Cybersecurity Management
1.2. Information Gathering

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Contents

- Network Information Gathering
- People Information Gathering
- People Hacking
- Extra Resources

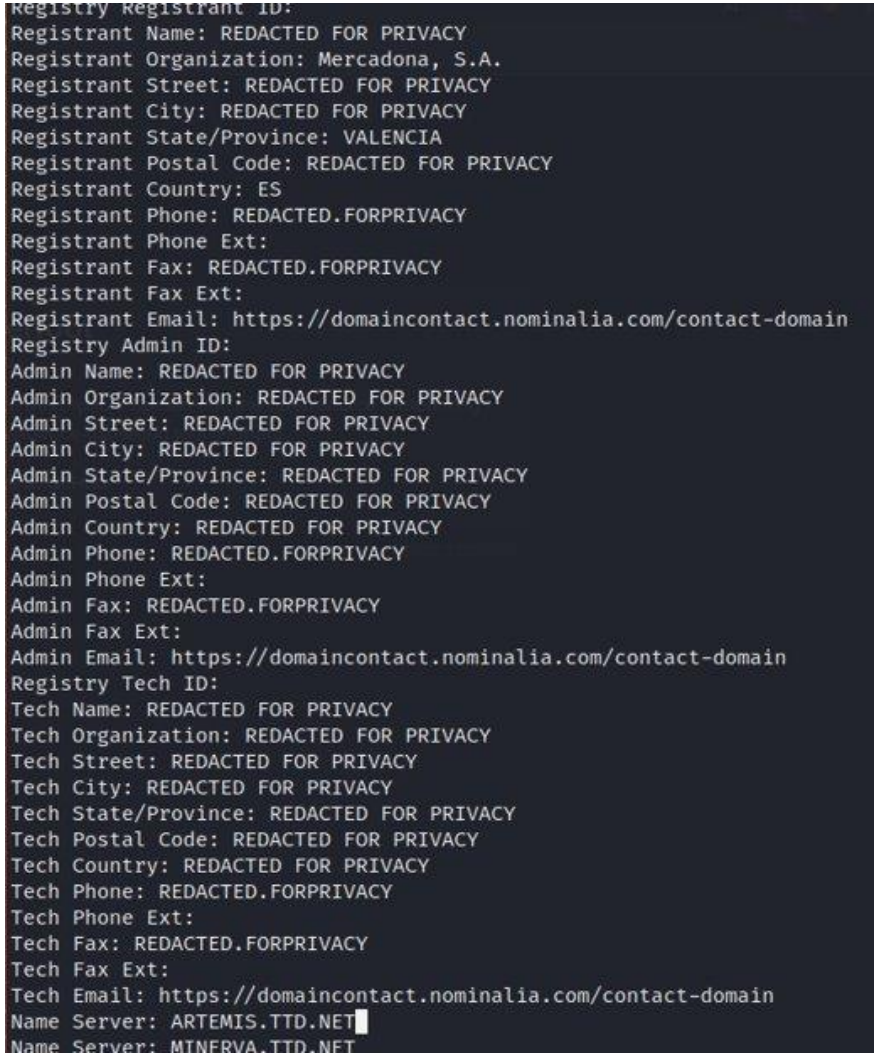
Network Information Gathering

Widening the scope and reducing the unknown

WHOIS and Reverse WHOIS

- WHOIS query by domain
- WHOIS query by IP
- Reverse WHOIS query by registrant
- Reverse WHOIS query by company
- Reverse WHOIS query by registrant's email

RIR (Regional Internet Registry)	Organisation
Europe, Russia, Asia (Central, West)	RIPE
USA, Canada	ARIN
Oceania, Asia (South and East)	APNIC
Latin America	LACNIC
Africa	AFRINIC

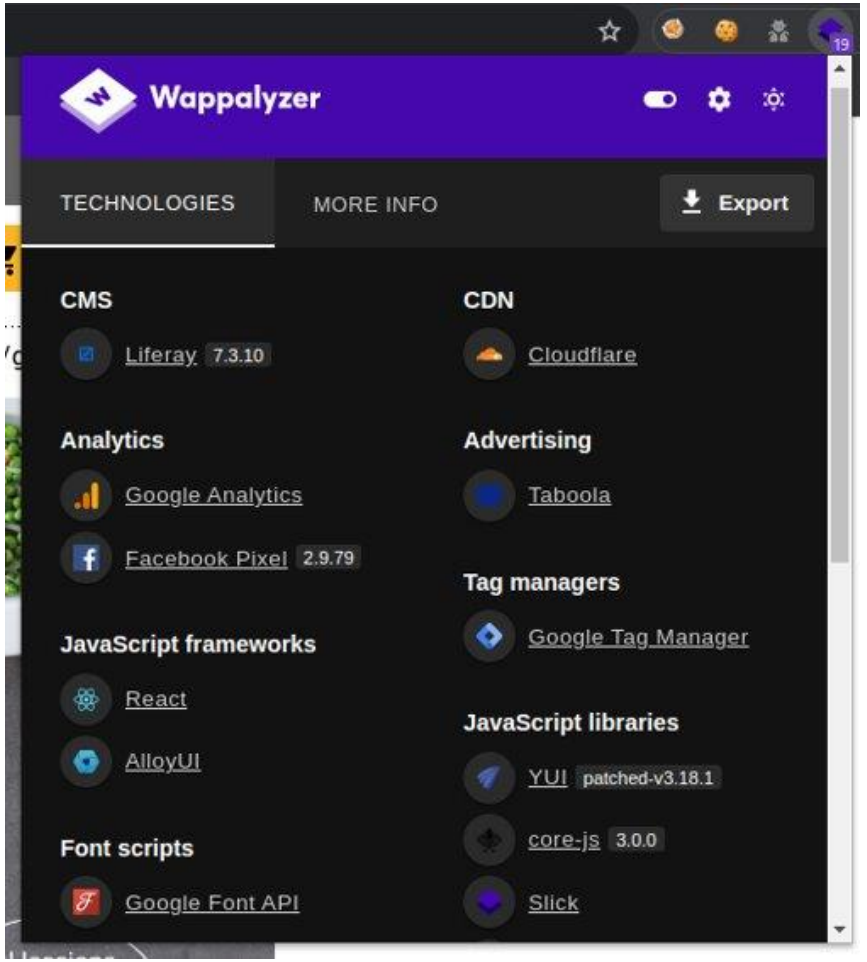


Domains and Subdomains

- Passive
  - Manual: Google dorks, pages (like crt.sh).
  - Automated: amass, dnsenum, dnsrecon, sublist3r, etc.
- Active
  - Zone transfer (it should be vulnerable)
  - DNS Zone Walk (it should be vulnerable)
  - Crawling, some good tools: ZAProxy, BurpSuite, FortiPenTest
  - Brute force, some tools: ffuf, gobuster, wfuzz
    - Brute force with subdomain
    - Brute force with HTTP Host header

Technologies in Use

- Useful to search for vulnerabilities
- Tools
  - Extensions: Wappalyzer
  - CLI: WhatWeb



Resources – Special Files

- sitemap.xml
- robots.txt
- humans.txt
- security.txt
- .well-known/

```
┌──(gz㉿kali)-[~/info-gathering]
└─$ curl -sS https://www.bugcrowd.com/robots.txt
User-agent: *
Disallow: /wp-admin/
Allow: /wp-admin/admin-ajax.php
┌──(gz㉿kali)-[~/info-gathering]
└─$
```

```
┌──(gz㉿kali)-[~/info-gathering]
└─$ curl -sS https://www.google.com/sitemap.xml | grep '<loc>'
<loc>https://www.google.com/gmail/sitemap.xml</loc>
<loc>https://www.google.com/forms/sitemaps.xml</loc>
<loc>https://www.google.com/slides/sitemaps.xml</loc>
<loc>https://www.google.com/sheets/sitemaps.xml</loc>
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<loc>https://www.google.com/finance/sitemap.xml</loc>
┌──(gz㉿kali)-[~/info-gathering]
└─$
```

Resources – "Hidden" Resources

- No link pointing to them
- They are found by brute force
  - The response differ in some properties
    - Status code
    - Size
    - Words
    - Lines
    - Characters
    - Response time
- Tools: ffuf, gobuster, feroxbuster, wfuzz, etc.

Resources – Open Source Projects

- Open Source hosting platforms
  - GitHub
  - GitLab
  - BitBucket
- There might be sensitive information
  - Credentials
  - Emails
  - API keys
- Do not forget other branches and previous commits
- GitHub Dorks (list, keywords, tools)

Resources – Archive

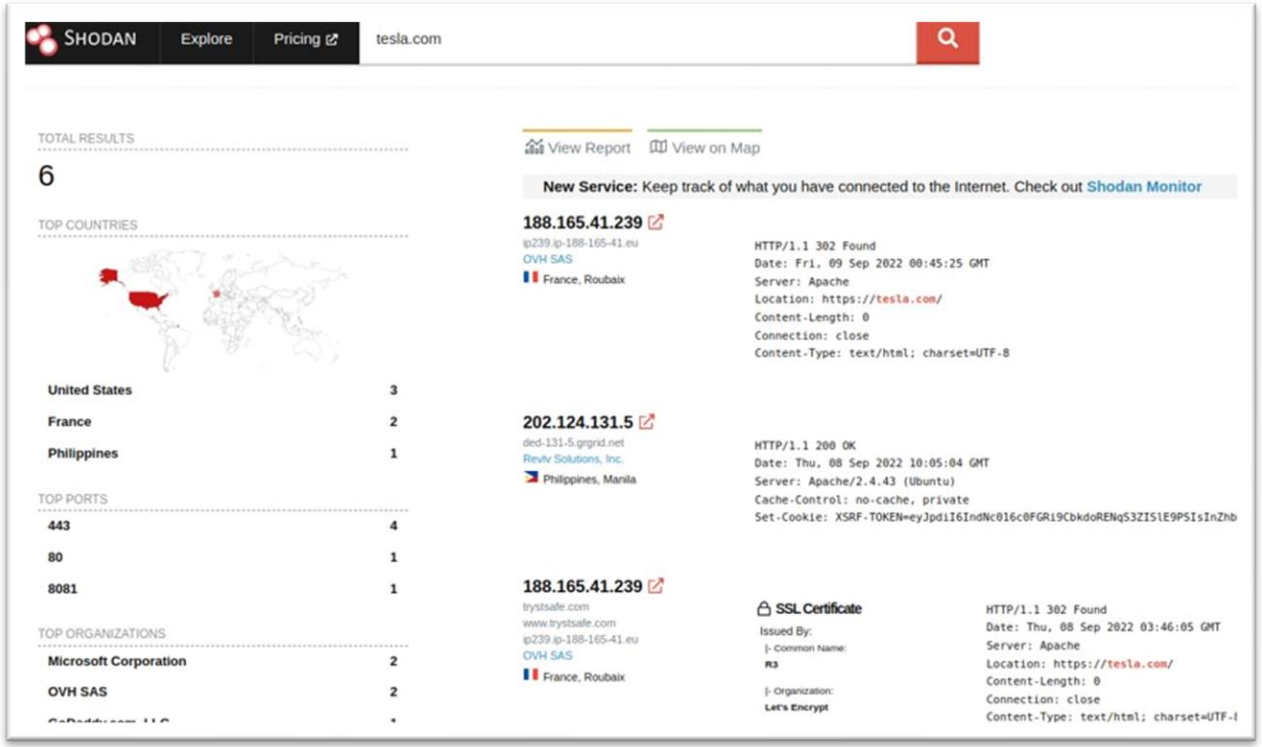
- Previous versions may contain sensitive information
- Internet Archives: WaybackMachine
- Cached websites (Google dork)
- Automated tools: waybackurls

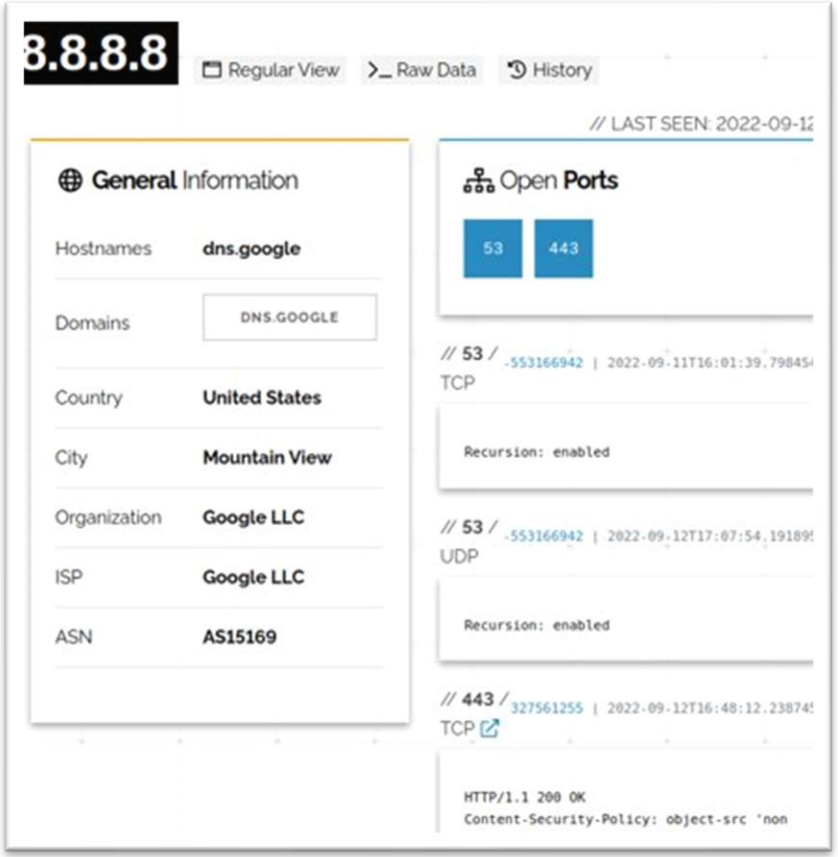
11/11/1998: Google in alpha version

02/12/1998: Google in beta version

More than just Web

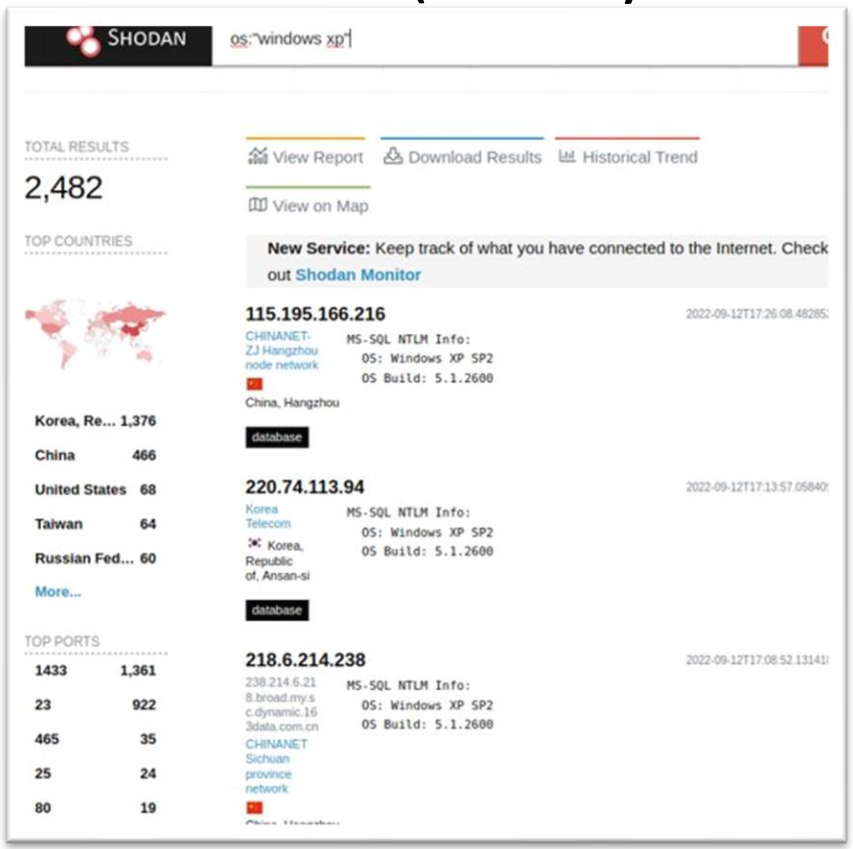
- IoT Search Engines: Shodan, Censys, ZoomEye
- CLI option: shodan (API key needed)

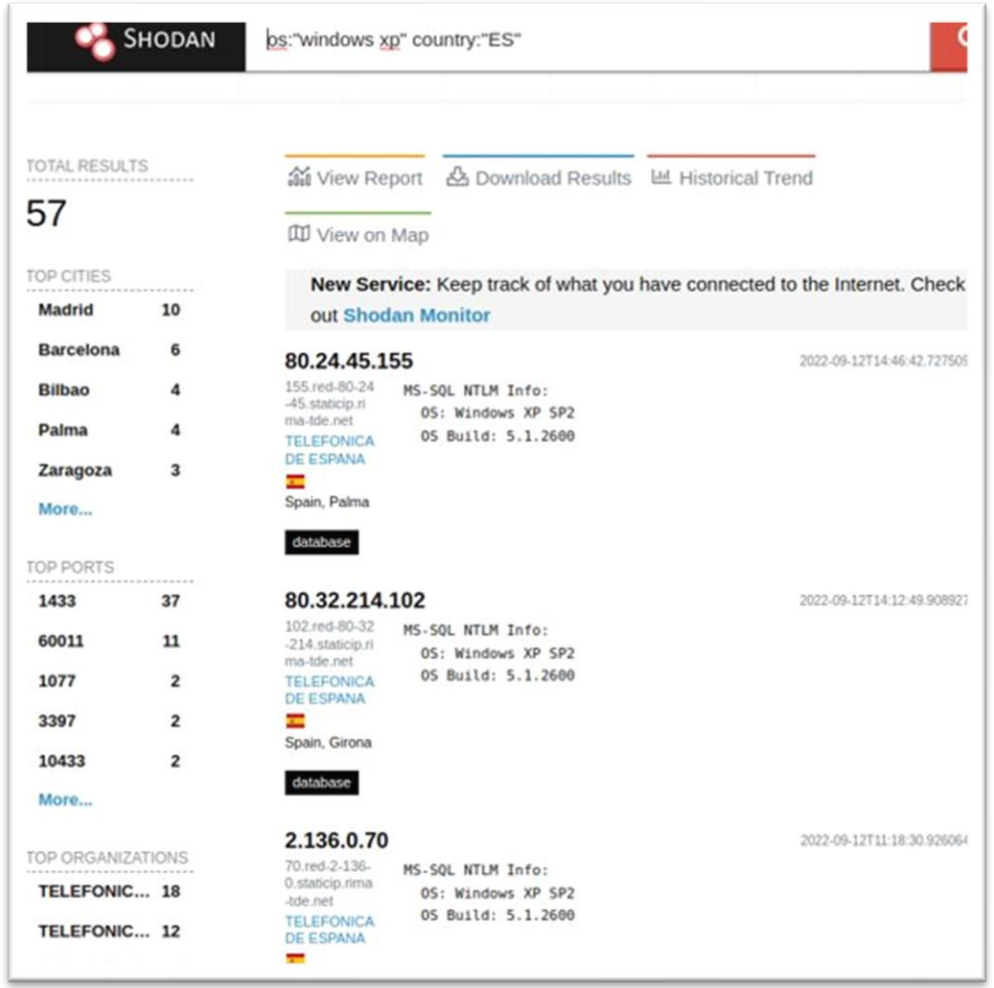




More than just Web

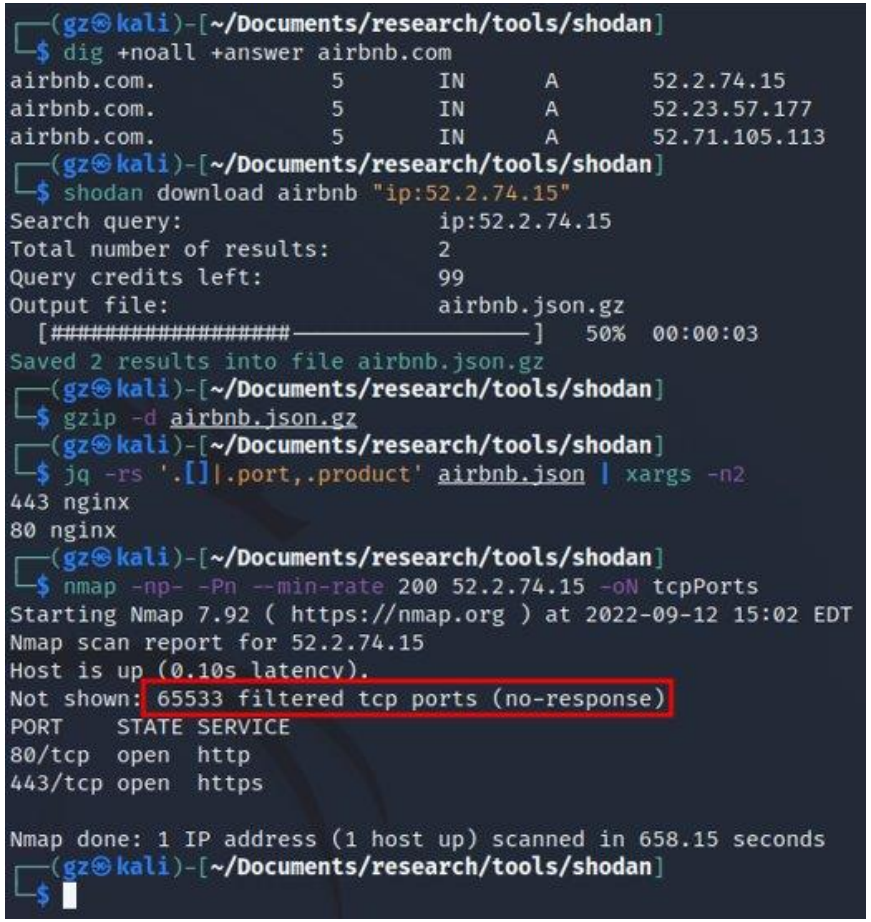
- Shodan Dorks (API key needed)





More than just Web

- Port Scan
  - Passive
    - Shodan
    - Censys
    - ZoomEye
  - Active
    - Nmap
    - Masscan



People Information Gathering

When there is too much information on the Internet

OSINT (Open-Source Intelligence)

- Not every piece of information publicly available is public information
- Public information is more than just the Internet
- Greatest OSINT sources
  - Clear Net
  - Deep Web
  - Dark Net
- Best tool: Search engines

OSINT – Search Engines

- Search Engines: Google, Bing, DuckDuckGo, Yandex, Baidu, CarrotSearch, Ask, etc.
  - Specialised Search Engines: Wolfram, IntelligenceX, Shodan, Censys, ZoomEye, etc.
  - Advanced Search: Dorks (e.g.: GHDB: *Google Hacking Database*).
- Video Search Engine: Youtube (unlisted videos), Vimeo, etc.
- Reverse Image : Yandex, Bing, Google, TinEye, etc.
- Archives: Wayback Machine, etc.
- Source code: GitHub, GitLab, BitBucket, etc.

OSINT – Tools

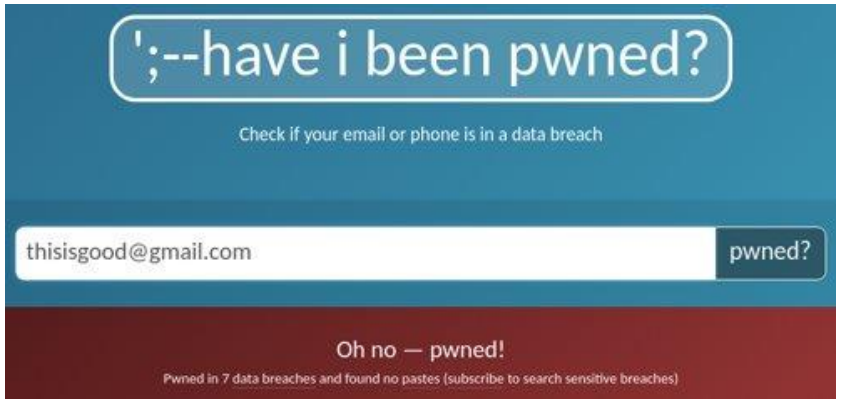
- Social media accounts: namecheckup.com (also domains)
- Leaked passwords
  - HIBP (it does not show the password)
  - Pwndb (it used to be available on the *dark net* **Tor**)
  - IntelligenceX (paid service, may offer some free information)
  - BreachCompilation (https://pwdquery.xyz/), etc.
- Automated tools: theHarvester, Sherlock, etc.
- Password generators
  - CeWL (wordlist out of a webpage)
  - CUPP (wordlist out of a profile)

OSINT – Gathering Emails

1. What is the domain of the organisation/corporation?
   - https://www.crunchbase.com/, search engines.
2. What is the email format they use?
   - https://hunter.io/
3. Create emails with (ex-)employees from LinkedIn:
   - CrossLinked
4. Which of those emails are valid?
   - https://www.verifyemailaddress.org/

- Is there a better/suplementary way? Phonebook.cz (by IntelligenceX)

OSINT – Gathering Credentials



Resources	Info
HIBP	Was it leaked?
PwdQuery	Password features
Wordlists	Possible passwords
COMB	Leaked passwords

Hashes

- Features
  - 1 bit change produces more than 50% of bits change
  - Fix length
  - Irreversible
  - Same input, same output
- Case uses
  - Data integrity
  - "Password" storage
- Concepts: collision, cracking, brute-force attack, dictionary attack, rainbow tables, salt.

Algorithm	Bits	Strong
MD5	128	false
SHA-1	160	false
SHA-256	256	true
SHA-512	512	true

Password Policy

- Tendency to re-use username/password
- Strong password
  - Length: +10 characters
  - Characters: /(?=[a-z])(?=[A-Z])(?=\d)(?=[^a-zA-Z0-9]).{10,}/
  - Non-relatable information (personal data, hobbies, etc.)
  - It cannot be made out of words
  - It should not have been leaked
  - It must seem completely random
  - It should be easy to remember

[How secure is my password?]

[Top passwords]

Password Policy – A Little more

- Do not tell anyone your password
- Do not save it in clear text (your wallet, post-it, etc.)
- Change it regularly (especially if there has been data breaches)
- Different passwords for different services

How to achieve so?

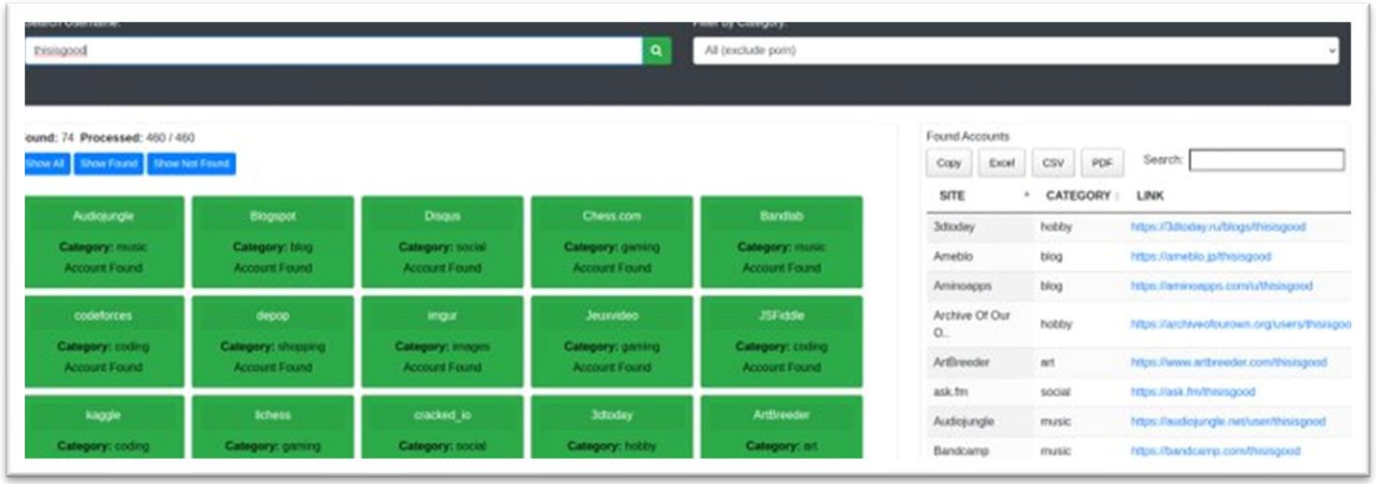
- Password managers (online, offline).
- **MFA** (*Multi-Factor Authentication*), **2FA** (*Two-Factor Authentication*).

OSINT – Gathering Accounts

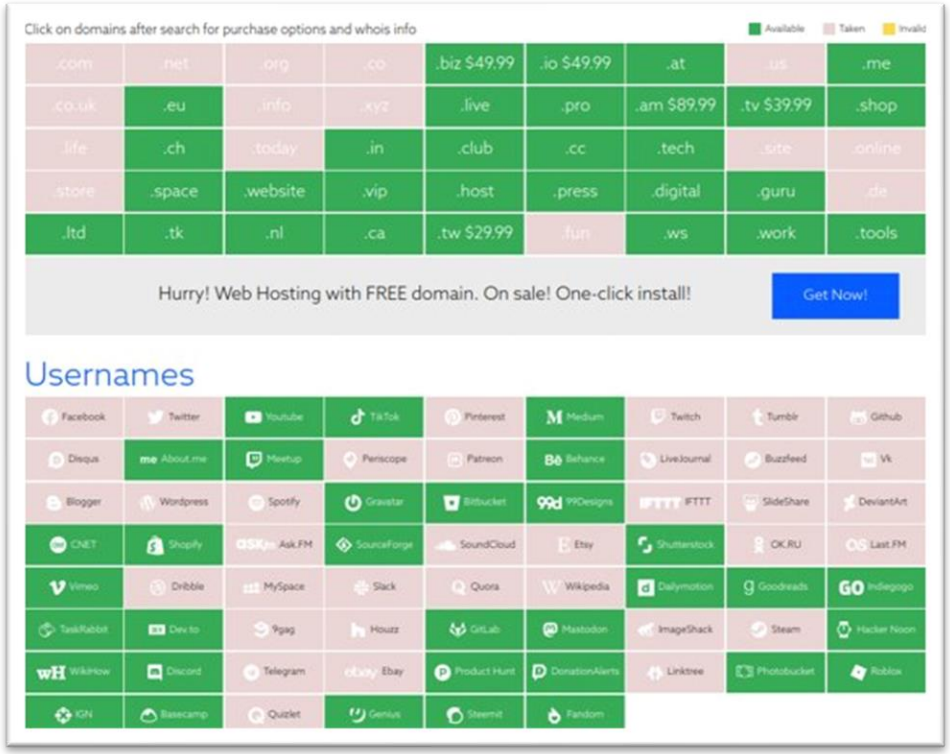
Note: Not every account belongs to our victim.

Try some possible variations.

whatsmyname.app

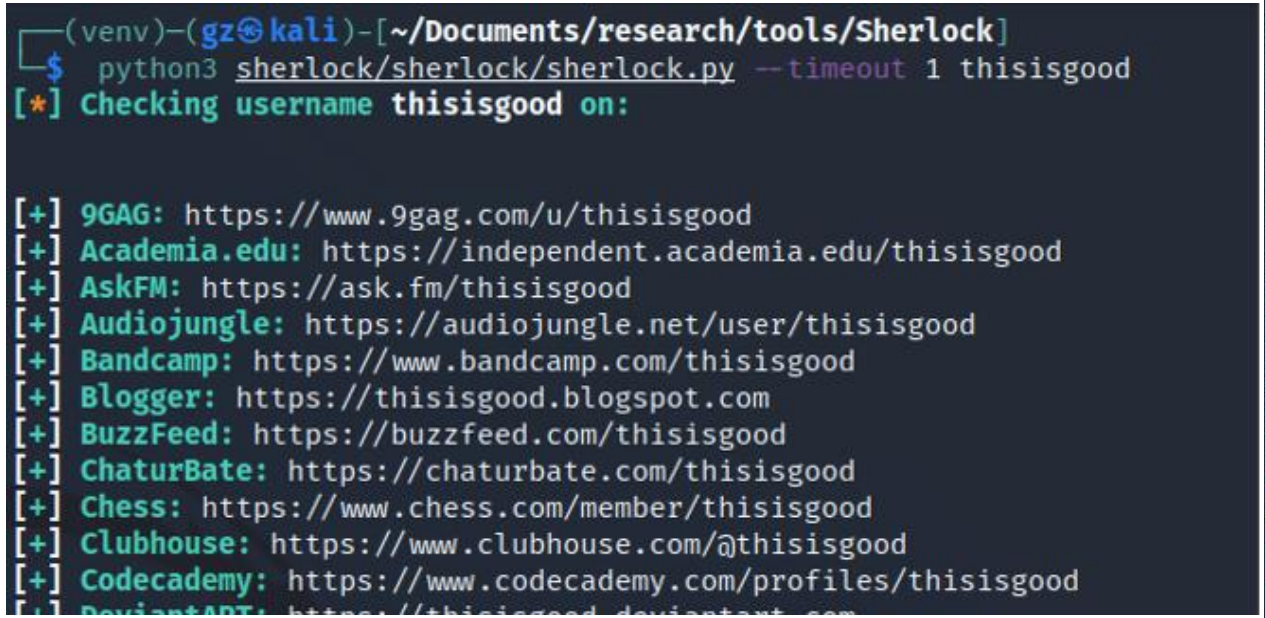


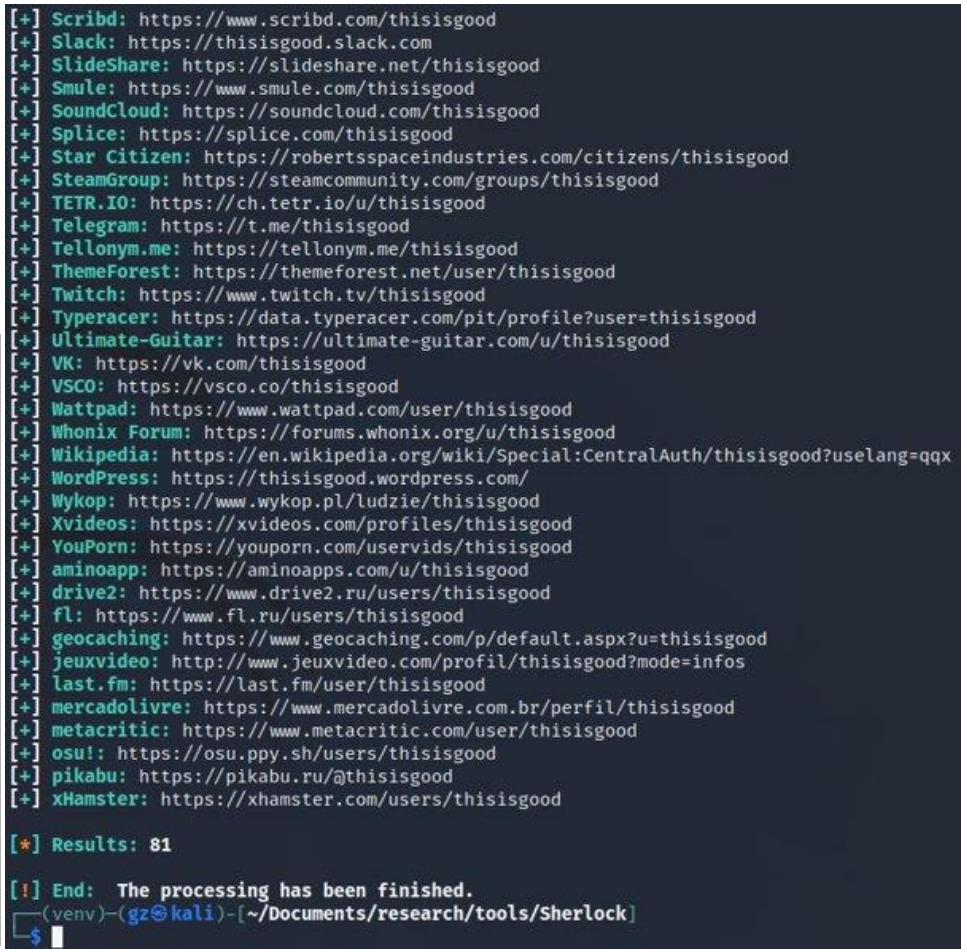
Namecheckup.com



OSINT - Gathering Accounts

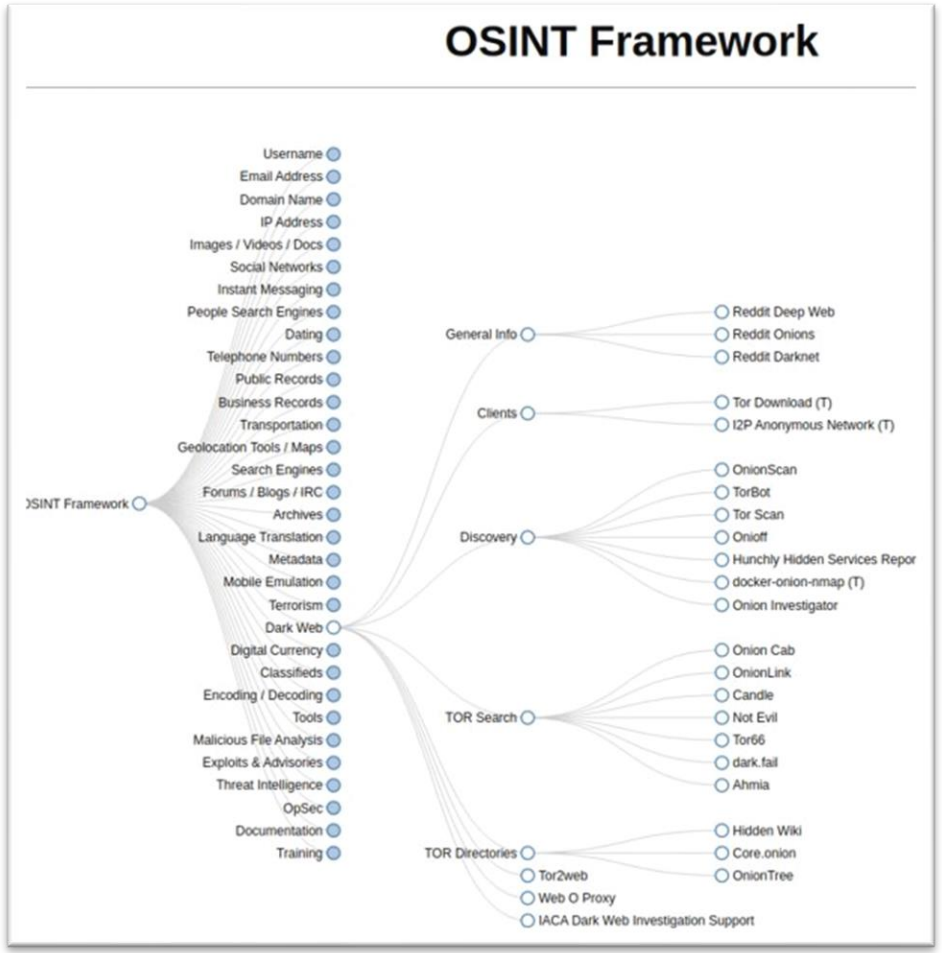
Automated tools: [Sherlock]





OSINT - Frameworks

- Many OSINT tools
- Recopilation:
  - OSINTFramework
  - Awesome-OSINT
- OSINT tools integrated:
  - IKy
  - Lampyre
  - Maltego



People Hacking

The weakest link

Spear Phishing – Avatar

Avatar: fake profile

- False information: https://www.fakenamegenerator.com/
- False face: https://thispersondoesnotexist.com/
- Virtual phone numbers: https://hushed.com/
- Virtual credit cards: *do some OSINT*
- Voice changer, Instagram filters, Deep Fake (Tom Cruise, How it was made), realistic human face masks, etc.

Spear Phishing - More Resources

- OneMillionTweetMap
- IKnowWhereYourCatLives
- IKnowWhatYouDownload
- CanaryTokens

People Hacking

- Not trained enough
- Some techniques
  - Identity Spoofing
  - Identity Theft
  - Hardware Introduction
  - Insider Agent

Social Engineering

- Human Vulnerabilities
  - Intense Emotions
    - Fear
    - Euphoria
    - Curiosity
    - Rage
    - Guilt
  - Urgency
  - Trust

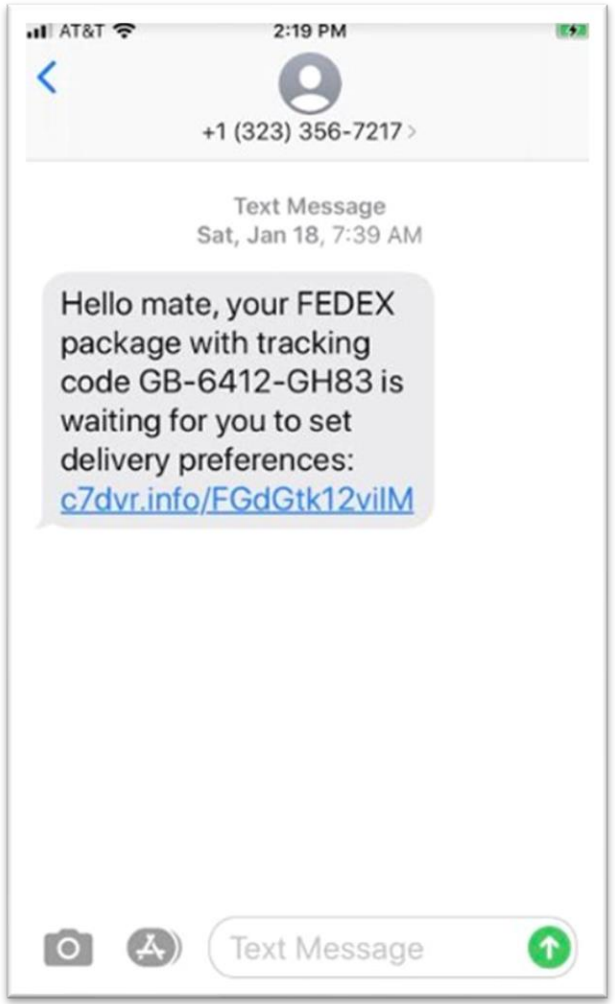
Social Engineering - Phishing

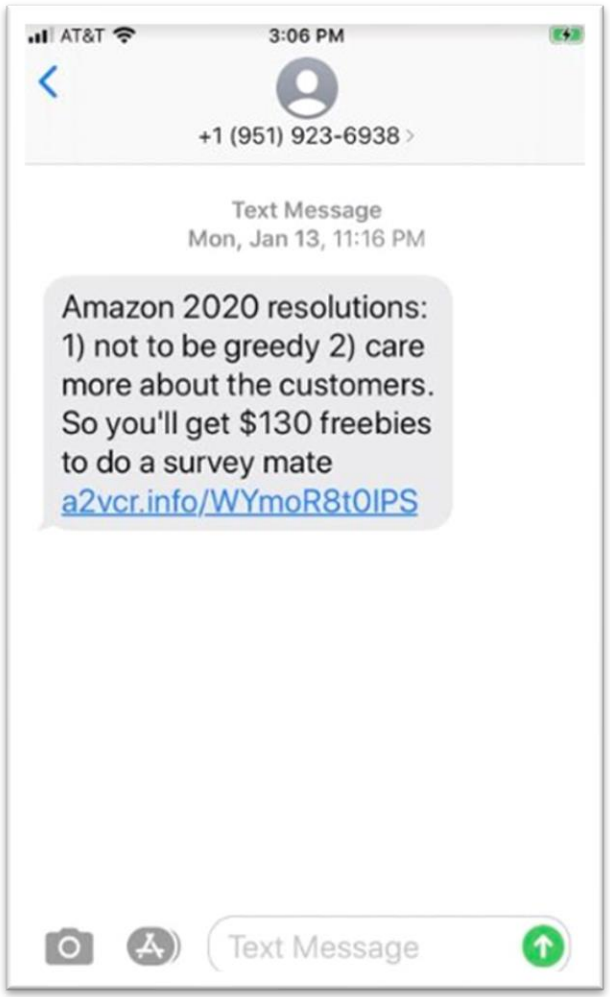
- Spam (*mass phishing*)
  - Smishing (*SMS phishing*)
- Vishing (*Voice phishing*)
- Pharming
- Spear Phishing
  - Whaling

Some Techniques
Spoof sender email
Attach malicious files
Use of malicious links

Some Features of mass phishing
Generic, not personalised
Loads of typos
Unnatural writing
Senseless messages

Social Engineering – Phishing – Smishing





Social Engineering – Phishing – Vishing

- More effective
  - Immediate response – little or no time to think
  - Victim's feedback – attacker can manipulate them
  - People tend to trust voice call more
- Some common methods
  - Virtual kidnapping (link)
  - Computer technician calling for a virus
  - Romance scam

Techniques
Spoof telephone number
Record your voice
Synthesize someone's voice

Social Engineering – Phishing – Masking URLs

- Masking link with another link
  - Example: google.com
  - Solution: Hover over links
- Triggering a function through an event
  - Example:
  - Solution: Deactivate Scripts on the browser
- Using short links
  - Solution: Use an unshortener, e.g.: unshorten.it.

Social Engineering – Phishing – Typosquatting

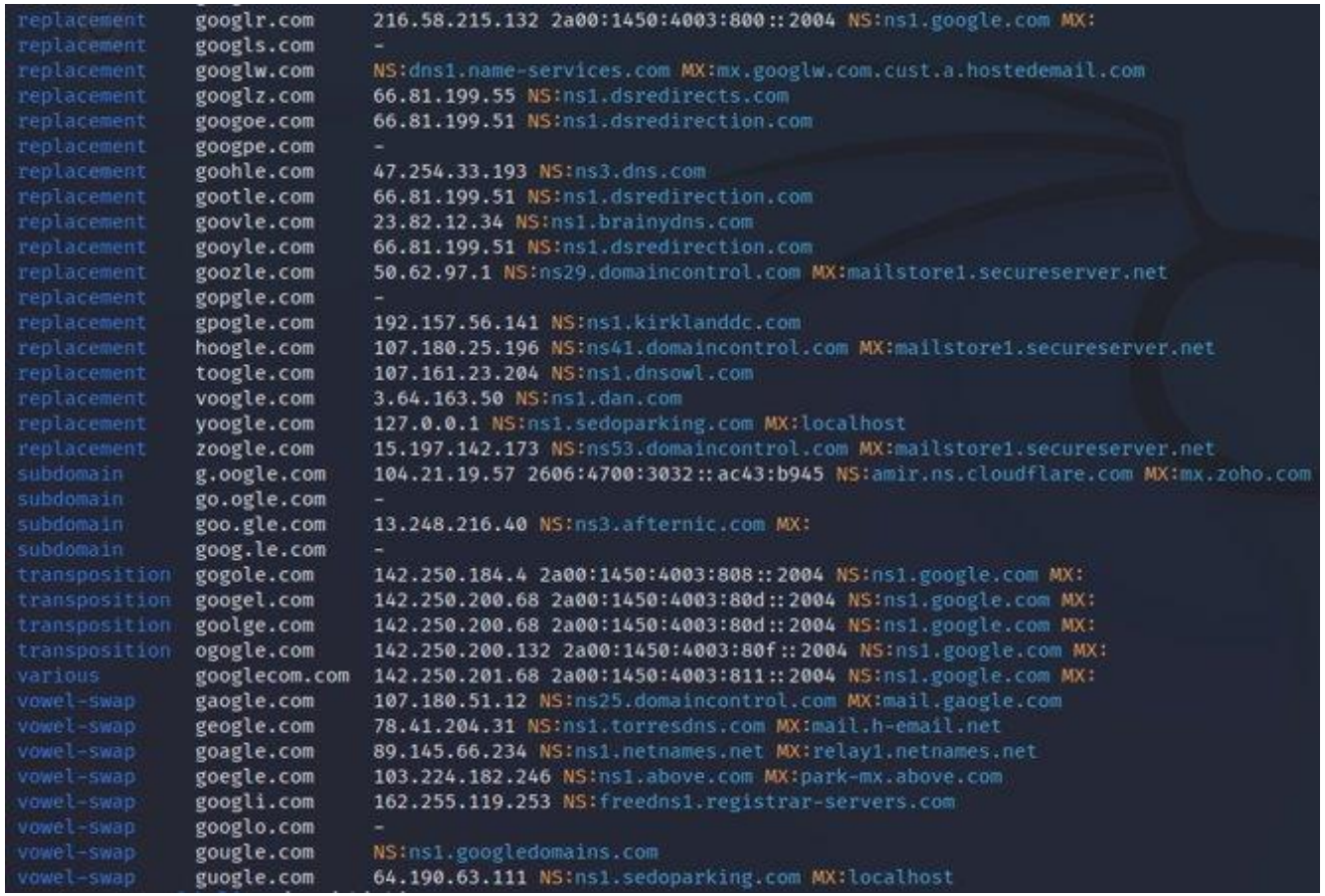
- Registering a misspelled domain

technique	example	technique	example
omission	gogle.com	hyphenation	goo-gle.com
repetition	gooogle.com	subdomain	g.oogle.com
insertion	googl1e.com	homoglyph	goog£e.com
transposition	goolge.com	bitsquatting	coogle.com
replacement	google.com	tld swapping	google.corn

- Easy to spot, isn't it?

Social Engineering – Phishing – Typosquatting

- Generation
  - DNSTwist
    - Web
    - CLI



```
replacement    googlr.com      216.58.215.132 2a00:1450:4003:800::2004 NS:ns1.google.com MX:
replacement    googls.com      -
replacement    googlw.com      NS:dns1.name-services.com MX:mx.googlw.com.cust.a.hostedemail.com
replacement    googlz.com      66.81.199.55 NS:ns1.dsredirects.com
replacement    googoe.com      66.81.199.51 NS:ns1.dsredirection.com
replacement    googpe.com      -
replacement    goohle.com      47.254.33.193 NS:ns3.dns.com
replacement    gootle.com      66.81.199.51 NS:ns1.dsredirection.com
replacement    goovle.com      23.82.12.34 NS:ns1.brainydns.com
replacement    gooyle.com      66.81.199.51 NS:ns1.dsredirection.com
replacement    goozle.com      50.62.97.1 NS:ns29.domaincontrol.com MX:mailstore1.secureserver.net
replacement    gopgle.com      -
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subdomain      goog.le.com     -
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vowel-swap     goagle.com      89.145.66.234 NS:ns1.netnames.net MX:relay1.netnames.net
vowel-swap     goegle.com      103.224.182.246 NS:ns1.above.com MX:park-mx.above.com
vowel-swap     googli.com      162.255.119.253 NS:freedns1.registrar-servers.com
vowel-swap     googlo.com      -
vowel-swap     gougle.com      NS:ns1.googledomains.com
vowel-swap     guogle.com      64.190.63.111 NS:ns1.sedoparking.com MX:localhost
```

Social Engineering – Phishing – Homoglyph

- Punycode: ASCII representation of Unicode characters

text (homoglyphs)	punycode
google.com	
google.com	
google.com	
google.com	

- Punycode converter, russian keyboard, homoglyph generator.
- Analysing domains: URLVoid, URLScan, DNSDumpster, TalosIntelligence, VirusTotal.

Social Engineering – Quizzes

- Phishingbox: https://www.phishingbox.com/phishing-iq-test
- Complete-it (context): https://www.complete-it.co.uk/cyber-security-phishing-quiz/
- Security Inside (actions taken): https://phishingquiz.securityinside.com/quiz/start?id=1
- Google Phishing Quiz (interactive): https://phishingquiz.withgoogle.com/

InfoSec culture:

- CybSafe (interactive): https://www.cybsafe.com/quizzes/

Social Engineering – USB – USB Drop

I have just found a thumb drive, lucky me!

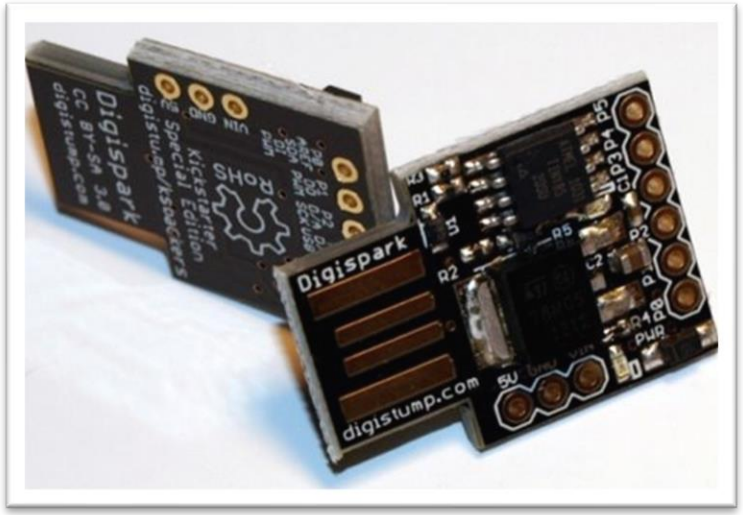
- Attack vectors
  - Social Engineering
    - Vulnerability: curiosity
    - Bait (appealing): salary, XXX, etc.
  - HID Spoofing (e.g.: Rubber Ducky)
  - 0-day (e.g.: *Stuxnet*)

Does dropping USB drives really work? BlackHat USA (2006)

Social Engineering – USB – Rubber Ducky

When you have little time span to type

- HID (Human Interface Device)
  - It behaves as a keyboard
  - It bypasses USB block policies



Social Engineering – USB – Juice Jacking

The dangers of public USB charging stations

- Solution
  - Carry your own portable charger
  - Use a Datablocker

Social Engineering – USB – USB Killer

When data is not the main target...

- Why?
  - The competition (companies)
  - Sabotage (ex-employee, vandalism)

Note: this technique will **not** be useful to gather information.

Student destroyed US$ 58,000 worth of college computers: link.

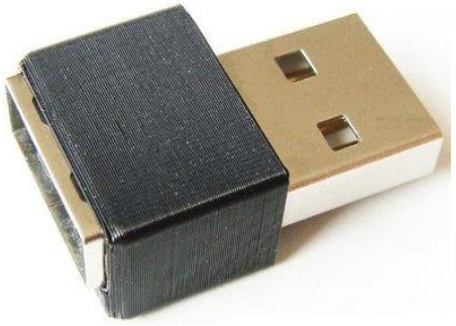
Malware

Malware (***Mal****icious Soft****ware***)

- Some examples
  - Virus
    - Ransomware
  - Worm
  - Trojan
  - Backdoor
  - Spyware
    - Keylogger
    - Screenlogger
  - Logic/Time bomb

Malware – Spyware – Keylogger

- Target information: credentials, cryptowallets, PINs, etc.
- Types
  - Hardware
  - Software
    - Local
    - Remote



[O.MG cable]

Malware – Spyware – Screenlogger

- Target information: credentials, cryptowallets, PINs, etc.
- Types
  - Hardware
  - Software
- There is a context, unlike with a keylogger
- Content from protected fields not seen
  - Example: `<input type="password" name="pwd">`
  - Solution: use along with keylogger

Extra Resources

There is more...

Documentaries, presentations, CTFs and more

- From email address to telephone number. A new OSINT approach, by Martin Vigo (BSides 2019) [31:05].
- Live recon and automation on Shopify's Bug Bounty Program with @TomNomNom (NahamSecCon 2021) [1:17:17].
- The Bug Hunter's methodology v4 – Recon edition by @jhaddix (NahamSecCon 2020) [1:39:42].
- Anatomy of a Killing – BBC [11:06].
- Hackers Find Missing People for Fun [6:06].
- CTF (Capture The Flag): cybersecurity challenges.
  - Contests: https://ctftime.org/
  - Set of CTF pages: https://ctfsites.github.io/
  - OSINT CTFs: OsintDojo, OsintGames, Trace Labs (searching for missing people).
  - DFIR CTFs: CyberDefenders.
  - Web3 CTFs: Ethernaut (Smart Contracts).
- Bug bounty platforms: websites where companies' security can be assessed and "pay" for bugs hunted.
  - BugCrowd, HackerOne, Intigriti.
- More (useful?) links: IsItHacked, IsItUp, PanoptiClick.

References

Links

- *https://domaineye.com/reverse-whois/*
- *https://github.com/OWASP/Amass*
- *https://github.com/fwaeytens/dnsenum*
- *https://github.com/darkoperator/dnsrecon*
- *https://github.com/aboul3la/Sublist3r*
- *zonetransfer.me*
- *https://github.com/ffuf/ffuf*
- *https://github.com/tomnomnom/assetfinder*
- *https://github.com/tomnomnom/httprobe*
- *https://github.com/tomnomnom/waybackurls*
- *https://github.com/tomnomnom/anew*
- *https://github.com/wappalyzer/wappalyzer*
- *https://github.com/urbanadventurer/WhatWeb*
- *https://github.com/zaproxy/zaproxy*
- *https://portswigger.net/burp/communitydownload*

Links

- *https://cheatsheet.haax.fr/open-source-intelligence-osint/dorks/github_dorks/*
- *https://github.com/random-robbie/keywords/blob/master/keywords.txt*
- *https://github.com/obheda12/GitDorker*
- *https://github.com/ROCXYROCK/CTF_Beginners_Git_Challenge*
- *https://www.shodan.io/search/filters (Shodan dorks)*
- *https://github.com/achillean/shodan-python*
- *https://censys.io/*
- *https://search.censys.io/search/examples?resource=hosts (Censys dorks)*
- *https://nmap.org/*
- *http://advangle.com/ (Dorks)*
- *https://www.exploit-db.com/google-hacking-database (GHDB)*
- *https://unlistedvideos.com/ (unlisted Youtube videos)*
- *https://archive.org/search.php (WaybackMachine)*
- *https://github.com/laramies/theHarvester (theHarvester)*
- *https://github.com/sherlock-project/sherlock (Sherlock)*

Links

- *https://www.namecheck.com/*
- *https://haveibeenpwned.com/ (HIBP)*
- *https://intelx.io/ (IntelligenceX)*
- *https://github.com/martintjj/BreachCompilation*
- *https://pwdquery.xyz/*
- *https://informationisbeautiful.net/visualizations/worlds-biggest-data-breaches-hacks/*
- *https://github.com/digininja/cewl*
- *https://github.com/Mebus/cupp*
- *https://www.crunchbase.com/*
- *https://hunter.io/*
- *https://github.com/m8sec/CrossLinked*
- *https://www.verifyemailaddress.org/*
- *https://phonebook.cz/*
- *https://gchq.github.io/CyberChef/*
- *https://crackstation.net/*

Links

- *https://howsecureismypassword.net/*
- *https://en.wikipedia.org/wiki/List_of_the_most_common_passwords*
- *https://whatsmyname.app/*
- *https://osintframework.com/*
- *https://www.maltego.com/*
- *https://kennbroorg.gitlab.io/ikyweb/*
- *https://lampyre.io/*
- *https://github.com/jivoi/awesome-osint*
- *https://github.com/smicallef/spiderfoot*
- *https://www.fakenamegenerator.com/*
- *https://thispersondoesnotexist.com/*
- *https://hushed.com/ (Virtual phone number service)*
- *https://www.voicemod.net/*
- *https://www.youtube.com/watch?v=qTgPSKKjfVg (DALL-E 2)*
- *https://onemilliontweetmap.com/*

Links

- *https://iknowwhereyourcatlives.com/*
- *https://iknowwhatyoudownload.com*
- *https://www.canarytokens.org/*
- *https://www.youtube.com/watch?v=opRMrEfAIiI (What is your password?)*
- *https://cybernews.com/editorial/fake-kidnap-scams-from-a-prison-cell-in-mexico-to-the-boardroom-of-a-top-firm/*
- *https://www.which.co.uk/consumer-rights/advice/microsoft-phone-scam-aYceu8o7aO4c*
- *https://www.truecaller.com/*
- *https://www.listarobinson.es/*
- *https://dnstwist.it/ (DNSTwist web)*
- *https://github.com/elceef/dnstwist.git (DNSTwist CLI)*
- *https://www.punycoder.com/*
- *https://www.lexilogos.com/keyboard/russian.htm*
- *https://www.irongeek.com/homoglyph-attack-generator.php*
- *https://urlvoid.com/*
- *https://urlscan.io/*

Links

- *https://dnsdumpster.com*
- *https://talosintelligence.com/*
- *https://www.virustotal.com/*
- *https://www.phishingbox.com/phishing-iq-test (phishing quiz)*
- *https://www.complete-it.co.uk/cyber-security-phishing-quiz/ (phishing quiz)*
- *https://phishingquiz.securityinside.com/quiz/start?id=1 (phishing quiz)*
- *https://phishingquiz.withgoogle.com/ (phishing quiz)*
- *https://www.cybsafe.com/quizzes/ (quiz)*
- *https://www.youtube.com/watch?v=ZI5fvU5QKwQ (USB drop - BlackHat USA 2016)*
- *https://juicejacking.org/product/datablock/*
- *https://usbkill.com/*
- *https://www.youtube.com/c/UsbKill (Testing the USBKill)*
- *https://www.theverge.com/2019/4/17/18412427/college-saint-rose-student-guilty-usb-killer-destroyed-computers*
- *https://www.youtube.com/watch?v=-jL_Xz-BKBM (O.MG Keylogger cable)*
- *https://www.keydemon.com/ (Spyware)*