

Introduction to Security

AP Cybersecurity ■ Unit 1

AP Cybersecurity



Introduction to Security

What we will cover

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

1 Social engineering

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└ Social engineering

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

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└ Social engineering

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

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└ Social engineering

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 **imperson-
ate** 冒充 them

**A one-time pass-
word** 一次性密码
handed over – the ad-
versary logs in as them

Malware 恶意软件
downloaded – it steals
data from the browser

2 Passwords

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, ran-
dom, unique**
a **password man-
ager** 密码管理器 gen-
erates 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.

Making an account hard to take

**Multifactor authenti-
cation** Multifactor authentication (MFA) beats any password policy: the attacker needs the second factor as well.

One-time password A one-time password (OTP) from an app is safer than one by SMS, which a SIM swap can intercept.

VPN A **virtual private network (VPN)** encrypts traffic to its exit point – useful on an untrusted network, and no protection against a phishing page.

What is coming Large language models (LLMs) write fluent phishing in any language, so the spelling mistakes people were taught to look for are gone.

A **denial of service (DoS)** attacks availability rather than secrecy – the third leg of the CIA triad, and the one most often forgotten.

3 Public networks

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└ Public networks

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.

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└ Public networks

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

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Three wireless attacks, in detail

Adversary ready: unencrypted traffic – but HTTPS stays safe.
All Cybersecurity 101 – evil twin attack: fake AP copies the real SSID.

a copied SSID captures the victim

An evil-twin access point copies the real network's name so victims connect to the attacker

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└ Public networks

Protecting yourself on public networks

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

Prefer **en-crypted** 加密的 sites – HTTPS stays unreadable

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

4 AI

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└ AI

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

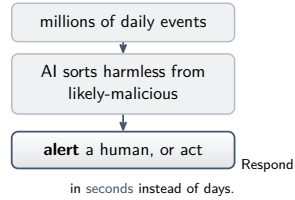
Defences: agree a **shared secret** 共享秘密 word with close contacts; enable MFA (a cloned voice alone cannot log in); never type sensitive data into a chatbot; double-check AI output against non-AI sources.

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.

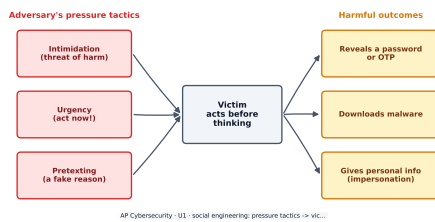


Suspicious Website Logins

A **password attack** 密码攻击 is any attempt to log in using guessed or stolen passwords.

- many failed logins in a short time,
- login attempts at unusual hours,
- login attempts from unknown devices.
- Create passwords that are **long, random, and unique** - a **password manager** 密码管理器 can generate and store them for you.

Understanding Social Engineering



AP Cybersecurity - U1 - social engineering: pressure tactics -> vic...

Social engineering uses psychological pressure to make a victim act before they think

Exam tips

- When a question asks you to rank risks, remember **high risk = high impact AND easy to exploit**. A parking-lot Wi-Fi leak matters less than an **open internal port that lets an adversary spoof a device**.
- Learn the social-engineering tactics by name - **intimidation, urgency, pretexting, authority, consensus, scarcity, familiarity** - and be ready to spot which one an email is using.
- **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".
- For "how to make authentication stronger", **MFA** is almost always part of the answer, plus long/unique passwords from a manager.
- AI is **dual-use**: the same tool (LLMs, code analysis) appears on both the attack and the defense side. Read the question carefully to see which side it asks about.

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Recap

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