**📡 Wi-Fi Protocols & PSK – Hacking 101**

**🔌 What Are Wi-Fi Protocols?**

Wi-Fi protocols are **standards** that define **how wireless networks work**. They control **speed**, **range**, and **security**.

**📶 Common Wi-Fi Protocols**

| **Protocol** | **Speed** | **Frequency** | **Notes** |
| --- | --- | --- | --- |
| **802.11a** | Up to 54 Mbps | 5 GHz | Faster but short range |
| **802.11b** | Up to 11 Mbps | 2.4 GHz | Slower, long range |
| **802.11g** | Up to 54 Mbps | 2.4 GHz | Compatible with b |
| **802.11n** | Up to 600 Mbps | 2.4 / 5 GHz | More range, better performance |
| **802.11ac** | Up to 1 Gbps+ | 5 GHz | Used in most modern routers |
| **802.11ax (Wi-Fi 6)** | Up to 10 Gbps | 2.4 / 5 / 6 GHz | Fastest and best for many devices |

**🔐 What is PSK (Pre-Shared Key)?**

**PSK = Wi-Fi Password**  
It’s used to secure Wi-Fi using encryption. You enter it to connect to a network.

**🛡️ Types of Wi-Fi Security with PSK**

| **Security** | **Description** | **Is It Secure?** |
| --- | --- | --- |
| **WEP** (Wired Equivalent Privacy) | Old, easy to crack | ❌ No |
| **WPA** (Wi-Fi Protected Access) | Temporary fix for WEP | ❌ Weak |
| **WPA2-PSK** | Industry standard for years | ✅ Strong |
| **WPA3-PSK** | Latest version | ✅✅ Very strong |

**💣 Hacking Relevance**

| **Technique** | **What It Does** |
| --- | --- |
| **WEP Cracking** | Very easy using tools like aircrack-ng |
| **WPA/WPA2 Handshake Capture** | Capture 4-way handshake, then brute force or use wordlist |
| **PMKID Attack** | Newer attack that doesn't need full handshake |
| **Evil Twin Attack** | Clone a Wi-Fi network to steal passwords |

**🧪 Example Tool: aircrack-ng**

**Goal:** Crack WPA2 Wi-Fi PSK

# Put Wi-Fi card in monitor mode

airmon-ng start wlan0

# Scan networks

airodump-ng wlan0mon

# Capture handshake

airodump-ng -c [channel] --bssid [router\_mac] -w capture wlan0mon

# Crack it

aircrack-ng capture.cap -w wordlist.txt

**💡 Summary**

* Wi-Fi protocols = rules for how wireless communication works.
* PSK = password used for securing Wi-Fi.
* WEP is outdated and crackable.
* WPA2 and WPA3 are secure (but not invincible).
* As a hacker, you must understand how to **analyze** and **test** these protocols.