12월 21일 보안 세미나

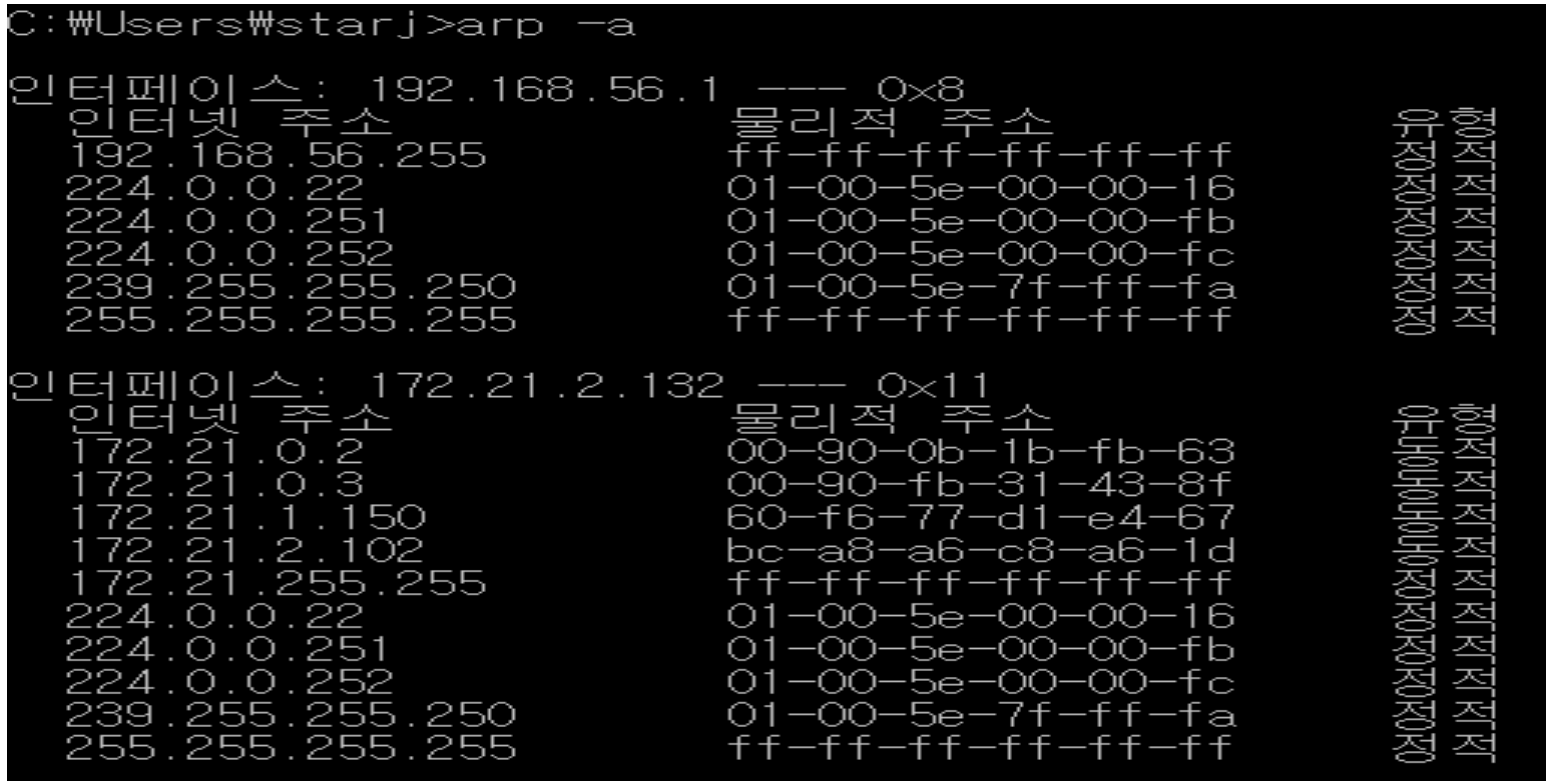
장경배

공공기관 프린터 관리 시스템

ARP Spoofing 공격법

ARP(Adresss Resolution Protocol) : IP주소를 물리적주소(MAC 주소)로 대응 시켜주는 프로토콜

ARP Spoofing : 공격대상에게 잘못된 Mac주소를 보내 테이블을 조작하여 정보를 빼내는 해킹 기법



ARP table

공격 시나리오

중간자공격(MITM)

ARP

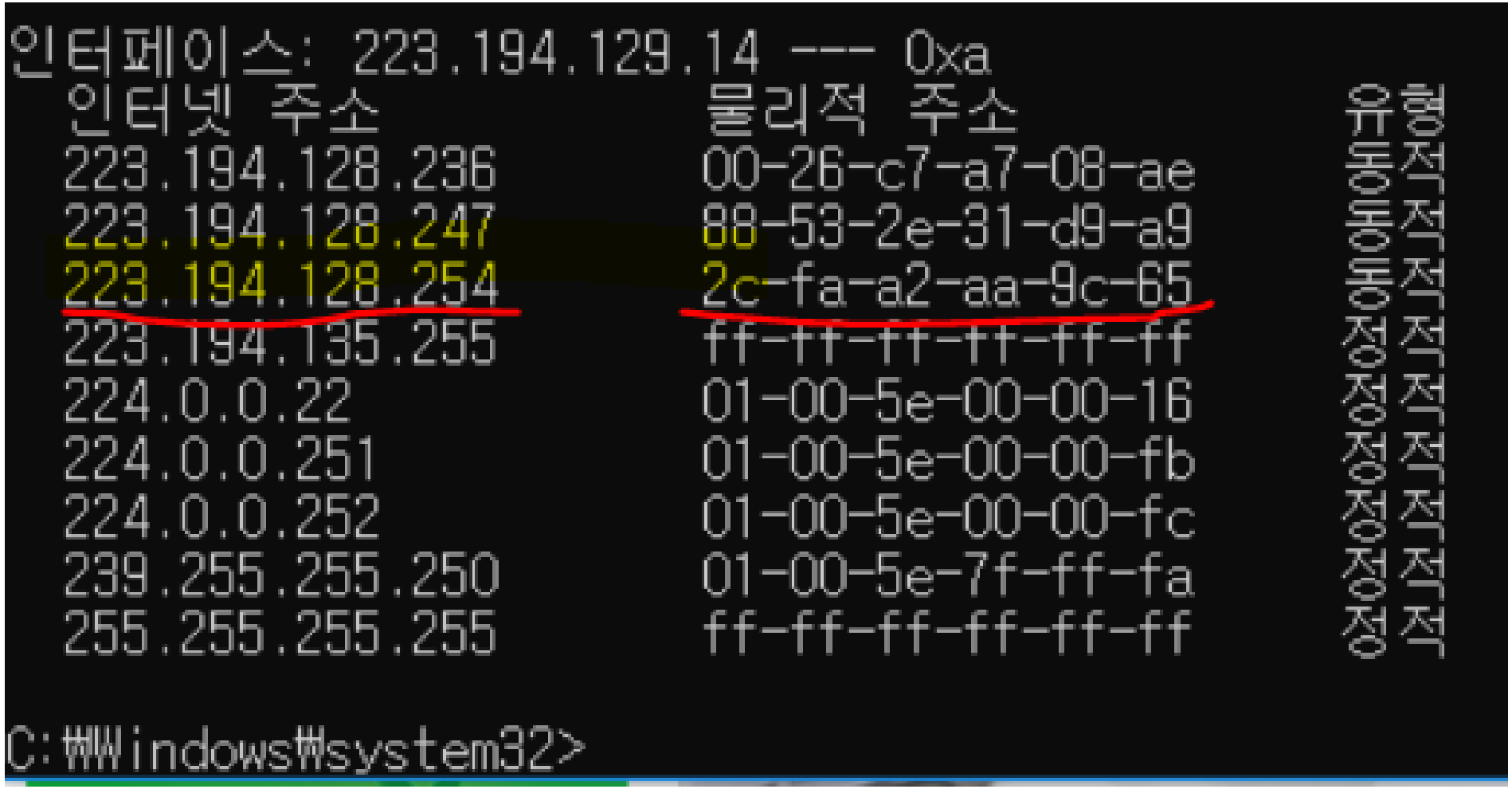
ARP

Printer PC

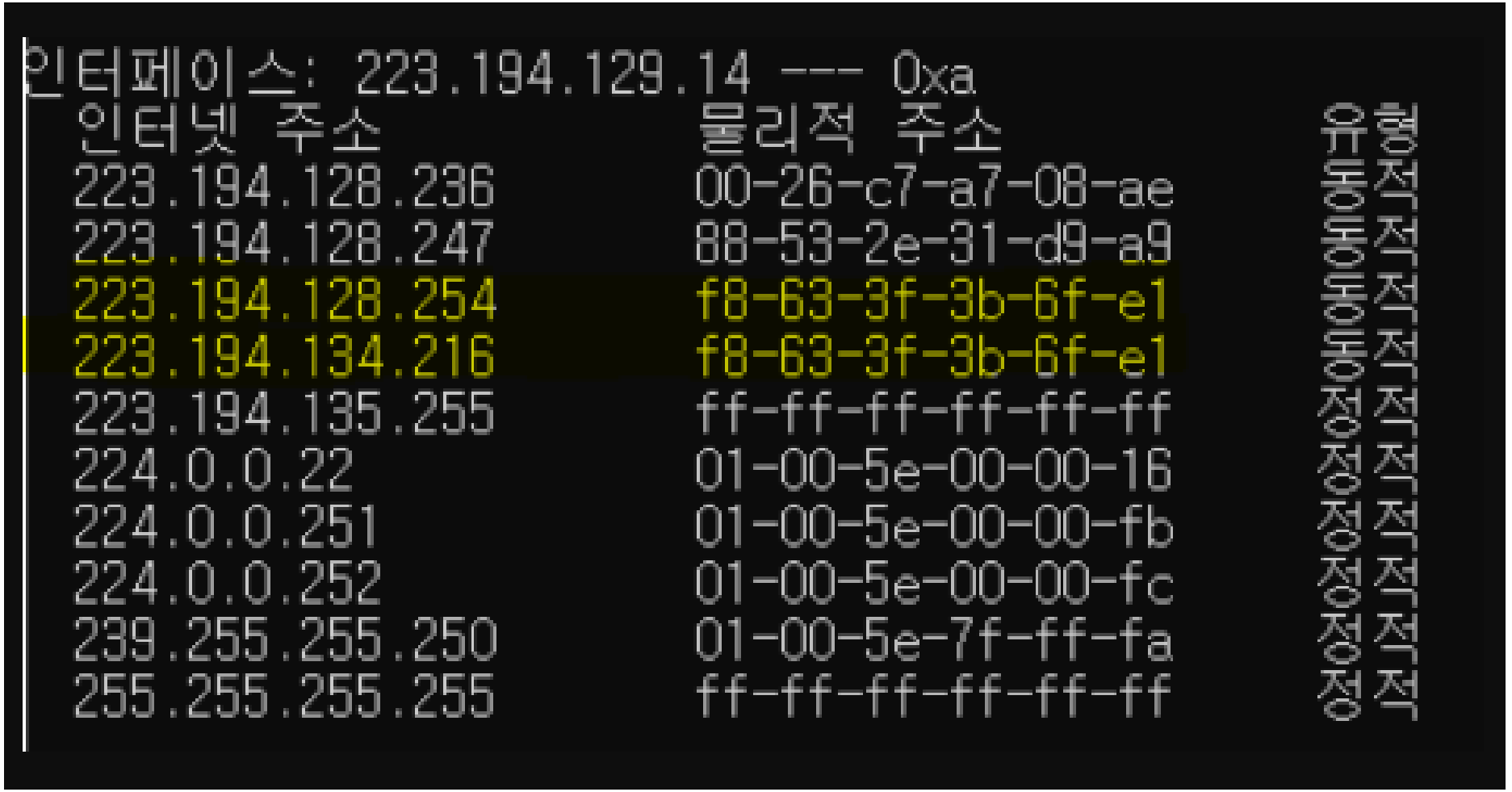
Sniffing

Printer Management Server

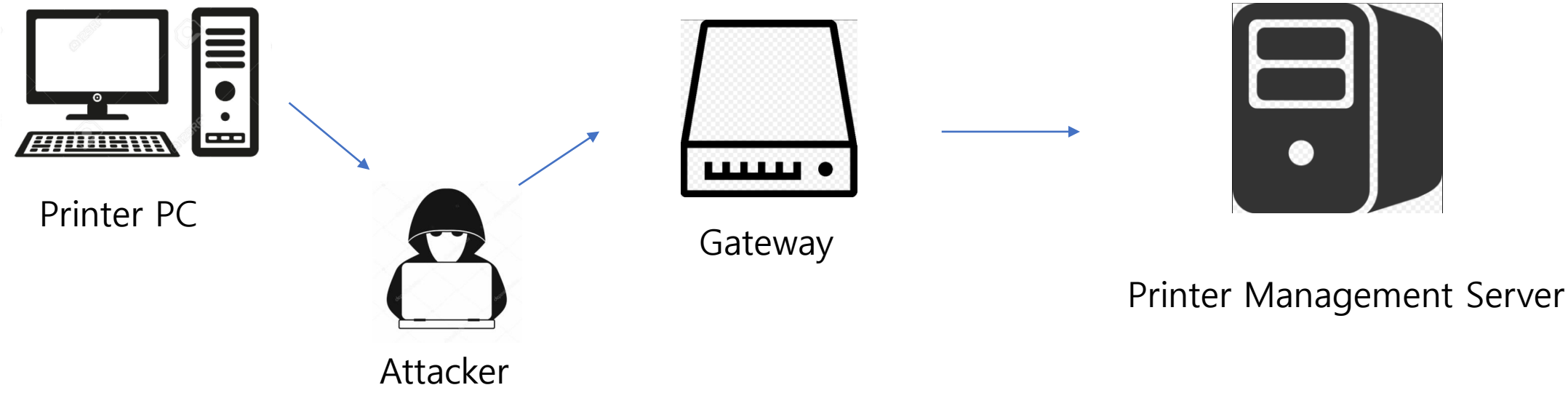
Victim PC 의 ARP table



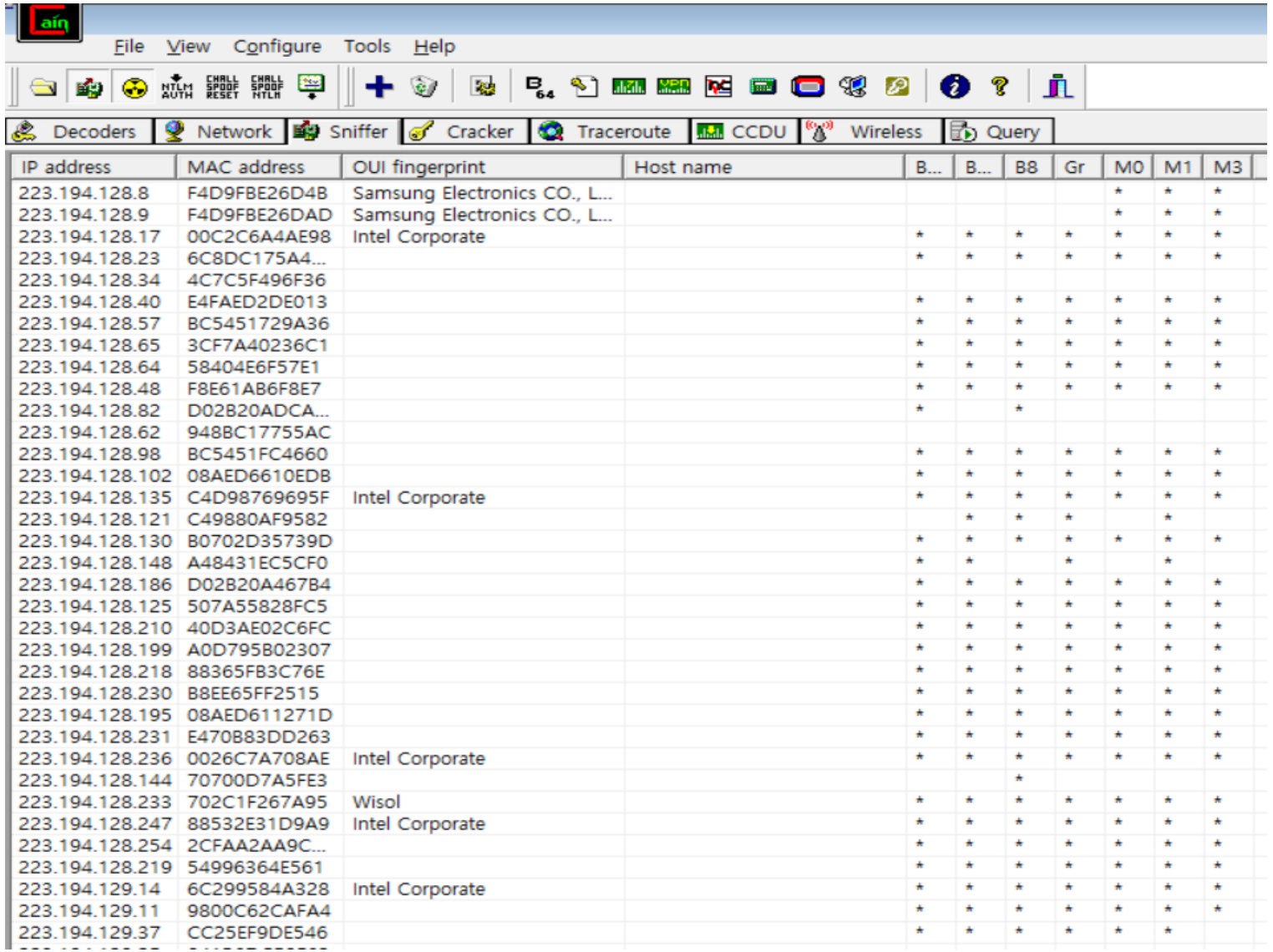
ARP Spoofing 공격을 당한 후



공격 성공 후 통신 모습



Spoofing 과정

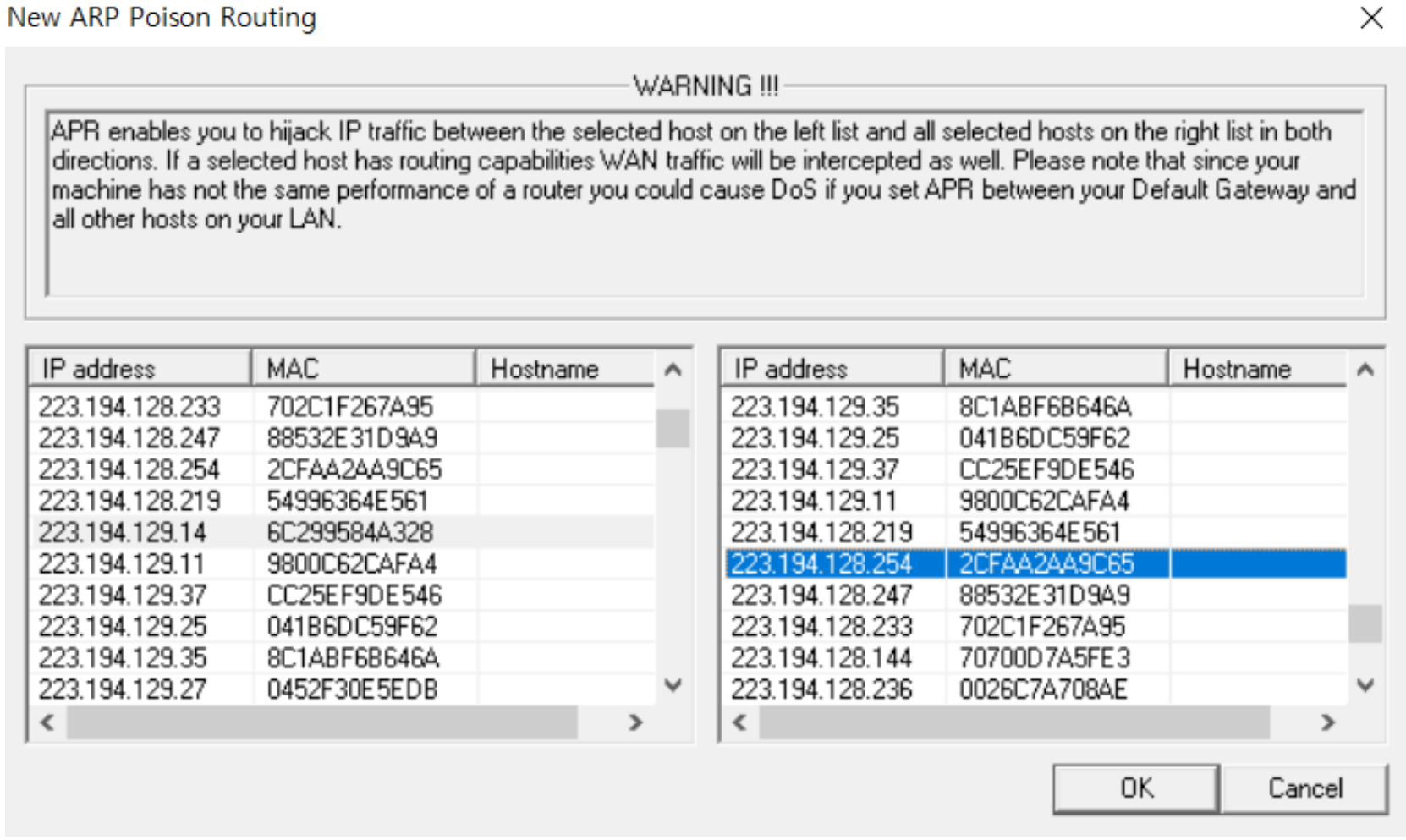


IP address	MAC address	OUI fingerprint	Host name	B...	B...	B8	Gr	M0	M1	M3
223.194.128.8	F4D9FBE26D4B	Samsung Electronics CO., L...						*	*	*
223.194.128.9	F4D9FBE26DAD	Samsung Electronics CO., L...						*	*	*
223.194.128.17	00C2C6A4AE98	Intel Corporate		*	*	*	*	*	*	*
223.194.128.23	6C8DC175A4...			*	*	*	*	*	*	*
223.194.128.34	4C7C5F496F36									
223.194.128.40	E4FAED2DE013			*	*	*	*	*	*	*
223.194.128.57	BC5451729A36			*	*	*	*	*	*	*
223.194.128.65	3CF7A40236C1			*	*	*	*	*	*	*
223.194.128.64	58404E6F57E1			*	*	*	*	*	*	*
223.194.128.48	F8E61AB6F8E7			*	*	*	*	*	*	*
223.194.128.82	D02B20ADCA...			*		*				
223.194.128.62	948BC17755AC									
223.194.128.98	BC5451FC4660			*	*	*	*	*	*	*
223.194.128.102	08AED6610EDB			*	*	*	*	*	*	*
223.194.128.135	C4D98769695F	Intel Corporate		*	*	*	*	*	*	*
223.194.128.121	C49880AF9582				*	*	*		*	
223.194.128.130	B0702D35739D			*	*	*	*	*	*	*
223.194.128.148	A48431EC5CF0			*	*		*		*	
223.194.128.186	D02B20A467B4			*	*	*	*	*	*	*
223.194.128.125	507A55828FC5			*	*	*	*	*	*	*
223.194.128.210	40D3AE02C6FC			*	*	*	*	*	*	*
223.194.128.199	A0D795B02307			*	*	*	*	*	*	*
223.194.128.218	88365FB3C76E			*	*	*	*	*	*	*
223.194.128.230	B8EE65FF2515			*	*	*	*	*	*	*
223.194.128.195	08AED611271D			*	*	*	*	*	*	*
223.194.128.231	E470B83DD263			*	*	*	*	*	*	*
223.194.128.236	0026C7A708AE	Intel Corporate		*	*	*	*	*	*	*
223.194.128.144	70700D7A5FE3					*				
223.194.128.233	702C1F267A95	Wisol		*	*	*	*	*	*	*
223.194.128.247	88532E31D9A9	Intel Corporate		*	*	*	*	*	*	*
223.194.128.254	2CFAA2AA9C...			*	*	*	*	*	*	*
223.194.128.219	54996364E561			*	*	*	*	*	*	*
223.194.129.14	6C299584A328	Intel Corporate		*	*	*	*	*	*	*
223.194.129.11	9800C62CAFA4			*	*	*	*	*	*	*
223.194.129.37	CC25EF9DE546			*	*	*	*	*	*	

네트워크 대역의

ip주소와

Mac 주소 검색



Victim

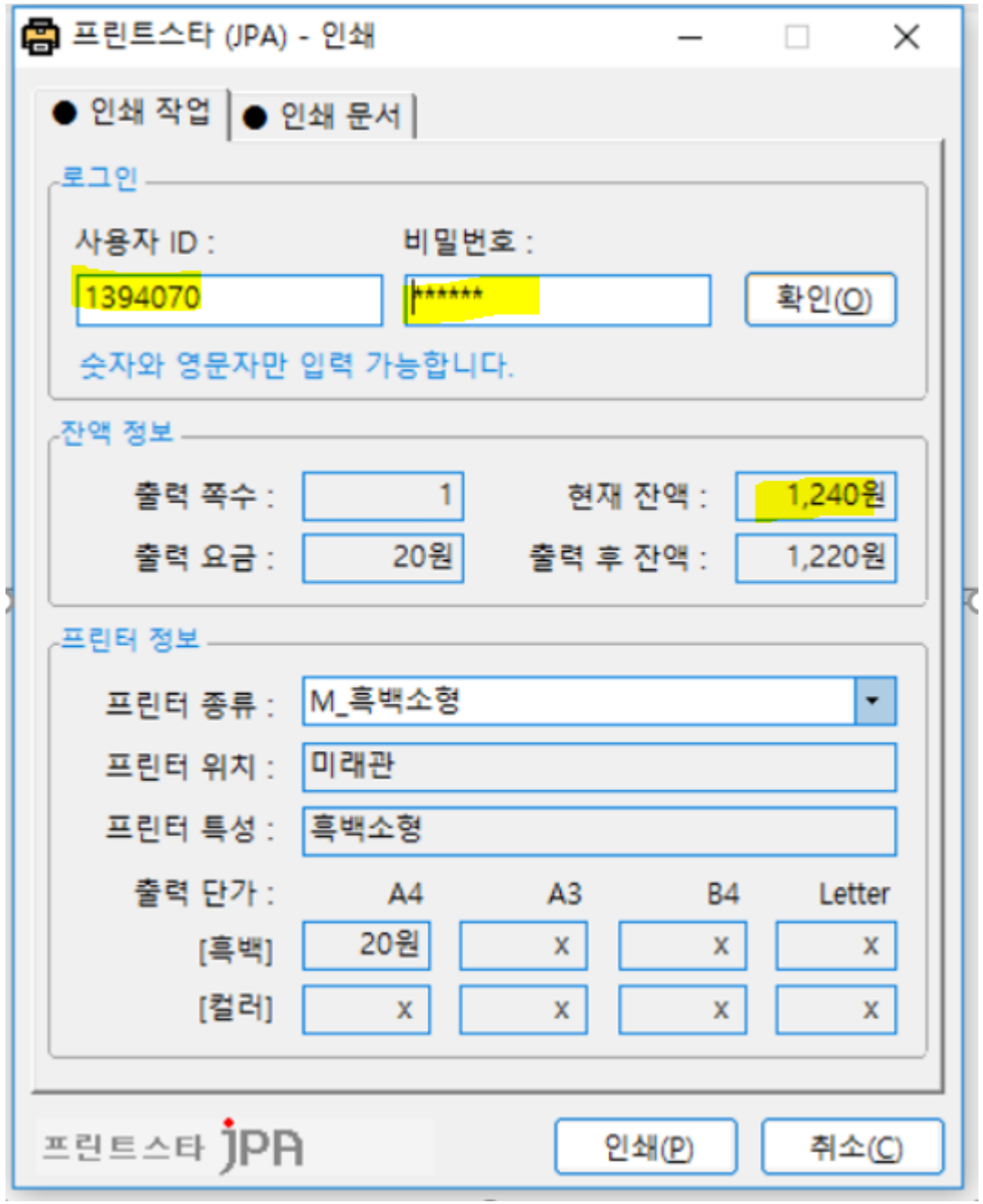
Gateway

3928	180.637479	220.67.228.178	113.198.79.60	TCP	88	62703 → 8891 [PSH, ACK] Seq=1 Ack=1 Win=525568 Len=34
3930	180.667795	113.198.79.60	220.67.228.178	TCP	97	8891 → 62703 [PSH, ACK] Seq=1 Ack=35 Win=525568 Len=43
3931	180.667901	220.67.228.178	113.198.79.60	TCP	54	62703 → 8891 [FIN, ACK] Seq=35 Ack=44 Win=525312 Len=0
3932	180.668244	113.198.79.60	220.67.228.178	TCP	60	8891 → 62703 [ACK] Seq=44 Ack=36 Win=525568 Len=0
3933	180.668245	113.198.79.60	220.67.228.178	TCP	60	8891 → 62703 [FIN, ACK] Seq=44 Ack=36 Win=525568 Len=0
3934	180.668275	220.67.228.178	113.198.79.60	TCP	54	62703 → 8891 [ACK] Seq=36 Ack=45 Win=525312 Len=0

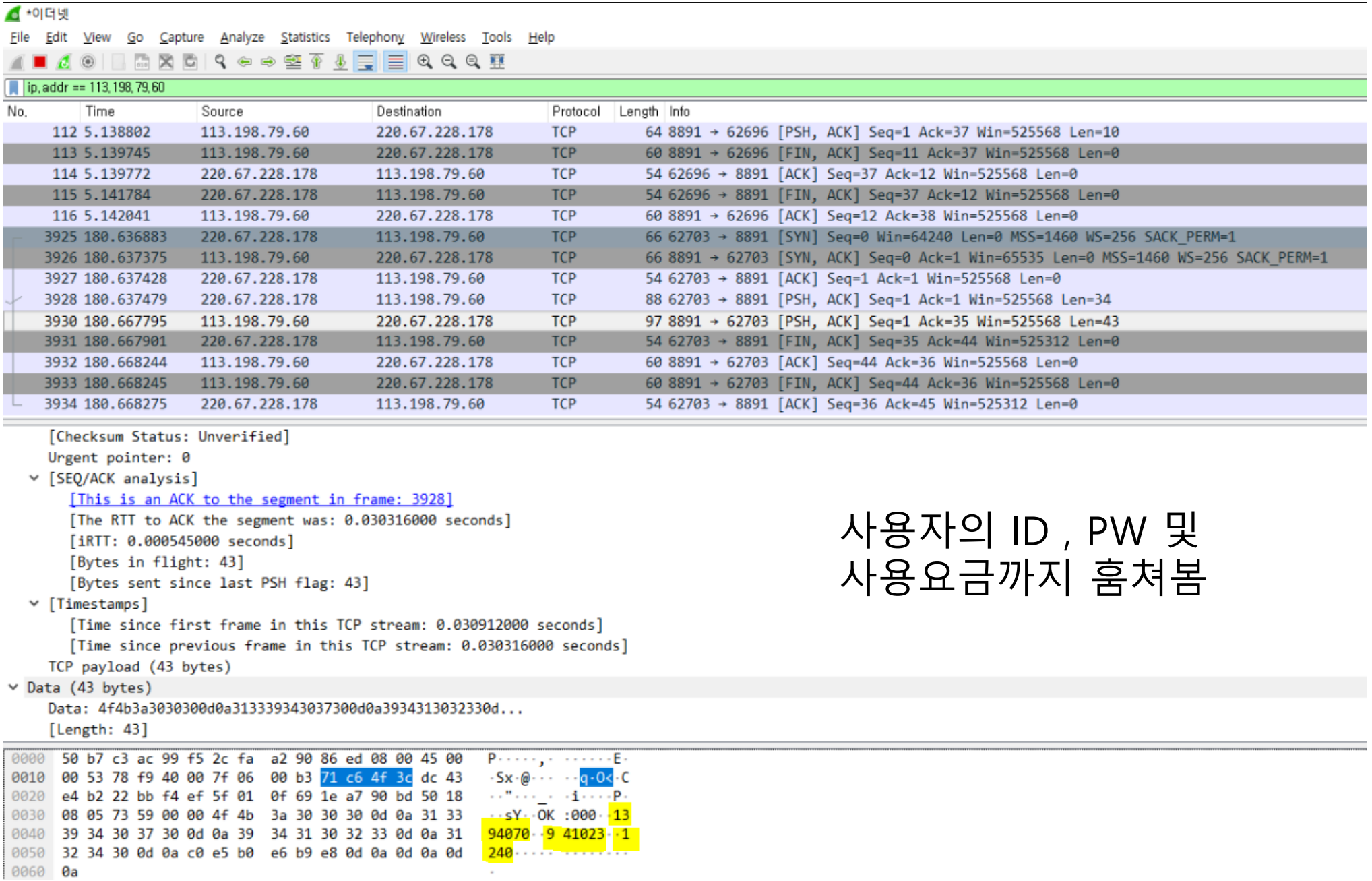
```
    .... .... ...0 = Fin: Not set
    [TCP Flags: ·······AP···]
  Window size value: 2053
  [Calculated window size: 525568]
  [Window size scaling factor: 256]
  Checksum: 0x7524 [unverified]
  [Checksum Status: Unverified]
  Urgent pointer: 0
▾ [SEQ/ACK analysis]
    [iRTT: 0.000545000 seconds]
    [Bytes in flight: 34]
    [Bytes sent since last PSH flag: 34]
▾ [Timestamps]
    [Time since first frame in this TCP stream: 0.000596000 seconds]
    [Time since previous frame in this TCP stream: 0.000051000 seconds]
```

```
0000  2c fa a2 90 86 ed 50 b7  c3 ac 99 f5 08 00 45 00   ,·····P· ·····E·
0010  00 4a 0c 50 40 00 80 06  6c 65 dc 43 e4 b2 71 c6   ·J·P@··· le·C··q·
0020  4f 3c f4 ef 22 bb 1e a7  90 9b 5f 01 0f 69 50 18   O<··"··· ··_··iP·
0030  08 05 75 24 00 00 47 45  54 55 53 45 52 49 4e 46   ··u$··GE TUSERINF
0040  4f 33 0d 0a 30 0d 0a 31  33 39 34 30 37 30 0d 0a   O3··0··1 394070··
0050  39 34 31 30 32 33 0d 0a                           941023··
```

Printer PC 의 통신패킷을 공격자의 PC에서
훔쳐볼 수 있게 된다.


프린트스타 (JPA) - 인쇄
인쇄 작업
인쇄 문서
로그인
사용자 ID :
비밀번호 :
1394070
******
확인(O)
숫자와 영문자만 입력 가능합니다.
잔액 정보
출력 폭수 :
1
현재 잔액 :
1,240원
출력 요금 :
20원
출력 후 잔액 :
1,220원
프린터 정보
프린터 종류 :
M_흑백소형
프린터 위치 :
미래관
프린터 특성 :
흑백소형
출력 단가 :
A4
A3
B4
Letter
[흑백]
20원
x
x
x
[컬러]
x
x
x
x
프린트스타 JPA
인쇄(P)
취소(C)

미래관 프린터실 로그인



사용자의 ID , PW 및
사용요금까지 훔쳐봄

DBpia

공공기관 프린터 관리 시스템의 취약점 분석

Vulnerability Analysis of Printer Management System in Public Institutions

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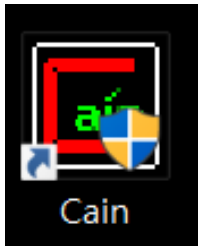

Cain & Abel

WIRESHARK

Wireshark

End