The Internet and its Uses

IGCSE Computer Science ▪ Topic 5

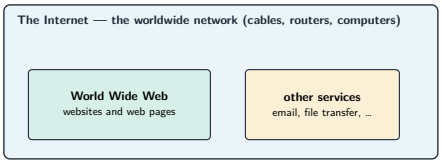
IGCSE Computer Science

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

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.

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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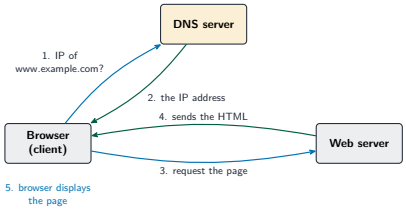
How a web page reaches you



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

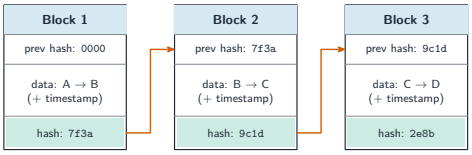
	session	**persistent**
kept on close?	no	yes
used for	basket, short-term	remembering you between visits

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

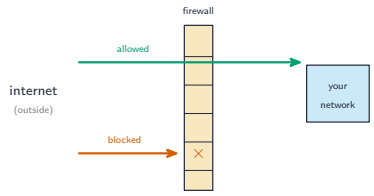
phishing / social engineering – trick a person into giving up secrets

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

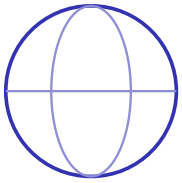
chained hashes make tampering obvious

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