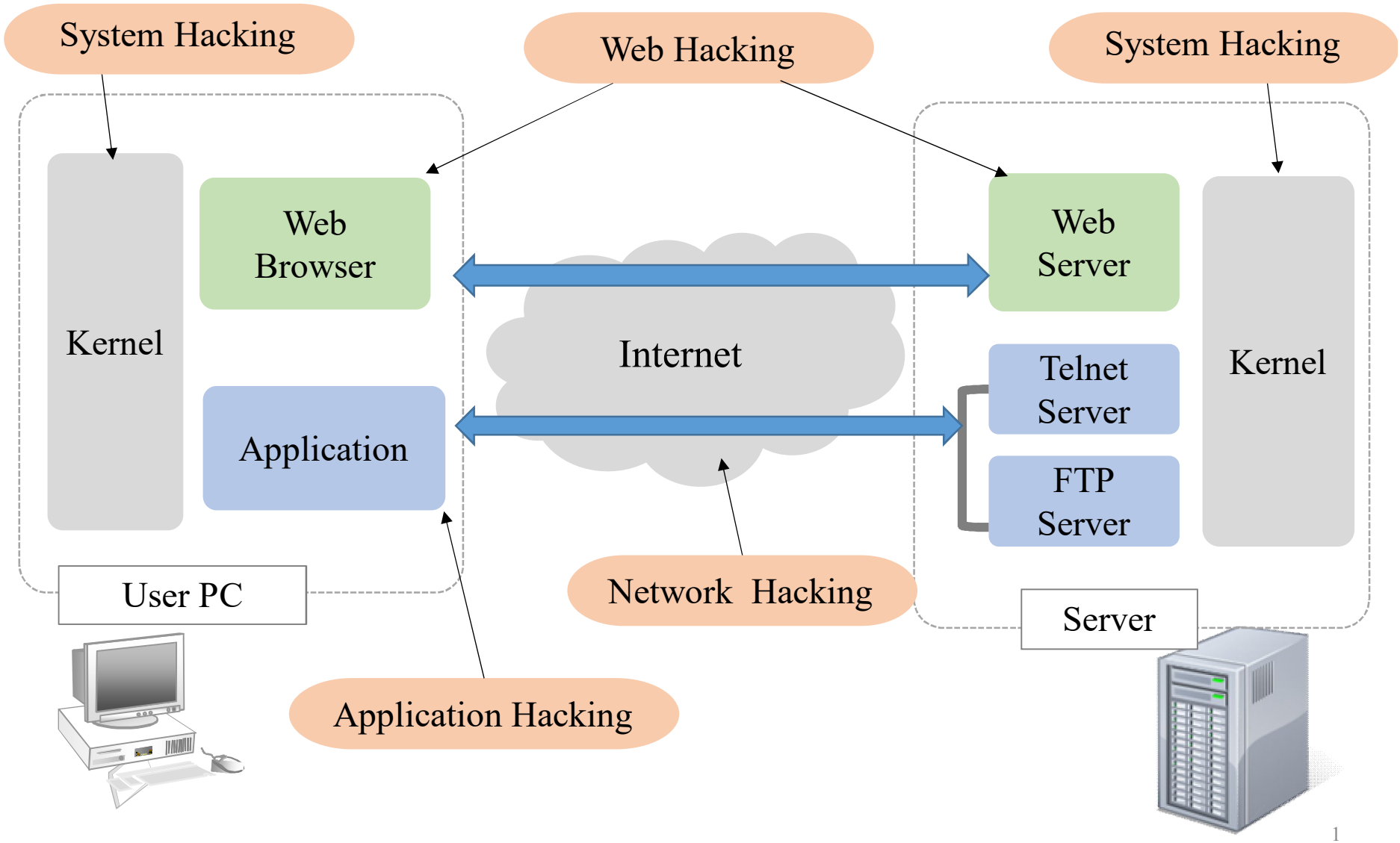
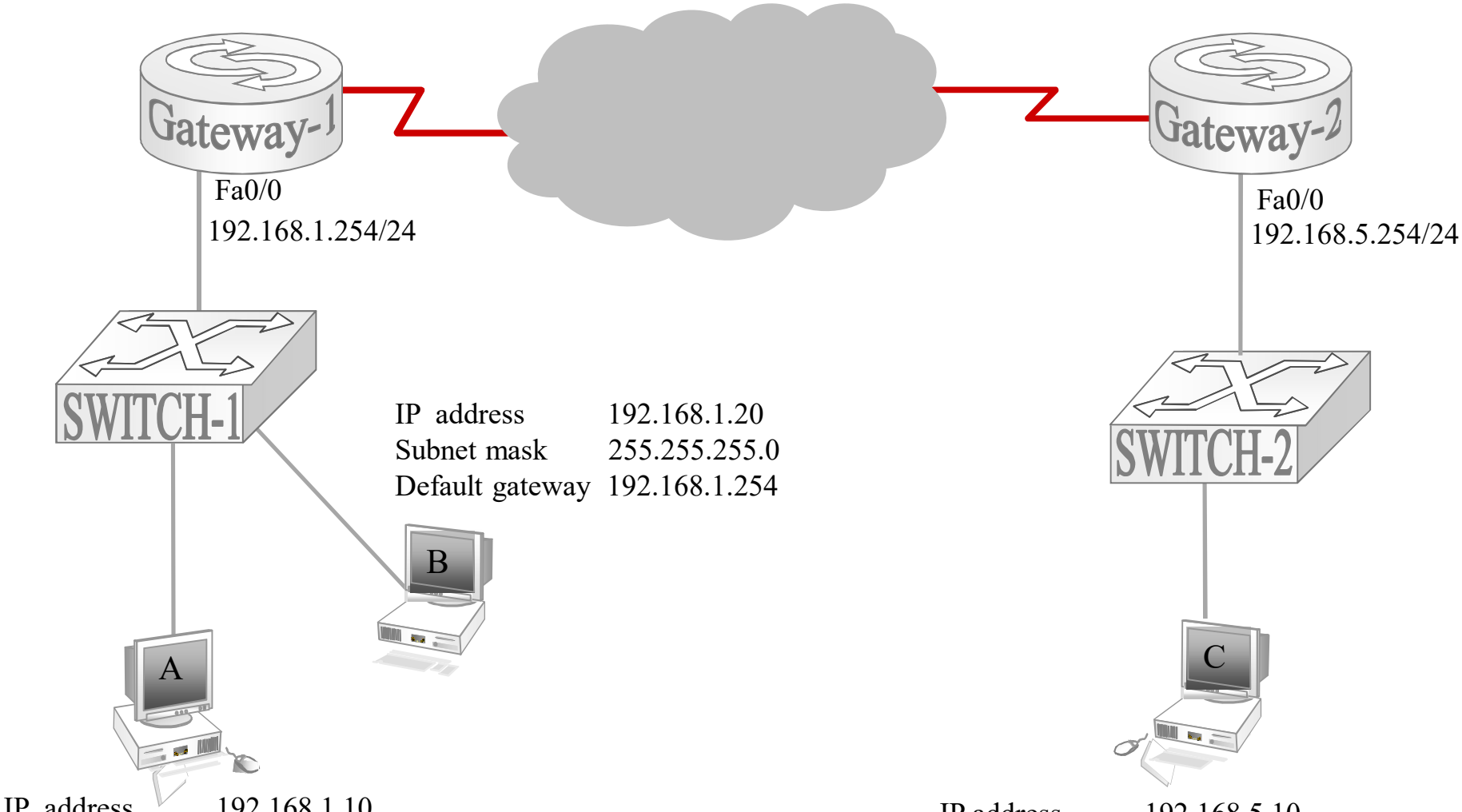
Attack 종류


System Hacking
Web Hacking
System Hacking
Kernel
Web
Browser
Web
Server
Kernel
Internet
Application
Telnet
Server
FTP
Server
User PC
Network Hacking
Server
Application Hacking

네트워크 개요


Gateway-1
Fa0/0
192.168.1.254/24
Gateway-2
Fa0/0
192.168.5.254/24
SWITCH-1
SWITCH-2
IP address 192.168.1.20
Subnet mask 255.255.255.0
Default gateway 192.168.1.254
B
A
C
IP address 192.168.1.10
Subnet mask 255.255.255.0
Default gateway 192.168.1.254
IP address 192.168.5.10
Subnet mask 255.255.255.0
Default gateway 192.168.5.254

1) 네트워크 주소

- FQDN
- Port number
- IP Address
- MAC Address

논리적 주소(3계층주소)

- IP address 구성

  Network ID + Host ID

- Subnet Mask 기능

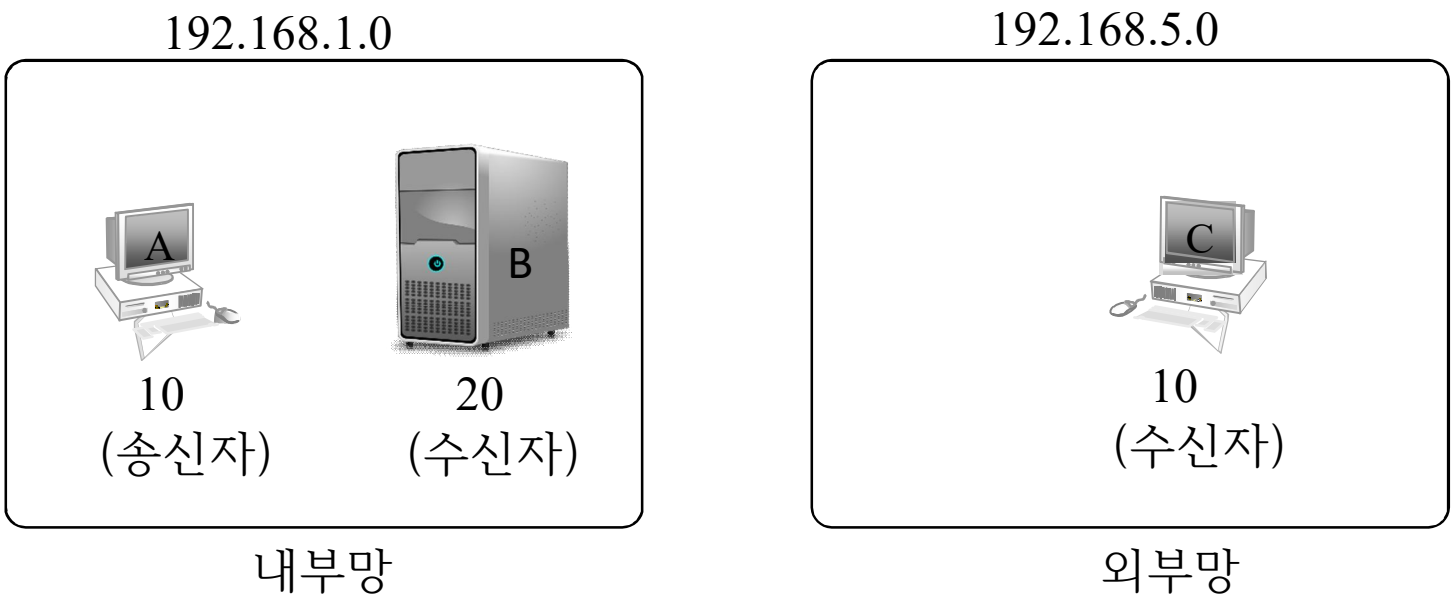
  - IP address의 Network ID와 Host ID 구분

IP address	192.168.1.10
& Subnet mask	& 255.255.255.0
Network ID	192.168.1. 0

255==1
& == X

내부망과 외부망

- 송신자 : 데이터를 보내는 측 / 수신자 : 데이터를 받는 측

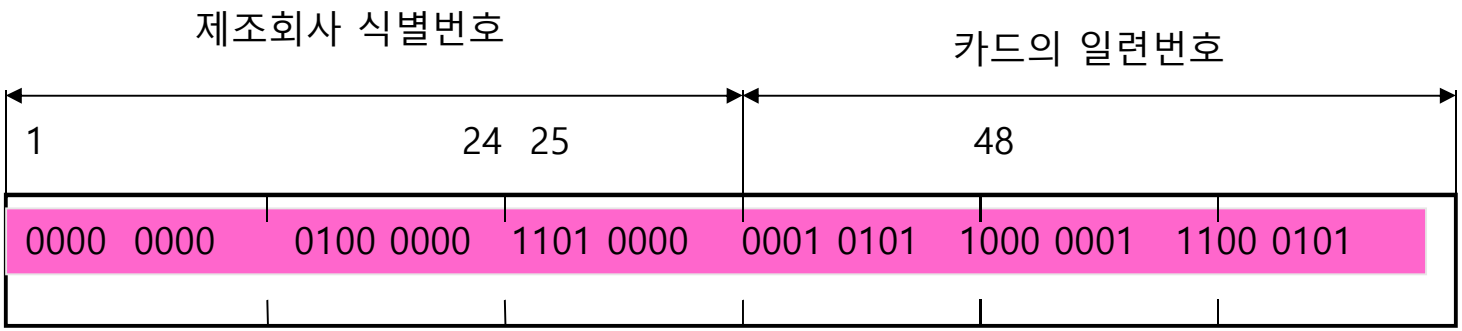


- 내부망 : 송수신자가 동일한 네트워크 ID를 사용
- 외부망 : 송수신지가 서로 다른 네트워크 ID를 사용

물리적 주소(2계층주소)

- Network Interface Card (NIC) 또는 Ethernet Card
- 데이터링크계층의 MAC 계층에 의해 사용되는 48비트의 하드웨어 주소

MAC 주소(16진수 표현) : 00-40-D0-15-81-C5



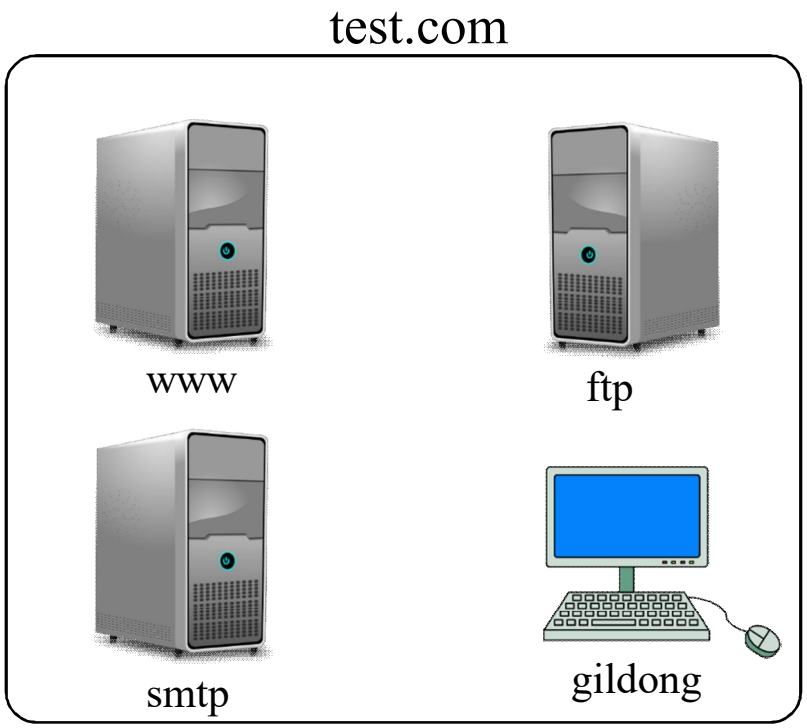
대표적인 제조회사 식별 번호의 예

- Intel: 00-A0-C9
- 3Com: 00-50-DA
- Realtek: 00-40-D0

Fully Qualified Domain Name (FQDN, 7계층 주소)

Host Name + Domain Name

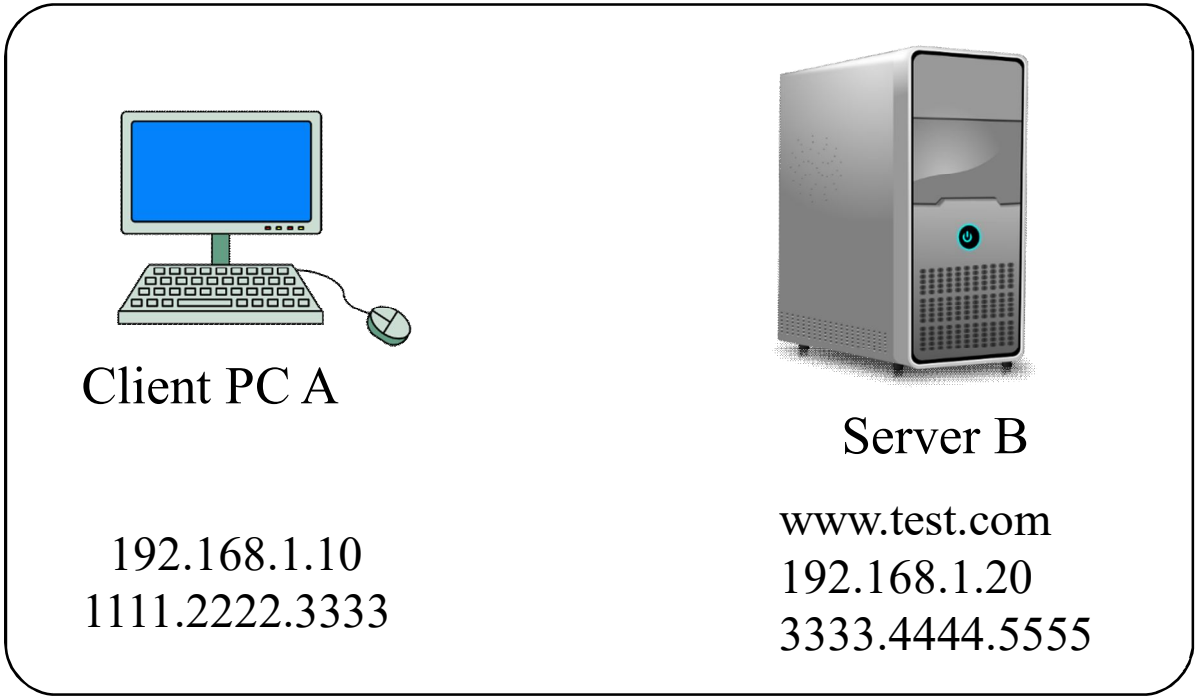
예) www.test.com



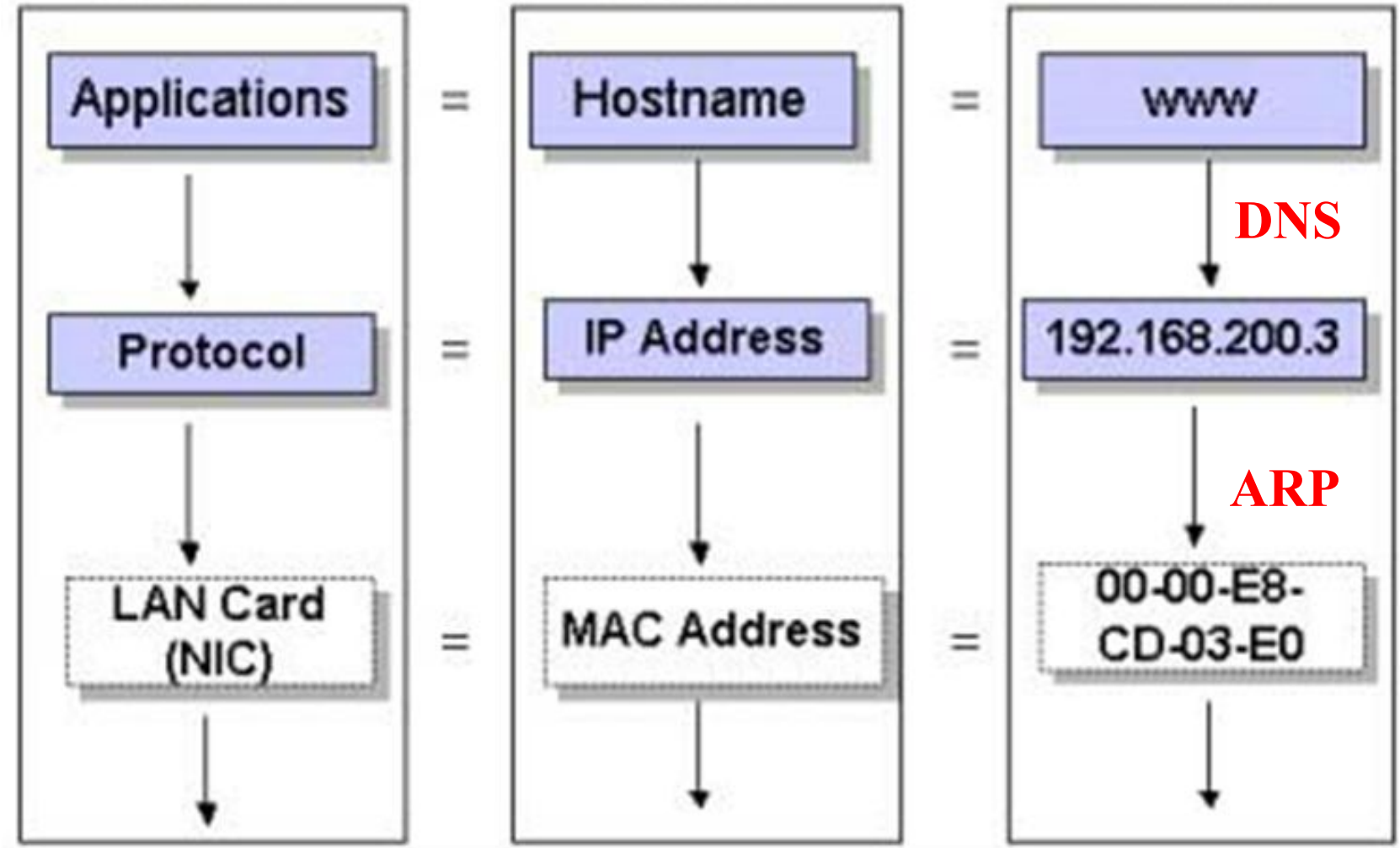
MAC/IP/FQDN Address

- MAC 주소 구성=제조회사+일련번호
- IP 주소 구성=네트워크ID+호스트ID
- FQDN 주소 구성=호스트명+도메인명

그룹주소+고유번호(명)



DNS & ARP


Applications
=
Hostname
=
www
DNS
Protocol
=
IP Address
=
192.168.200.3
ARP
LAN Card
(NIC)
=
MAC Address
=
00-00-E8-
CD-03-E0

포트번호(4계층 주소)

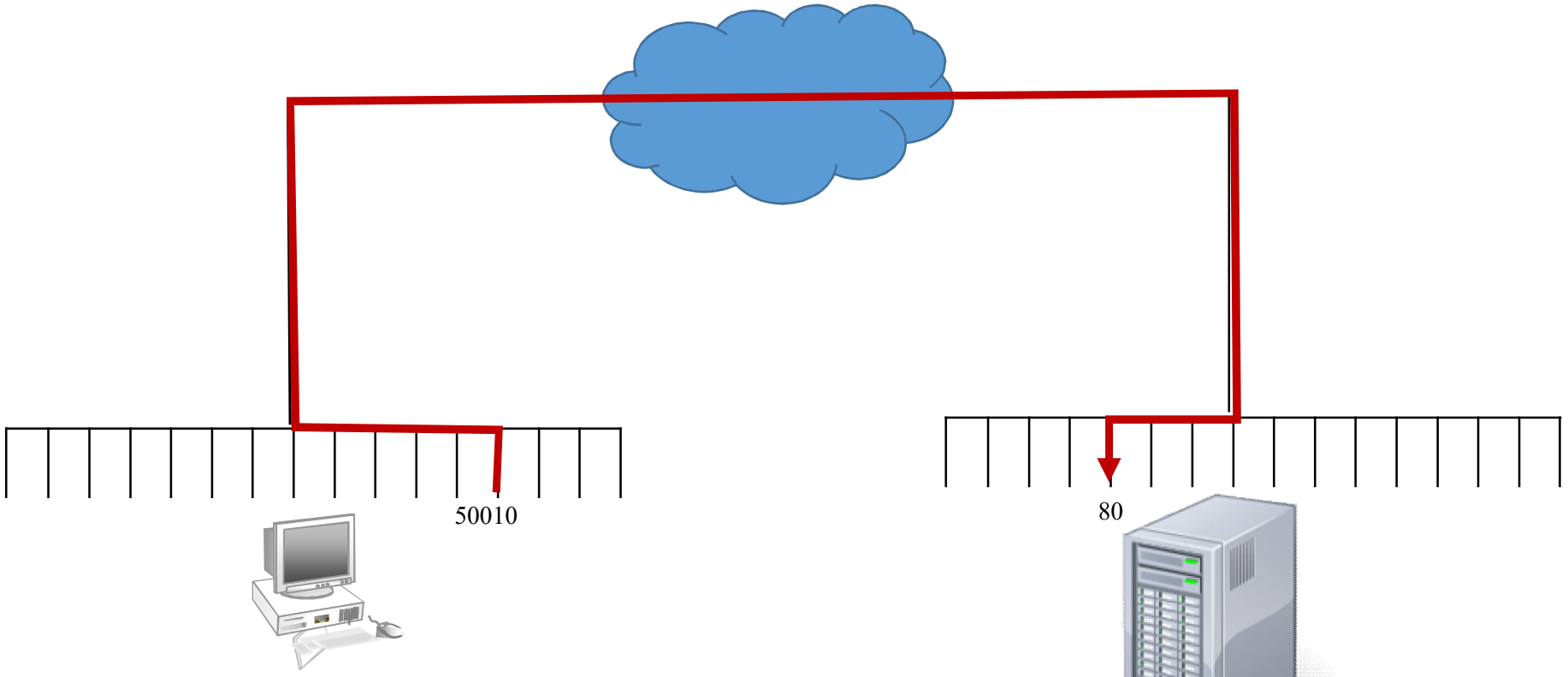
- 데이터 송수신 번호
- 서비스 번호 또는 애플리케이션 번호
- 애플리케이션에서 부착해 전송

  - Well-Known Port : 1-1023

  - Registered Port : 1024-49151

  - Dynamic Port : 49152-65535

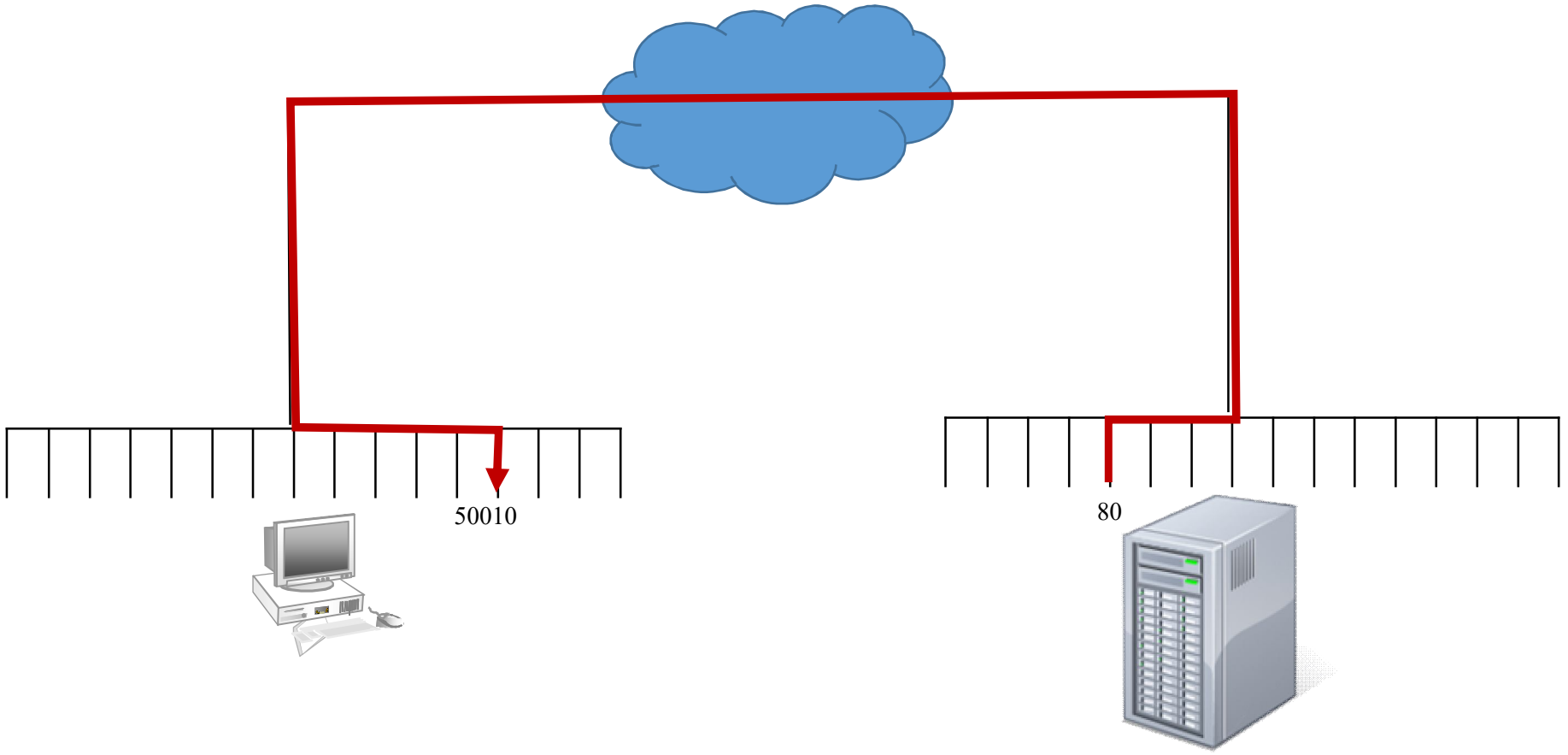
포트주소 (송신)



송신지 192.168.10.10 : 50010
수신지 200.10.10.10 : 80

Web Server
200.10.10.10

포트주소(수신)

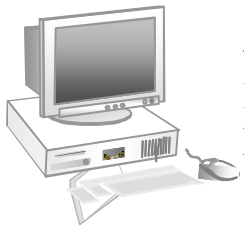


송신지 200.10.10.10 : 80
수신지 192.168.10.10 : 50010

2) 전송모드

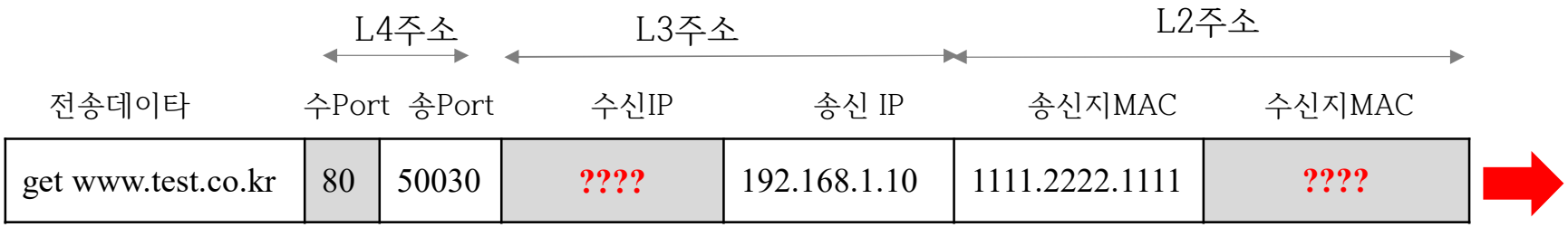
- Unicast 1 : 1
- Broadcast 1 : m (불특정다수)
- Multicast 1 : n (특정다수)

Unicast 전송모드

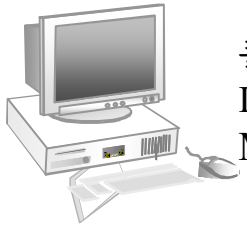


클라이언트(송신지)
IP 192.168.1.10
MAC 1111.2222.1111

서버(수신지)
www.test.com
IP 192.168.1.20
MAC 1111.2222.2222

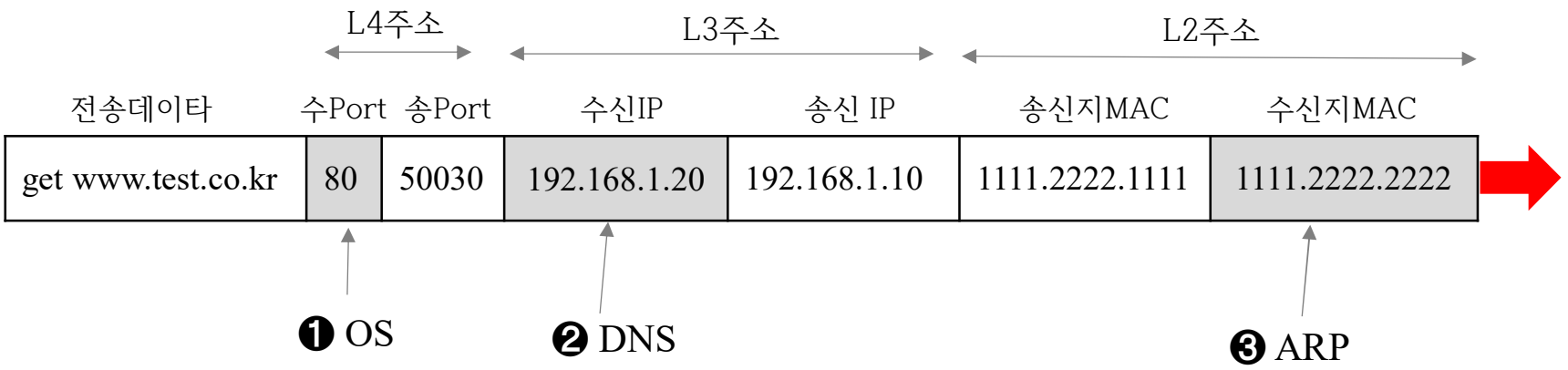


Unicast 전송모드



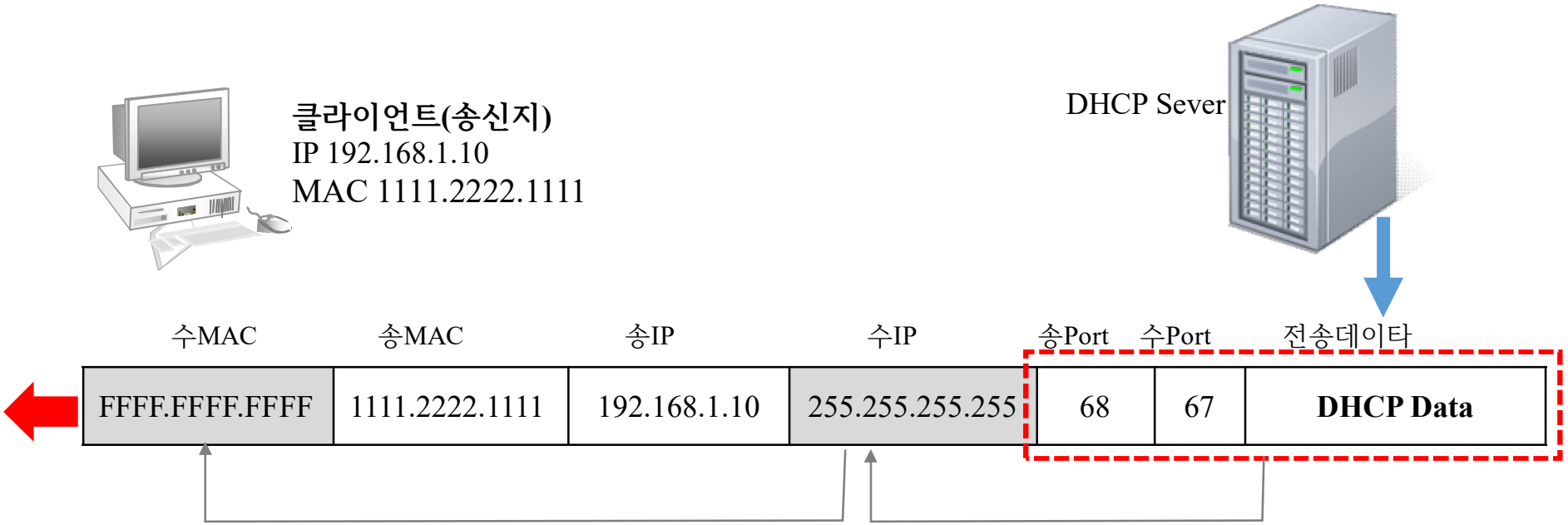
클라이언트(송신지)
IP 192.168.1.10
MAC 1111.2222.1111

서버(수신지)
IP 192.168.1.20
MAC 1111.2222.2222



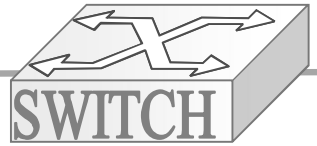
Broadcast 전송모드

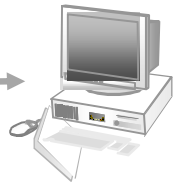
- Broadcast IP 주소
  - Limited Broadcast(local broadcast) : 255.255.255.255
  - Directed Broadcast : 192.168.1.255/24
- Broadcast MAC 주소
  - FFFF.FFFF.FFFF

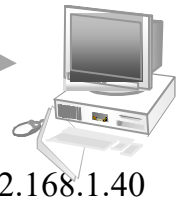


브로드캐스트 전송 예제

수신IP	송신 IP	송신지MAC	수신지MAC
255.255.255.255	192.168.1.10	1111.2222.1111	FFFF.FFFF.FFFF







송신자
IP 192.168.1.10
MAC 1111.2222.1111
BIP 255.255.255.255
BMAC FFFF.FFFF.FFFF

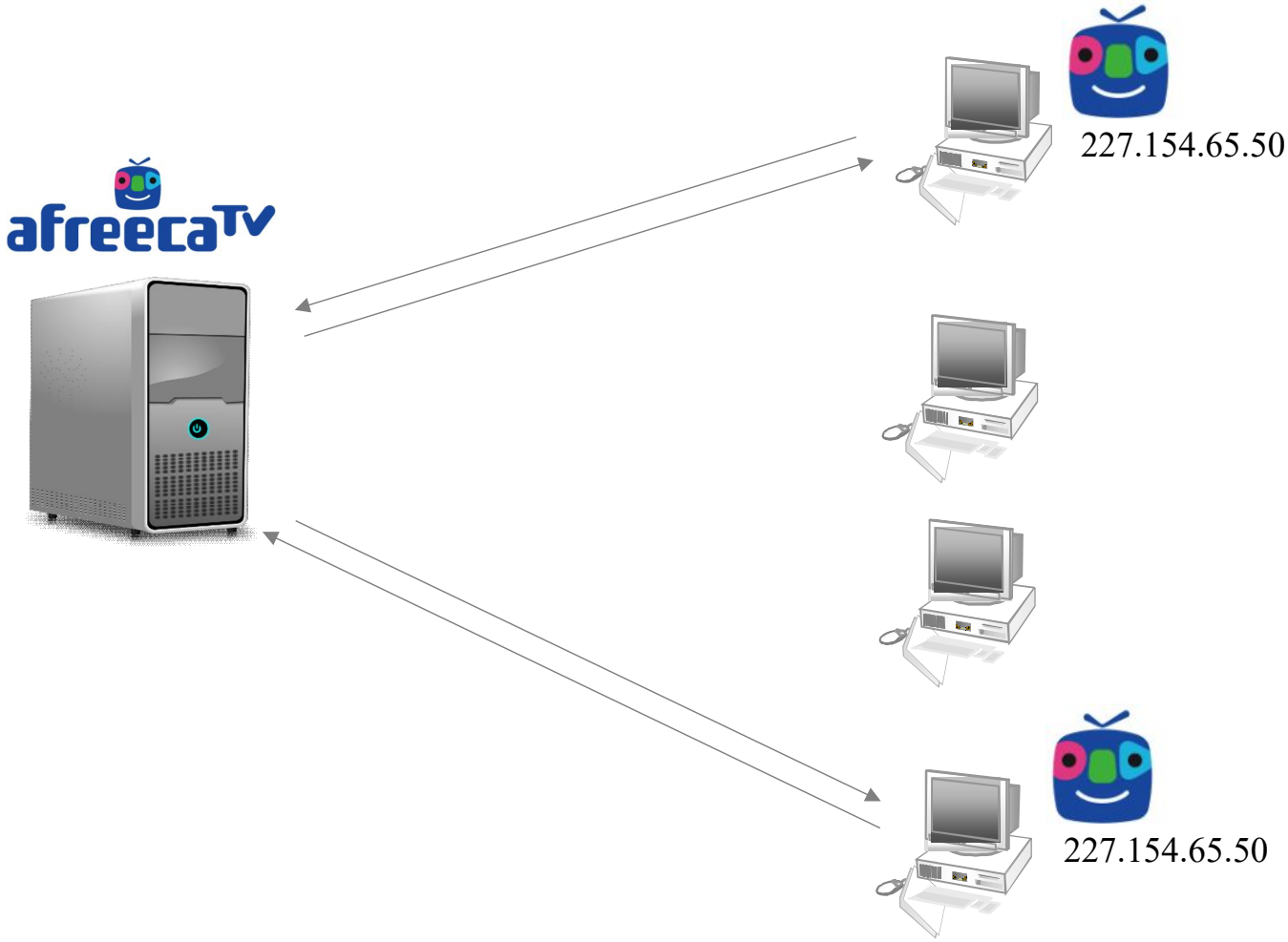
IP 192.168.1.20
MAC 1111.2222.2222
BIP 255.255.255.255
BMAC FFFF.FFFF.FFFF

IP 192.168.1.30
MAC 1111.2222.3333
BIP 255.255.255.255
BMAC FFFF.FFFF.FFFF

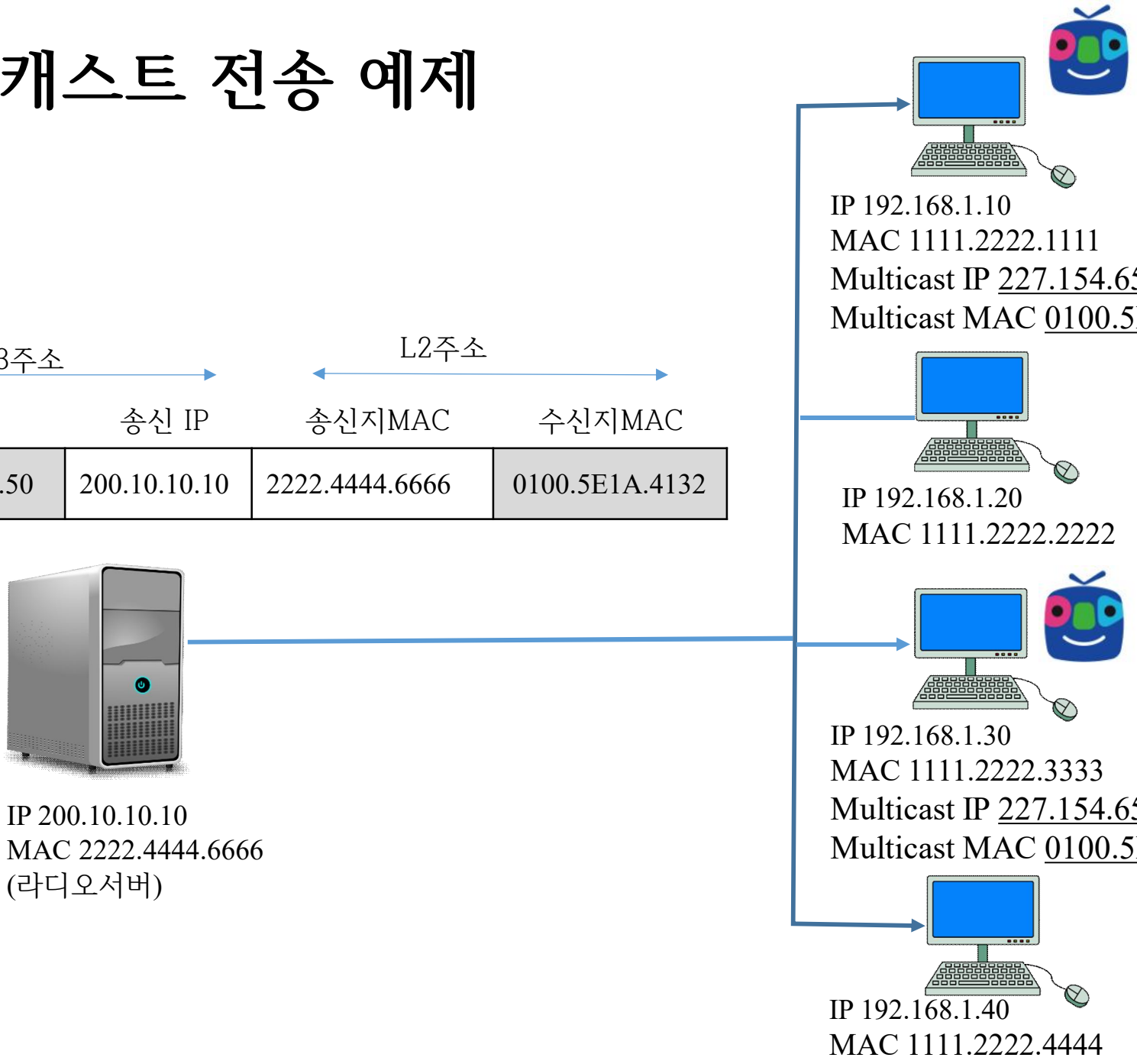
IP 192.168.1.40
MAC 1111.2222.4444
BIP 255.255.255.255
BMAC FFFF.FFFF.FFFF

Multicast 전송모드

- Multicast IP 주소
  - 224-239.X.X.X (예) 230.10.10.10

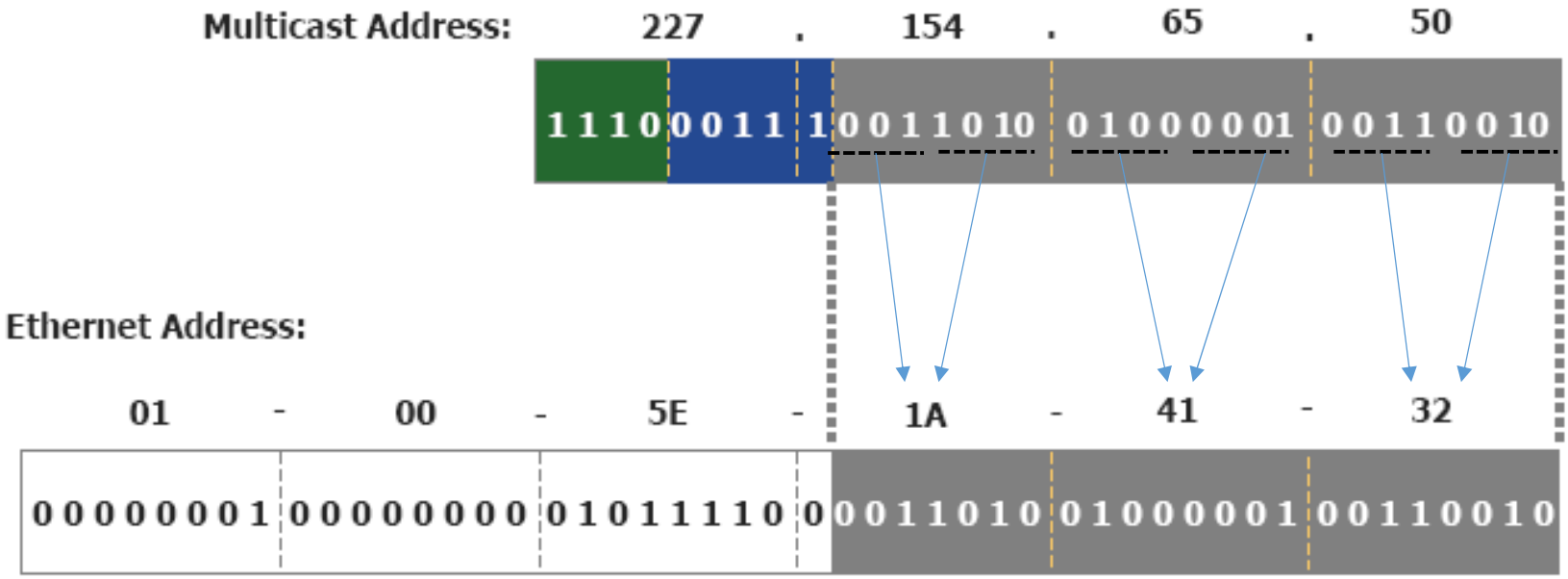


멀티캐스트 전송 예제

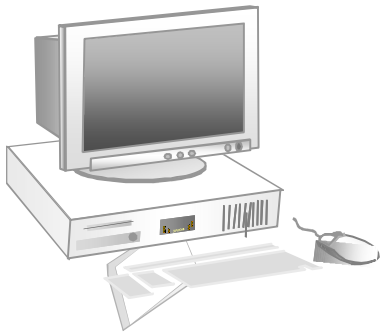

L3주소
L2주소
수신IP
송신 IP
송신지MAC
수신지MAC
227.154.65.50
200.10.10.10
2222.4444.6666
0100.5E1A.4132
IP 200.10.10.10
MAC 2222.4444.6666
(라디오서버)
IP 192.168.1.10
MAC 1111.2222.1111
Multicast IP 227.154.65.50
Multicast MAC 0100.5E1A.4132
IP 192.168.1.20
MAC 1111.2222.2222
IP 192.168.1.30
MAC 1111.2222.3333
Multicast IP 227.154.65.50
Multicast MAC 0100.5E1A.4132
IP 192.168.1.40
MAC 1111.2222.4444

Multicast MAC 주소 형식 : **0100.5E***XX.XXXX*

- Multicast주소에 대한 MAC address Mapping 적용 예



227.154.65.50 ➔ 0100.5E1A.4132



- Uni IP address / MAC address
  - 192.168.1.10/ MAC 1111.2222.1111
- Broadcast IP Address/ MAC Address
  - 255.255.255.255/ ffff.ffff.ffff
  - 192.168.1.255 / ffff.ffff.ffff
- Multicast IP Address/ MAC address
  - 224.0.0.22 (IGMPv3)/01-00-5e-00-00-16
  - 239.255.255.250(Device discovery)/01-00-5e-7f-ff-fa

ARP(Address Resolution Protocol)

- IP 주소에 대응 되는 MAC 주소를 조회 변환해 주는 서비스
- ARP 패킷 종류

❶ ARP request 패킷

- 송신지가 수신지의 MAC 주소를 조회하기 위해 보내는 질의 패킷
- 브로드캐스트 방식으로 운영

❷ ARP reply 패킷

- ARP request에 대해 응답 패킷
- 유니캐스트 방식으로 운영

ARP Cache Table

- IP주소와 MAC 주소의 대응 관계를 저장한 테이블
- ARP 캐쉬 테이블 확인 명령어 : arp -a

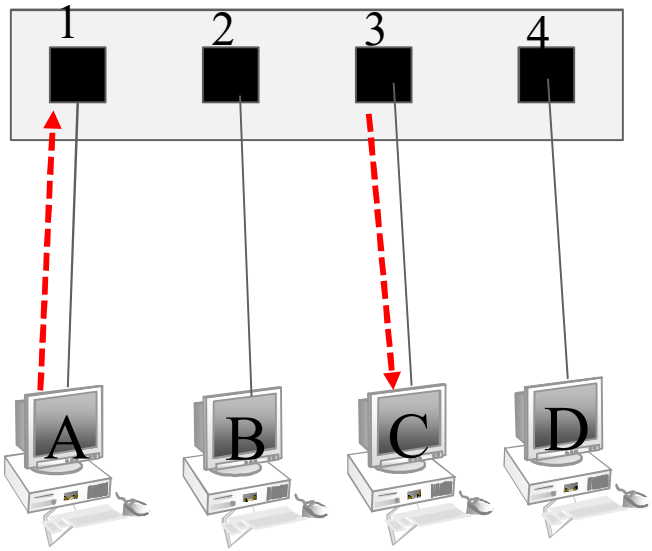
```
C:₩>arp -a

인터페이스: 192.168.35.131 --- 0x4
  인터넷 주소           물리적 주소           유형
  192.168.35.1          00-23-aa-83-11-69     동적
  192.168.35.115        38-8c-50-9a-9b-b1     동적
  192.168.35.211        04-b4-29-bf-07-09     동적
  192.168.35.255        ff-ff-ff-ff-ff-ff     정적
  224.0.0.22            01-00-5e-00-00-16     정적
  224.0.0.251           01-00-5e-00-00-fb     정적
  224.0.0.252           01-00-5e-00-00-fc     정적
  239.255.255.250       01-00-5e-7f-ff-fa     정적
  255.255.255.255       ff-ff-ff-ff-ff-ff     정적
```

3) 계층별 장비

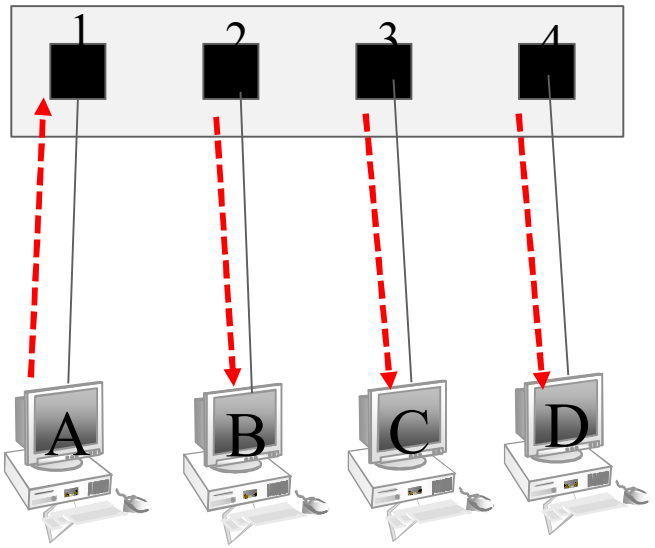
- Switch
- Router
- Hub

Forwarding과 Flooding

- Forwarding : 하나의 송신지 포트에서 하나의 수신지 포트로 트래픽 전송
- Flooding : 송신지 포트를 제외한 나머지 포트들로 트래픽 전송



Forwarding(포워딩)

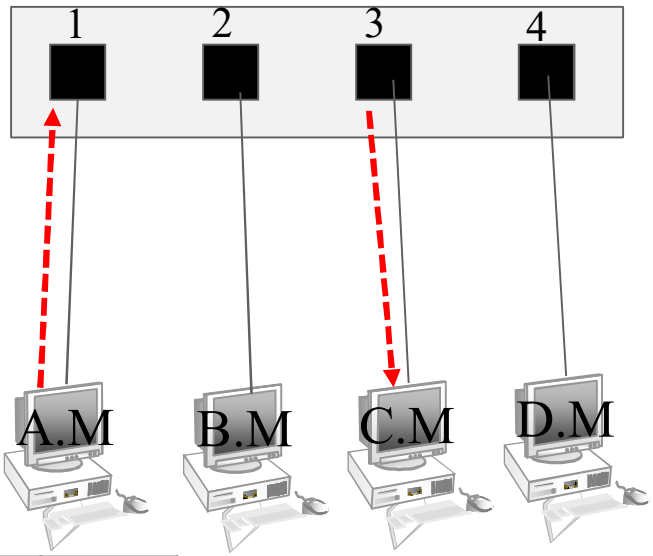


Flooding(플러딩)

Switch(2계층 장비)

MAC Address Table

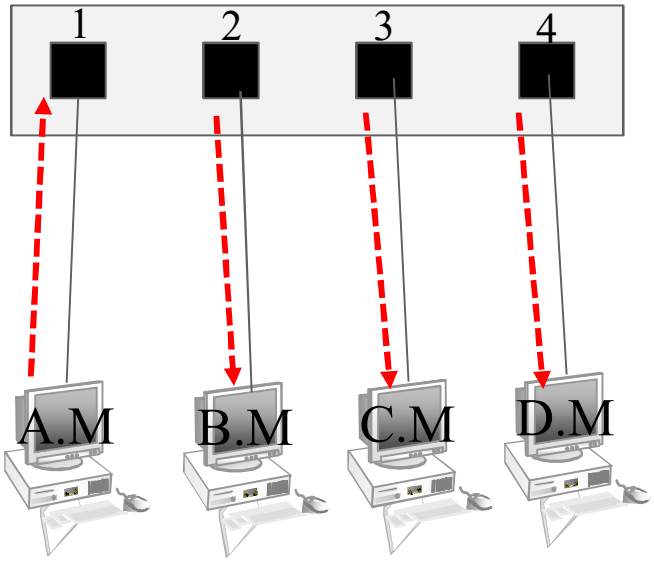
목적지	출구번호
A.M	1
B.M	2
C.M	3



A.M	C.M
송MAC	수MAC

MAC Address Table

목적지	출구번호
A.M	1
B.M	2
C.M	3

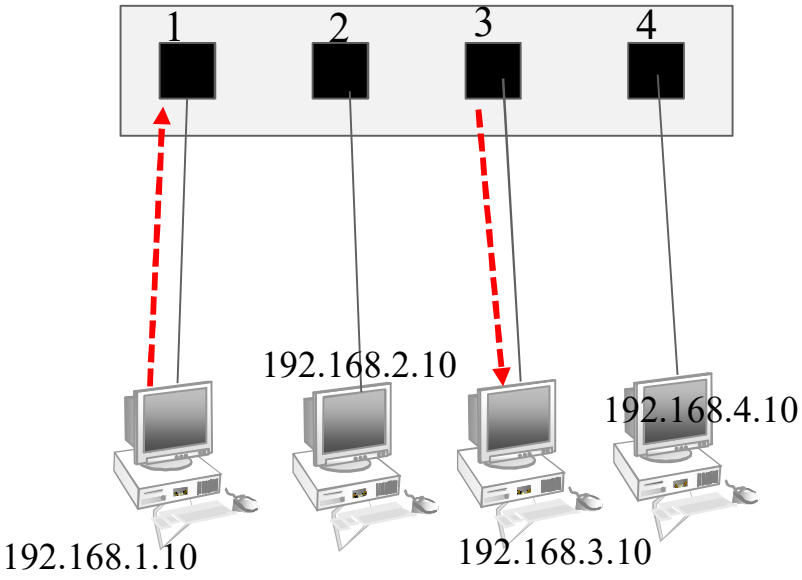


A.M	D.M
송MAC	수MAC

Router(3계층 장비)

Routing Table

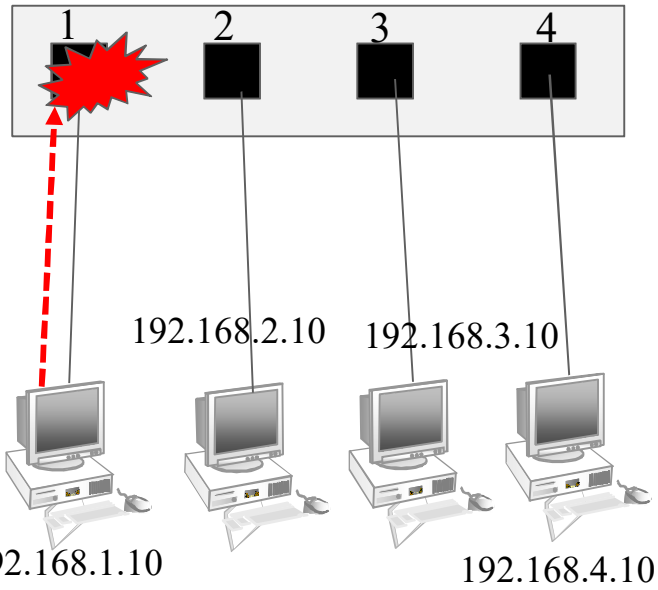
목적지	출구번호
192.168.1.0	1
192.168.2.0	2
192.168.3.0	3



192.168.1.10	192.168.3.10
송신지IP	수신지IP

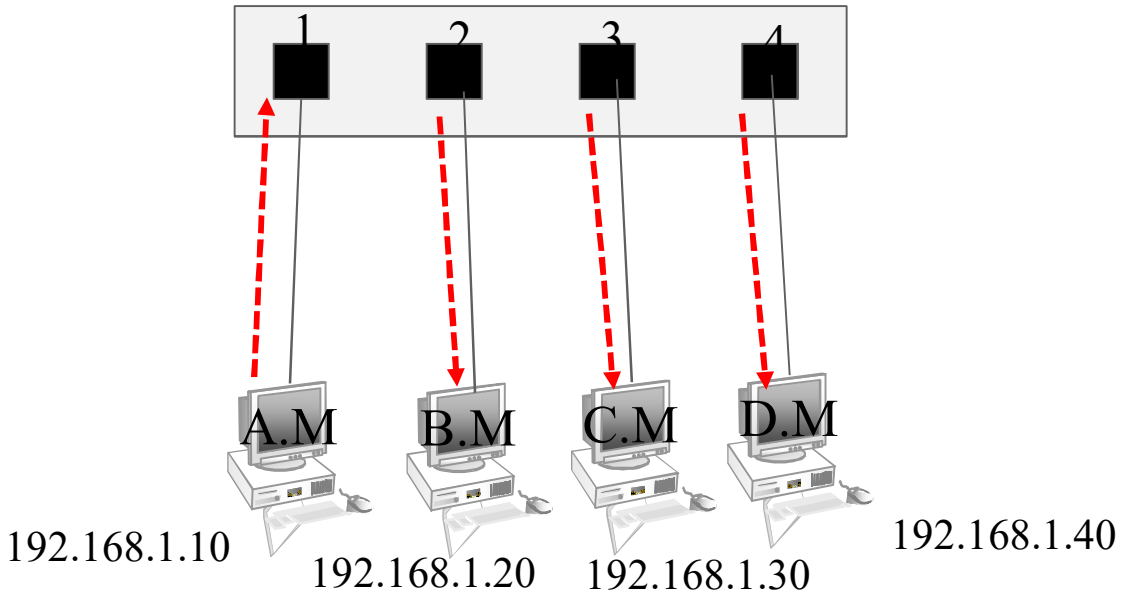
Routing Table

목적지	출구번호
192.168.1.0	1
192.168.2.0	2
192.168.3.0	3



192.168.1.10	192.168.4.10
송신지IP	수신지IP

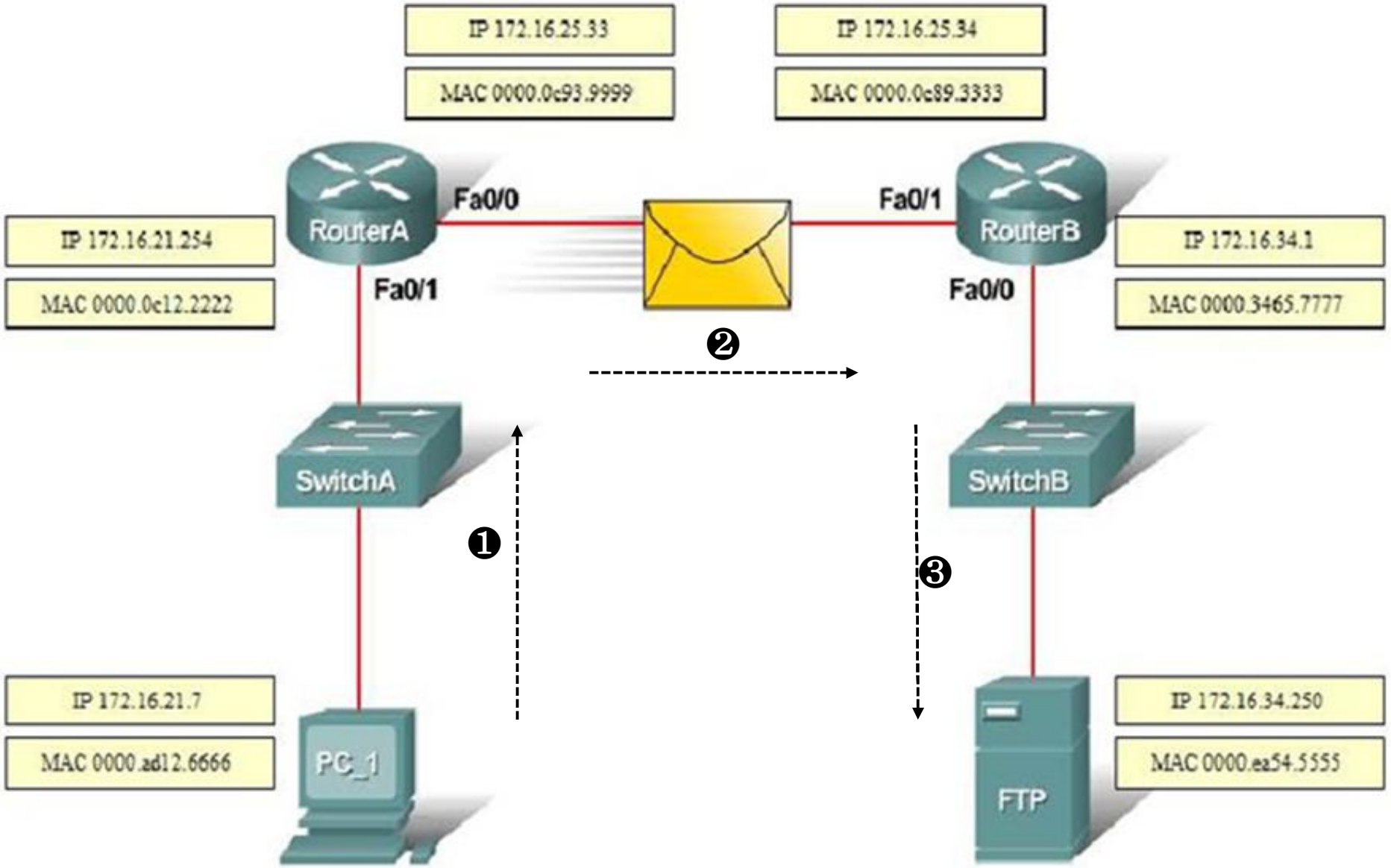
Hub(1계층 장비)



192.168.1.10	192.168.4.10	A.M	D.M
송신지IP	수신지IP	송MAC	수MAC

Media Translation

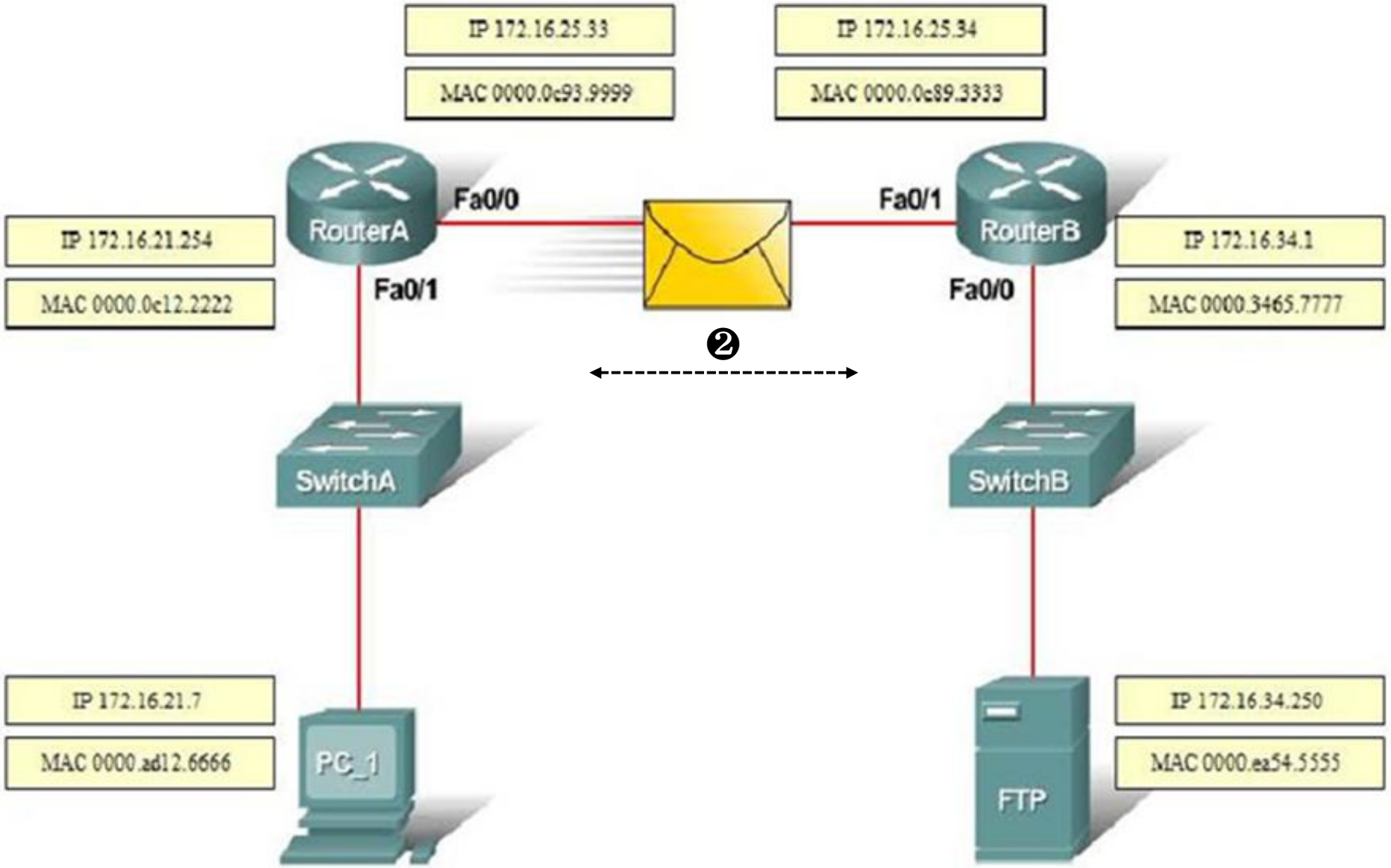
- 3계층 이상의 장비에서 처리
- 패킷이 출발지에서 목적지까지 가는 동안 3계층 장비를 거칠 때마다 L2 헤더 (프레임 헤더) 변경
  - 3계층 주소(IP주소) 변환 없음
  - 2 계층주소는 스위칭 환경에 따라 변환



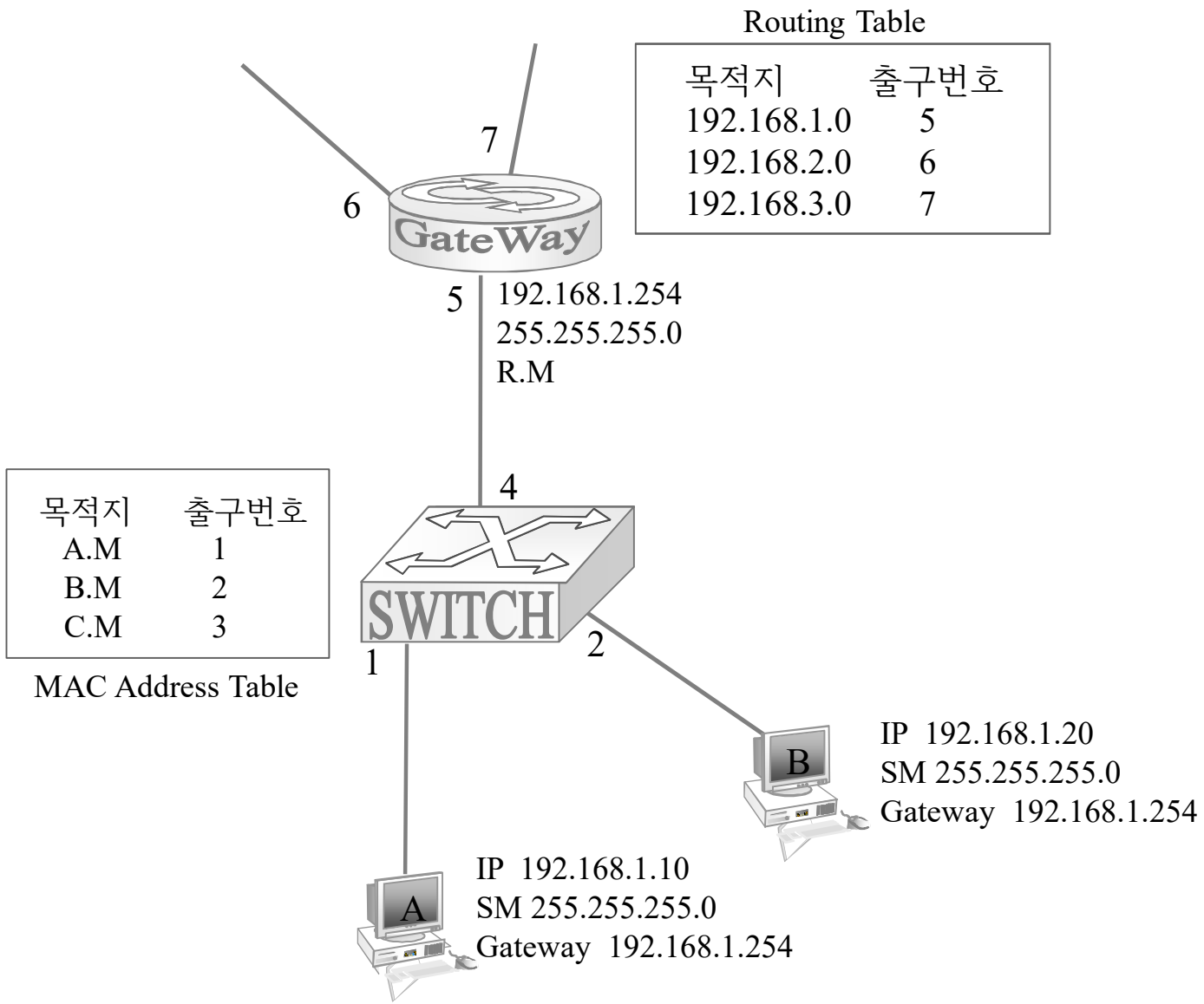
Source MAC	Destination MAC	Source IP	Destination IP

Media Translation

	Source IP	Destination IP	Source MAC	Destination MAC
PC-1 → RA	172.16.21.7	172.16.34.250	6666	2222
RA → RB	172.16.21.7	172.16.34.250	9999	3333
RB →FTP	172.16.21.7	172.16.34.250	7777	5555



Source MAC	Destination MAC	Source IP	Destination IP



192.168.1.10	192.168.5.10	A.M	R.M
송신지IP	수신지IP	송신지MAC	수신지MAC

4) 트래픽 흐름

- 내부망 트래픽 흐름
- 외부망 트래픽 흐름

트래픽 흐름(내부망)

1 단계. DNS를 이용하여 수신지 IP 주소 조회

- DNS 캐시 조회 (c:\> ipconfig /displaydns)
- Hosts.txt 파일 조회 (\windows\system32\drivers\etc\hosts)
- DNS 서버 이용

2 단계. 송신자 서브넷 마스크를 이용하여 수신지가 (내부망/외부망)에 존재하는지 확인

3 단계. 수신지 MAC 주소 조회

- ARP 캐쉬 조회
- ARP Request/Reply 를 이용

4단계. 수신지로 트래픽 전송

트래픽 흐름(외부망)

1 단계. DNS를 이용하여 수신지 IP 주소 조회

- DNS 캐시 조회 (c:\> ipconfig /displaydns)
- Hosts.txt 파일 조회 (windows\system32\drivers\etc\hosts)
- DNS 서버 이용

2 단계. 송신자 서브넷 마스크를 이용하여 수신지가 (내부망/**외부망**)에 존재하는지 확인

3 단계. **GateWay의 MAC 주소 조회**

- ARP 캐쉬 조회
- ARP Request/Reply 전송

4단계. Media Translation 방법으로 수신지로 트래픽 전송