Introduction to Security

AP Cybersecurity ▪ Unit 1

AP Cybersecurity

What we will cover

1. Social engineering
2. Password attacks & authentication
3. Adversaries & public networks
4. AI-based attacks
5. AI in cyber defence

The weakest part is the human

Social engineering 社会工程学 tricks people into breaking security. The **adversary** 对手 does not break the code – only the person.

> The goal is **elicitation** 套取信息 – getting sensitive information out of someone without them realising.

Security key supports the idea on this slide

Two feelings the adversary leans on

Intimidation 恐吓

a threatened bad result – fear pushes you to act

Urgency 紧迫感

an invented deadline – when rushed, we stop thinking

Security token supports the idea on this slide

Worked example – naming the tactics

A phishing email

"Over 90% of staff have already verified their account – confirm yours in the next hour or lose payroll access." Two tactics are stacked: "in the next hour" → urgency
"over 90% of staff have already" → consensus

Naming each tactic – not just calling the email "suspicious" – is exactly what an exam answer needs.

The impact on a victim

Personal details

name, address, pet, birthday – later used to answer **challenge questions** 安全问题 and **impersonate** 冒充 them

A one-time password 一次性密码

handed over – the adversary logs in as them

Malware 恶意软件

downloaded – it steals data from the browser

Password attacks – the warning signs

In an online **password attack** 密码攻击 the adversary tries passwords against a real login page. The logs show it:

- many failed logins in a short time
- attempts at unusual hours
- attempts from unknown devices

> Adversaries succeed because people choose **weak** 弱 passwords: a word + a two-digit year + a symbol (`Summer24!`), or a pet's name.

Those patterns are so common that a **dictionary** 字典 of likely passwords can be built from facts about you and tried automatically.

Making authentication stronger

Long, random, unique

a **password manager** 密码管理器 generates and stores them

No meaning

avoid names, dates and meaningful words

MFA 多因素身份验证

extra proof on top of the password

> For "how would you make authentication stronger?", MFA is almost always part of the answer – plus long, unique passwords from a manager.

Know your adversary

Adversaries differ by skill:

Low-skilled – buy ready-made tools, reuse known **exploits** 漏洞利用

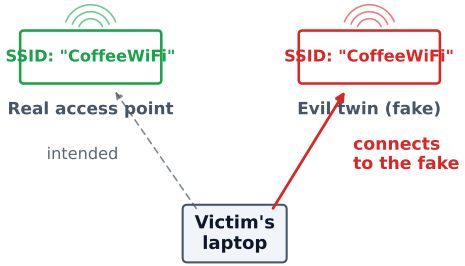
High-skilled – write their own tools, find brand-new **zero days** 零日漏洞

Their **motivation** 动机 varies too: greed, revenge, politics, or belief.

When ranking risks: high risk = high impact AND easy to exploit. A parking-lot Wi-Fi leak matters less than an open internal port.

Three wireless attacks

- **Evil twin** 双胞胎恶意热点 – a fake **access point** 接入点 copying the real **SSID** 服务集标识符
- **Jamming** 干扰攻击 – flooding the air so nobody can connect: a **denial of service** 拒绝服务
- **War driving** 战争驾驶 – driving around detecting networks and where signal leaks outside



Adversary reads unencrypted traffic — but HTTPS stays safe.

a copied SSID captures the victim

Encryption still protects you on an evil twin: the adversary sees your traffic but cannot read HTTPS. Say what is exposed – not just "it's unsafe".

Protecting yourself on public networks

Check the network name matches exactly the one you intend to join

Prefer **encrypted** 加密的 sites – HTTPS stays unreadable

Consider a **VPN** 虚拟专用网络 – it encrypts all traffic to the operator

AI-based attacks

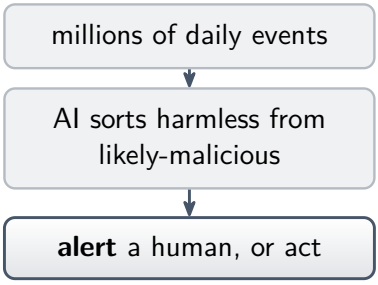
- a **deepfake** 深度伪造 avatar impersonates someone on a call
- **LLMs** 大语言模型 write **phishing** 钓鱼 emails in perfect language – removing the clumsy wording that once gave scams away
- back-end: prompts that pull secret data out of an LLM, poisoning training data, scanning for targets, writing malware

> Defences: agree a **shared secret** 共享秘密 word with close contacts; enable MFA (a cloned voice alone cannot log in); never type sensitive data into a chatbot; double-check AI output against non-AI sources.

AI in cyber defence – the same tool, the other side

AI can review firewall rules and access settings and recommend safer options – though a human expert must always check before applying.

Its biggest advantage is scale: a medium network makes millions of events a day, far too many for people to read.



AI is dual-use: the same tool appears on both the attack and the defence side. Read the question carefully to see which side it asks about.

Unit 1 – key takeaways

1 Name the tactic

urgency, consensus, intimidation – not just “suspicious”

2 Authentication

long, unique, from a manager – plus MFA

3 Evil twin

a copied SSID; HTTPS still cannot be read

4 AI is dual-use

the same tool attacks and defends – which side is asked?

Check yourself

1. "Reply within the hour" – name the tactic.
2. On an evil twin, can the adversary read your HTTPS traffic?
3. What makes a risk HIGH?
4. Name one defence against a cloned-voice call.

Answers **1.** urgency **2.** no – it stays encrypted **3.** high impact AND easy to exploit **4.** a shared secret word, or MFA