Introduction to OSINT

Nipun Negi 17th March , 2024



What is OSINT?

OSINT is a phrase you'll hear about in the cybersecurity community. It's an essential skill and methodology for researchers and defensive security professionals. So what is it?

Introduction to OSINT

- Open Source Intelligence (OSINT) is the practice of collecting and analyzing information from publicly available sources to gather insights and make informed decisions.
- Using various tools and techniques, OSINT plays a crucial role in cybersecurity, threat intelligence, and investigative work by uncovering valuable data from the open web.
- These sources may include social media, websites, public records, and more. OSINT is crucial for understanding and assessing security threats, as well as gathering valuable insights for various investigative purposes.

Why do people do OSINT?

Here are some of the reasons why people engage in OSINT:

- To learn about employers or job applicants before hiring
- To learn about people before dating or making friends with them
- To make consumer or corporate purchasing decisions
- To engage in many different areas of academic work
- To learn about cybercriminal activity
- To learn about specific cyber threats
- To conduct old-fashioned criminal investigation for law enforcement
- To find missing people or lost family members
- To plan holidays or business trips
- To facilitate pentesting, to gather information on your pentesting target

And the list goes on and on.

OSINT in action

- Tracking cyber threats
- Social media analysis
- Geospatial Analysis

Gathering information from open sources

Public Records

- Accessing public records to gather information on individuals, businesses, and properties.
- Examples: Property deeds, court filings, business licenses.

Social Media

- Utilizing social media platforms to monitor public posts, interactions, and user-generated content.
- Considerations: Geo-tagged posts, user profiles, connection networks.

Online Forums and Communities

- Engaging with online communities to gather insights, discussions, and opinions on specific topics or events.
- Considerations: Forums, Q&A websites, interest-based communities.

Importance of OSINT in security

Early Threat Detection

OSINT allows for the early detection of potential security threats by monitoring public information.

Risk Assessment

 It plays a crucial role in conducting comprehensive risk assessments to identify vulnerabilities and potential attacks.

Reputation Management

• Helps in monitoring online reputation and identifying any potential reputational risks or security breaches.

Competitive Analysis

• Use in understanding the competitive landscape and potential risks posed by competitors in the cyber domain.

Best Practices for Using OSINT

Data Collection

Ensure data gathered is legal and ethical

Source Verification

Confirm the credibility and authenticity of information sources

Data Analysis

Thoroughly

Why is OSINT important?

- Investigations: OSINT is crucial for investigations by law enforcement, intelligence agencies, and private organizations. It helps uncover hidden connections, track individuals, and identify potential threats.
- Threat Assessment: OSINT assists in assessing risks, monitoring online activities, and understanding the intentions of individuals or groups.
- Business Intelligence: Companies use OSINT to gather competitive intelligence, analyze market trends, and make informed decisions.

Examples of OSINT Sources:

- Social Media: Profiles, posts, and interactions
 on platforms like Twitter, Facebook, LinkedIn, and Instagram.
- Websites and Forums: Extracting data from websites, forums, and blogs.
- Public Records: Court records, property records, business registrations, and government databases.
- News Articles: Analyzing news reports for relevant information.
- Geospatial Data: Maps, satellite imagery, and location-based data.

What isn't OSINT?

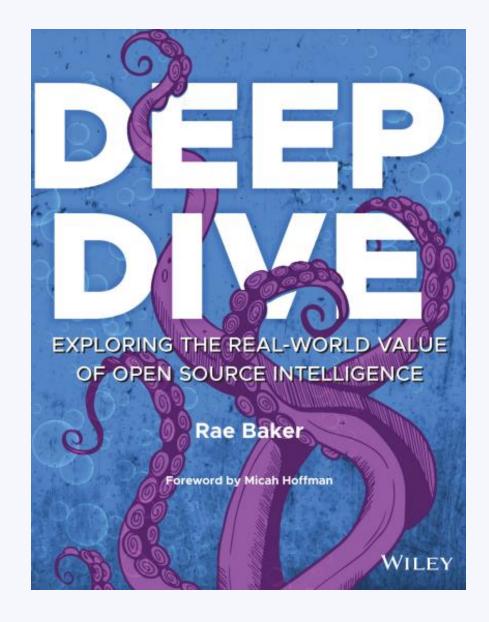
 OSINT is passive and lawful research. OSINT is based only on the passive gathering of information. So the moment you have to directly ask someone for information or initiate a scan that interacts with the target, that isn't OSINT. That's active research. And if your research requires breaking the law or otherwise accessing information you aren't permitted to access, that isn't OSINT either. Cyber attacks such as brute forcing and spyware usage, and any espionage conducted by civilians and without a police search warrant are both highly illegal pretty much everywhere in the world. That definitely isn't OSINT.

TOP OSINT TOOLS

- Maltego
- SpiderFoot
- Intelligence X
- Shodan
- OSINT Framework
- Metagoofil
- Lampyre
- Spokeo
- Recon-ng
- Mitaka
- Babel Street
- Seon
- ***Resource: https://builtin.com/big-data/osint-tools

SANS Blog on OSINT

https://www.sans.org/blog/what-is-open-source-intelligence/



Book Recommended by SANS for OSINT

Open-source information is content that can be found from various sources such as:

- Public Records
- News media
- Libraries
- Social media platforms
- Images, Videos
- Websites
- The Dark web













- Government
- Law Enforcement
- Military
- Investigative journalists
- Human rights investigators
- Private Investigators
- Law firms
- Information Security
- Cyber Threat Intelligence
- Pen Testers
- Social Engineers



Government



Investigative Journalsist



Law Firms



Private Investigators



Social Engineers



Military

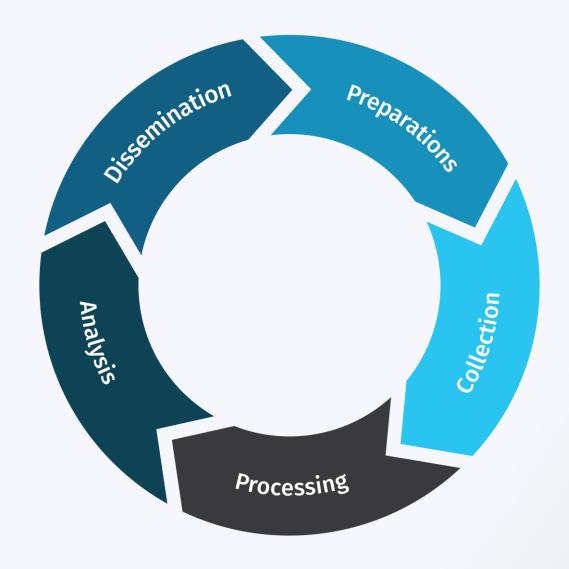
- We all use open-source and probably don't even realize it, but we also use it for different reasons. You might use open-source information to do a credibility check and to find out more about the person selling you something on Facebook marketplace. You may research someone you met on a dating app or before hiring someone for a job.
- A few years ago I found someone's driver's license on the street when I was on a lunch break. I picked it up, thinking I should drop it off at the local driver's license branch. Then I thought to myself, I wonder what I will find if I just Google the person's name (which I did). Turns out the second Google result was a LinkedIn page with the person's name, photo, and workplace which was in the area. I decided to call the company and ask to speak with this person and let them know I had found their license on the street.
- It seems like it was too easy to Google and find the result quickly but this is not uncommon nowadays. Most people, if not everyone, have some sort of **digital footprint**. This is a simple example to show you how quickly you can find information on a person by simply Googling their name.

Intelligence Cycle

 Let's talk about the Intelligence Cycle and what it means for those working in OSINT. There are some variations of the intelligence cycle but generally, it includes similar steps. Using the Intelligence Cycle can assist with understanding what each stage of the cycle means to the OSINT research that will follow.

Stages of the Intelligence Cycle

- <u>Preparation</u> is when the needs and requirements of the request are assessed, such as determining the objectives of the tasking and identifying the best sources to use to find the information for which you are looking.
- <u>Collection</u> is the primary and most important step in collecting data and information from as many relevant sources as possible.
- <u>Processing</u> is when the collected data and information are organized or collated.
- Analysis and Production is the interpretation of the collected information to make sense of what
 was collected, i.e. identifying patterns or a timeline of travel history. Produce a report to answer the
 intelligence question, draw conclusions, and recommend next steps.
- <u>Dissemination</u> is the presentation and delivery of open-source findings, i.e. written reports, timelines, recommendations, etc. Answer the intel question for stakeholders.



Passive versus Active OSINT

- Passive means you do not engage with a target. Passive open-source collection is defined as gathering information about a target using publicly available information. Passive means there will be no communicating or engaging with individuals online, which includes commenting, messaging, friending, and/or following.
- Active means you are engaging with a target in some fashion, i.e. adding the target as a friend on social profiles, liking, commenting on the target's social media posts, messaging the target, etc. Active open-source research is considered engagement and can be looked upon as an undercover operation for some organizations. Please be aware of the differences and request clarification from your agency prior to engaging.
- For active research, it's a must to blend in with the group. If you are engaging with a target you may want to create a couple of accounts on different platforms to make it look like you are a real person.
- Each organization may have different interpretations of what is considered passive versus active engagement. For example, joining private Facebook Groups may appear passive to some organizations, whereas others may consider this as engaging. Sometimes this difference can imply some sort of undercover operation capacity, therefore it's extremely important to have SOPs that outline where the organization stands with this type of engagement.
- Some researchers justify joining groups as passive, as they are only "passively" looking and not actually communicating with targets.
- A good example to consider is where a Facebook Group consists of 500 members or more, where blending in may be easy, whereas a smaller group of 20 people may be riskier. Talk to your managers before proceeding one way or the other.

Passive OSINT

- No engagement with the target
- Passively collecting from publicly available information
- Low risk of attribution

Active OSINT

- Engagement with the target
- May require special permission
- High risk of attribution

Many job descriptions and fields incorporate OSINT skills including the following:

- Journalism
- Intelligence (CIA, NSA, FBI, etc.)
- Government
- Armed forces
- Business
- Genealogy
- Education (training)
- Private investigation
- Security assessments

Qualities	and Skills o	f a Great	OSINT	Analyst
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Curious	Analytical	Active listening	Communication
Detail-oriented	Creative	Technical interest	Methodical
Structured	Self-motivated	Written/oral skills	Critical thinker
Organized	Tenacious		

owasp.org

emailrepo.io--> it will check an email is active or not

The Five INT's:

- HUMINT
- SIGINT
- IMINT
- MASINT
- · OSINT

These are terms used in intelligence and military contexts:

- **HUMINT: Human Intelligence.** This involves collecting information from human sources, such as spies, informants, and other individuals with access to valuable information.
- **SIGINT: Signals Intelligence.** This refers to the interception and analysis of electronic signals, including communications, radar emissions, and other electronic transmissions.
- **IMINT: Imagery Intelligence.** This involves collecting and analyzing images, such as photographs, satellite imagery, and reconnaissance footage, to gather information about enemy activities and terrain.
- MASINT: Measurement and Signature Intelligence. This involves the analysis of various physical attributes, such as radar signatures, chemical compositions, and nuclear emissions, to gather intelligence.
- **OSINT: Open Source Intelligence.** This involves gathering information from publicly available sources, such as newspapers, websites, social media, and other publicly accessible data, to gather intelligence.

How Is Open Source Intelligence Used?

- Open Source Intelligence (OSINT) is the collection, analysis, and dissemination of information that is publicly available and legally accessible. Right now, OSINT is used by a organizations, including governments, businesses, and non-governmental organizations. It is useful in information gathering for a wide range of topics such as security threats, market research, and competitive intelligence.
- Here are some common ways in which OSINT is used:
- Security and Intelligence: OSINT can be used to gather information on potential security threats, such as terrorist activity or cyberattacks. It can also be used for intelligence gathering on foreign governments, organizations, or individuals.
- Business and Market Research: OSINT can be used to gather information on competitors, industry trends, and consumer behavior. This information can be used to inform business strategy and decision-making.
- Investigative Journalism: OSINT can be used by journalists to gather information on a range of topics, including politics, business, and crime. This can help to uncover stories and provide evidence for reporting.
- Academic Research: OSINT can be used by researchers to gather data on a range of topics, including social trends, public opinion, and economic indicators.
- Legal Proceedings: OSINT can be used in legal proceedings to gather evidence or to conduct due diligence on potential witnesses or defendants.
- OSINT is an exceptional tool for gathering information on a wide range of topics and can be used by a variety of organizations and individuals to inform decision-making and strategy.

How does open-source intelligence (OSINT) work?

- Open-source intelligence (OSINT) is the practice of collecting and analyzing publicly available information to generate actionable intelligence. Here's a general overview of how OSINT works:
- Collection: OSINT collection involves gathering publicly available information from a variety of sources such as social media, news articles, government reports, academic papers, and commercial databases. This process can be done manually by searching for and reviewing sources, or through automated tools that can search and aggregate information.
- **Processing**: Once the information is collected, it is processed to remove duplicate, irrelevant or inaccurate data. This step involves filtering and categorizing the information based on relevance and importance.
- Analysis: The processed information is then analyzed to identify trends, patterns, and relationships. This can involve using data visualization tools, data mining, and natural language processing to extract meaningful insights from the data.
- **Dissemination:** The final step in the OSINT process is disseminating the intelligence to decision-makers. This can be done in the form of reports, briefings, or alerts, depending on the needs of the organization.

OSINT is an iterative process that involves constantly refining the collection, processing, and analysis of information based on new data and feedback. Additionally, OSINT is subject to the same biases and limitations as other forms of intelligence collection, and therefore requires careful evaluation and interpretation by trained analysts.

Common OSINT techniques

Common OSINT techniques

Open-source intelligence (OSINT) encompasses a wide range of techniques for collecting and analyzing publicly available information. Here are some common OSINT techniques:

- **Search Engines:** Search engines such as Google, Bing, and Yahoo are valuable tools for gathering OSINT. By using advanced search operators, analysts can quickly filter and refine search results to find relevant information.
- **Social Media:** Social media platforms such as Twitter, Facebook, and LinkedIn are valuable sources of OSINT. By monitoring and analyzing social media activity, analysts can gain insight into trends, sentiment, and potential threats.
- Public Records: Public records such as court documents, property records, and business filings are valuable sources of OSINT. By accessing these records, analysts can gather information on individuals, organizations, and other entities.
- **News Sources:** News sources such as newspapers, magazines, and online news outlets are valuable sources of OSINT. By monitoring and analyzing news articles, analysts can gain insight into current events, trends, and potential threats.
- Web Scraping: Web scraping involves using software tools to extract data from websites. By scraping data from multiple websites, analysts can gather large amounts of data quickly and efficiently.
- Data Analysis Tools: Data analysis tools such as Excel, Tableau, and R are valuable for analyzing large datasets. By using these tools, analysts can identify patterns, trends, and relationships in the data.

OSINT techniques are constantly evolving as new technologies and sources of information become available. It's important for analysts to stay up-to-date on new techniques and tools in order to effectively gather and analyze OSINT.

How OSINT can benefit your organization

- Support criminal investigations by providing background profiles on people and businesses
- Support human source assessments
- Support security/risk assessments
- Support decision making
- Assist with making associations between entities
- Provide situational awareness such as getting insight into current events

The OSINT Process Identifying Where you can find the source the information Its time to get relevant data from the Harvesting identified source Data Process the acquired data and get processing the meaningful information Join the data acquired Analysis from multiple sources Create the Reporting final report

Offensive OSINT – End goals:

The information above can lead to the following cyber attacks:

- Social Engineering
- Denial of Service
- Password Brute Force Attacks
- User accounts takeover
- Identity Theft
- Data theft
- And the list continues......

OSINT Search Engines:

- 1. Google
- 2. Bing
- 3. Yahoo
- 4. Duckduckgo
- 5. Dogpile
- 6. Httrack

Conclusion:

- Open Source Intelligence is a powerful tool with far-reaching applications.
 Its ethical use can empower individuals, businesses, and governments with
 valuable insights. Understanding the types, methods, and significance of
 OSINT is key to harnessing its potential responsibly. As we navigate the
 information age, OSINT stands as a beacon of knowledge, accessible to
 those willing to explore its depths.
- In conclusion, **OSINT** is not just a tool; it's a mindset that values transparency, accuracy, and the responsible use of information. Whether you are a cybersecurity professional, a business strategist, or a curious individual, OSINT opens doors to a wealth of knowledge waiting to be discovered in the vast landscape of publicly available information.

DNS / Subdomain Enumeration

Sub domain findings...

Digital Footprints and OSINT ?? IS there any relationship.....

Digital Footprints:

- Definition: The trail of data left behind by online interactions
- Components:
 - Social media activity (posts, likes, comments)
 - Browsing history
 - Publicly accessible records
- Importance:
 - Privacy
 - Security
 - Reputation

Open Source Intelligence (OSINT)

Definition: Collecting and analysing publicly available information.

Sources:

- Public records
- Social media
- Websites

Applications:

- Criminal investigations
- Journalism
- Corporate due diligence

The Relationship

- Data Collection: OSINT uses digital footprints for information gathering.
- Insights: Social media analysis reveals behavior and connections.
- Ethical Boundaries: OSINT respects privacy and legal constraints.

Watching you drink Beer ...

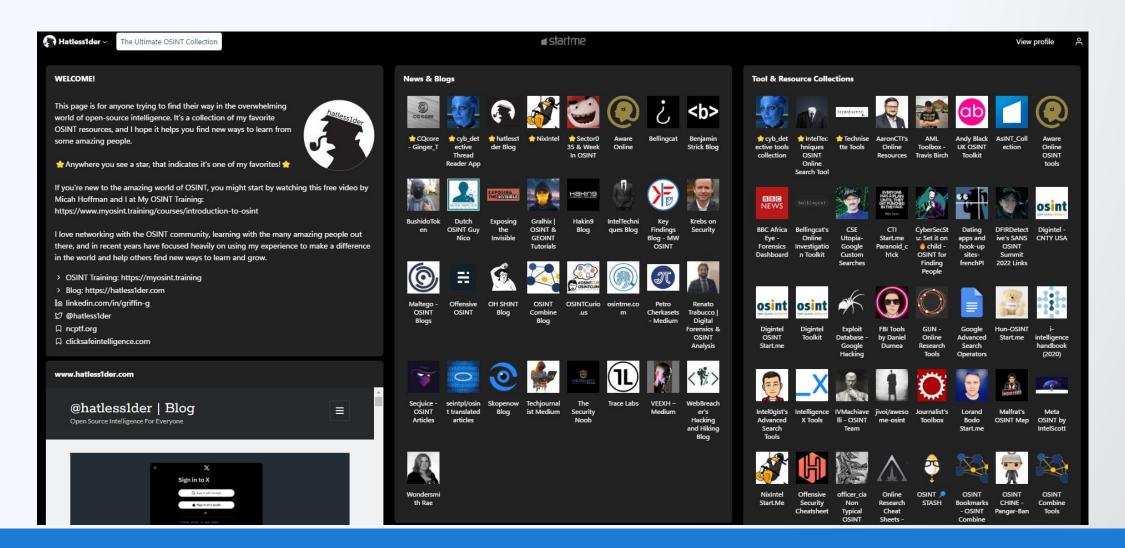
- https://github.com/WebBreacher/untappdScraper
- https://brandone.github.io/untappd-scraper-web/
- https://webbreacher.com/2016/10/29/watching-you-drink-beer/

I noticed that many people on Twitter publish when they use the Untappd.com application. This app allows a user to "check-in" when they drink beer. They get badges, the dates and times of their drinking is noted, and many times the geographic location of where they drank is also available.....all with no authentication! Woohoo!

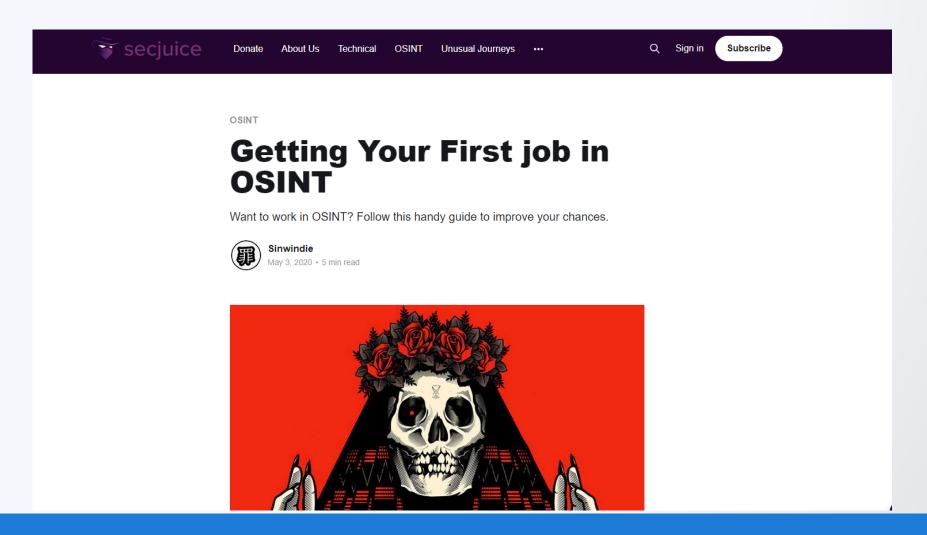
So I wondered if I could patch together some Python to scrape the Untappd.com web site for a given user and then do some analytics on their drinking habits. Stuff like:

- What time of day do they drink most often?
- What day of the week do they drink most often?
- What day of the month do they drink most often?
- Who do they drink with?
- Where do they drink?
- Are they "binge" drinking?

https://start.me/p/DPYPMz/the-ultimate-osint-collection?source=post_page----9993129c10c7-



https://www.secjuice.com/landing-your-first-job-in-osint/



https://www.osintdojo.com/resources/?source=post_page-9993129c10c7----#ctfs







OSINT Resources

Submit Resource or Broken Link

General OSINT Dojo Resources

General OSINT and Methodology ∂

First Steps to Getting Started in Open Source Research

OSINT Attack Surface Diagrams

OSINT & The Intelligence Cycle Part I

OSINT & The Intelligence Cycle Part II

OSINT & The Intelligence Cycle Part III

OSINT & The Intelligence Cycle Part IV

OSINT & The Intelligence Cycle Part V

UN OHCHR OSINT Guide

Verification Handbook I

Verification Handbook II

Verification Handbook III

What is OSINT?

Article Publishing Platforms &

Secjuice

Blogger

Medium

OSINTCurious Contribute

Trace Labs Call for Content

OSINT CTFs and Quizzes *∂*

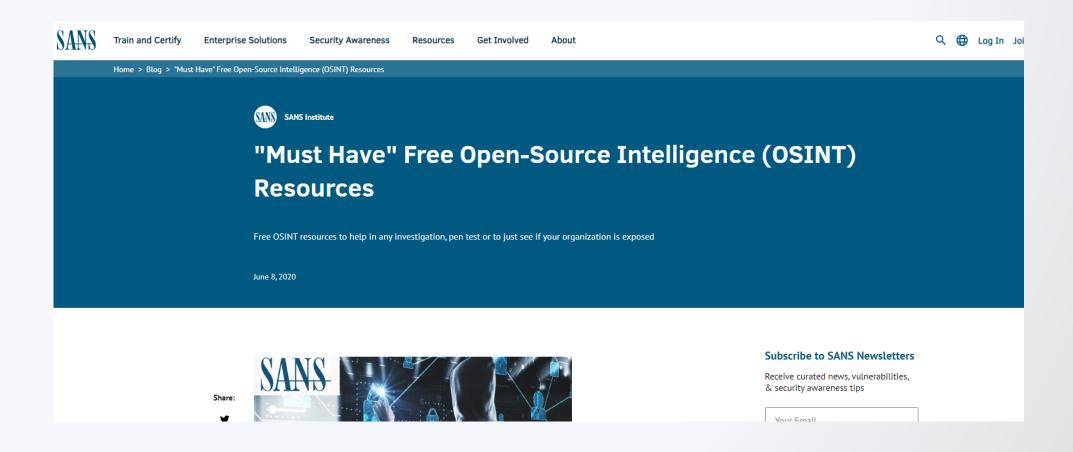
Kase Scenarios (CTF) Quiztime Crew (QUIZ) Sector035's OSINT Quiz (QUIZ)

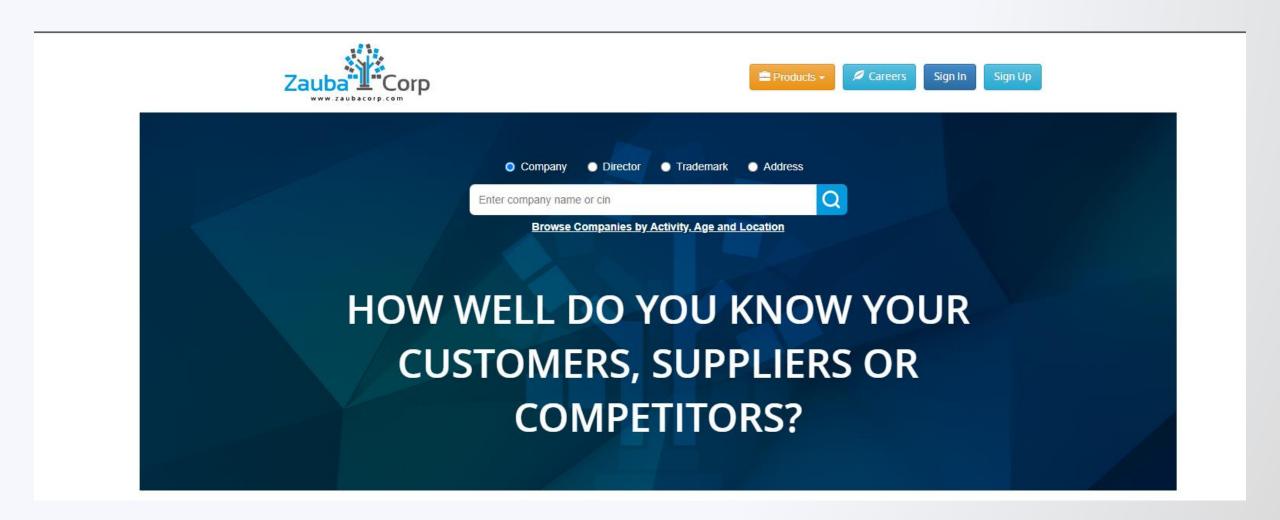
SEINT NI OSINT OUIZZOS (OLIIZ)

https://www.sans.org/brochure/co urse/practical-open-sourceintelligence/4040

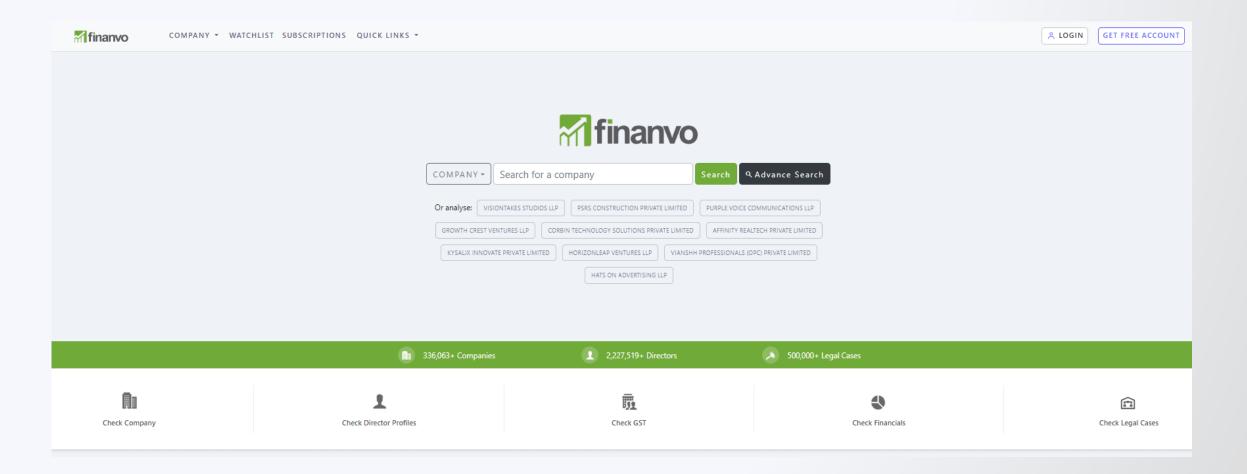


https://www.sans.org/blog/-must-have-free-resources-for-open-source-intelligence-osint-/





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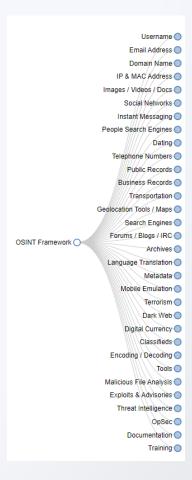


What is the OSINT Framework?

- Gathering information from a vast range of sources is timeconsuming, but there are many tools to simplify intelligence gathering. While you may have heard of tools like <u>Shodan</u> and port scanners like Nmap and Zenmap, the full range of tools is vast. Fortunately, security researchers themselves have begun to document the tools available.
- A great place to start is the <u>OSINT Framework</u> put together by <u>Justin Nordine</u>. The framework provides links to a large collection of resources for a huge variety of tasks from harvesting email addresses to searching social media or the dark web.

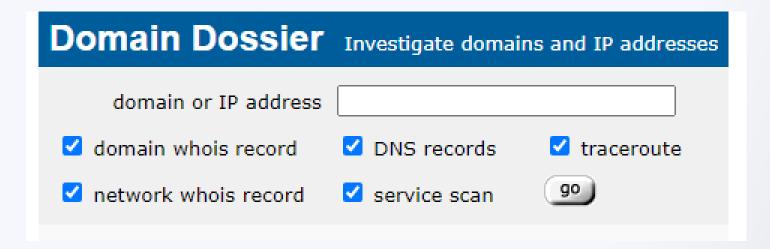
OSINT Framework:

https://osintframework.com/





https://centralops.net/co/domaindossier.aspx



https://viewdns.info/



DomainIQ https://www.domainiq.com/

http://whois.domaintools.com/

https://dnsdumpster.com/

https://website.informer.com/ --->> useful

https://www.ip-tracker.org/

https://whoismind.com/

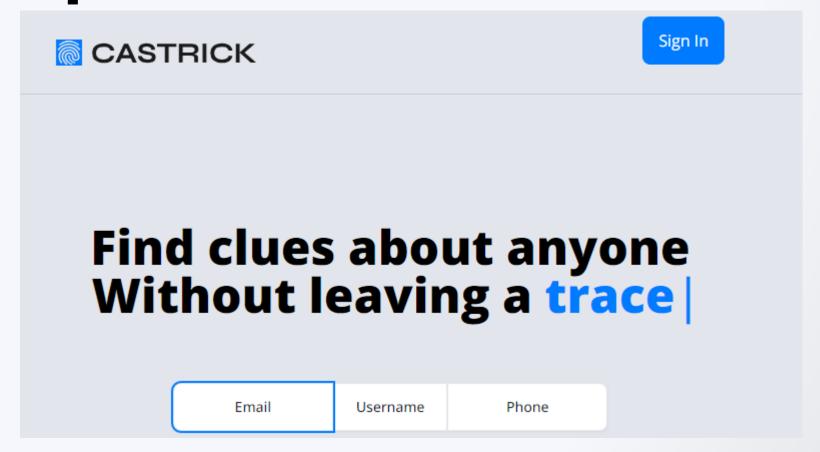
Email OSINT

https://epieos.com/



The ultimate OSINT tool for email and phone reverse lookup

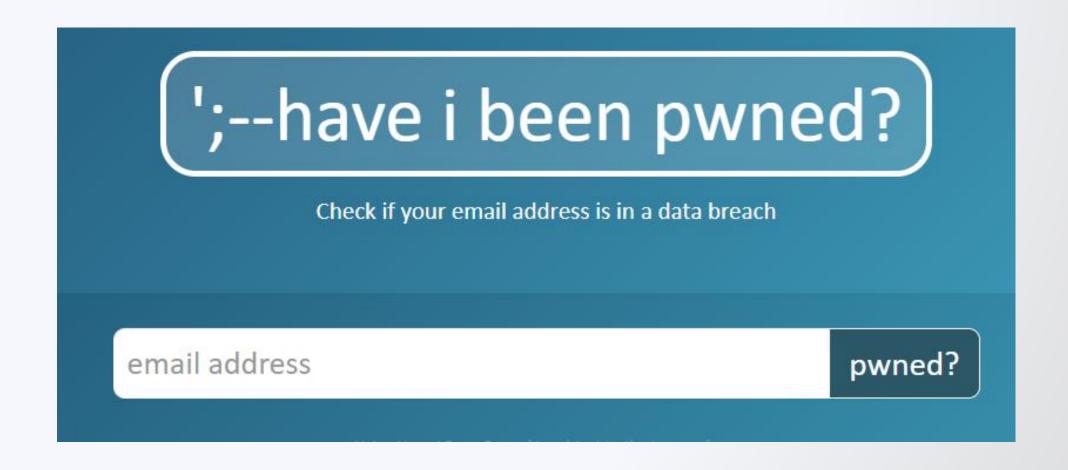
https://castrickclues.com/ **Map**



https://www.signalhire.com/

Very useful for LinkedIn based research.

https://rocketreach.co/person





Some more:

- Amass
- Maltego
- Recon-ng
- Phoneinfoga
- Truecaller
- Freecarrierlookup (Carrier Information / Wireless info)
- Numlookup (not supported in India)
- IRBIS, WHITEPAGES, SPYDIALER
- Twillo lookup api
- Phone Validator
- Numverify

- https://t.co/imoZqP0Tew: OSINT TIP #278! OSINTBuddy The Open-Source Alternative to Maltego!
 Node graphs, OSINT data mining, and plugins. Connect unstructured and public data for
 transformative insights.: https://x.com/0xtechrock/status/1746216488133148709?s=20
- 2. https://github.com/The-Art-of-Hacking/h4cker/tree/master/osint
- 3. asns cidr and subdomains: https://twitter.com/Bugcrowd/status/1745460098540163498
- Brand new [#osint](https://twitter.com/hashtag/osint?src=hashtag_click) geolocation tool
 [https://geospy.web.app](https://t.co/C6e13Mrc9T) from Boston "startup" [@GrayLark_io]
 (https://twitter.com/GrayLark_io).
- [viewdns.info](https://t.co/qsiAOPnHGG) also allows you to find if email is associated with domain names. Simply enter the email address or name of the person or company to find other domains registered with the same data.
- 7. GitHub iudicium/pryingdeep: Prying Deep An OSINT tool to collect intelligence on the dark web.
- 8. https://github.com/SocialLinks-IO/telegram-similar-channels: visualization the connections between different channels (thanks to Telegram's new similar channels feature)
- 9. https://play.google.com/store/apps/details?id=com.cuvora.carinfo car vehicle info for india
- 10. unmasking ip: https://blog.sociallinks.io/center-of-excellence-column-ip-address-analysis-in-osint-investigations/
- 11. https://github.com/SocialLinks-IO/telegram-similar-channels similar telegram channels
- 12. GitHub wishihab/userrecon: Find usernames across over 75 social networks
- 13. Fotoforensics, a multi-faceted photo analysis [#tool](https://twitter.com/hashtag/tool? src=hashtag_click), extracts metadata and detects any tampered images. [http://fotoforensics.com] (https://t.co/8XCYM0HwGM) (from https://x.com/DailyCTI/status/1724796291086217334?s=20)
- 14. https://x.com/lautyb/status/1729162359757766922?s=20 real time location of any telegram user
- 15. [https://github.com/Alfredredbird/alfred](https://t.co/Zi8GkWpdQ4) Alfred is a advanced OSINT information gathering tool that finds social media accounts based on inputs. (from https://x.com/DailyDarkWeb/status/1722245636891066393?s=20)
- 16. help you look up spam databases? SpamDB is the perfect solution for you. [https://spamdb.org] (https://t.co/yNZVRNilln)
- 17. ipinfo.io: map every associated ip address associated with asn in a map

Recommended OSINT Tools for Security Research (**Sentinal one)

- Many different OSINT (Open-Source Intelligence) tools are available for security research. Some of the most popular and effective tools include:
- <u>Maltego</u>: This tool is used for conducting open-source intelligence and forensic analysis. It allows users to collect, visualize, and analyze data from various sources, including social media, the deep web, and other online sources.
- <u>FOCA</u>: This tool is used for metadata analysis, allowing users to extract hidden information from documents and other files. It can uncover hidden data, such as IP addresses, email addresses, and other sensitive information.
- <u>Shodan</u>: This tool is used for internet scanning and search, allowing users to discover connected devices and networks. It can be used to identify vulnerabilities and potential security threats.
- <u>TheHarvester</u>: This tool is used for collecting email addresses, subdomains, and other information from a variety of online sources, including search engines, social media, and the deep web.
- Recon-ng: This tool is used for web reconnaissance, allowing users to gather information from various online sources, including social media, DNS records, and the deep web.
- These are just a few examples of OSINT tools that can be used for security research. There are many other tools available, and the best one for a given situation will depend on the specific needs and goals of the researcher.



Information Gathering

Vulnerability Analysis

Wireless Attacks

Web Applications

- ace-voip
- Amap
- APT2
- arp-scan
- Automater
- bing-ip2hosts
- braa
- CaseFile
- CDPSnarf

- BBQSQL
- BED
- cisco-auditing-tool
- cisco-global-exploiter
- cisco-ocs
- cisco-torch
- copy-router-config
- Doona
- DotDotPwn

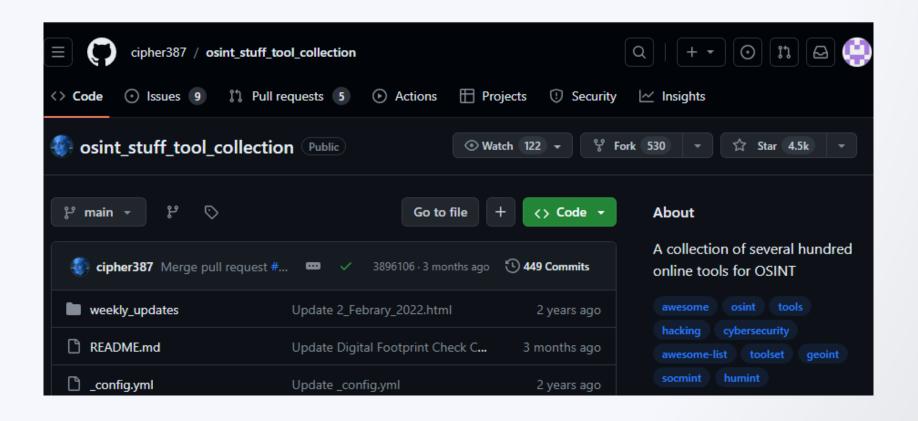
- Airbase-ng
- Aircrack-ng
- Airdecap-ng and Airdecloak-ng
- Aireplay-ng
- airgraph-ng
- Airmon-ng
- Airodump-ng
- airodump-ng-ouiupdate

- apache-users
- Arachni
- BBQSQL
- BlindElephant
- Burp Suite
- CutyCapt
- DAVTest
- deblaze
- DIRB
- DirBuster

OSINT Tools recommended on blackberry:

- OSINT Framework
- Nmap
- Recon-Ng
- Twint
- Metagoofil

https://github.com/cipher387/osint_stuff_tool_collection





 Bellingcat is a well-known open-source investigative journalism organization. They are known for their work in using opensource intelligence (OSINT) and digital forensics to investigate a wide range of topics, including conflict zones, human rights abuses, and geopolitical events. Bellingcat gained significant recognition for their investigations into incidents like the downing of Malaysia Airlines Flight MH17 and the poisoning of Sergei Skripal. Their approach often involves analyzing publicly available information such as satellite imagery, social media posts, and other digital data to uncover facts and evidence that may not be readily apparent.

Belling Cat:



Challenges and Limitations of OSINT

Data Overload

 One of the main challenges in OSINT is sifting through vast amounts of data.

Data Quality

 Ensuring the accuracy and reliability of information obtained from open sources.

Data Privacy

Respecting privacy boundaries while collecting and using open-source data.

Misinformation

 Dealing with the prevalence of fake news and misinformation in open sources.

OSINT is important and still gets overlooked by attackers and defenders

Feedback Form:

https://forms.gle/9iDVVbDyVj9sTyqq7





Lets connect:

LinkedIn: https://www.linkedin.com/in/nipun-negi-020391227/

Email: nipun.negi@owasp.org

nipunnegi2002@gmail.com

