



# Search Skills

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## Introduction

A quick Google search for “learn cyber security” returned around 600 million hits, while a search for “learn hacking” returned more than double that number! The number might have grown even further with time.

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## Evaluation of Search Results



On the Internet, everyone can publish their writings. It can be in the form of blog posts, articles, or social media posts. It can be even in more subtle ways, such as by editing a public wiki page. This ability makes it possible for anyone to voice their unfounded claims. Everyone can express their opinion about best cyber security practices, future programming trends, and how to best prepare for a DevSecOps interview.

It is our job, as readers, to evaluate the information. What to consider when evaluating information:

- **Source:** Identify the author or organization publishing the information. Consider whether they are reputable and authoritative on the subject matter. Publishing a blog post does not make one an authority on the subject.
- **Evidence and reasoning:** Check whether the claims are backed by credible evidence and logical reasoning. We are seeking hard facts and solid arguments.

- **Objectivity and bias:** Evaluate whether the information is presented impartially and rationally, reflecting multiple perspectives. We are not interested in authors pushing shady agendas, whether to promote a product or attack a rival.
- **Corroboration and consistency:** Validate the presented information by corroboration from multiple independent sources. Check whether multiple reliable and reputable sources agree on the central claims.

## Snake Oil

A cryptographic method or product considered bogus or fraudulent.

## ss (socket statistics)

Is the name of the command replacing `netstat` in Linux systems.

## netstat (network statistics)

Is a classic command-line utility in Linux used for monitoring network connections, viewing routing tables, and displaying network interface statistics. It is a versatile tool for system administrators to diagnose network issues and perform security analysis.

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## Search Engines

Operators supported by Google.

- `"exact phrase"` : Double quotes indicate that you are looking for pages with the exact word or phrase. For example, one might search for `"passive reconnaissance"` to get pages with this exact phrase.
- `site:` : This operator lets you specify the domain name to which you want to limit your search. For example, we can search for success stories on TryHackMe using `site:tryhackme.com success stories`.
- `-` : The minus sign allows you to omit search results that contain a particular word or phrase. For example, you might be interested in learning about the

pyramids, but you don't want to view tourism websites; one approach is to search for `pyramids -tourism` or `tourism pyramids`.

- `filetype:` : This search operator is indispensable for finding files instead of web pages. Some of the file types you can search for using Google are Portable Document Format (PDF), Microsoft Word Document (DOC), Microsoft Excel Spreadsheet (XLS), and Microsoft PowerPoint Presentation (PPT). For example, to find cyber security presentations, try searching for `filetype:ppt cyber security`.



## Specialized Search Engines



### Shodan

a search engine for devices connected to the Internet. It allows you to search for specific types and versions of servers, networking equipment, industrial control systems, and IoT devices. You may want to see how many servers are still running Apache 2.4.1 and the distribution across countries. To find the answer, we can search for `apache 2.4.1`, which will return the list of servers with the string "apache 2.4.1" in their headers.

The screenshot shows the Shodan search interface with the query `apache 2.4.1` entered in the search bar. The results page displays a total of 9,707 findings. A world map highlights countries where these servers are located. Below the map, a table lists the top countries: Singapore (1,393), Japan (1,363), United Kingdom (1,223), France (708), and Canada (661). Two specific search results are shown in detail:

- DigitalOcean, LLC** (Singapore, Singapore) - IP: [REDACTED] - Status: HTTP/1.1 200 OK - Date: Mon, 06 May 2024 14:14:14 GMT - Server: Apache/2.4.1 (Unix) - Content-Type: text/html - Content-Length: 44
- northeast-2.compute.amazonaws.com** (AWS Asia Pacific (Seoul) Region, Korea, Republic of, Incheon) - IP: [REDACTED] - Status: HTTP/1.1 200 OK - Date: Mon, 06 May 2024 13:54:58 GMT - Server: Apache/2.4.1 (Unix) - Content-Type: text/html - Content-Length: 44



### Censys

Focuses on Internet-connected hosts, websites, certificates, and other Internet assets. Some of its use cases include enumerating domains in use, auditing open ports and services, and discovering rogue assets within a network.

The screenshot shows the Censys web interface. At the top, there is a search bar with the query "Hosts" and "apache 2.4.1". Below the search bar, the results page is displayed under the heading "Results". On the left, there is a sidebar titled "Host Filters" with sections for "Labels", "Autonomous System", and "Location". The main area shows a list of hosts, each with a small icon, the operating system or service name, the IP address, the location, and a list of open ports and protocols. For example, one host is listed as "Centos Linux" from "CHINANET-BACKBONE No.31,Jin-rong Street (4134)" in "Jiangsu, China" with ports 8082/HTTP, 9001/HTTP, 1701/L2TP, 3001/HTTP, 3309/HTTP, 10080/HTTP, 10090/HTTP, 11180/HTTP, 11443/HTTP, 18100/HTTP, 18110/HTTP, 18580/HTTP, 22022/SSH, 22024/SSH, 26060/HTTP, 28080/HTTP, 30010/HTTP, 30060/HTTP, 30070/HTTP, 30080/HTTP, and 30880/HTTP. Another host is listed as "Microsoft Windows" from "KINET PROVEDOR DE INTERNET E SERVICOS DE TELECOM (268885)" in "Rio Grande do Sul, Brazil" with ports 80/HTTP, 443/HTTP, 1723/PPTP, 5555/RTSP, 8071/HTTP, 8078/HTTP, 8079/HTTP, 8080/HTTP, 8082/HTTP, 8087/HTTP, 8088/HTTP, 8089/HTTP, 8097/HTTP, and 8181/HTTP. A third host is listed as "Linux" from "ALIBABA-CN-NET Hangzhou Alibaba Advertising Co.,Ltd. (37963)" in "Guangdong, China" with ports 5657/HTTP, 8081/HTTP, 8096/HTTP, and 8089/HTTP.

## VirusTotal

Is an online website that provides a virus-scanning service for files using multiple antivirus engines. It allows users to upload files or provide URLs to scan them against numerous antivirus engines and website scanners in a single operation. They can even input file hashes to check the results of previously uploaded files.

The screenshot below shows the result of checking the submitted file against 67 antivirus engines. Furthermore, one can check the community's comments for more insights. Occasionally, a file might be flagged as a virus or a Trojan; however, this might not be accurate for various reasons, and that's when community members can provide a more in-depth explanation.

The screenshot shows a detailed analysis of a file named 'eicar.com2.zip'. The top navigation bar includes a search bar with the file name, a 'Sign in' button, and a 'Sign up' button. On the left, there's a circular 'Community Score' meter at 57/67. The main content area displays the file's metadata: size 308 B, last modified a moment ago, and a ZIP icon. Below this, tabs for 'DETECTION', 'DETAILS', 'RELATIONS', 'BEHAVIOR', and 'COMMUNITY' are visible, with 'COMMUNITY' currently selected. Under 'Popular threat label', it lists 'virus.eicar/test'. Threat categories include 'virus' and 'trojan'. Family labels include 'eicar', 'test', and 'file'. A section titled 'Security vendors' analysis' lists vendor responses for various engines like Alibaba, AliCloud, ALYac, Antiy-AVL, Avast, AVG, Baidu, BitDefenderTheta, CMC, and DrWeb. A blue 'Report' button is located on the right side of this section.

## ? Have I Been Pwned

Have I Been Pwned (HIBP) does one thing; it tells you if an email address has appeared in a leaked data breach. Finding one's email within leaked data indicates leaked private information and, more importantly, passwords. Many users use the same password across multiple platforms, if one platform is breached, their password on other platforms is also exposed. Indeed, passwords are usually stored in encrypted format; however, many passwords are not that complex and can be recovered using a variety of attacks.

The screenshot shows the homepage of the 'Have I Been Pwned?' website. At the top, a large button contains the text ':--have i been pwned?'. Below it, a sub-header reads 'Check if your email address is in a data breach'. A search bar is followed by a 'pwned?' button. The main content area has a red background and displays the message 'Oh no — pwned!' in white. It also states 'Pwned in 18 data breaches and found no pastes (subscribe to search sensitive breaches)'. Below this, there's a 'Donate' button with social media sharing icons. A section titled 'Breaches you were pwned in' lists the '500px' breach, which is described as follows:

**500px**: In mid-2018, the online photography community 500px suffered a data breach. The incident exposed almost 15 million unique email addresses alongside names, usernames, genders, dates of birth and either an MD5 or bcrypt password hash. In 2019, the data appeared listed for sale on a dark web marketplace (along with several other large breaches) and subsequently began circulating more broadly. The data was provided to HBIB by a source who requested it to be attributed to "BenjaminBlue@exploit.lm".

**Compromised data:** Dates of birth, Email addresses, Genders, Geographic locations, Names, Passwords, Usernames

## 💣 Vulnerabilities and Exploits

### 🥊 Common Vulnerabilities and Exposures (CVE)

We can think of the CVE program as a dictionary of vulnerabilities. It provides a standardized identifier for vulnerabilities and security issues in software and hardware products. Each vulnerability is assigned a CVE ID with a standardized format like [CVE-2024-29988](#). This unique identifier (CVE ID) ensures that everyone from security researchers to vendors and IT professionals is referring to the same vulnerability, [CVE-2024-29988](#) in this case. The MITRE Corporation maintains the CVE system.

**CVE** About Partner Information Program Organization Downloads Resources & Support Report/Request

**CVE-2014-0160** [ PUBLISHED ] View JSON

**Important CVE JSON 5 Information** +

**Assigner:** Red Hat, Inc.  
**Published:** 2014-04-07 **Updated:** 2022-11-15

The (1) TLS and (2) DTLS implementations in OpenSSL 1.0.1 before 1.0.1g do not properly handle Heartbeat Extension packets, which allows remote attackers to obtain sensitive information from process memory via crafted packets that trigger a buffer over-read, as demonstrated by reading private keys, related to d1\_both.c and t1\_lib.c, aka the Heartbleed bug.

**Product Status**

**Learn About the Versions Section** +

*Information not provided*

**References**

- <https://support.f5.com/kb/en-us/solutions/public/15000/100/sol15159.html?sr=36517217> ↗
- securitytracker.com: 1030077 ↗ vdb-entry
- seclists.org: 20140408 heartbleed OpenSSL bug CVE-2014-0160 ↗ mailing-list
- http://www.getchef.com/blog/2014/04/09/chef-server-heartbleed-cve-2014-0160-releases/ ↗
- debian.org: DSA-2896 ↗ vendor-advisory

## 🐞 Exploit Database

Lists exploit codes from various authors; some of these exploit codes are tested and marked as verified.

**EXPLOIT DATABASE**

Verified Has App

Show 15 ▾

Date D A V Title Type Platform Author

2014-04-24	1	✓	OpenSSL TLS Heartbeat Extension - 'Heartbleed' Information Leak (2) (DTLS Support)	Remote	Multiple	Ayman Sagy
2014-04-10	1	✓	OpenSSL TLS Heartbeat Extension - 'Heartbleed' Information Leak (1)	Remote	Multiple	prdelka
2014-04-09	1	✓	OpenSSL 1.0.1f TLS Heartbeat Extension - 'Heartbleed' Memory Disclosure (Multiple SSL/TLS Versions)	Remote	Multiple	Fitzl Csaba
2014-04-08	1	✓	OpenSSL TLS Heartbeat Extension - 'Heartbleed' Memory Disclosure	Remote	Multiple	Jared Stafford

Showing 1 to 4 of 4 entries (filtered from 46,034 total entries)

FIRST PREVIOUS 1 NEXT LAST

Databases	Links	Sites	Solutions
Exploits	Search Exploit-DB	OffSec	Courses and Certifications
Google Hacking	Submit Entry	Kali Linux	Learn Subscriptions
Papers	SearchSploit Manual	VulnHub	OffSec Cyber Range
Shellcodes	Exploit Statistics		Proving Grounds
			Penetration Testing Services

GitHub, a web-based platform for software development, can contain many tools related to CVEs, along with proof-of-concept (PoC) and exploit codes.

The screenshot shows a GitHub search interface with the query "CVE-2014-0160". The left sidebar includes filters for Code, Repositories (65 results), Issues (250), Pull requests (265), Discussions (3), Users (0), and More. Below these are language filters for Python, Go, JavaScript, Dockerfile, Lua, PHP, Ruby, C, Perl, and Shell, with a link to "More languages...". The main area displays 65 results. The first result is "FiloSottile/Heartbleed", a checker for CVE-2014-0160, updated on 2021年2月24日. The second result is "Lekensteyn/pacemaker", a Heartbleed client exploit, updated on 2016年1月22日. The third result is "titanous/heartbleeder", an OpenSSL vulnerability test, updated on 2014年5月28日. The fourth result is "musalbas/heartbleed-masstest", a multi-threaded host scanner, updated on 2015年7月2日. The fifth result is "sensepost/heartbleed-poc", a test for SSL heartbeat vulnerability, updated on 2014年7月11日. Each repository card includes a "Star" button.

## Technical Documentation

### Linux Manual Pages

On Linux and every Unix-like system, each command is expected to have a man page. In fact, man pages also exist for system calls, library functions, and even configuration files.

Let's say we want to check the manual page for the command `ip`. We issue the command `man ip`. The screenshot below shows the page we received. You might want to start the AttackBox and run `man ip` on the terminal. Press `q` to quit.

```

IP(8)                               Linux                               IP(8)

NAME
    ip - show / manipulate routing, network devices, interfaces and tunnels

SYNOPSIS
    ip [ OPTIONS ] OBJECT { COMMAND | help }

    ip [ -force ] -batch filename

    OBJECT := { link | address | addrlabel | route | rule | neigh | ntable | tunnel | tuntap | maddress | mroute | mrule | monitor | xfrm | netns |
               l2tp | tcp_metrics | token | macsec | vrf | mptcp | ioam | stats }

    OPTIONS := { -V[ersion] | -h[uman-readable] | -s[tatistics] | -d[etails] | -r[esolve] | -iec | -fAMILY { inet | inet6 | link } | -4 | -6 | -B
                 | -0 | -l[oops] { maximum-addr-flush-attempts } | -o[neline] | -rc[vbuf] { size } | -t{imestamp} | -ts{hort} | -n{etns} name | -N{umeric}
                 | -a[ll] | -c[olor] | -br[ief] | -j[son] | -p[retty] }

OPTIONS
    -V, -Version
        Print the version of the ip utility and exit.

    -h, -human, -human-readable
        output statistics with human readable values followed by suffix.

    -b, -batch <FILENAME>
        Read commands from provided file or standard input and invoke them. First failure will cause termination of ip.

    -force Don't terminate ip on errors in batch mode. If there were any errors during execution of the commands, the application return code will
        be non zero.

    -s, -stats, -statistics
        Output more information. If the option appears twice or more, the amount of information increases. As a rule, the information is statis-
        tics or some time values.

    -d, -details
        Output more detailed information.

    -l, -loops <COUNT>
        Specify maximum number of loops the 'ip address flush' logic will attempt before giving up. The default is 10. Zero (0) means loop until
        all addresses are removed.

Manual page ip(8) line 1 (press h for help or q to quit)

```

If you prefer to read the man page of `ip` in your web browser, just type `man ip` in your favourite search engine. This [page](#) might be at the top of the results.

The **AttackBox** is a Linux system accessible from your browser. Clicking on the **Start AttackBox** button will display the AttackBox in a split screen, making it convenient to read the task text and apply the instructions within the same browser window. If you hide the AttackBox window, you can show it again by clicking the blue Show Split View button at the top. In this task, you can start the AttackBox and use it to try Linux commands such as `man`.

## Microsoft Windows

Microsoft provides an official [Technical Documentation](#) page for its products. The screenshot below shows the search results for the command `ipconfig`.

The screenshot shows a search interface with a search bar containing "ipconfig". Below the search bar, it says "1,185 results for 'ipconfig'". On the left, there's a "Filter" section with "Content area" and "Products" sections. The "Content area" section has a radio button for "All" (selected) and other options like Documentation, Training, etc., with counts like 1.2K, 252, 0, 0, 824, 107, and 2. The "Products" section includes a "Find a product" input field and dropdowns for ".NET", "Azure", "Clarity", and "Dynamics". The main results list starts with "ipconfig" and "IPConfig interface".



## Product Documentation

Every popular product is expected to have well-organized documentation. This documentation provides an official and reliable source of information about the product features and functions. Examples include [Snort Official Documentation](#), [Apache HTTP Server Documentation](#), [PHP Documentation](#), and [Node.js Documentation](#).

It is always rewarding to check the official documentation as it is the most up-to-date and offers the most complete product information.



The Linux command `cat` stand for *concatenate*.

The `netstat` parameter in MS Windows that displays the executable associated with each active connection and listening port is `-b`.

## ➡️ Social Media



## Cybersecurity Best Practices

### 1. Personnel Security & Social Engineering

It is critical to ensure that employees are mindful of their social media footprint. Oversharing can inadvertently provide adversaries with the building blocks for a breach.

- **The Risk:** Personal details shared online often contain the answers to security "secret questions" (e.g., *"What was the name of your primary school?"*).
- **The Consequence:** Attackers can use this information to perform unauthorized password resets and take over accounts with minimal effort.



Conduct regular awareness training on "Digital Hygiene" to prevent the disclosure of sensitive personal data.

## 2. Professional Growth & Networking

As a cybersecurity professional, staying stagnant is not an option. Engaging with the right communities is essential for maintaining a competitive edge.

- **Community Engagement:** Joining specialized groups and channels creates a collaborative environment for sharpening technical expertise.
- **Trend Tracking:** Following industry leaders helps you stay ahead of emerging threats, new technologies, and defensive products.

## 3. Continuous Information Monitoring

Beyond social media, a diversified information diet is necessary to stay informed.

- **Industry News Outlets:** Monitor reputable cybersecurity news websites to get vetted, deep-dive analysis on global vulnerabilities.
- **Primary Sources:** Use a mix of RSS feeds or newsletters to aggregate updates from hundreds of available security platforms.