

Introduction to Security

AP Cybersecurity ■ Unit 1

AP Cybersecurity



What we will cover

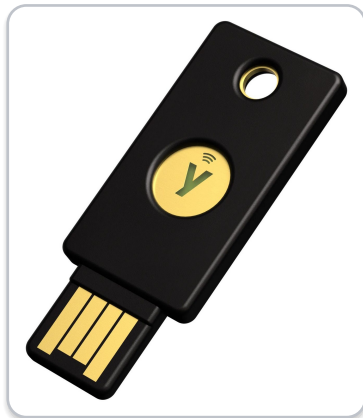
- 1 Social engineering
- 2 Password attacks & authentication
- 3 Adversaries & public networks
- 4 AI-based attacks
- 5 AI in cyber defence



The weakest part is the human

Social engineering tricks people into breaking security. The **adversary** does not break the **code** – only the **person**.

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



Security key

Two feelings the adversary leans on

Intimidation

a threatened bad result
– fear pushes you to act

Urgency

an invented deadline – when
rushed, we stop thinking



Security token

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 and
impersonate them

A one-time password

handed over – the ad-
versary logs in as **them**

Malware

downloaded – it steals
data from the browser



Password attacks – the warning signs

In an **online password attack** 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** passwords: a word + a two-digit year + a symbol (Summer24!), or a pet's name.

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

Making authentication stronger

Long, random, unique
a **password manager** generates and stores them

No meaning
avoid names, dates and meaningful words

MFA
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 authentication

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.



Know your adversary

Adversaries differ by *skill*:

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

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

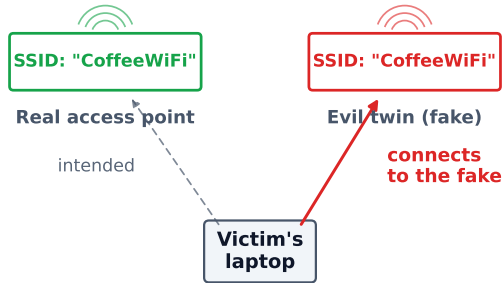
Their **motivation** varies too: greed, revenge, politics, or belief.

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** – a fake **access point** copying the real **SSID**
- **Jamming** – flooding the air so nobody can connect: a **denial of service**
- **War driving** – driving around detecting networks and where signal leaks outside

Three wireless attacks, in detail



Adversary reads unencrypted traffic — but HTTPS stays safe.
AP Cybersecurity · U1 · 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

Protecting yourself on public networks

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

Prefer **encrypted**
sites – HTTPS
stays unreadable

Consider a **VPN**
– it encrypts *all*
traffic to the operator



AI-based attacks

- a **deepfake** avatar impersonates someone on a call
- **LLMs** write **phishing** 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** 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** 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** can generate and store them for you.

Understanding Social Engineering

Adversary's pressure tactics

**Intimidation
(threat of harm)**

**Urgency
(act now!)**

**Pretexting
(a fake reason)**

**Victim
acts before
thinking**

Harmful outcomes

**Reveals a password
or OTP**

Downloads malware

**Gives personal info
(impersonation)**

AP Cybersecurity · U1 · social engineering: pressure tactics -> victim action

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.



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