0.0.0.255 area 1
    12.12.12.0 0.0.0.255 area 0
  Routing Information Sources:
    Gateway         Distance      Last Update
    13.13.13.1       110          00:18:36
    32.32.32.1       110          00:18:33
    34.34.34.1       110          00:18:36
    35.35.35.1       110          00:18:32
  Distance: (default is 110)
    
```

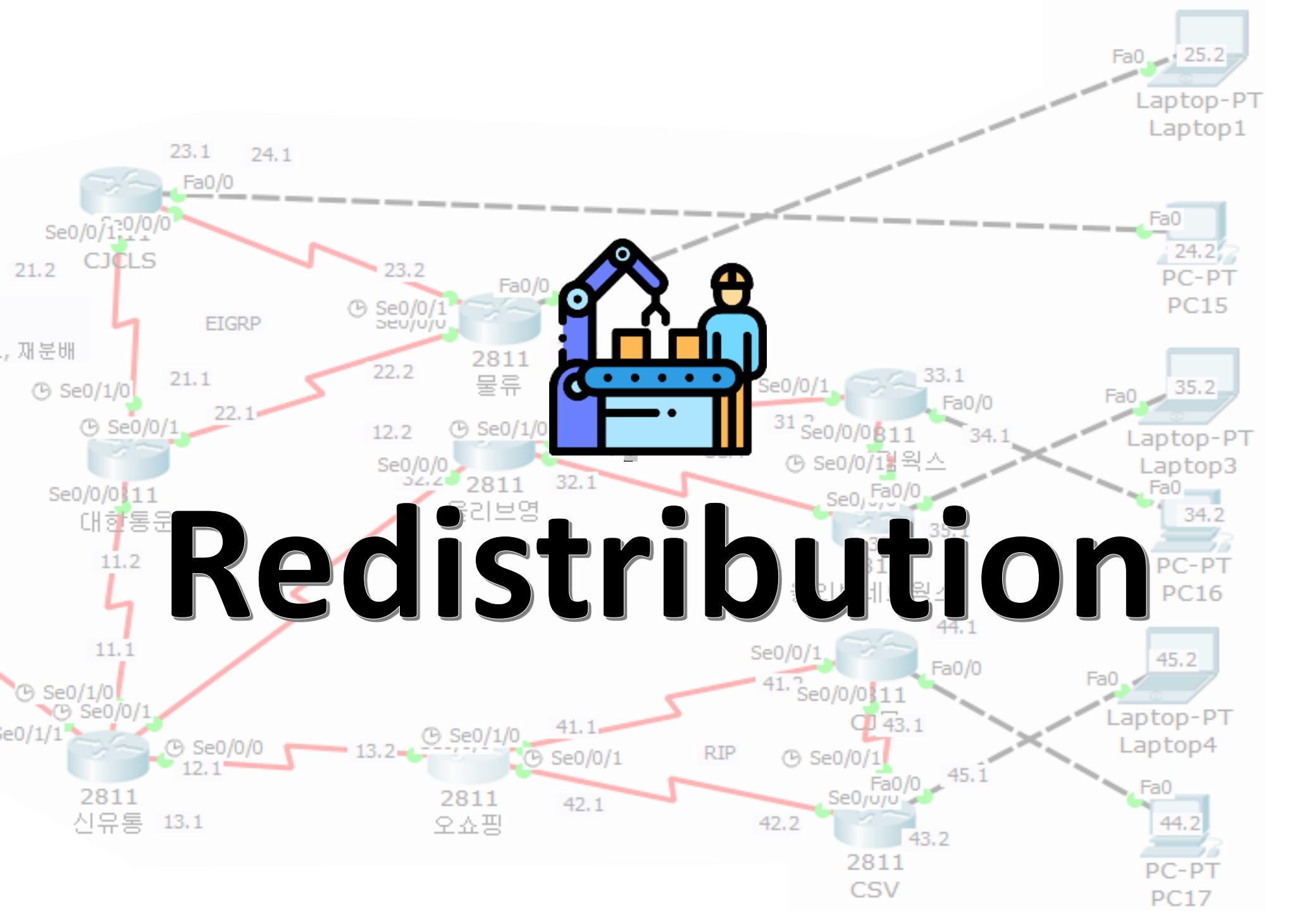
```

IOS Command Line Interface
11.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
O E2 11.0.0.0/8 [110/20] via 12.12.12.1, 04:46:00, Serial0/0/0
O 11.11.11.0/24 [110/128] via 12.12.12.1, 04:46:00, Serial0/0/0
O E2 12.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
O E2 12.0.0.0/8 [110/20] via 12.12.12.1, 04:46:00, Serial0/0/0
C 12.12.12.0/24 is directly connected, Serial0/0/0
O E2 13.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
O E2 13.0.0.0/8 [110/20] via 12.12.12.1, 04:46:00, Serial0/0/0
O 13.13.13.0/24 [110/128] via 12.12.12.1, 04:46:00, Serial0/0/0
O 21.0.0.0/24 is subnetted, 1 subnets
O E2 21.21.21.0 [110/20] via 12.12.12.1, 04:46:00, Serial0/0/0
O E2 22.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
O E2 22.0.0.0/8 [110/20] via 12.12.12.1, 04:46:00, Serial0/0/0
O E2 22.22.22.0/24 [110/20] via 12.12.12.1, 04:46:00, Serial0/0/0
O E2 23.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
O E2 23.0.0.0/8 [110/20] via 12.12.12.1, 04:46:00, Serial0/0/0
O E2 23.23.23.0/24 [110/20] via 12.12.12.1, 04:46:00, Serial0/0/0
O 24.0.0.0/24 is subnetted, 1 subnets
O E2 24.24.24.0 [110/20] via 12.12.12.1, 04:46:00, Serial0/0/0
O E2 25.0.0.0/8 [110/20] via 12.12.12.1, 04:46:00, Serial0/0/0
O E2 31.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
O E2 31.0.0.0/8 [110/20] via 12.12.12.1, 04:46:00, Serial0/0/0
C 31.31.31.0/24 is directly connected, Serial0/1/0
O E2 32.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
O E2 32.0.0.0/8 [110/20] via 12.12.12.1, 04:46:00, Serial0/0/0
C 32.32.32.0/24 is directly connected, Serial0/0/1
O E2 33.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
O E2 33.0.0.0/8 [110/20] via 12.12.12.1, 04:46:00, Serial0/0/0
O 33.33.33.0/24 [110/128] via 31.31.31.2, 04:45:55, Serial0/1/0
[110/128] via 32.32.32.2, 04:45:55, Serial0/0/1
O E2 34.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
O E2 34.0.0.0/8 [110/20] via 12.12.12.1, 04:46:00, Serial0/0/0
O 34.34.34.0/24 [110/65] via 31.31.31.2, 04:45:55, Serial0/1/0
O E2 35.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
O E2 35.0.0.0/8 [110/20] via 12.12.12.1, 04:46:00, Serial0/0/0
O 35.35.35.0/24 [110/65] via 32.32.32.2, 04:45:55, Serial0/0/1
O 41.0.0.0/24 is subnetted, 1 subnets
O E2 41.41.41.0 [110/20] via 12.12.12.1, 04:46:00, Serial0/0/0
O E2 42.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
O E2 42.0.0.0/8 [110/20] via 12.12.12.1, 04:46:00, Serial0/0/0
O E2 42.42.42.0/24 [110/20] via 12.12.12.1, 04:46:00, Serial0/0/0
O 43.0.0.0/24 is subnetted, 1 subnets
O E2 43.43.43.0 [110/20] via 12.12.12.1, 04:46:00, Serial0/0/0
O 44.0.0.0/24 is subnetted, 1 subnets
O E2 44.44.44.0 [110/20] via 12.12.12.1, 04:46:00, Serial0/0/0
O E2 45.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
O E2 45.0.0.0/8 [110/20] via 12.12.12.1, 04:46:00, Serial0/0/0
O E2 45.45.45.0/24 [110/20] via 12.12.12.1, 04:46:00, Serial0/0/0
    
```

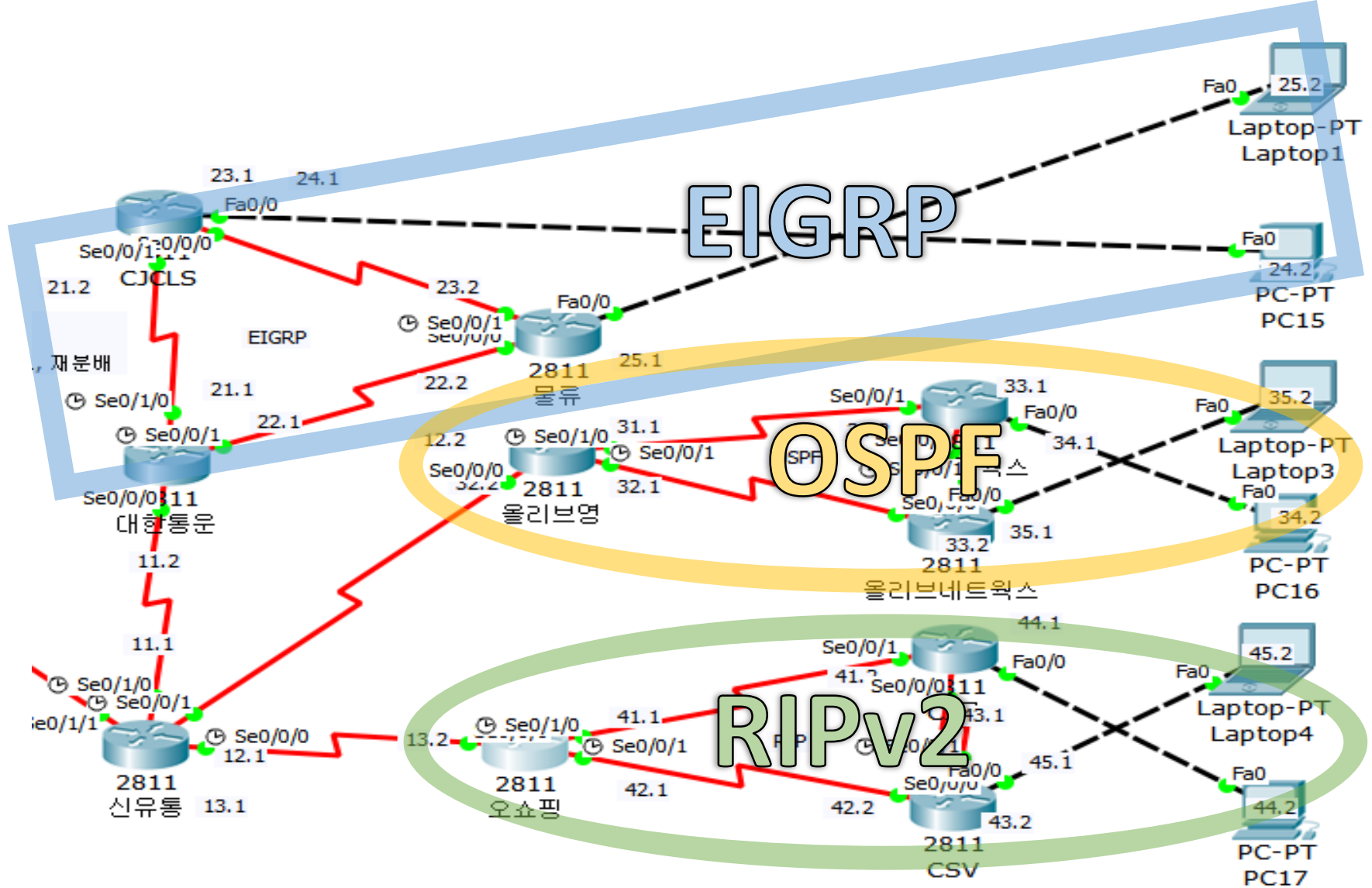
```

올리브영(config)#router ospf 10
올리브영(config-router)#network 31.31.31.0 0.0.0.255 area 1
올리브영(config-router)#network 32.32.32.0 0.0.0.255 area 1
올리브영(config-router)#network 12.12.12.0 0.0.0.255 area 0
    
```

Redistribution



재분배 (Redistribution)



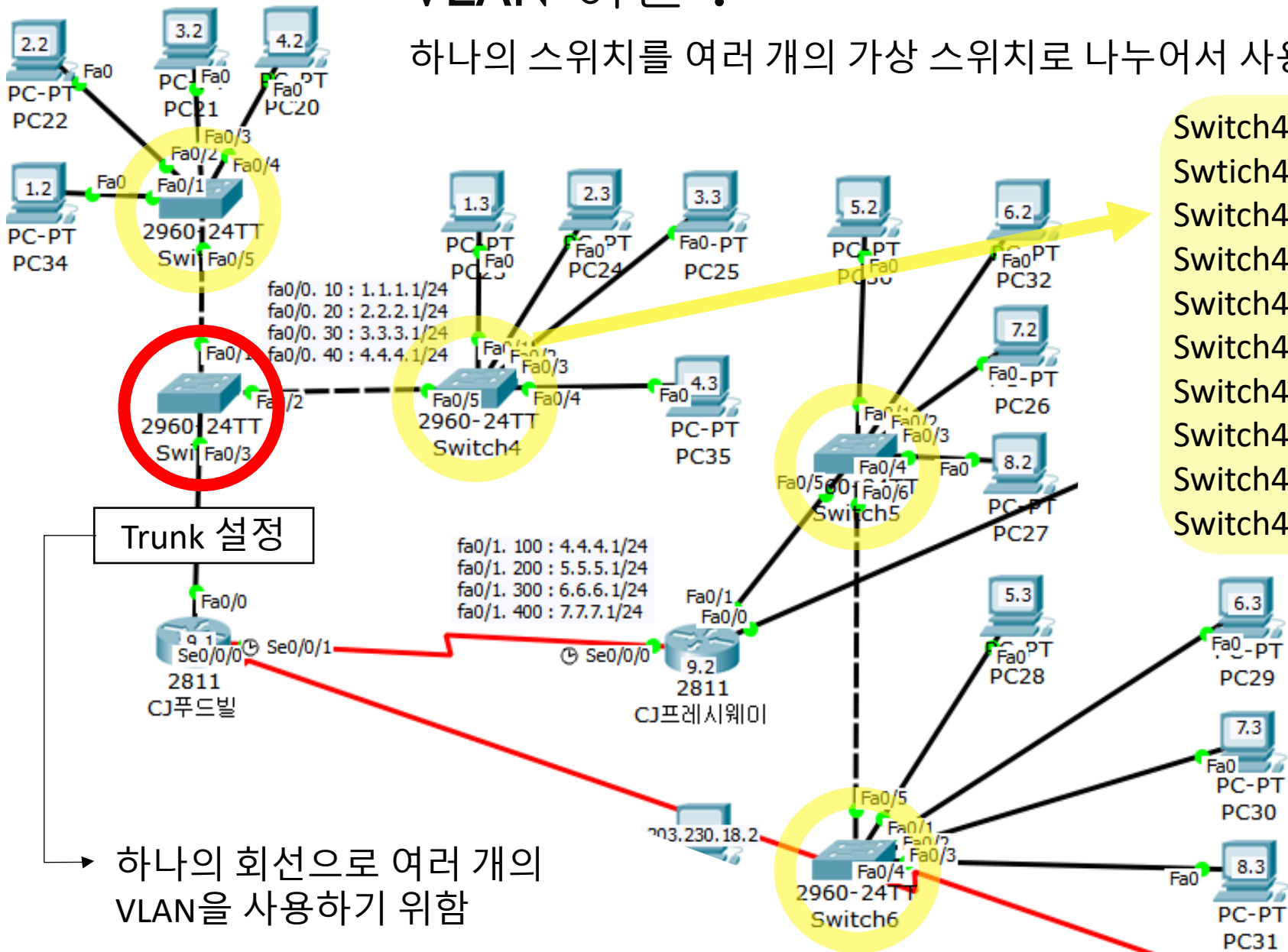
Fire	Last Status	Source	Destination	Type	Color	Time(se)	Periodic	Num	Edit	Delete
	Successful	대한통운	올리브영	ICMP		0.000	N	0	(edit)	(delete)
	Successful	올리브영	오쇼핑	ICMP		0.000	N	1	(edit)	(delete)
	Successful	대한통운	오쇼핑	ICMP		0.000	N	2	(edit)	(delete)



VLAN

VLAN 이란 ?

하나의 스위치를 여러 개의 가상 스위치로 나누어서 사용하는 것

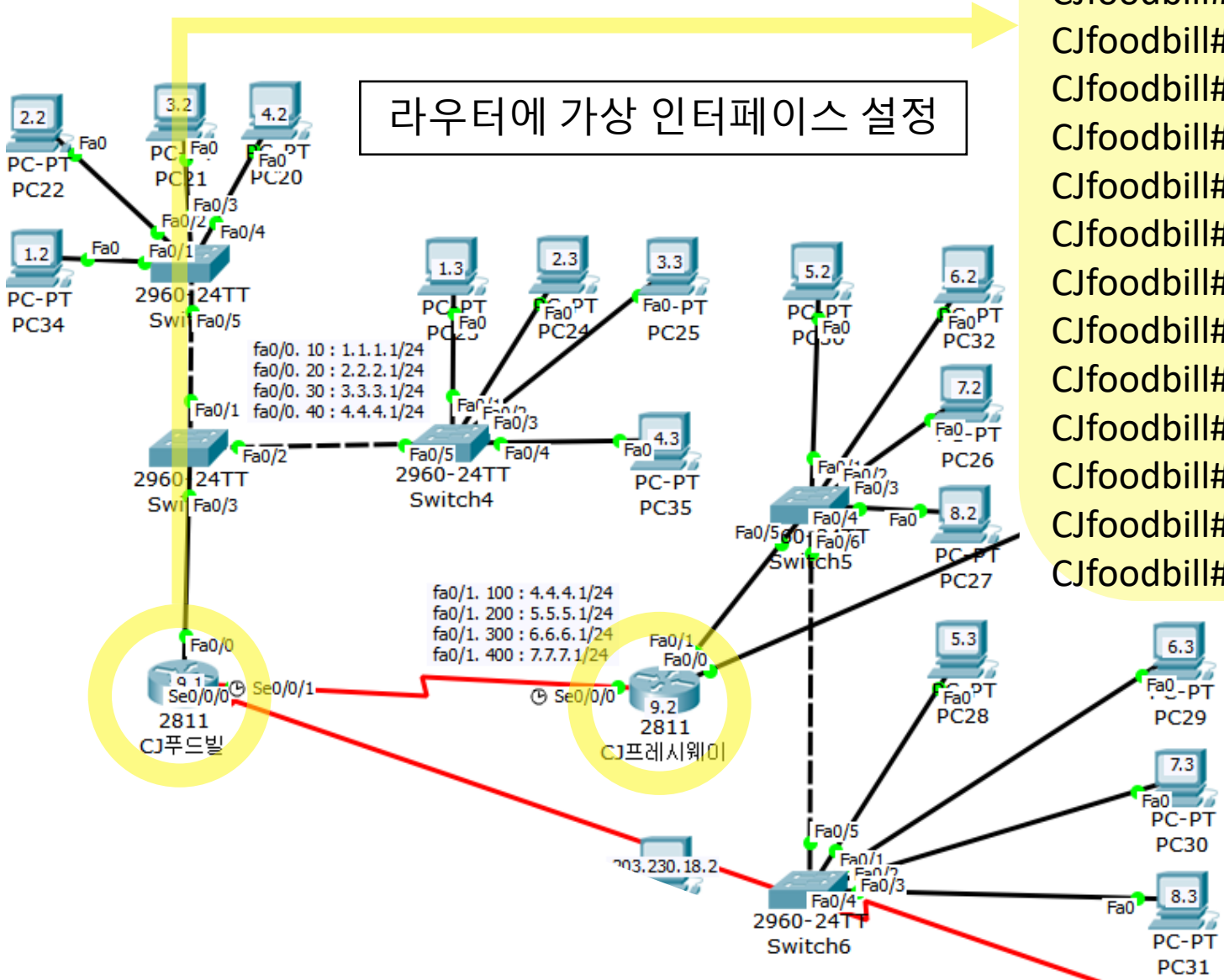


```
Switch4# vlan 10
Switch4# name vlan10
Switch4# exit
Switch4# vlan 20
Switch4# name vlan20
Switch4# exit
Switch4# vlan 30
Switch4# name vlan30
Switch4# vlan 40
Switch4# name vlan40
```

하나의 회선으로 여러 개의 VLAN을 사용하기 위함

라우터-온-어-스틱

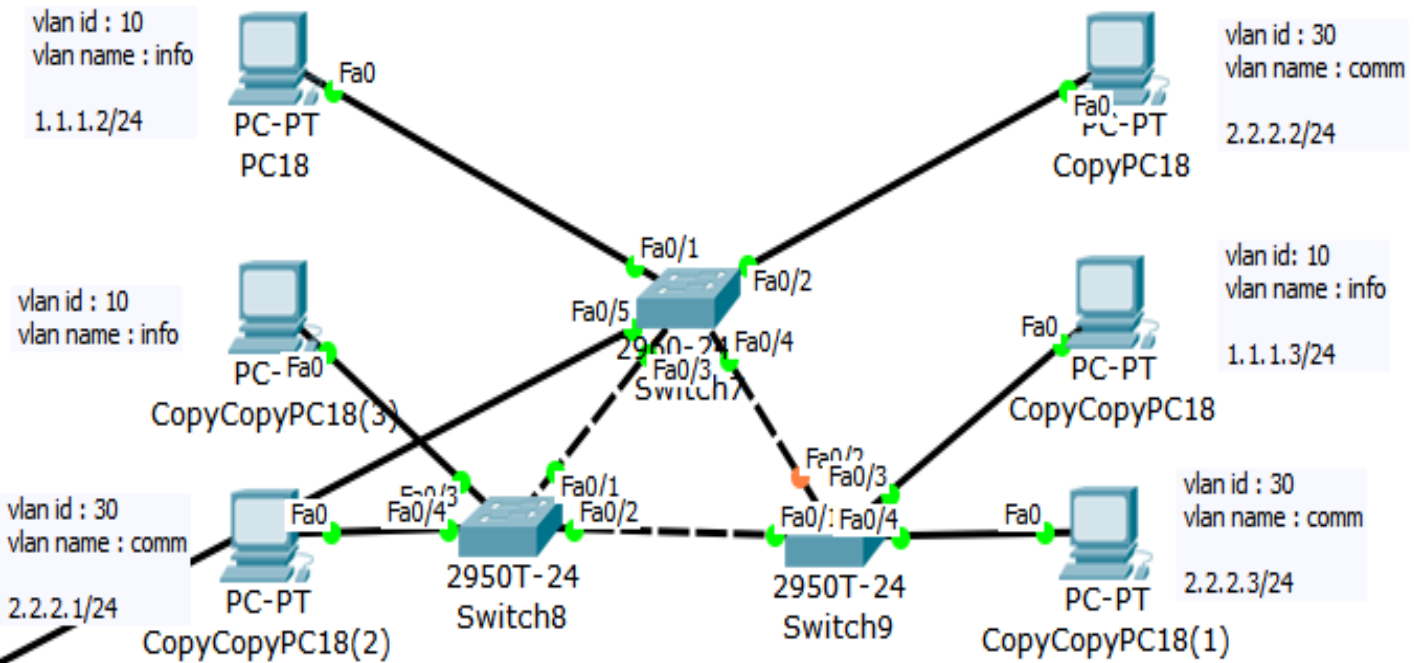
라우터에 가상 인터페이스 설정



```

CJfoodbill# int fa0/0.10
CJfoodbill# encapsulation dot1q 10
CJfoodbill# ip add 1.1.1.1 255.255.255.0
CJfoodbill# exit
CJfoodbill# int fa0/0.20
CJfoodbill# encapsulation dot1q 20
CJfoodbill# ip add 2.2.2.2 255.255.255.0
CJfoodbill# exit
CJfoodbill# int fa0/0.30
CJfoodbill# encapsulation dot1q 30
CJfoodbill# ip add 3.3.3.3 255.255.255.0
CJfoodbill# exit
CJfoodbill# int fa0/0.40
CJfoodbill# encapsulation dot1q 40
CJfoodbill# ip add 4.4.4.1 255.255.255.0
CJfoodbill# exit
    
```

VTP



- 스위치마다 일일이 VLAN을 설정하지 않아도 네트워크 전체에 일관성 있는 VLAN 설정이 가능

- VTP는 VLAN 정보만을 전달하고 포트의 설정까지 전달하지는 않음

VLAN이 설정된 것을 확인 →

```

Switch7
Physical Config CLI
IOS Command Line Interface
Switch#show vlan
VLAN Name                Status    Ports
-----
1    default                 active    Fa0/5, Fa0/6, Fa0/7, Fa0/8
                                           Fa0/9, Fa0/10, Fa0/11, Fa0/12
                                           Fa0/13, Fa0/14, Fa0/15, Fa0/16
                                           Fa0/17, Fa0/18, Fa0/19, Fa0/20
                                           Fa0/21, Fa0/22, Fa0/23, Fa0/24
                                           Gig0/1, Gig0/2
10   info                    active    Fa0/1
30   comm                    active    Fa0/2
  
```

STP

```
Switch8
Physical Config CLI
IOS Command Line Interface
Switch>show spanning-tree
VLAN0001
Spanning tree enabled protocol ieee
Root ID    Priority    32769
Address    0009.7C77.0D99
This bridge is the root
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID  Priority    32769 (priority 32768 sys-id-ext 1)
Address    0009.7C77.0D99
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20

Interface      Role Sts Cost      Prio.Nbr Type
-----
Fa0/1          Desg FWD 19
Fa0/2          Desg FWD 19
Fa0/3          Desg FWD 19
Fa0/4          Desg FWD 19
128.4         P2p
```

루트브리
지
선출

```
Switch7
Physical Config CLI
IOS Command Line Interface
Switch#show spanning-tree
VLAN0001
Spanning tree enabled protocol ieee
Root ID    Priority    32769
Address    0009.7C77.0D99
Cost       19
Port       3(FastEthernet0/3)
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID  Priority    32769 (priority 32768 sys-id-ext 1)
Address    000B.BE86.5602
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20

Interface      Role Sts Cost      Prio.Nbr Type
-----
Fa0/5          Desg FWD 19      128.5    P2p
Fa0/3          Root FWD 19      128.3    P2p
Fa0/4          Desg FWD 19      128.4    P2p
```

```
Switch9
Physical Config CLI
IOS Command Line Interface
Switch#show spanning-tree
VLAN0001
Spanning tree enabled protocol ieee
Root ID    Priority    32769
Address    0009.7C77.0D99
Cost       19
Port       1(FastEthernet0/1)
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec

Bridge ID  Priority    32769 (priority 32768 sys-id-ext 1)
Address    00D0.58E7.9272
Hello Time 2 sec Max Age 20 sec Forward Delay 15 sec
Aging Time 20

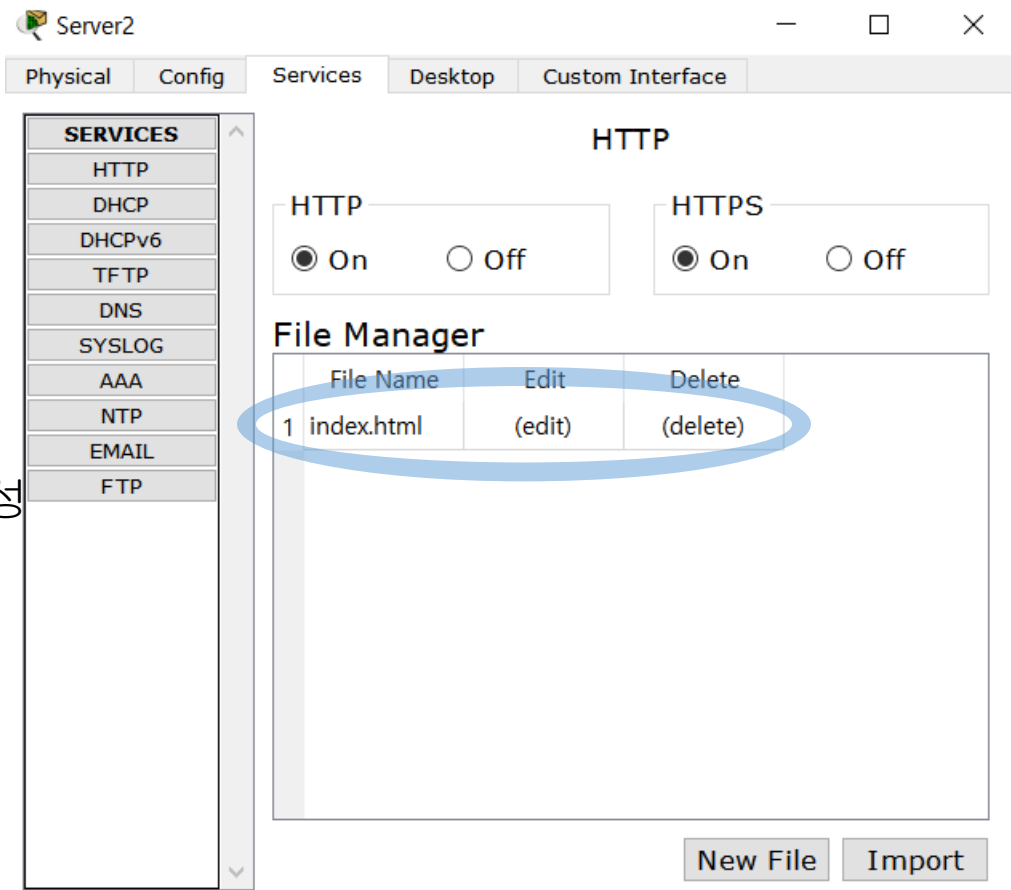
Interface      Role Sts Cost      Prio.Nbr Type
-----
Fa0/3          Desg FWD 19      128.3    P2p
Fa0/4          Desg FWD 19      128.4    P2p
Fa0/1          Root FWD 19      128.1    P2p
Fa0/2          Altn BLK 19      128.2    P2p
```



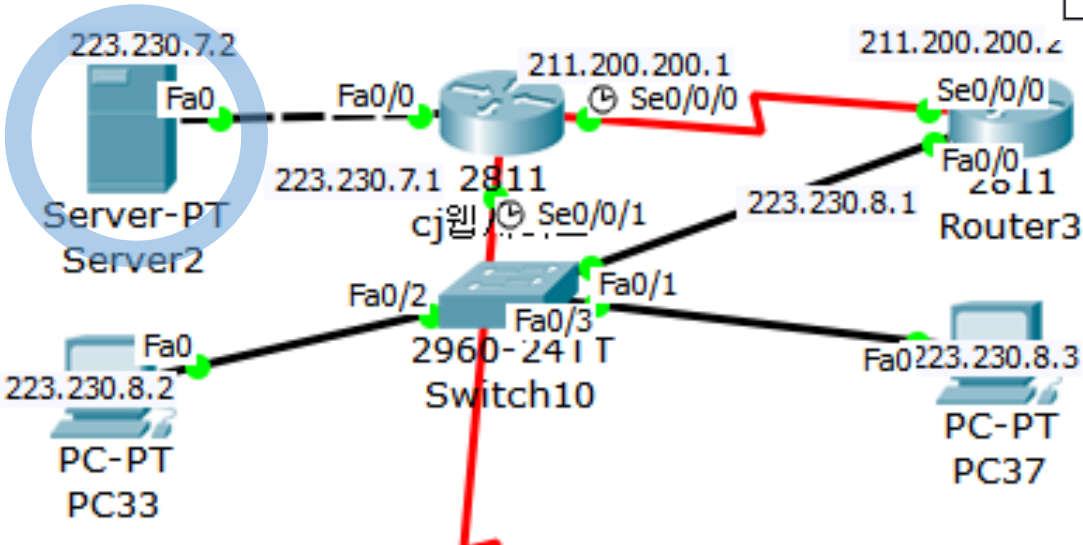
HTTP

HTTP

1학기에 배운 Atom 을 활용하여 Index.html 작성
HTTP SERVICES 파일 매니저에 첨부



15장: 패킷트레이서 서버 기능 활용



Server2

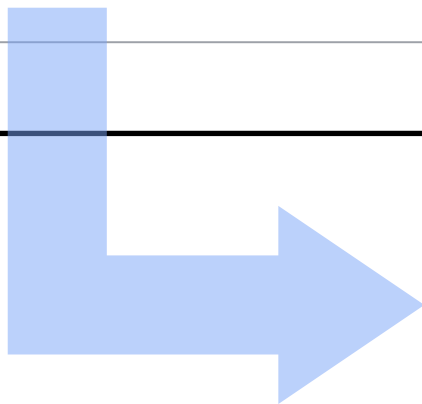
Physical Config Services Desktop Custom Interface

SERVICES

- HTTP
- DHCP
- DHCPv6
- TFTP
- DNS
- SYSLOG
- AAA
- NTP
- EMAIL
- FTP

File Name:

```
<html>
<head>
<meta charset="UTF-8">
<meta name="viewport" content="width=device-width, initial-scale=1.0">
<meta http-equiv="X-UA-Compatible" content="ie=edge">
<style>
body {
background-color : pink;
color: black;
margin:40px;
}
h3 {
text-align :center;
color : black;
}
</style>
</head>
<body>
<h3>Welcome CJ</h3>
</body>
</html>
```



Server2

Physical Config Services Desktop Custom Interface

Web Browser

URL Go Stop

Welcome CJ