

The Internet and its Uses

IGCSE Computer Science • Topic 5

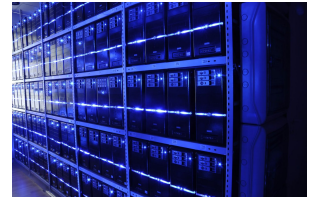
IGCSE Computer Science



The Internet and its Uses

What we will cover

- 1 Internet vs the web
- 2 URL & the browser
- 3 How a page reaches you
- 4 Cookies & blockchain
- 5 Cyber threats
- 6 Keeping data safe

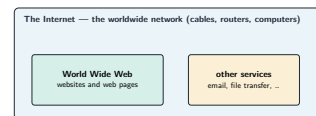


1 Web basics

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Web basics

Internet vs the world wide web



- The **internet** 互联网 is the **infrastructure** 基础设施 – the huge worldwide network of computers and the cables, routers and connections that join them.
- The **world wide web** 万维网 (WWW) is a collection of **websites** 网站 and web pages that you view using the internet.

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Web basics

URL and the browser

`https:// www.example.com /index.html`

protocol domain name path to the page on the server

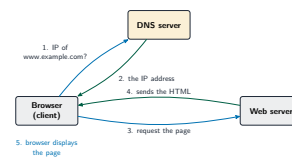
the parts of a URL

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Web basics

How a web page reaches you



- 1 a URL is a **name**, not a number
- 2 the browser asks a **DNS** 域名服务 for the IP
- 3 the DNS returns the **IP address**
- 4 the browser contacts the **web server** 网络服务器
- 5 the server sends back the HTML
- 6 the browser renders the page

DNS is the internet's phone book – name in, IP address out.

2 Data and trust

Cookies

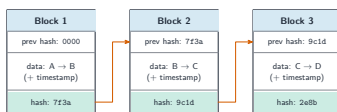
	session	persistent
kept on close?	no	yes
used for	basket, short-term	remembering you between visits

A **cookie** 网络跟踪器 is a small text file a site stores on your device to remember things – logins, preferences, basket contents.

Session cookies die when you close the browser; **persistent** ones survive to recognise you next time.

Blockchain

each block stores the previous block's hash



A **blockchain** 区块链 is a shared **digital ledger** 数字账本 of every transaction. Each block holds the data, a **timestamp** 时间戳, a **hash** 哈希值, and the **hash of the block before**.

Change one old block and its hash changes – breaking every block after it. That chained hash is what makes tampering **obvious**.

3 Security

Cyber threats

brute force 暴力破解
try many passwords
fast until one works

data interception 数据拦截
"listen in" to steal data in transit

DDoS 分布式拒绝服务
flood a server until it cannot respond

malware 恶意软件
virus, worm, Trojan, spyware, ransomware

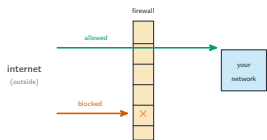
phishing / social engineering – trick a person into giving up secrets

Malware – know the differences

virus attaches to a file; spreads when opened
worm spreads over a network **on its own**
Trojan pretends to be useful software
spyware secretly records what you do
ransomware locks files, demands payment

The key distinction: a **worm** needs no file and no user action – it copies itself across the network. A **virus** needs a file to be opened.

Keeping data safe



- **firewall** 防火墙: checks traffic in/out, blocks the disallowed
- **authentication** 身份验证: password, **biometrics** 生物识别, two-step
- **access levels** 访问权限: see only what you need
- anti-malware, updates, **proxy server** 代理服务器

Against **phishing** the defence is a person: check the spelling, the urgent tone, and the real **URL** behind a link.

4

Recap

Topic 5 – key takeaways

1 Net vs web

internet is the network; web runs on it

2 DNS

name in, IP address out

3 Blockchain

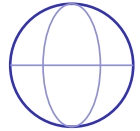
chained hashes make tampering obvious

4 Safety

firewall, authentication, access levels

Check yourself

- 1 What does a DNS turn a URL into?
- 2 Which malware spreads with no user action?
- 3 Which cookie survives closing the browser?
- 4 What checks traffic in and out of a network?



Answers 1. an IP address 2. a worm 3. persistent 4. a firewall