A brief guide to Passwords and Internet Security

Mendlesham Computer Club

By Giles Godart-Brown

My Public Digital Footprint

- Here is what ChatGPT knows about me;

📌 **Professional Background (Technology/Telecoms)**

- **Giles Godart-Brown** is a figure associated with **British Sky Broadcasting (BSkyB)**, where he served in roles related to research, development and standards (often referenced as *research programme manager* or *R&D programme manager*). EDN+1
- In that capacity, he commented publicly on technical issues such as **broadcast copy protection technologies** and spoke at industry events like those about **copy protection models for digital television.**
- He has also been quoted regarding **Sky's HDTV decoder strategies** and the rollout of high-definition broadcast technologies, indicating involvement in technology planning and partnerships.

📌 **Industry Involvement**

- He has appeared in profiles related to **technology standards events** (e.g., TPAC — a technical working/standards gathering), suggesting participation in broader technical and standards communities. W3C

📌 **Local / Community Activity**

- A *Giles Godart-Brown* (likely the same name) is listed as a **contact for the Mendlesham Computer Club** in Suffolk, UK. Mendlesham Parish Council

Does your digital footprint matter?

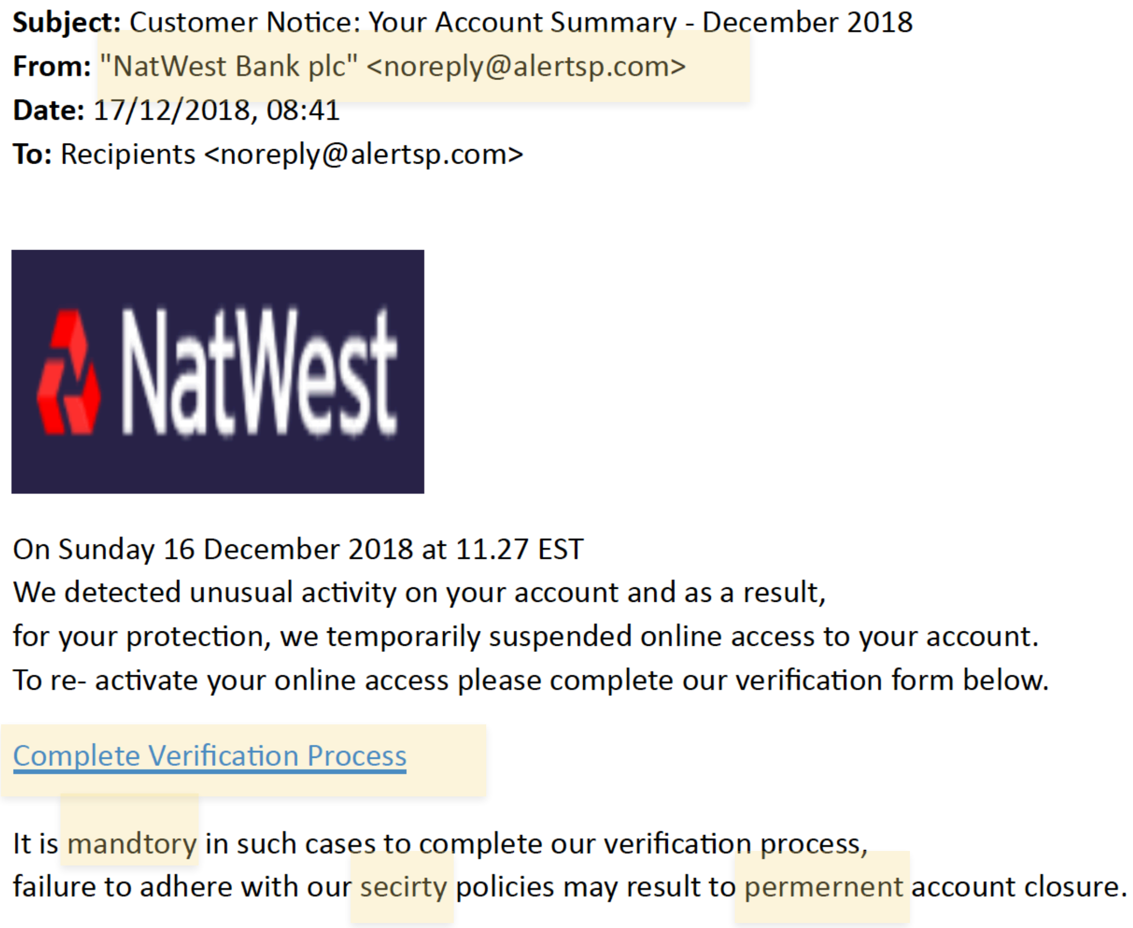
- In addition to our Public Footprint we have a bigger Private one, every time we visit a web page or use social media we leave a footprint, but does this really matter?
- NO - Its very useful that you don’t have to log-in every time you access a web page, however if it does get compromised, then the consequences can be very bad.
- Anti-virus software helps, but cannot save us from ourselves
- Common scams that target your digital footprint:
  - Fake emails & texts. e.g.
    - Delivery messages.
    - Prize or lottery scams.
  - Social Media.

Phishing and Smishing

Mendlesham Computer Club

By Giles Godart-Brown

How to spot a scam in an email



Subject: Customer Notice: Your Account Summary - December 2018
From: "NatWest Bank plc" <noreply@alertsp.com>
Date: 17/12/2018, 08:41
To: Recipients <noreply@alertsp.com>

On Sunday 16 December 2018 at 11.27 EST
We detected unusual activity on your account and as a result,
for your protection, we temporarily suspended online access to your account.
To re- activate your online access please complete our verification form below.

Complete Verification Process

It is mandtory in such cases to complete our verification process,
failure to adhere with our secirty policies may result to permernent account closure.

- Content:
  - What is it about?
  - Is it urgent or threatening.
  - Does it ask for money or details.
  - Bad spelling and grammar.
- Sender.
- Links.

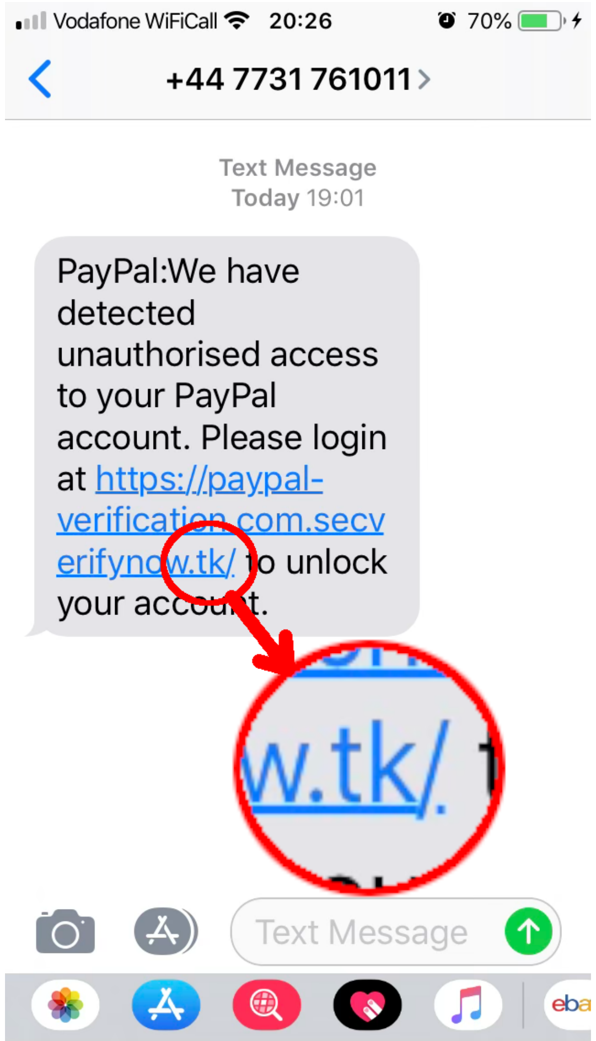
http://antiquecarriages.com/images/smilies/zzoundt.php

- If in any doubt - Delete (and report).

What to do if you get a phishing email

- Do not click on any links or attachments, go direct to the company’s official web site first.
- Never call a number on an email, check first with the company’s official web site.
- Report it to the National Fraud and Cyber Crime Centre, Action Fraud by calling 0300 123 2040 or report it online on https://www.actionfraud.police.uk/

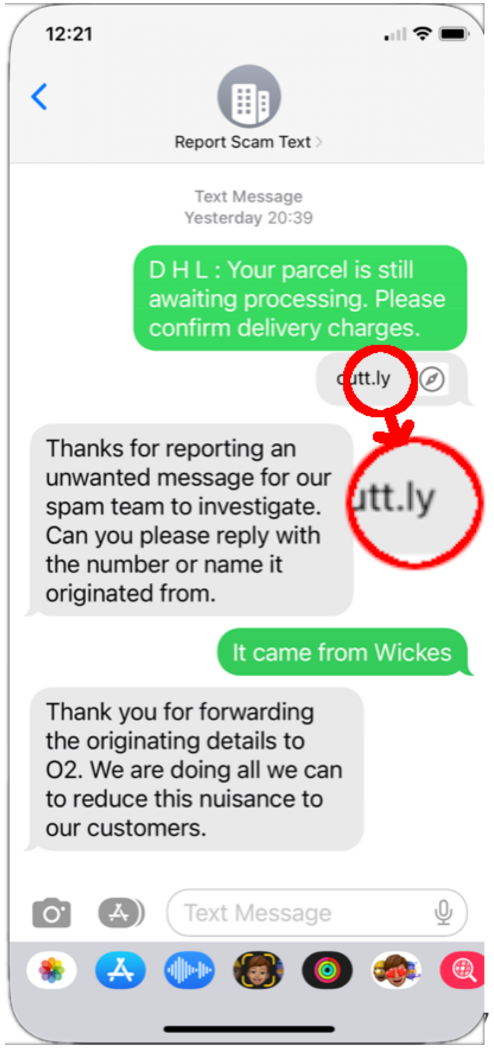
How to spot a scam in a text (smishing)



+44 7731 761011

Text Message
Today 19:01

PayPal:We have detected unauthorised access to your PayPal account. Please login at https://paypal-verification.com.secverifynow.tk/ to unlock your account.



Report Scam Text

Text Message
Yesterday 20:39

D H L : Your parcel is still awaiting processing. Please confirm delivery charges.

cutt.ly

Thanks for reporting an unwanted message for our spam team to investigate. Can you please reply with the number or name it originated from.

It came from Wickes

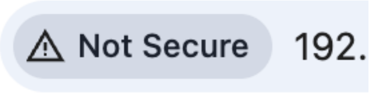
Thank you for forwarding the originating details to O2. We are doing all we can to reduce this nuisance to our customers.

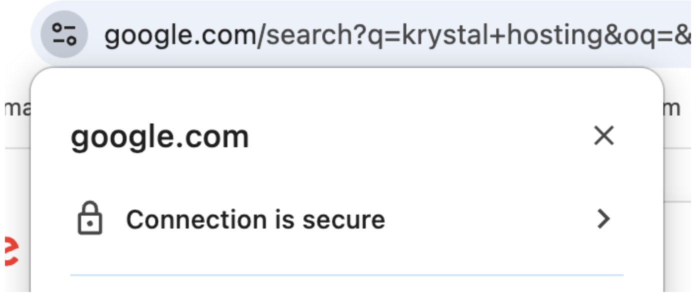
If you suspect a text is a scam, DO NOT CLICK on the link, but instead forward it to the National Cyber Security Centre on 7726, then Block the user and report as scam on your phone.

Social Media

- Use 2 factor authentication and log out of devices you don’t use.
- Look for similar scams to email and text especially ‘fun quizzes’ and other scams that harvest your personal data.
- Keep profiles private - regularly review your privacy settings and limit who can contact you.
- Beware of WhatsApp groups, especially ‘Add everyone’ ones. Set "Who can add me to groups?" to "My Contacts".
- Don’t overshare - birth date, address, holiday plans, pet or partner names.
- Do not allow location sharing.
- Be careful of friend requests from people you do not know - check profile histories.
- Beware of fake profiles - Agree a ‘safe word’ with your family and close friends.
- **Assume everything you post COULD one day be made public.**

On-line shopping safety





- Use trusted sites.
- Avoid deals that seem too good.
- Only use sites starting with https:// not http:// e.g.

  http://example.com

  https://example.com
- Modern browsers will warn you, so never put personal or financial details into a site without it.

Passwords and other access controls

By Giles Godart-Brown

Passwords

Please tell me you're not adding a special cymbal to your password.
Blazek

How to steal someone’s password

- Guess it:
  - Brute force.
  - Dictionary.

- Steal it:
  - From you.
  - From the network.
  - From a company

Which password is the strongest?

A. 123456

B. password

C. John1945

D. T7!pL9@Q

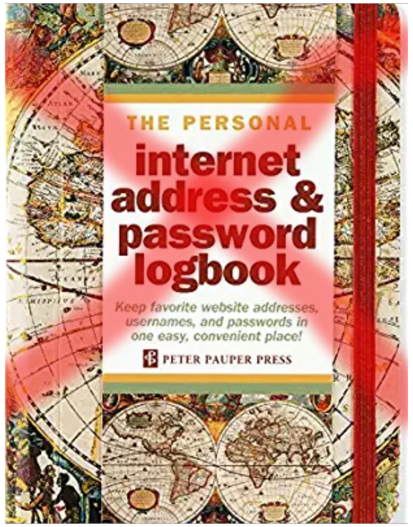
E. bulC_retupmoC_mahseldneM

What makes a good password?

- Make it long.
- Include mixed cases (Cc), numbers, and odd characters (-,+ etc).
- It is easy to remember
  - Have a code
    - e.g. instead of Password, use drowssaP
  - Use a phrase you can remember
    - e.g. mY-soN-waS-borN-iN-1990
  - Have a different password for each site
    - e.g. for Amazon use Amazon-StowWI-080127

How to prevent your passwords being stolen

NEVER WRITE THEM DOWN !!!!!


THE PERSONAL
internet address & password logbook
Keep favorite website addresses, usernames, and passwords in one easy, convenient place!
PETER PAUPER PRESS

If you have problems remembering them, use a password vault.

- e.g. LastPass – Cloud based or
- KeePass for local storage or
- MacPass.

What do companies do with your password?

- They are not allowed to store the cleartext version of your password.
- They must use a one-way encryption to create a version that cannot be decrypted back to the original cleartext.
- This is why they cannot tell you your password and only you can create a new one.

Are you being tracked?
And does it matter?

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Tracking

- There are two ways that you are tracked;
  - by your browsing history – which sites you previously visited and
  - by your approximate physical location.

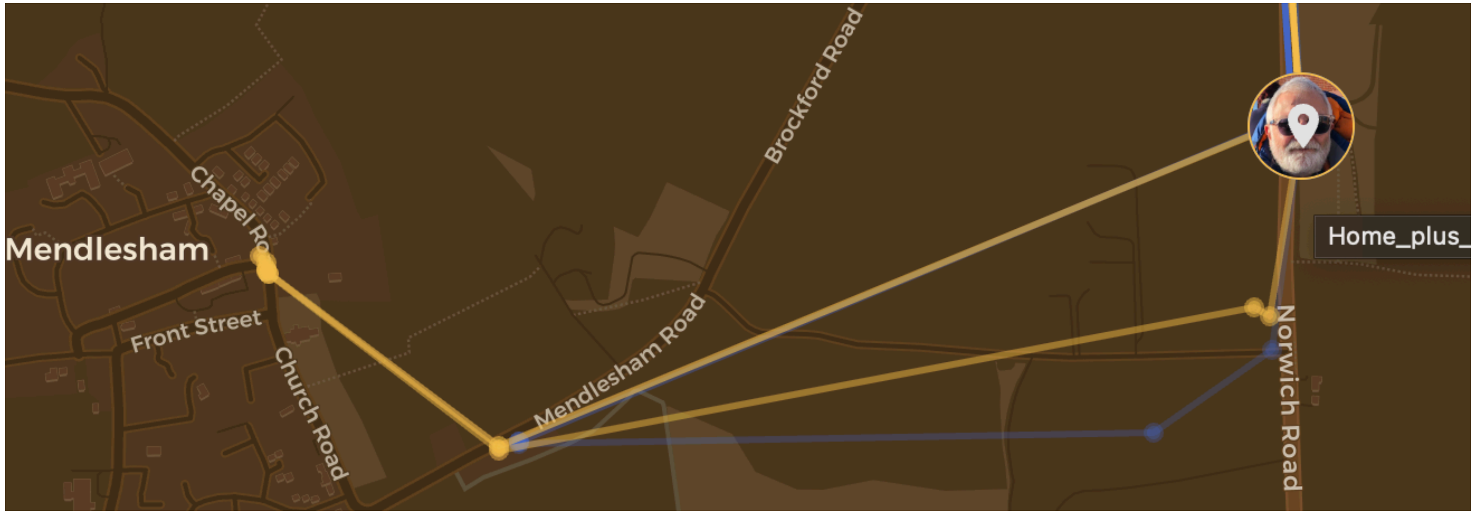
Is my browsing history being tracked?

- Yes, when you visit a web site it stores keys called cookies in your browser that it can use later on, e.g. so you don’t have to log in again.
- These can be used by trackers to do things like bombard you with adverts tailored to the other sites you have visited.
- Its mandatory that they ask if you will allow cookies. I usually allow cookies as they make navigating the site much easier.
- If in doubt the browser has an option to delete them from your device if you need to. BUT you will almost certainly need to log in again.

Physical location - 1

If you enable Location Services on your Mobile phone then your location is known to an accuracy of about 5 metres.

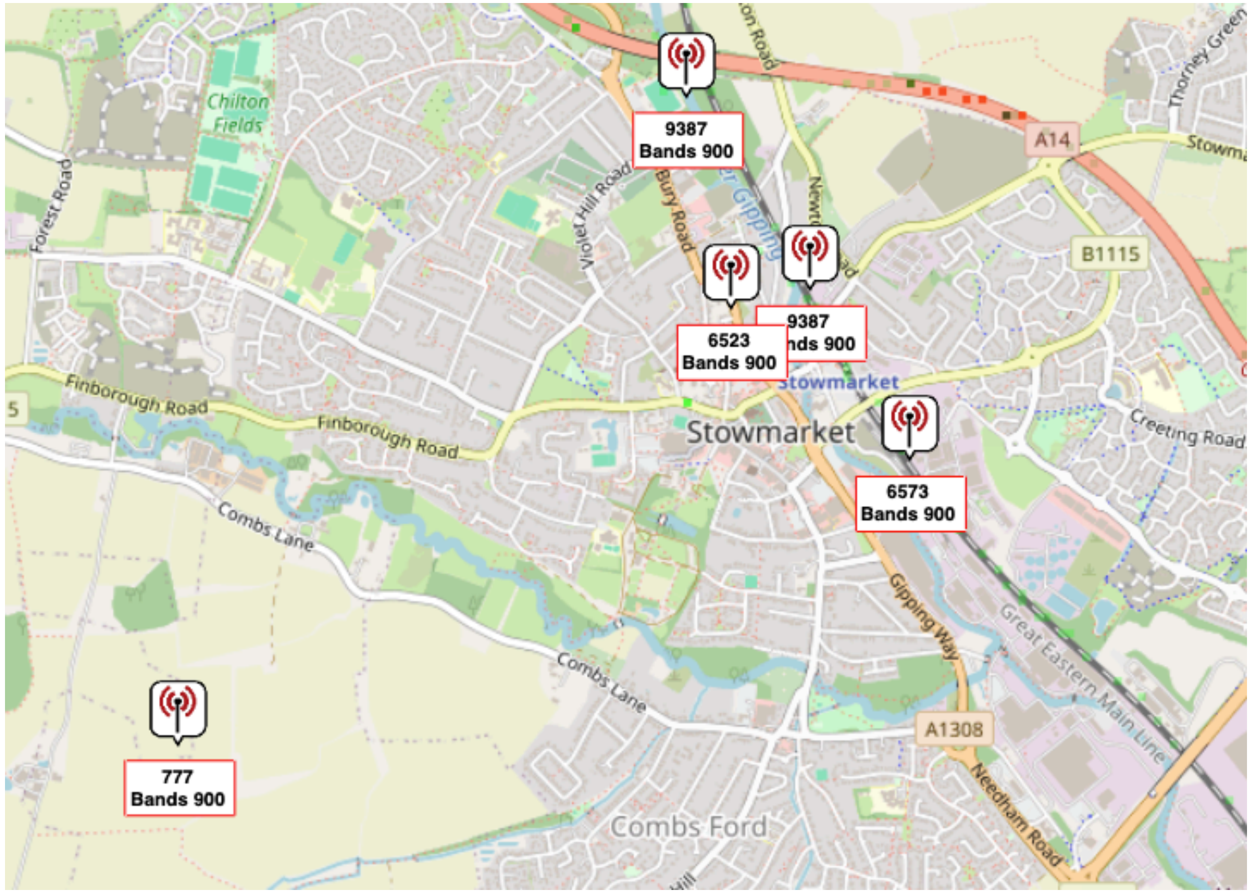
You must give your permission for this data to be used by any application – e.g. maps and fitness trackers



Physical location - 2

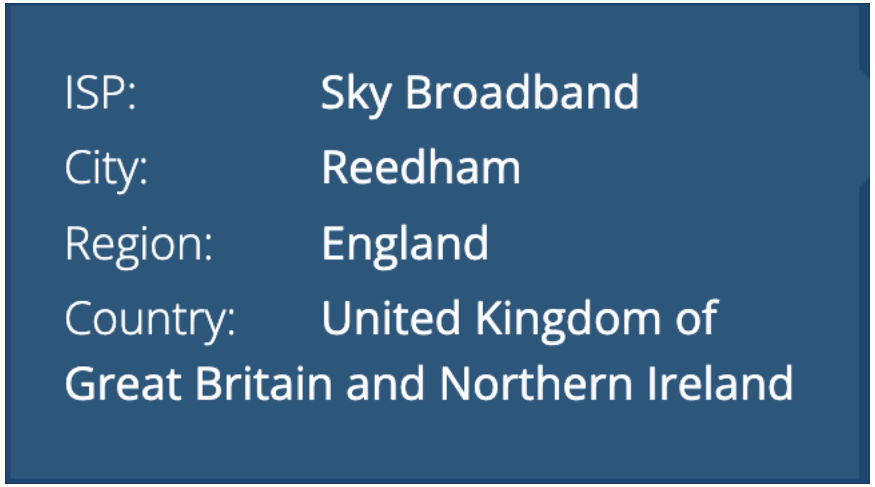
If you don’t enable location services then your Mobile Phone location is still known because it ’pings’ the nearest mast.

This is how the Police and other emergency services are able to locate people.



Physical Location - 3

- If you are connected to broadband, your location can be found, however this is only where you connect to the internet. When I am at home it thinks that my home is in Reedham, Norfolk and not Brockford! (https://whatismyipaddress.com/)
- You will often see messages on your PC and TV ads warning that you are being tracked and trying to sell you a VPN to prevent it.
- Its up to you to decide if this is worth doing. My personal views are;
  - I don’t really care if ‘they’ do know where I am.
  - They already know within a little from my mobile phone.
  - I’m not involved in anything illegal.
  - If anything, it might be quite handy if ‘they’ knew where I was and I was incapacitated.



ISP: Sky Broadband

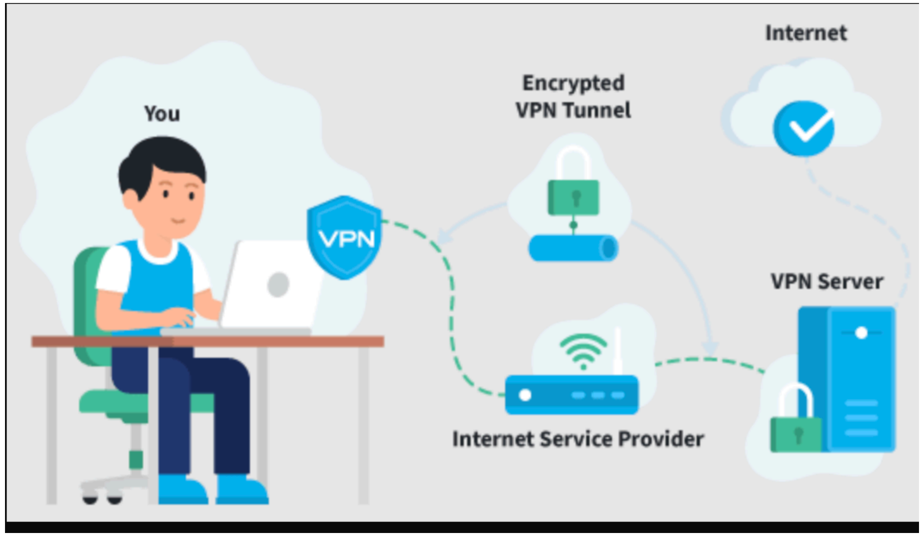
City: Reedham

Region: England

Country: United Kingdom of Great Britain and Northern Ireland

What is a Virtual Private Network (VPN)

- A VPN is a software encrypted tunnel through the internet between a client (e.g. your PC) and a VPN server that acts as a gateway to the internet.
- Internet traffic from your PC is encrypted and web sites can only track you to the VPN server.



Secure communications

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By Giles Godart-Brown

Secure communications

- It is essential that communications between your PC and the host web server are secure, especially for financial transactions.
- There are 2 parts to this
  - Are you actually connected to the server you think you are (‘spoofing’).
  - Can the messages you send be seen by someone listening on the network (‘snooping’ or ‘man-in-the-middle’).
- Spoofing is prevented by each web site having a unique, verifiable certificate.
- Man-in-the-middle and snooping is prevented by encrypting using keys
- The Secure Socket Layer (SSL) implements both of these.

How can you be sure you are connected to the site you think you are.

- Each site has a unique digital certificate which expires after a period of time.
- When your browser connects to a site it checks that the certificate has not expired and then checks this against a known, trusted Certificate Authority.
- If these do not match, the browser will stop you visiting that site.
- If the site does not have a current, active certificate you will be asked if you want to proceed, nearly always stop at this point.

Firewall

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What is a firewall?

- A firewall looks at network traffic flowing into and out of your PC. It checks to see if it is malicious and if so, will block it.
- Both Windows and Mac have built-in firewalls that really don’t need any configuration.
- Your Broadband Router also has a firewall which may include configurable features like Parental Control that blocks access to certain sites deemed by the firewall to be unsuitable for children.
- Note that browsers also have features to enable Parental Controls.

Anti-Virus

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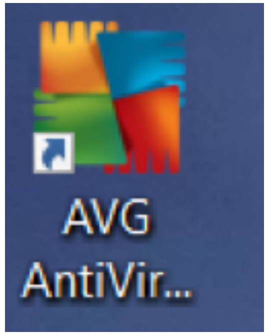
What do Viruses do?

- Attacks range from annoying e.g. sending an embarrassing email to everyone on your email contacts list to devastating e.g. encrypting your hard disk and only allowing you to access it if you pay a ransom.
- Viruses usually propagate as email attachments.
- Prevention
  - Be very wary of any email attachment.
- Protection
  - Always check that Anti-Virus software is installed on any PC you use and check that it is active.
  - Make regular backups



Anti-Virus software

- Never rely on the Microsoft built-in Anti-Virus software or software that came ‘Free” with your computer e.g. McAffee or Norton. Your license will expire after a year, it may not be working and you are NOT PROTECTED.
- We recommend that near the end of your free license, you uninstall the current Anti-Virus and install the free (Basic) AVG software instead.
  - Settings>Apps & features, then scroll down to the app you want to uninstall, left click on it and select uninstall
  - Go to https://www.avg.com/en-gb/free-antivirus-download and follow the instructions to install AVG.
- NEVER have 2 anti-virus software programs running at the same time.
- ALWAYS keep your Anti-Virus software up-to-date
- AVG will often ask if you want to upgrade to their Pay version, you almost certainly do not need to do this.

Anti-Virus on other devices

- Mac
  - Until recently hackers ignored Macs, but now they are also a target, so it’s a good idea to install an Anti-virus
- Phone, Smart watch or Tablet
  - You can only install applications on your Phone, Smart watch or Tablet via an App Store where they are rigorously tested and validated to be virus-free.
  - With the recent increase of smashing attacks on smartphones it may be worth installing Anti-virus on Android Phones and Tablets.
- Smart speakers
  - These are even more tightly controlled and do not need Anti-virus software

WARNING

- Anti-virus software cannot prevent everything, so always beware when clicking on links or installing software on your PC or Mac.

- In particular NEVER install software when asked to by a call centre unless you can really trust them.

Secure documents

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When do we use symmetric encryption

Both OpenOffice and Microsoft Office allow you to save a document or spreadsheet with a password so it can only be opened by someone who has the password (the key).

This is useful if you want to send a confidential document via email.

If you do this then you should send the password via a different route. I usually text passwords as this is a very secure mechanism.

Conclusion

By Giles Godart-Brown

The internet is not intrinsically unsafe

Of the trillions of users of the WWW, very few are compromised, just be ‘Web Savvy’

Extra slides

Encryption

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Let’s have a go at code breaking

IFMMP UP FWFSZPOF

_E___ __ E_E____E

ELL __ E_E____E

HELLO TO EVERYONE

Symmetric encryption

- This is called Rotation-1 (rot-1) encoding.
- A code book would look like this; A=B B=C etc.
- This mechanism was improved by having random associations rather than simple rotation and a code book with one page per day e.g. On the 10th January 2025 - A=Q B=N etc.
- This is called symmetric encryption because the same key is used the encrypt and decrypt.
- The Enigma machine added a level of complexity to symmetric encoding by changing the encryption after each letter, e.g. AA may be encoded as HY, it also eliminated the code book.

What’s wrong with symmetric encryption ?

- Everyone who wants to decrypt the message has the same key, if someone was to leak the key and say put it on the internet, everyone can decrypt the message. This was a big problem with early pay TV systems with hackers publishing the keys and cloning the set top boxes.
- Whitfield Diffie and Martin Hellman invented Asymmetric encryption where one key is used to encrypt a message and a different key is used to decrypt it.
- The sender of the message has a Public key they share with all recipients. Each recipient has their own unique Private Key. How this works is fiendishly complicated and involves several messages between the recipient and the sender before the message can be decrypted.

What do keys and certificates look like?

Certificate

```
MIIGkDCCBHigAwIBAgIRAP9bf/aQe6ieMG/
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Key

```
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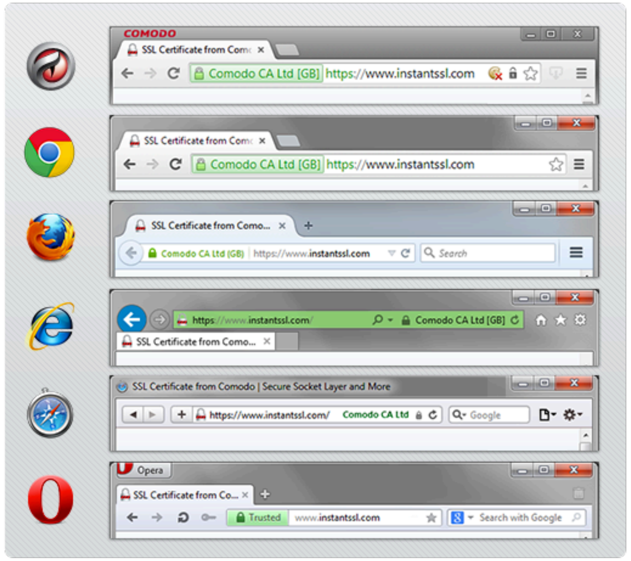
The Maths for these is VERY complicated

$$H(s) = \frac{1}{1 + \underbrace{\frac{RC(m+1/m)}{n}}_{\frac{2\zeta}{\omega_0} = \frac{1}{\omega_0 Q}} s + \underbrace{R^2 C^2}_{\frac{1}{{\omega_0}^2}} s^2},$$

How do I make sure the site is secure?

- Sites that have valid certificates and use encryption use the Secure Socket Layer (SSL) to protect messages.
- Never put personal details into a site which starts with http rather than https – s means secure! Look for the padlock.


COMODO
SSL Certificate from Comc
Comodo CA Ltd [GB] https://www.instantssl.com
SSL Certificate from Comc
Comodo CA Ltd [GB] https://www.instantssl.com
SSL Certificate from Como...
Comodo CA Ltd (GB) https://www.instantssl.com
Search
https://www.instantssl.com/
Comodo CA Ltd [GB]
SSL Certificate from Como...
SSL Certificate from Comodo | Secure Socket Layer and More
https://www.instantssl.com/
Comodo CA Ltd
Google
Opera
SSL Certificate from Co...
Trusted
www.instantssl.com
Search with Google

These sites encrypt all messages

Examples

http://example.com

https://example.com

What is a virus?

Mendlesham Computer Club

By Giles Godart-Brown

What is a virus?

- Wikipedia definition:
  “A computer virus is a type of computer program that, when executed, replicates itself by modifying other computer programs and inserting its own code. If this replication succeeds, the affected areas are then said to be "infected" with a computer virus”
- Strictly speaking it’s a virus only if it gets itself buried into a host program (e.g. Microsoft Mail) if it runs on its own it is called a Worm
- People create viruses for a number of reasons, profit (e.g. ransomware where it demands payment to restore your computer), political power, to demonstrate a vulnerability of a product, corporate gain, or just plain devilment.

A VERY simple virus example

- A simple program to print “Hello Mendlesham”
  - print ("Hello Mendlesham");
- Now with a virus
  - print ("Hello Mendlesham");
    # the next line will delete your windows directory rendering your computer useless
    rmdir ”C:/Windows";
- Typically, they are much more complex than this and include mechanisms for infecting other computers

Are you being tracked?

Mendlesham Computer Club

By Giles Godart-Brown

Do I need a Virtual Private Network (VPN)

- There are a lot of adverts on the TV trying to scare you into buying a VPN (NordVPN, Norton).
- They prey on the fact that:
  1. You need to encrypt ALL of your Internet traffic.
  2. You need to avoid ’Trackers’
  3. Your location can be accurately tracked
- This is overkill for regular consumers because;
  1. Most internet traffic is already encrypted (urls that start with https)
  2. Browsers with Ad blockers prevent trackers
  3. The physical location is pretty inaccurate for all but your permitted Phone apps

AD blockers

- You can prevent trackers from bombarding you with Ads by using an AD blocker that prevents these malicious pop-ups. Mine has currently blocked 492,306 ads.
- The most popular AD blocker for Chrome users is called ADblock and can be installed from https://chromewebstore.google.com/detail/adblock
- There are also Ad blockers for phones and tablets (search the App Store)
- Note some web sites detect you are using an AD blocker and will ask you to disable it. In nearly all cases there is another web site you can use that works with the AD blocker (back to a Google search)

Application Tracking

- On a Phone or Tablet you may be asked to allow the app to track your location so they can send you more tailored ads.
- I would only allow this for apps that need to know where I am e.g. fitness trackers, and then I would only allow it when using the App, if this makes sense.
- A notable exception is device trackers like Tile.

Two Factor Authentication

Mendlesham Computer Club

By Giles Godart-Brown

What is 2-Factor Authentication ?

- 2 Factor Authentication (sometimes called Multi Factor Authentication or MFA) is based on “something you know (a password) and something you own (a mobile phone or email account)” thus doubling the security of the connection. Increasingly web sites that involve a financial transaction or private data will implement this.
- How it works
  - When you register on a web site, in addition to your password, you also register your email address and mobile phone number.
  - When you log into the site, it first asks for your password (factor 1), then sends you a text or email.
  - The text or email contains a code (usually a 6 digit number) that you must enter into the web site in order to log on. This confirms that whoever is logging in also has your mobile phone (factor 2).
- If you are in an area with poor mobile coverage, some sites allow you to specify an email address instead of mobile number. If you get a new phone, don’t forget to update the number on the web sites that use it.

Security hints and tips
Summary

Mendlesham Computer Club

By Giles Godart-Brown

Additional security mechanisms

- Most financial sites and some shopping sites now use 2 factor authentication, these need a smart phone and a connection to the internet.
- If your phone supports it, use biometrics (fingerprint or face recognition) to increase security and reduce the need for Pins and passwords.
- Enable ‘Stolen Device Protection’ on Apple devices to restrict or delay what can be done on your device when it is not at your familiar locations.

Advanced Security

- Always use 2 factor authentication on anything sensitive.
- Use fingerprint or face recognition, if possible, on phones and laptops
  - Face recognition only works on more modern phones e.g. iPhone 11 and above, Google Pixel 6, Samsung Galaxy S21, OnePlus 9, Xiaomi Redmi Note 10 Pro

More hints and tips

- NEVER click on a link or attachment sent from an email address or phone number that you don’t recognise even if it was forwarded from someone you know.
- Be especially wary of emails and texts from Banks and Insurance companies especially if they ask to re-verify your credentials.
  - if in doubt ignore them, a genuine Bank will find another way of contacting you.
- Be wary of any sites or callers that ask for the entire password or PIN in financial transactions.

Software updates

- Always keep your software up to date;
  - Windows and MAC OSX usually update automatically, but phones often need you to do something
  - Browsers (Explorer, Chrome, Safari etc.) usually update automatically
  - Anti Virus usually updates automatically – It’s essential that you have one on a PC (search. AVG free), less so on phone/tablet though this will change.

Beware of offerings to ’fix’ your PC

- There have been many reports of scammers pretending to be Microsoft or BT calling to offer to help you speed up your PC or ‘fix’ it.
- These are always BOGUS, just politely hang up.
- NEVER let ANYONE instruct you to install software, especially if it lets them control your PC e.g. TeamViewer

Questions

https://www.avg.com/en-gb/free-antivirus-download