HO#2.3
Scanning & Vulnerability Analysis: Part 1

Phase 1- Reconnaissance and Information Gathering

The Information gathering phase (reconnaissance) is the initial step in the penetration testing lifecycle. This phase involves collecting as much public information as possible about the organization, systems, networks, applications, and employees to identify potential vulnerabilities and formulate a strategy for further testing. Passive information gathering (reconnaissance) involves collecting data without directly interacting with the target system, reducing the risk of detection. Gathering information from publicly available sources like news outlets, blogs and social media platforms (Twitter, Facebook, LinkedIn) is named as Open-Source Intelligence (OSINT). The techniques used for OSINT are Web Scraping, Google Dorking, and social media profiling. The tools that we have used for this in HO#2.2 were `netdiscover, traceroute, host, nslookup, dig, whois, whatweb, theHarvester, sherlock, knockpy, wfw00f, Google Dorks,` and the famous `OSINT framework`.

Phase 2- Scanning and Vulnerability Analysis

Scanning and vulnerability analysis is the second phase of penetration testing whose objective is to discover open ports, services, OS, library versions and other information about the target machine/NW. In cybersecurity, scanning and vulnerability analysis are closely related but differ in terms of purpose, depth, and focus. ***Scanning*** is broader and focuses on identifying what is present (systems, ports, services), while ***vulnerability analysis*** digs deeper to determine what is wrong with those systems (misconfigurations, unpatched software, exploitable flaws).

- **Scanning:** The objective of scanning is to identify systems, services, and potential points of entry (ports, protocols and their versions) in a network. Its primary focus is to map the target's environment and identify what is running and reachable. Unlike reconnaissance and information gathering scanning is Active information gathering, because the tools used in this phase directly interact with the target network, hosts, ports, employees, and so on to collect data. So DONOT perform active network scanning unless you have written permission of the system owner to perform that testing.The tools that we normally use for scanning are `nmap, zenmap, unicornscan, nikto` and so on. There can be different types of scanning like:
  - Port Scanning: Detects which ports are open and which services are running on those ports.
  - Network Scanning: Identifies live hosts, devices, and IP addresses within a network.
  - Service/OS Detection: Determines which operating systems and services are running on discovered hosts.

  Scanning results provide a list of systems, open ports, and running services. However, it doesn't necessarily reveal whether these are vulnerable.

- **Vulnerability Analysis (or Vulnerability Assessment):** The objective of vulnerability analysis is to identify and assess security weaknesses (vulnerabilities) in the systems, applications, and configurations. Its primary focus is to evaluate the specific risks associated with the discovered systems and services by doing an in-depth examination to uncover known vulnerabilities, misconfigurations, or weaknesses. The tools that we normally use for vulnerability analysis are `nessus, searchsploit, OpenVAS, MSF, Burp-Suite, SQLMap` and so on. While working with vulnerability scanning tools, one must keep in mind, that they may have a high false positive and false negative rate.

The steps that we normally perform during vulnerability analysis are:

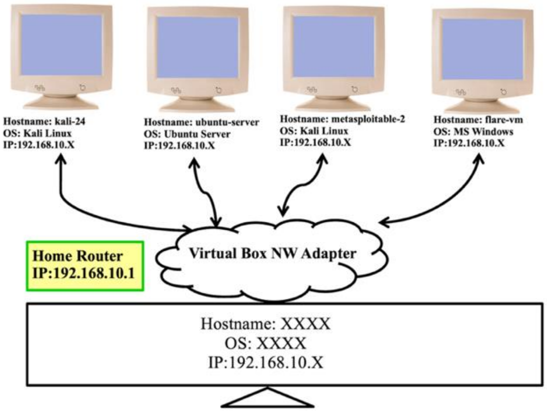
- Vulnerability Scanning: Scanning the target for known vulnerabilities using databases like CVE (Common Vulnerabilities and Exposures).
- Risk Evaluation: Assessing the severity of discovered vulnerabilities, often using metrics like CVSS (Common Vulnerability Scoring System) to prioritize them.
- Remediation Recommendations: A detailed report highlighting specific vulnerabilities, their risk levels, and actionable steps to mitigate those vulnerabilities (e.g., patching, configuration changes, etc.).

So to summarize, one can say that Information Gathering focuses on collecting general data about the target (e.g., open ports, services, OS), while Vulnerability Scanning focuses on detecting specific vulnerabilities that can be exploited (e.g., unpatched software, weak configurations).

Environment Setup

You can use the following machines for a hands-on practice of this handout in which I am using kali Linux as attacker machine and scanning Metasploitable 2:

1. Kali Linux (IP: x.x.x.x)
2. Metasploitable 2 (IP: x.x.x.x)



Nmap https://nmap.org

The **nmap** (Network Mapper) is a free and open-source utility for network discovery and security auditing. **Nmap** uses raw IP packets in novel ways to determine what hosts are available on the network, what services (application name and version) those hosts are offering, what operating systems (and OS versions) they are running, what type of packet filters/firewalls are in use, and dozens of other characteristics. Simply speaking, we can use **nmap** for *network scanning*, *port scanning*, and *vulnerability scanning*. Some of the most useful tasks that **nmap** can perform, are mentioned below:

- **Host Discovery**: Identifying live hosts on a network. This can be done using various techniques such as ICMP echo requests, TCP/UDP packets, and ARP requests.
- **Port Scanning**: Determining which ports on a target are open, closed, or filtered. Different types of scans include SYN scan, TCP connect scan, UDP scan, and FIN scan.
- **Service Version Detection**: Identifying the versions of services running on open ports. This helps in determining specific software vulnerabilities.
- **Operating System Detection**: Fingerprinting the target's operating system and sometimes even determining the OS version and device type.
- **Scriptable Interaction**: Using Nmap Scripting Engine (NSE) to perform advanced network tasks such as vulnerability detection, backdoor detection, and more. NSE scripts can also be customized or created to meet specific needs.
- **Stealth Scanning**: Performing scans in a way that minimizes detection by firewalls and intrusion detection systems (IDS).

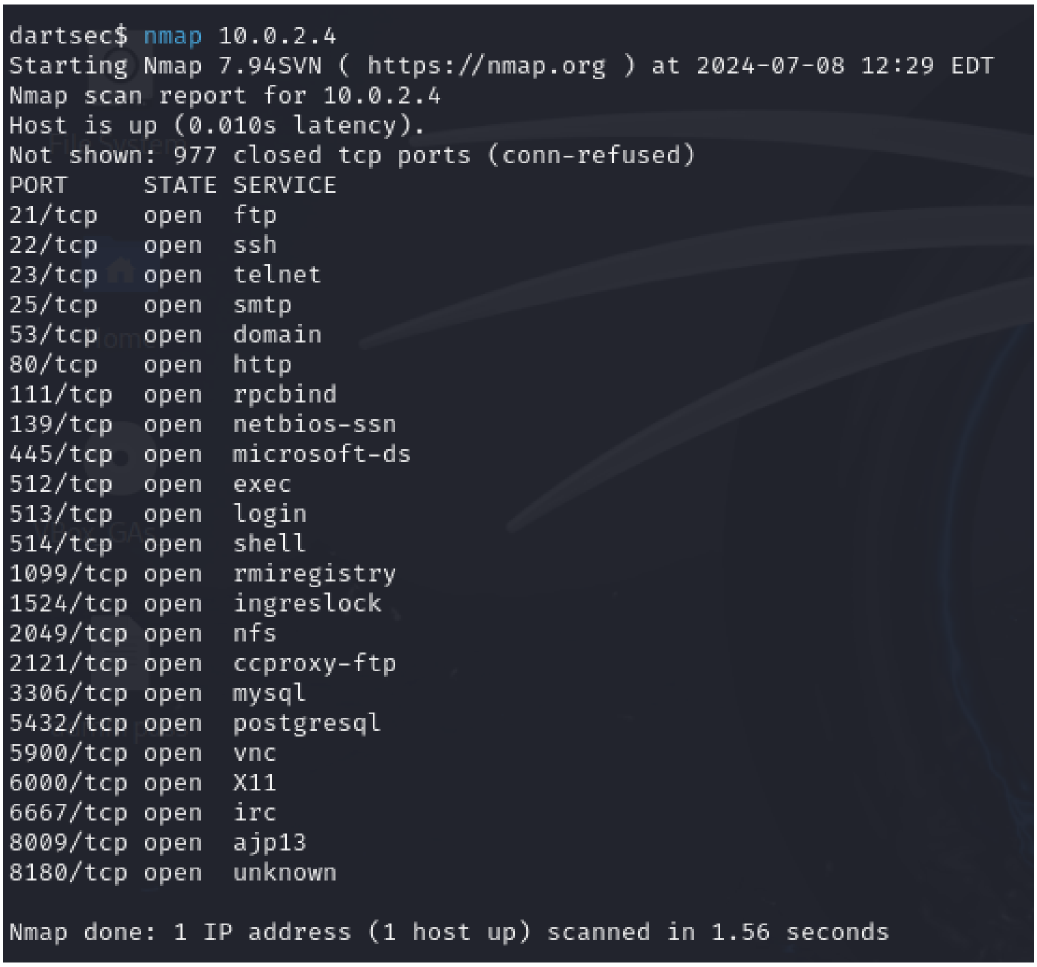
Basic Usage of nmap

```
$ nmap --version
$ nmap -h
$ man nmap
$ nmap <IP/hostname/NW Addr>
```

Command	Description
`$ nmap 192.168.1.1`	Scanning a single IP
`$ nmap www.domain.com`	Scanning a hostname
`$ nmap 192.168.1.1-100`	Scanning an IP range
`$ nmap 192.168.1.1/24`	Scanning an entire subnet
`$ nmap -iL list.txt`	Scanning from a predefined list

Command	Description
`$ nmap -p 22 192.168.1.1`	Scanning a single port (By default nmap scans first 1000 ports)
`$ nmap -p 20-80 192.168.1.1`	Scanning a range of ports
`$ nmap 20-25,80,443 192.168.1.1`	Scanning a range and individual ports
`$ nmap -p- 192.168.1.1`	Scanning all 65535 ports
`$ nmap -F 192.168.1.1`	Scanning first 100 ports (Fast Scan)
`$ nmap -A 192.168.1.1`	Aggressive Scan enables OS detection, version detection, script scanning and traceroute

$ nmap <IP of Metasploitable2>



```
dartsec$ nmap 10.0.2.4
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-07-08 12:29 EDT
Nmap scan report for 10.0.2.4
Host is up (0.010s latency).
Not shown: 977 closed tcp ports (conn-refused)
PORT     STATE SERVICE
21/tcp   open  ftp
22/tcp   open  ssh
23/tcp   open  telnet
25/tcp   open  smtp
53/tcp   open  domain
80/tcp   open  http
111/tcp  open  rpcbind
139/tcp  open  netbios-ssn
445/tcp  open  microsoft-ds
512/tcp  open  exec
513/tcp  open  login
514/tcp  open  shell
1099/tcp open  rmiregistry
1524/tcp open  ingreslock
2049/tcp open  nfs
2121/tcp open  ccproxy-ftp
3306/tcp open  mysql
5432/tcp open  postgresql
5900/tcp open  vnc
6000/tcp open  X11
6667/tcp open  irc
8009/tcp open  ajp13
8180/tcp open  unknown

Nmap done: 1 IP address (1 host up) scanned in 1.56 seconds
```

Description of output: Although the STATE of all the ports in this screenshot is open, however, in the output of **nmap** scan, a port can be in one of the following six states:

- **Open**: This indicates that an application is accepting connections on this port and is reachable.
- **Closed**: This indicates that the port is reachable but not currently in use, i.e., no application is listening on it.
- **Filtered**: Nmap cannot determine whether the port is open because packet filtering prevents its probes from reaching the port. This is often due to a firewall or other NW security devices.
- **Unfiltered**: The port is accessible, but Nmap cannot determine if it is open or closed.
- **Open|Filtered**: Nmap cannot determine whether the port is *open* or *filtered*. This happens when Nmap does not receive enough information to decide between the two states.
- **Closed|Filtered**: Nmap cannot determine whether the port is *closed* or *filtered*. This is a less common state, indicating ambiguous results.

Scanning the Famous http://scanme.nmap.org

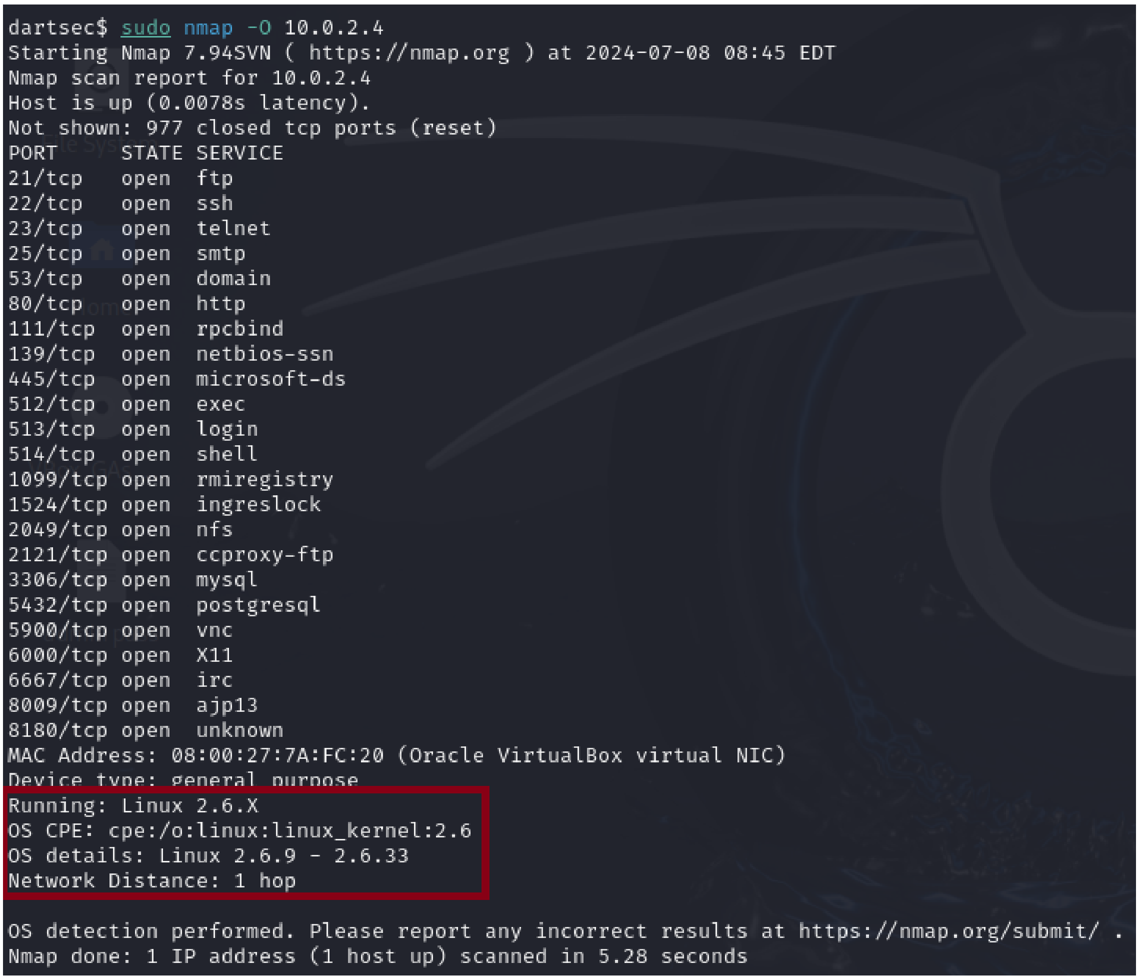
This is a machine that nmap has setup for the folks to test and make sure that their Nmap installation (or Internet connection) is working properly. You are authorized to scan this machine with Nmap or other port scanners. Try not to hammer on the server too hard.

```
$ nmap -p 20-100 scanme.nmap.org
$ nmap -p 20-100 45.33.32.156
```

Target OS Discovery

Discovering the operating system (OS) of a target host using `nmap` is a useful feature for network scanning and security assessments. Different operating systems and versions have distinct ways of responding to network probes. By sending probes to both open and closed ports, `nmap` can gather more varied responses. We can perform OS detection using the `-O` option to `nmap`:

`$ nmap -O <ip of M2>`



```
dartsec$ sudo nmap -O 10.0.2.4
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-07-08 08:45 EDT
Nmap scan report for 10.0.2.4
Host is up (0.0078s latency).
Not shown: 977 closed tcp ports (reset)
PORT     STATE SERVICE
21/tcp   open  ftp
22/tcp   open  ssh
23/tcp   open  telnet
25/tcp   open  smtp
53/tcp   open  domain
80/tcp   open  http
111/tcp  open  rpcbind
139/tcp  open  netbios-ssn
445/tcp  open  microsoft-ds
512/tcp  open  exec
513/tcp  open  login
514/tcp  open  shell
1099/tcp open  rmiregistry
1524/tcp open  ingreslock
2049/tcp open  nfs
2121/tcp open  ccproxy-ftp
3306/tcp open  mysql
5432/tcp open  postgresql
5900/tcp open  vnc
6000/tcp open  X11
6667/tcp open  irc
8009/tcp open  ajp13
8180/tcp open  unknown
MAC Address: 08:00:27:7A:FC:20 (Oracle VirtualBox virtual NIC)
Device type: general purpose
Running: Linux 2.6.X
OS CPE: cpe:/o:linux:linux_kernel:2.6
OS details: Linux 2.6.9 - 2.6.33
Network Distance: 1 hop

OS detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 5.28 seconds
```

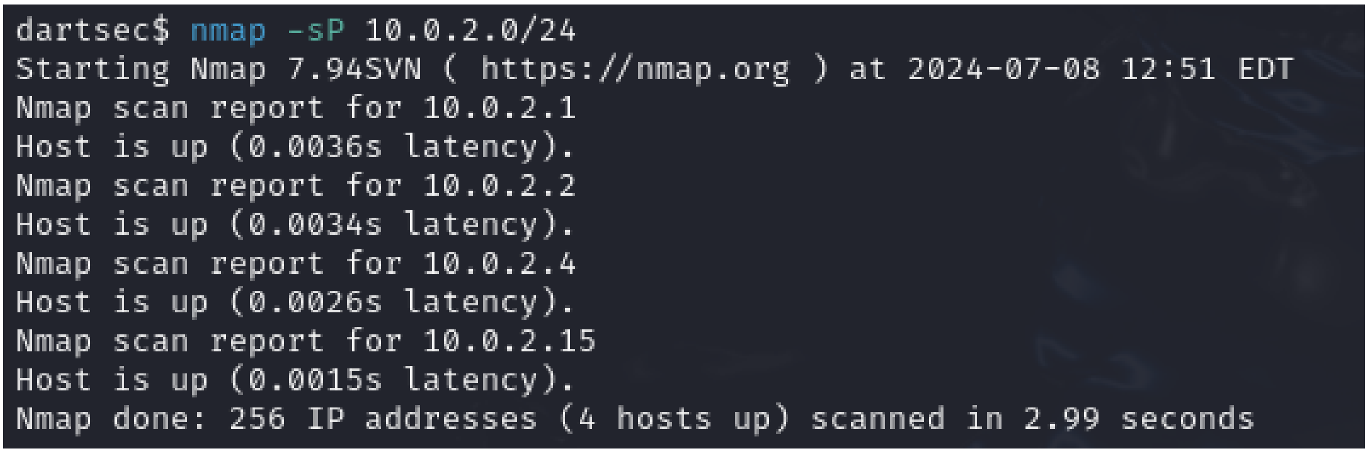
The highlighted output in red tells us about the running Linux kernel. The **`X`** in version numbers like **`2.6.X`** signifies that `nmap` has identified the major and minor version of the OS but does not have enough information to determine the exact patch level or sub-version. This shows that `nmap` scans are not all accurate or give complete information. We need to run more scans with more `nmap` options to find full information.

To check what all machines are running in the LAN

Ping/Network Scan

The `nmap` ping scan is used for network discovery. It sends various probes (like ICMP echo request, TCP SYN to port 443, or ICMP timestamp request) to check if the target is up. By default, it won't scan any ports, only determining whether the host is active. In older versions of Nmap (before version 4.0), **`-sp`** was used to perform a ping scan. However, in recent versions, it has been deprecated in favor of **`-sn`** option.

```
$ nmap -sn 10.0.2.0/24
```

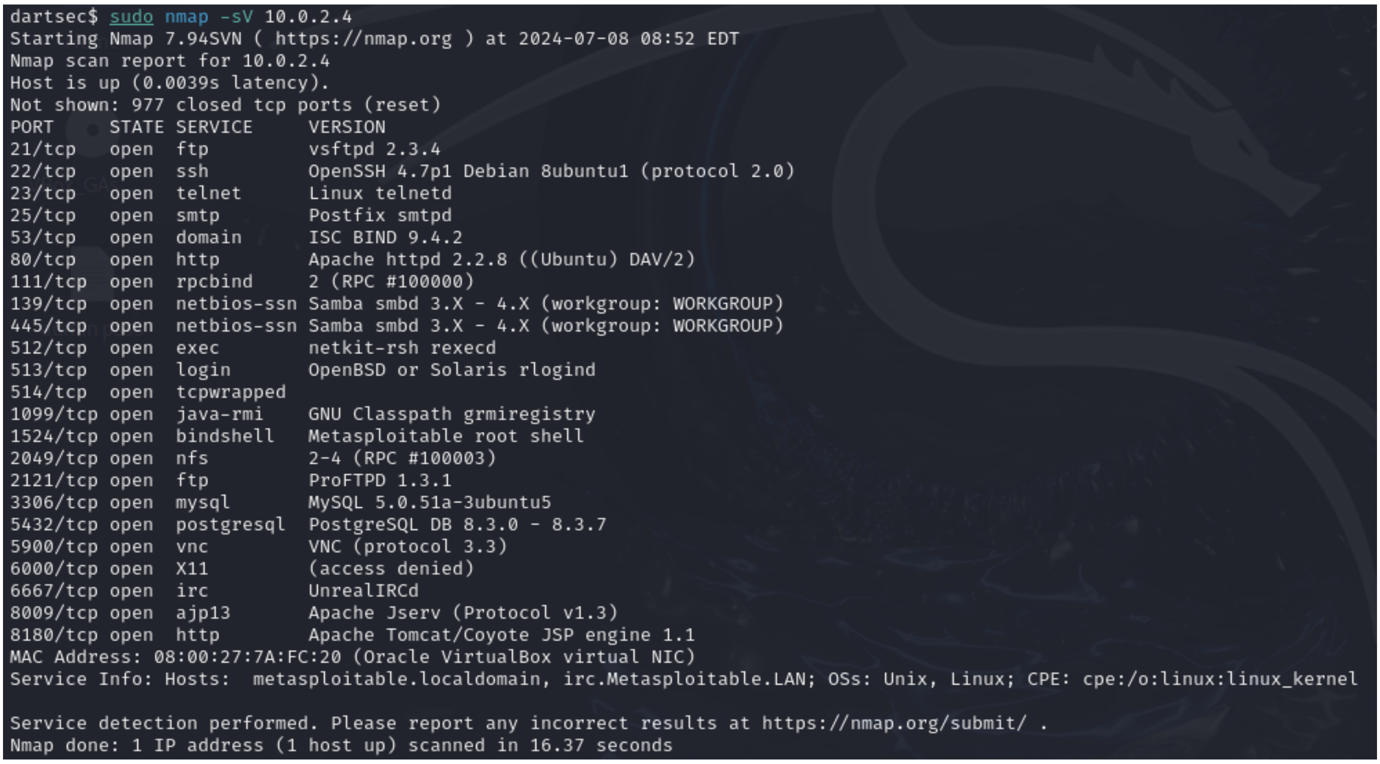


```
dartsec$ nmap -sP 10.0.2.0/24
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-07-08 12:51 EDT
Nmap scan report for 10.0.2.1
Host is up (0.0036s latency).
Nmap scan report for 10.0.2.2
Host is up (0.0034s latency).
Nmap scan report for 10.0.2.4
Host is up (0.0026s latency).
Nmap scan report for 10.0.2.15
Host is up (0.0015s latency).
Nmap done: 256 IP addresses (4 hosts up) scanned in 2.99 seconds
```

Finding Versions of Services

To tell `nmap` to display the version of different services running on different ports we can use the `-sV` option. Remember for this to work we need to be root or in the sudoer file.

`$ sudo nmap -sV <ip of M2>`



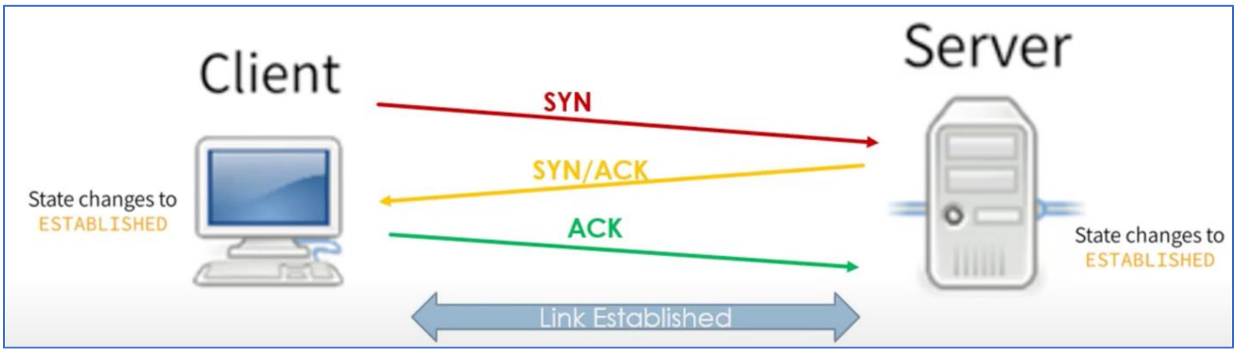
```
dartsec$ sudo nmap -sV 10.0.2.4
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-07-08 08:52 EDT
Nmap scan report for 10.0.2.4
Host is up (0.0039s latency).
Not shown: 977 closed tcp ports (reset)
PORT     STATE SERVICE     VERSION
21/tcp   open  ftp         vsftpd 2.3.4
22/tcp   open  ssh         OpenSSH 4.7p1 Debian 8ubuntu1 (protocol 2.0)
23/tcp   open  telnet      Linux telnetd
25/tcp   open  smtp        Postfix smtpd
53/tcp   open  domain      ISC BIND 9.4.2
80/tcp   open  http        Apache httpd 2.2.8 ((Ubuntu) DAV/2)
111/tcp  open  rpcbind     2 (RPC #100000)
139/tcp  open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
445/tcp  open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
512/tcp  open  exec        netkit-rsh rexecd
513/tcp  open  login       OpenBSD or Solaris rlogind
514/tcp  open  tcpwrapped
1099/tcp open  java-rmi    GNU Classpath grmiregistry
1524/tcp open  bindshell   Metasploitable root shell
2049/tcp open  nfs         2-4 (RPC #100003)
2121/tcp open  ftp         ProFTPD 1.3.1
3306/tcp open  mysql       MySQL 5.0.51a-3ubuntu5
5432/tcp open  postgresql  PostgreSQL DB 8.3.0 - 8.3.7
5900/tcp open  vnc         VNC (protocol 3.3)
6000/tcp open  X11         (access denied)
6667/tcp open  irc         UnrealIRCd
8009/tcp open  ajp13       Apache Jserv (Protocol v1.3)
8180/tcp open  http        Apache Tomcat/Coyote JSP engine 1.1
MAC Address: 08:00:27:7A:FC:20 (Oracle VirtualBox virtual NIC)
Service Info: Hosts:  metasploitable.localdomain, irc.Metasploitable.LAN; OSs: Unix, Linux; CPE: cpe:/o:linux:linux_kernel

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 16.37 seconds
```

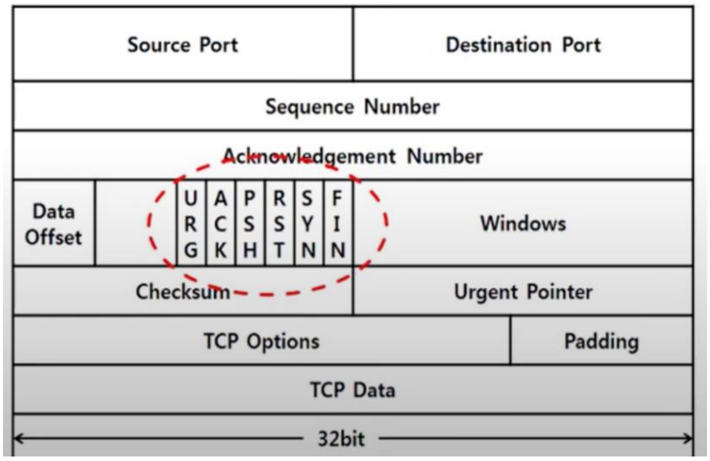
As we can see along with services, we can now also see the version of each service. We can see that `nmap` has failed to find the versions of some of the services. This can be solved by `--version-intensity` that allows you to control the aggressiveness or intensity of version detection when scanning target services. It determines how much effort `nmap` puts into identifying the version details of the services running on open ports. The higher the intensity the more time it takes, but more detailed and accurate information about the services running on the specified target. We can specify a level of intensity from 0 to 9:

- **0**: Disable version detection.
- **1-4**: Low to moderate intensity, suitable for quick scans with less detailed version information.
- **5 (default)**: Balanced intensity, providing a good compromise between speed and accuracy.
- **6-9**: Higher intensity levels, which increase the accuracy of version detection but might take longer and be more intrusive.

TCP Three Way Hand Shake

Before talking about the TCP SYN Scan, we need to talk about how TCP connections are established. The connections are scanned using a 3-way handshake. The 3-way handshake is a fundamental process used in the TCP/IP protocol suite to establish a reliable connection between a client and a server. It ensures that both parties are ready to communicate and can establish a connection with synchronized parameters. Steps in a handshake are mentioned below:





- **SYN (Synchronize):**
    - The client initiates the connection by sending a TCP segment with the SYN (synchronize) flag set to the server. This segment includes an initial sequence number (ISN), which is a random value used to synchronize the sequence numbers between the client and the server.
- **SYN-ACK (Synchronize-Acknowledge):**
    - The server responds to the client's SYN segment with a TCP segment that has both the SYN and ACK (acknowledge) flags set. The server's segment also includes its own initial sequence number (SYN) and acknowledges the client's SYN by setting the ACK number to the client’s ISN + 1.
- **ACK (Acknowledge):**
    - The client sends a final acknowledgment (ACK) to the server. This segment acknowledges the server's SYN by setting the acknowledgment number to the server’s ISN + 1.
    - At this point, the connection is established, and both parties are ready to exchange data. The ports on both client and server side are now in established state.

TCP SYN Scan

Now we are ready to understand TCP SYN Scan. TCP SYN scan, often referred to as a "**half-open**" scan, is one of the most common and efficient scanning techniques used by `nmap`. It works by sending SYN packets to the target ports and analyzing the responses. This type of scan is called "half-open" because it does not complete the full TCP handshake. Here's how it works:

```
$ sudo  nmap -sS <ip of M2>
```

- **SYN Packet Sent**: `nmap` sends a SYN packet to the target port.
- **Response Analysis**:
  - **SYN/ACK Received**: If the target port is open, it responds with a SYN/ACK packet. Nmap then sends an RST (reset) packet to terminate the connection before the handshake completes, which prevents the connection from being logged.
  - **RST Received**: If the target port is closed, it responds with an RST packet.
  - **No Response/Filtered**: If there is no response or if a packet filtering device (like a firewall) is present, the port is marked as filtered.

TCP Connect Scan

A TCP Connect scan perform full 3-way handshake and so do not require root privileges. It is easily detected. By the target machine administrator as it leaves quite a bit of foot print. TCP Scan works in the following way:

```
$ nmap -sT <ip of M2>
```

- **SYN Packet Sent**: Nmap sends a SYN packet to the target port.
- **SYN/ACK Received**: If the target port is open, it responds with a SYN/ACK packet.
- **ACK Sent**: Nmap sends an ACK packet to complete the TCP three-way handshake, establishing a connection.
- **RST Packet Sent**: Immediately after establishing the connection, Nmap sends an RST (reset) packet to close the connection.

UDP Scan

A UDP scan is a type of network scan performed by Nmap to identify open UDP ports on a target system. Unlike TCP, UDP (User Datagram Protocol) is connectionless, which makes it more challenging to scan. However, it is crucial for identifying services that run over UDP, such as DNS (53), DHCP(67), and TFTP (69) and SNMP.

```
$ nmap -sU <ip of M2>
```

- **UDP Packet Sent**: Nmap sends a UDP packet to the target port. The default payload for the UDP packet is empty, but Nmap can use more specific probes for well-known services.
- **Response Analysis**:
  - **No Response**: If there is no response, the port is assumed to be open or filtered. Many UDP services do not respond unless they receive a valid request, which can make definitive detection challenging.
  - **ICMP Port Unreachable**: If the target sends back an ICMP Port Unreachable message (Type 3, Code 3), the port is closed.
  - **Other ICMP Responses**: Different ICMP responses may indicate that the port is filtered or unreachable for other reasons.
- **Retries**: Nmap may send multiple probes and use different payloads to increase accuracy. This is because UDP scanning is prone to packet loss and other issues that can cause false positives or negatives.

Evading Firewalls/IDS using nmap

A Firewall is a NW security device or software that monitors and controls incoming and outgoing network traffic based on predetermined security rules. The two main types are *Network firewall* that protects an entire network by filtering traffic at the network level and *Host-based firewall* that protects individual devices (like computers or servers) by filtering traffic at the operating system or application level.

An Intrusion Detection Ssystem (IDS), on the other hand is a security tool that monitors network or system activities for malicious or suspicious activities and alerts administrators or takes automated actions in response. The two main types are *Network-based IDS (NIDS)* that monitors network traffic in real-time, analyzing packets and patterns to detect suspicious activities across the network and *Host-based IDS (HIDS)* that runs on individual devices or hosts, monitoring activities

Firewalls are unpredictable as we don't know the rules applied to the firewall. So, we don't know what kind of scan to perform. Some firewalls allow only specific MAC addresses to connect to a specific port, some drop specific packets. The point is we need to try different options to successfully perform scans. Now, let's see some **nmap** options that can help us evade these security mechanisms.

The **-f** option in **nmap** is used to fragment packets. This means nmap splits the probes into smaller IP fragments rather than sending them as one complete packet. The goal of using packet fragmentation is to evade detection by firewalls, intrusion detection systems (IDS), and intrusion prevention systems (IPS) that may be set up to detect and block standard nmap scanning patterns.

```
$ nmap -f 10.0.2.4        // splits packets into 8-bytes fragments
$ nmap -f -f 10.0.2.4     // splits packets into 16-bytes fragments
```

The **--mtu** option in **nmap** allows you to specify the maximum transmission unit (MTU) for the scan, which controls the size of the packets that Nmap sends. Setting a smaller MTU can help in evading detection by some firewalls and intrusion detection/prevention systems, like the -f option, but with more control over the exact size of the packets.

```
$ nmap -mtu 32 10.0.2.4     // Max packet size is 4-bytes
```

Decoy Scanning

The **-D** option in **nmap** is used to perform decoy scanning, which helps to obscure the true source of the scan by making it appear as if multiple hosts (decoys) are scanning the target. This technique can be useful for evading detection and confusing firewalls, intrusion detection systems (IDS), and intrusion prevention systems (IPS).

```
$ nmap -D RND:5 10.0.2.4
```

The above command will make 5 random decoys and will scan the target machine along with the original source machine.

Using Proxies to Redirect your Nmap Scans

In our previous handout we have already seen and understood different techniques like proxies and Tor browser to anonymize our traffic on the Internet. Right now let's take a look at how we can use proxy and proxy chains to redirect our **nmap** scans in order to mask our original IP address to the target that we are scanning

```
$ proxychains nmap nmap.org -F
```

Using Nmap Scripts

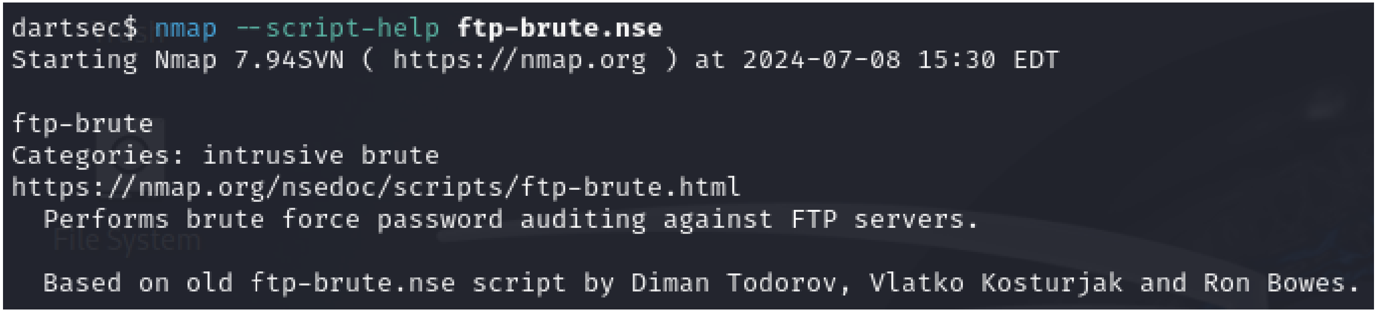
The **nmap** scripts are part of the Nmap Scripting Engine (NSE), which has extended the capabilities of nmap beyond just network scanning and port discovery. These scripts are used to perform more detailed scanning and automate a wide range of tasks, from vulnerability detection to network auditing. These scripts can automate various network tasks, perform complex network reconnaissance, vulnerability detection, exploitation, and more. On Linux machine, these scripts are located at **/usr/share/nmap/scripts/** directory containing over 600 different scripts with each script belonging to a specific category/group. Visit this directory to check out the available scripts on your Kali Linux machine and practice running different scripts on Metasploitable2 machine.

You can run nmap scripts using the **--script** option, specifying either an individual script or a group of scripts. The following command runs all scripts categorized under "vuln" (vulnerability) on the target.

```
$ nmap --script vuln <target>
```

- **Check out what a specific script does:** Some scripts are very noisy, some not at all. So, it is important to read what each script does and if it is easily detectable by the target or not

```
$ nmap --script-help ftp-brute.nse
```

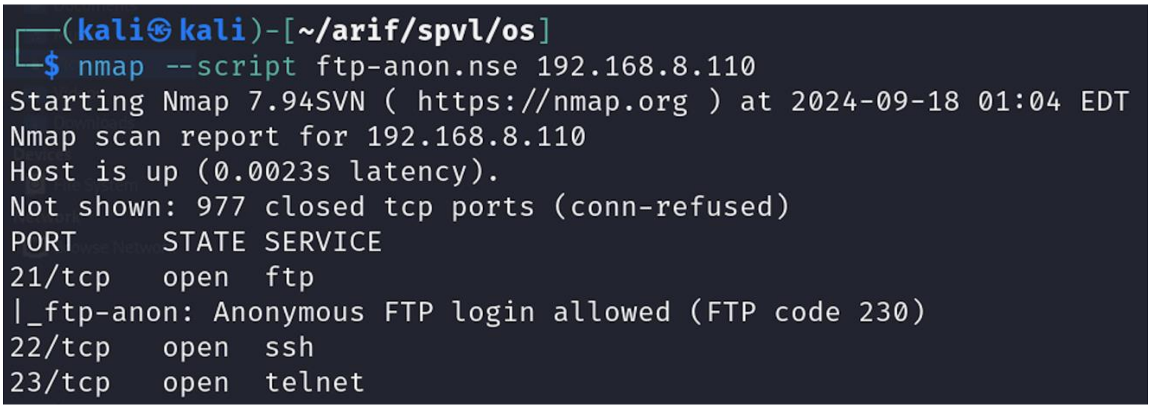


```
dartsec$ nmap --script-help ftp-brute.nse
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-07-08 15:30 EDT

ftp-brute
Categories: intrusive brute
https://nmap.org/nsedoc/scripts/ftp-brute.html
  Performs brute force password auditing against FTP servers.

  Based on old ftp-brute.nse script by Diman Todorov, Vlatko Kosturjak and Ron Bowes.
```

- **Running single script**

We can run single script of our choice using the following command:

```
$ nmap --script ftp-anon.nse <IP of M2>
```



```
┌──(kali㉿kali)-[~/arif/spvl/os]
└─$ nmap --script ftp-anon.nse 192.168.8.110
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-09-18 01:04 EDT
Nmap scan report for 192.168.8.110
Host is up (0.0023s latency).
Not shown: 977 closed tcp ports (conn-refused)
PORT     STATE SERVICE
21/tcp   open  ftp
|_ftp-anon: Anonymous FTP login allowed (FTP code 230)
22/tcp   open  ssh
23/tcp   open  telnet
```

Since the Metasploitable2 has anonymous FTP vulnerability, let us exploit it, by trying to login using anonymous username and any password of your choice:

```
$ ftp <IP>
ftp>
```

You get the FTP prompt, now give the help command to get the available ftp commands and enjoy ☺

Categories/Groups of NSE Scripts:
To check out the usage of different script groups visit: https://nmap.org/book/nse-usage.html

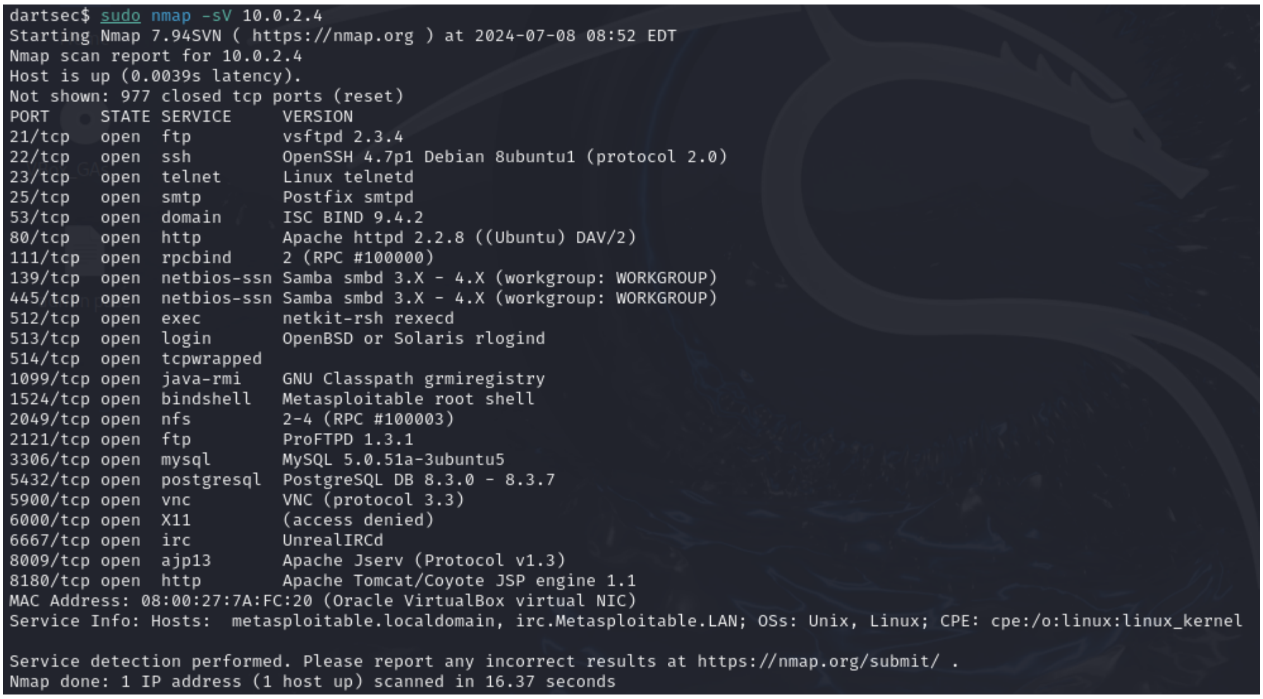
- **Auth**: These scripts deal with authentication credentials (or bypassing them) on the target system. For example, `ftp-anon.nse` script attempts to guess FTP login credentials
- **Brute**: These scripts use brute force attacks to guess authentication credentials of a remote server. Nmap contains scripts for brute forcing dozens of protocols, including `http-brute-nse`, `oracle-brute.nse`, `snmp-brute.nse` and so on.
- **Malware**: These scripts test whether the target platform is infected by malware or backdoors. An example script in this category is `smb-vuln-ms17-010.nse` that checks for the MS17-010 vulnerability exploited by WannaCry.
- **Exploit**: These scripts exploit vulnerabilities to confirm their existence. An example script in this category is `http-sql-injection.nse` that checks for the SQL injection vulnerabilities. Other example include `http-shellshock.nse`
- **Default**: These scripts are the default set and are run when using the `-A` options rather than listing scripts with `--script` providing a balance of speed and functionality. his category can also be specified explicitly like any other using `--script default`.

- **Running a Script Group:** Try running the following script groups and from their output understand different vulnerabilities in the Metasploitable2 machine that they come up with.

```
$ nmap --script auth <ip>
$ nmap --script malware <ip>
$ nmap --script exploit <ip>
```

Searchsploit

We have already seen that we can use the `nmap -sV` option to check for the versions of different services along with their state and port numbers as shown in the following screenshot.



```
dartsec$ sudo nmap -sV 10.0.2.4
Starting Nmap 7.94SVN ( https://nmap.org ) at 2024-07-08 08:52 EDT
Nmap scan report for 10.0.2.4
Host is up (0.0039s latency).
Not shown: 977 closed tcp ports (reset)
PORT     STATE SERVICE     VERSION
21/tcp   open  ftp         vsftpd 2.3.4
22/tcp   open  ssh         OpenSSH 4.7p1 Debian 8ubuntu1 (protocol 2.0)
23/tcp   open  telnet      Linux telnetd
25/tcp   open  smtp        Postfix smtpd
53/tcp   open  domain      ISC BIND 9.4.2
80/tcp   open  http        Apache httpd 2.2.8 ((Ubuntu) DAV/2)
111/tcp  open  rpcbind     2 (RPC #100000)
139/tcp  open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
445/tcp  open  netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
512/tcp  open  exec        netkit-rsh rexecd
513/tcp  open  login       OpenBSD or Solaris rlogind
514/tcp  open  tcpwrapped
1099/tcp open  java-rmi    GNU Classpath grmiregistry
1524/tcp open  bindshell   Metasploitable root shell
2049/tcp open  nfs         2-4 (RPC #100003)
2121/tcp open  ftp         ProFTPD 1.3.1
3306/tcp open  mysql       MySQL 5.0.51a-3ubuntu5
5432/tcp open  postgresql  PostgreSQL DB 8.3.0 - 8.3.7
5900/tcp open  vnc         VNC (protocol 3.3)
6000/tcp open  X11         (access denied)
6667/tcp open  irc         UnrealIRCd
8009/tcp open  ajp13       Apache Jserv (Protocol v1.3)
8180/tcp open  http        Apache Tomcat/Coyote JSP engine 1.1
MAC Address: 08:00:27:7A:FC:20 (Oracle VirtualBox virtual NIC)
Service Info: Hosts:  metasploitable.localdomain, irc.Metasploitable.LAN; OSs: Unix, Linux; CPE: cpe:/o:linux:linux_kernel

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 16.37 seconds
```

Now a $100 question is how can we find out, which out of these services has some vulnerability without using any tool. One way is open a browser and type the `` `service name` `` followed by `` `exploit` `` keyword and press enter (e.g., "`vsftpd 2.3.4 exploit`" or "`Appache httpd 2.2.8 exploit`"). Visit some links and try to find whether these are vulnerable applications, and if yes try finding exploits for these vulnerable applications. Interested students can visit this link for details: https://www.cve.org/

The **`searchsploit`** is a Linux command-line search tool for the Exploit Database (EDB), that allows you to take a copy of EDB with you everywhere you go. It is used for searching and accessing publicly available exploits and vulnerability information from the EDB. It allows you to quickly find exploits based on various criteria like software names, CVE identifiers, or platform types. The most common use cases of `searchsploit` are:

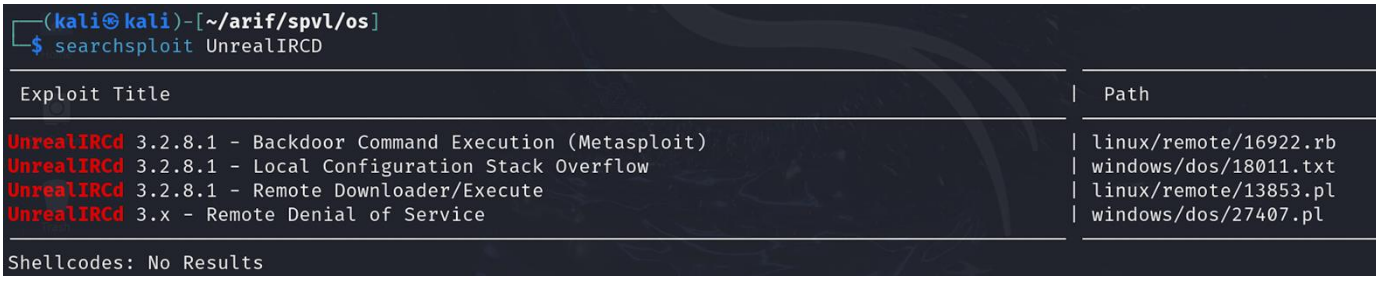
- **Vulnerability & Exploit Discovery**: It is used to search for known vulnerabilities and exploits related to hardware, software, operating systems, web applications, and configurations. These exploits are already indexed in the Exploit Database.
- **Offline Access**: It provides an offline version of the Exploit Database, so users can access the information without an internet connection. This is especially useful in environments with limited internet access or when conducting security assessments in isolated environments.
- **Filtering Results**: It allows for refined searches using filters such as operating systems, programming languages, and their specific versions, making it easier to find relevant vulnerabilities and exploits.
- **Exploit Code and Proof of Concepts (PoCs)**: It offers access to exploit code and proof-of-concept (PoC) scripts that can be used for testing and verification of vulnerabilities. These are useful for both offensive (penetration testing) and defensive (security testing) purposes.

Installing and using searchsploit:

- An easy way to install `exploitdb` and use `searchsploit` on your Kali Linux machine use following command:
  `$ sudo apt-get install exploitdb`

- You can also install from source, available at https://gitlab.com/exploit-database/exploitdb
- Do check out `/usr/share/exploitdb` directory for available exploits and shellcodes for different OSs and different architectures.
- To get help about the usage and different options of `searchsploit` use following command:
  `$ searchsploit –help`

- Let us try to find out if UnrealIRCd is a vulnerable service and if there is an exploit available for it. To `searchsploit`, we just need to give the name of the service along with its version, and it searches in the local Kali Linux `exploitdb` directory for all the exploits that Kali Linux has and tries to find an exploit that will work for that specific version.
  `$ searchsploit UnrealIRCd`



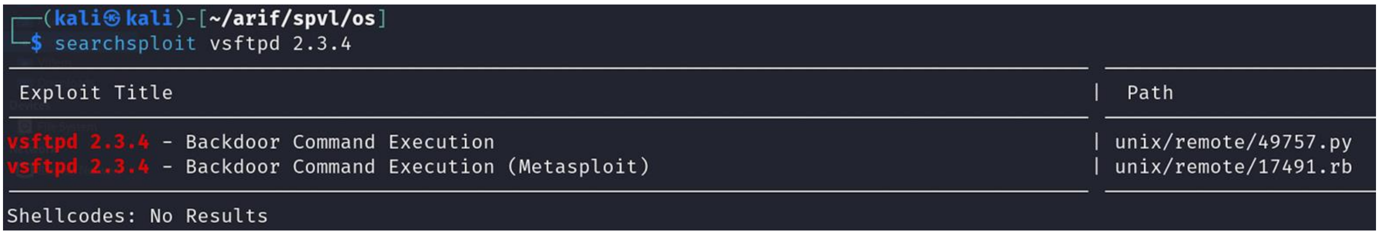
```
┌──(kali㉿kali)-[~/arif/spvl/os]
└─$ searchsploit UnrealIRCD
 Exploit Title                                                 |  Path
UnrealIRCd 3.2.8.1 - Backdoor Command Execution (Metasploit)  | linux/remote/16922.rb
UnrealIRCd 3.2.8.1 - Local Configuration Stack Overflow       | windows/dos/18011.txt
UnrealIRCd 3.2.8.1 - Remote Downloader/Execute                | linux/remote/13853.pl
UnrealIRCd 3.x - Remote Denial of Service                     | windows/dos/27407.pl
Shellcodes: No Results
```

For your information IRCD is an Internet Relay Chat server. From the output of the above command, you can see that there exists an exploit with the name of Backdoor Command Execution, and the location of that exploit is `linux/remote/16922.rb` inside the exploitdb. Another way to locate this Ruby file is:

```
$ locate UnrealIRCd
/usr/share/exploitdb/exploits/linux/remote/16922.rb
```

- Let us now find out if vsftpd 2.3.4 is vulnerable and if there exist an exploit for this vulnerability

  `$ searchsploit vsftpd 2.3.4`



```
┌──(kali㉿kali)-[~/arif/spvl/os]
└─$ searchsploit vsftpd 2.3.4
 Exploit Title                                                  |  Path
vsftpd 2.3.4 - Backdoor Command Execution                       | unix/remote/49757.py
vsftpd 2.3.4 - Backdoor Command Execution (Metasploit)          | unix/remote/17491.rb
Shellcodes: No Results
```

From the output of the above command, you can see that it also suffers with the Backdoor Command Execution vulnerability and we have two exploits for it one written in Python and other in Ruby

- **Tips for Search:**

  - **Basic Search:** Simply add any number of search terms you wish to look for. Remember, `searchsploit` uses an AND operator, not an OR operator. The more terms that are used, the more results will be filtered out:

    ```
    $ searchsploit afd windows local
    ```

  - **Title Searching:** By default, `searchsploit` will check BOTH the title of the exploit as well as the path. Depending on the search criteria, this may bring up false positives (especially when searching for terms that match platforms and version numbers). Searches can be restricted to the titles by using the **`-t`** option:

    ```
    $ searchsploit -t oracle windows
    ```

- **Removing Unwanted Results using `--exclude` Pipe:** One can use the `--exclude` option of searchsploit to narrow down the results as shown below:

  ```
  $ searchsploit linux kernel 3.2 --exclude="(PoC)|/dos/"
  ```

- **Removing Unwanted Results using Pipe and grep:** It is recommended to use "`/dos/`" with grep rather than "`dos`" so the filter is applied to the ***path***, rather than the ***title***. Although denial of service entries may not include "dos" in their title, they will nevertheless have "dos" in the path. Removing results based on the path will also ensure you don't inadvertently filter out results that legitimately contain "dos" in their title.

  ```
  $ searchsploit XnView | grep -v '/dos/'
  ```

Common Vulnerabilities and Exposures

Common Vulnerabilities and Exposures (CVE) is a widely-used system (database) for identifying and cataloging publicly known cybersecurity vulnerabilities in software and hardware. A CVE number uniquely identifies one vulnerability from the list. CVE provides a convenient, reliable way for vendors, enterprises, academics, and all other interested parties to exchange information about cyber security issues. Enterprises typically use CVE, and corresponding CVSS scores, for planning and prioritization in their vulnerability management programs. CVE is publicly available and free for anyone to use: https://nvd.nist.gov/. Some key aspects of CVE are given below:

- **Structure of CVE Entries**
    - **CVE ID**: A unique identifier for the vulnerability, formatted as CVE-YYYY-NNNNN. For example, CVE-2024-12345.
    - **Description**: A brief description of the vulnerability or exposure, including its impact and affected systems or software.
    - **References**: Links to additional information, such as advisories, patches, and reports. These may include vendor-specific details, security bulletins, and technical documentation.

- **Types of CVE Entries:** CVE entries fall into two main categories:
    - **Vulnerabilities**: Security flaws in software or hardware that can be exploited to compromise systems. Examples include buffer overflows, SQL injection flaws, and cross-site scripting (XSS) vulnerabilities.
    - **Exposures**: Weaknesses that could potentially be exploited but are not necessarily a direct security threat. Exposures are usually less critical but still relevant for security assessments.

- **Vulnerability Severity**: While CVE itself doesn't score vulnerabilities, it is often used in conjunction with systems like CVSS **(Common Vulnerability Scoring System)**, which provides a severity score based on factors such as exploitability, impact, and complexity. This helps prioritize the severity of vulnerabilities in Common Vulnerabilities and Exposures (CVE) entries, and is a standard for assessing the risk and impact of vulnerabilities. CVSS provides a numeric score (ranging from 0 to 10) along with a severity level rating to help organizations prioritize their responses to vulnerabilities.
    - **Critical (9.0 – 10.0)**: Vulnerabilities that are extremely easy to exploit and lead to complete compromise of systems or data. These require immediate attention. An example is **CVE-2021-44228** (Log4Shell) with a CVSS score of 10.0 due to its remote code execution capability, ease of exploitation, and severe impact on systems.
    - **High (7.0 – 8.9)**: These vulnerabilities are more easily exploitable and have a significant impact on confidentiality, integrity, or availability. An example is **CVE-2021-34527** (PrintNightmare), which had a CVSS score of 8.8, indicating a high risk due to ease of exploitation and severe impact on affected systems.
    - **Medium (4.0 – 6.9)**: Vulnerabilities that can be exploited but typically require some conditions, and the impact is moderate. An example is **CVE-2021-22986** (6.8 CVSS score), which is categorized as medium since it requires network access but is moderately complex to exploit.

- **Low (0.1 – 3.9)**: Vulnerabilities that have limited impact or require complex conditions to exploit. An example is **CVE-2020-1380** (3.1 CVSS score), which is considered low because it requires specific configurations and offers minimal impact.
- **None (0.0)**: No impact or exploitation potential. An example is **CVE-2021-21986** had a CVSS score of 0.0 after remediation, indicating the vulnerability was fully mitigated.

- **CVE Process:** The process for a CVE entry typically involves several steps:
  - **Discovery**: A vulnerability or exposure is discovered by a security researcher, vendor, or another entity.
  - **Reporting**: The issue is reported to a CVE Numbering Authority (CNA) or directly to MITRE. CNAs are organizations authorized to assign CVE IDs and manage CVE entries for their respective domains.
  - **Review**: The reported issue is reviewed for accuracy and completeness. This may involve verifying the details and coordinating with the original reporter or affected vendor.
  - **Publication**: Once validated, the CVE entry is published in the CVE database and made publicly available.

To Do:

Students should visit https://www.cve.org/ and check out the details of a/m CVEs

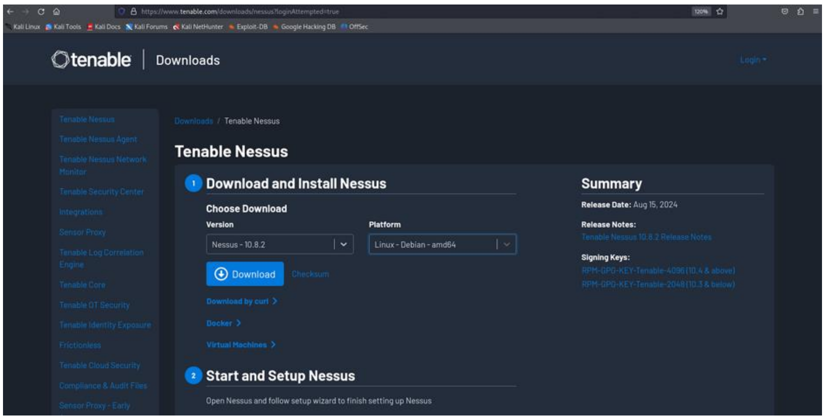
Nessus

Nessus is a platform developed by Tenable that scans for security vulnerabilities in devices, applications, operating systems, cloud services and other network resources. The Professional version has a cost to pay, so we will install and use the free *Nessus Essentials* version, which can work only in a Local Area Network and cannot perform a scan on a machine/website on the Internet. Moreover, with Nessus Essentials version, we can scan up to 16 IP addresses within a LAN. Some common features of Nessus are:

- **Vulnerability scanning:** Nessus scans servers for known vulnerabilities. For example, detecting outdated software versions that may be suspectable to exploits.
- **Credential-based scanning:** Authenticated scans with login credentials provide Nessus deeper access, enhancing the accuracy of vulnerability detection.
- **Web Application scanning:** It identifies the vulnerabilities in web applications such as SQL injection or XSS flaws.
- **Malware detection:** Nessus identifies the potential malware indicators by analyzing the system files and configuration.

Downloading, Installing and Configuring Nessus on your Kali Machine:

- Open your browser and search for *download nessus*. Use the Tenable link and download the latest version of Nessus for your platform, i.e., Linux-Debian-amd64, which will download the `Nessus-10.8.2-debian10_amd64.deb` file.



Tenable Nessus

1 Download and Install Nessus

Choose Download

Version: Nessus - 10.8.2

Platform: Linux - Debian - amd64

2 Start and Setup Nessus

Open Nessus and follow setup wizard to finish setting up Nessus

Summary

Release Date: Aug 15, 2024

Release Notes: Tenable Nessus 10.8.2 Release Notes

Signing Keys: RPM-GPG-KEY-Tenable-4096 (10.4 & above) RPM-GPG-KEY-Tenable-2048 (10.3 & below)

- Now to install it use the following command:

```
$ sudo dpkg -i Nessus-10.8.2-debian10_amd64.deb
```

- After installation is done, you need to start the service using following command:

```
$ sudo systemctl start nessusd.service
$ systemctl status nessusd.service
```

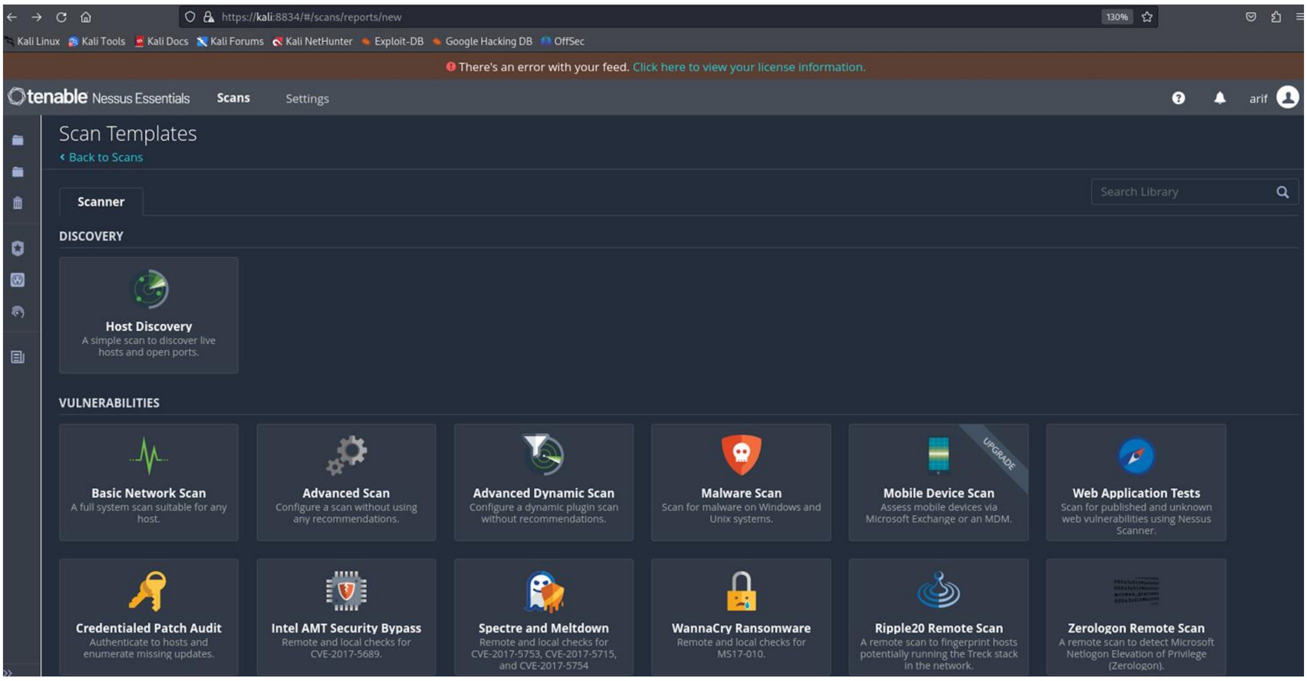
- Now to configure the Nessus Essential (free version), you need to go to https://kali:8834 link inside your browser. Perform the steps and finally it will initialize and download all required plugins. This may take a bit of time depending on your Internet speed. Must remember the credentials (username:password) while creating an account on tenable for Nessus Essentials.
- Inside your browser go to https://kali:8834 login giving your credentials. If you get an error of plugins not installed then use the following command to install plugins:

```
$ sudo systemctl stop nessusd.service
$ sudo /opt/nessus/sbin/nessuscli update
$ sudo systemctl start nessusd.service
```

- Once again, inside your browser go to https://<ip of kali>:8834 login giving your credentials, and go ahead with your first scan.

Basic NW Scan using Nessus:

- Now inside your browser go to https://<ip of kali>:8834 or https://127.0.0.1:8834 and login giving your credentials, and go ahead with your first scan, by clicking the *New Scan* button at the top right.



https://kali:8834/#/scans/reports/new

There's an error with your feed. Click here to view your license information.

Scan Templates

‹ Back to Scans

Scanner

DISCOVERY

Host Discovery
A simple scan to discover live hosts and open ports.

VULNERABILITIES

Basic Network Scan
A full system scan suitable for any host.

Advanced Scan
Configure a scan without using any recommendations.

Advanced Dynamic Scan
Configure a dynamic plugin scan without recommendations.

Malware Scan
Scan for malware on Windows and Unix systems.

Mobile Device Scan
Assess mobile devices via Microsoft Exchange or an MDM.

Web Application Tests
Scan for published and unknown web vulnerabilities using Nessus Scanner.

Credentialed Patch Audit
Authenticate to hosts and enumerate missing updates.

Intel AMT Security Bypass
Remote and local checks for CVE-2017-5689.

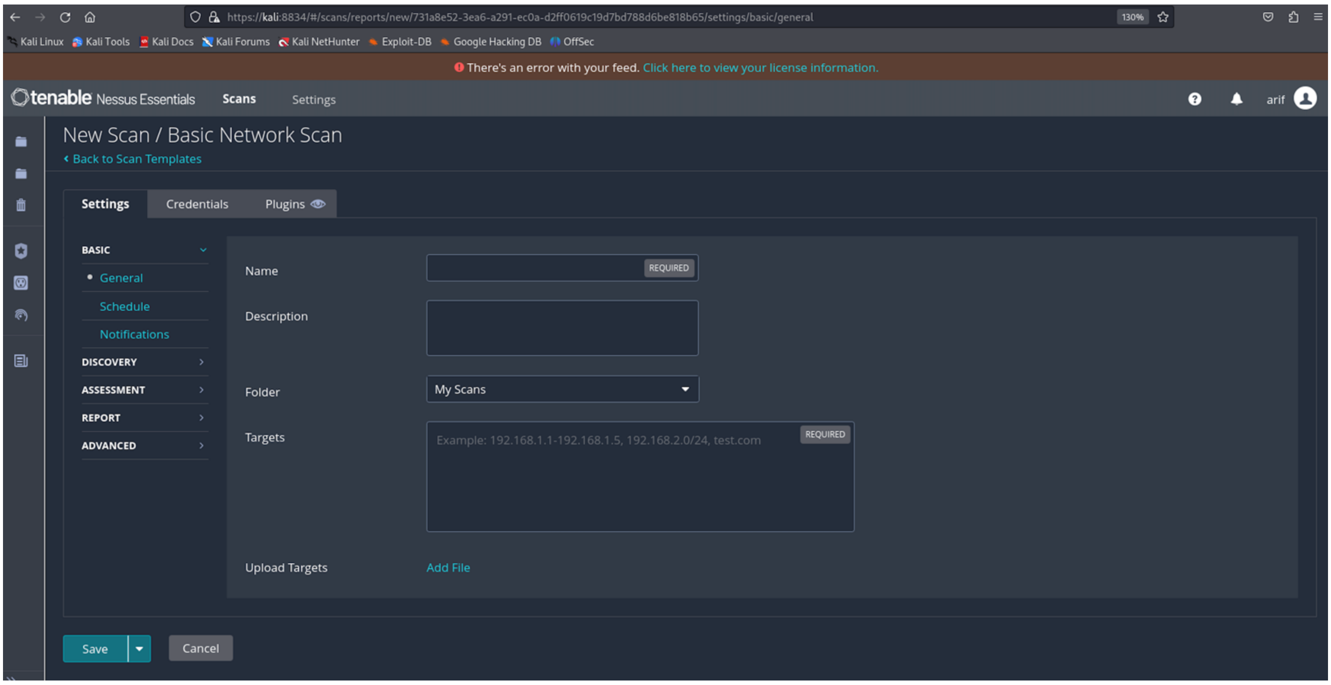
Spectre and Meltdown
Remote and local checks for CVE-2017-5753, CVE-2017-5715, and CVE-2017-5754

WannaCry Ransomware
Remote and local checks for MS17-010.

Ripple20 Remote Scan
A remote scan to fingerprint hosts potentially running the Treck stack in the network.

Zerologon Remote Scan
A remote scan to detect Microsoft Netlogon Elevation of Privilege (Zerologon).

- Let us perform a basic scan by clicking on the Basic Network Scan in the above screenshot and then enter the details about your scan like the IP of your Metasploitable2 machine. Once done you can click the save button.



https://kali:8834/#/scans/reports/new/731a8e52-3ea6-a291-ec0a-d2ff0619c19d7bd788d6be818b65/settings/basic/general

There's an error with your feed. Click here to view your license information.

New Scan / Basic Network Scan

‹ Back to Scan Templates

Name: REQUIRED

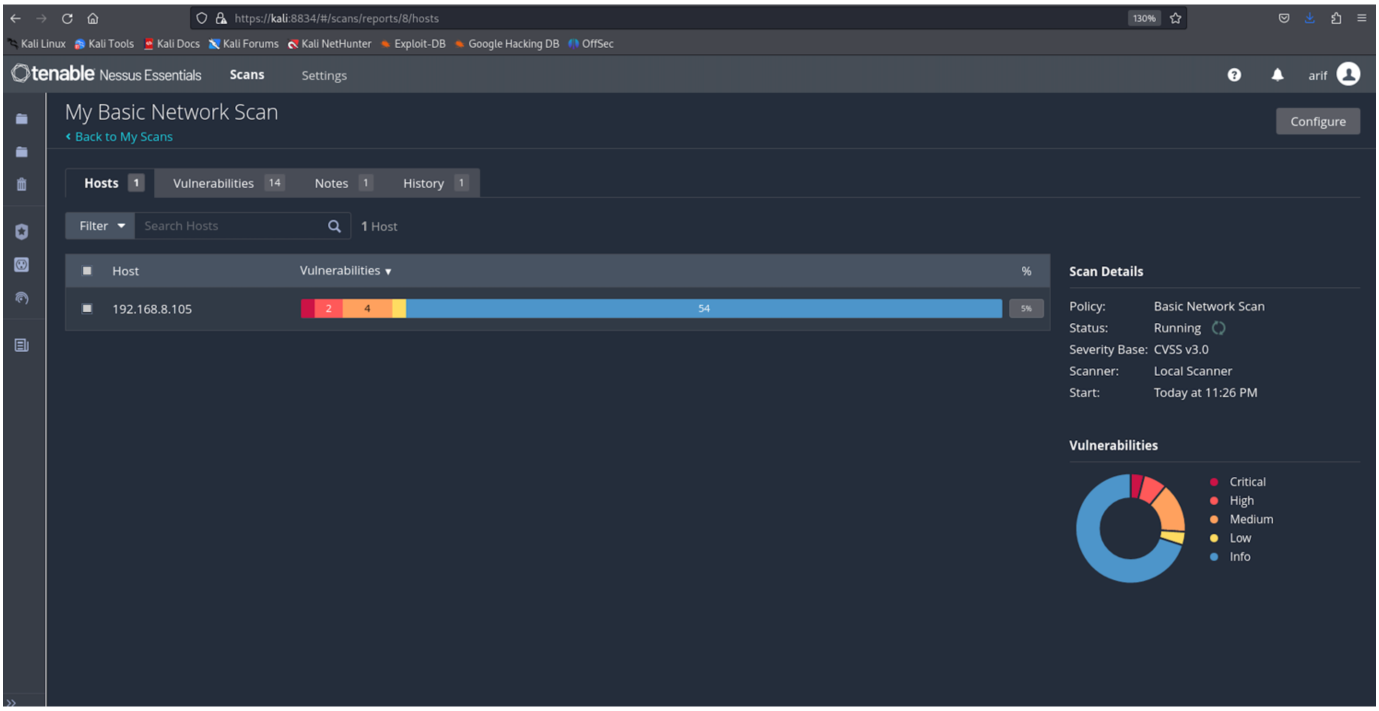
Description:

Folder: My Scans

Targets: Example: 192.168.1.1-192.168.1.5, 192.168.2.0/24, test.com REQUIRED

Upload Targets: Add File

- You can schedule or run your saved scan at time of your convenience. The following screenshot shows the scan in progress. This may take a bit of time.



My Basic Network Scan

1 Host

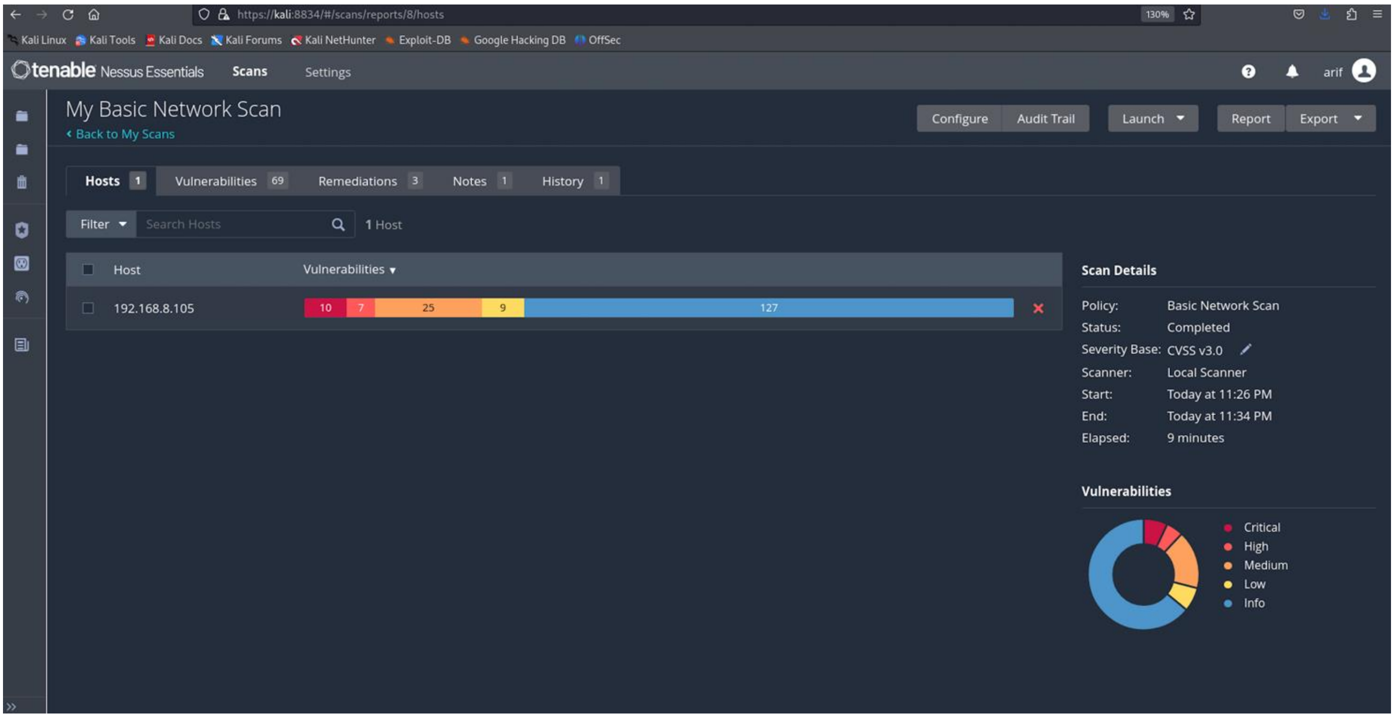
Host	Vulnerabilities	%
192.168.8.105	2 4 54	5%

Scan Details

Policy: Basic Network Scan
Status: Running
Severity Base: CVSS v3.0
Scanner: Local Scanner
Start: Today at 11:26 PM

Vulnerabilities

- Following screenshot shows the output when the scan is completed, showing 10 critical, 7 high, 25 medium and 9 low vulnerabilities and 127 information disclosures.



My Basic Network Scan

1 Host

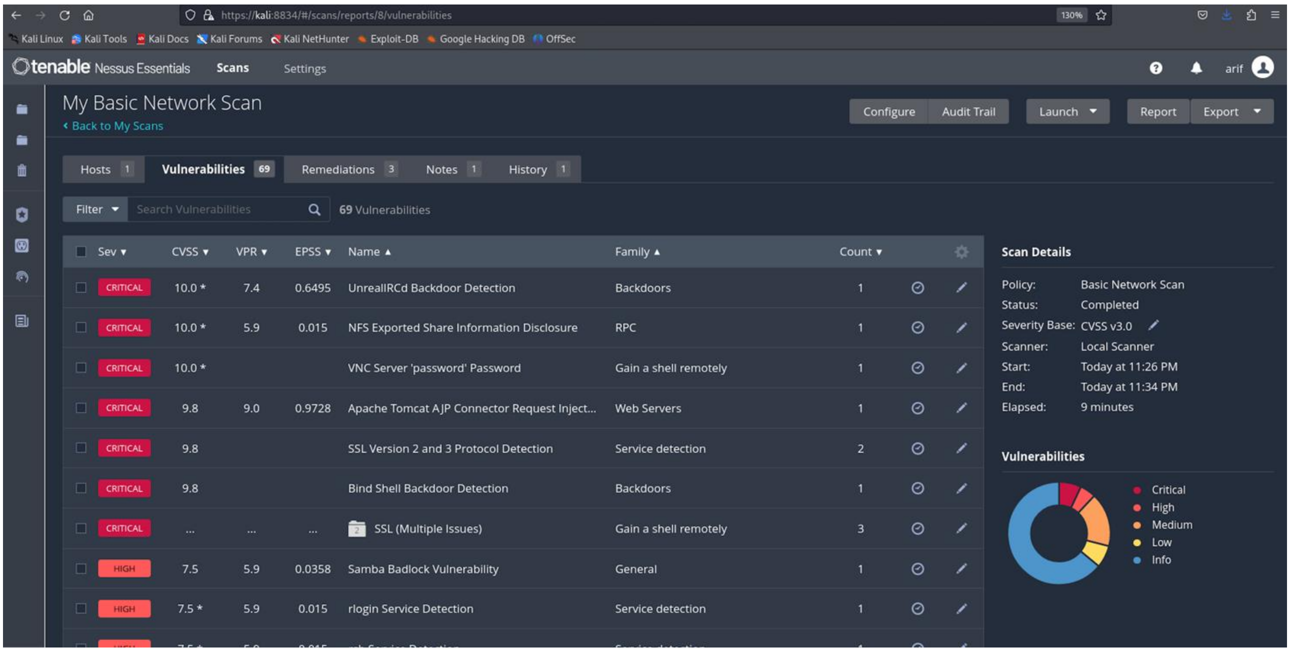
Host	Vulnerabilities
192.168.8.105	10 7 25 9 127

Scan Details

Policy: Basic Network Scan
Status: Completed
Severity Base: CVSS v3.0
Scanner: Local Scanner
Start: Today at 11:26 PM
End: Today at 11:34 PM
Elapsed: 9 minutes

Vulnerabilities

- You can click the Vulnerabilities tab to check the total 69 vulnerabilities that were detected by `nessus` on Metasploitable2, can search for a specific one or use filter.



My Basic Network Scan
‹ Back to My Scans

69 Vulnerabilities

Sev ▾	CVSS ▾	VPR ▾	EPSS ▾	Name ▴	Family ▴	Count ▾
CRITICAL	10.0 *	7.4	0.6495	UnrealIRCd Backdoor Detection	Backdoors	1
CRITICAL	10.0 *	5.9	0.015	NFS Exported Share Information Disclosure	RPC	1
CRITICAL	10.0 *			VNC Server 'password' Password	Gain a shell remotely	1
CRITICAL	9.8	9.0	0.9728	Apache Tomcat AJP Connector Request Inject...	Web Servers	1
CRITICAL	9.8			SSL Version 2 and 3 Protocol Detection	Service detection	2
CRITICAL	9.8			Bind Shell Backdoor Detection	Backdoors	1
CRITICAL	...	...	...	2 SSL (Multiple Issues)	Gain a shell remotely	3
HIGH	7.5	5.9	0.0358	Samba Badlock Vulnerability	General	1
HIGH	7.5 *	5.9	0.015	rlogin Service Detection	Service detection	1

Scan Details

Policy:	Basic Network Scan
Status:	Completed
Severity Base:	CVSS v3.0
Scanner:	Local Scanner
Start:	Today at 11:26 PM
End:	Today at 11:34 PM
Elapsed:	9 minutes

Vulnerabilities

- Click critical vulnerability, *UnrealIRCd Backdoor Detection* (CVE-2010-2075) having a CVSS of 10.0, to check out the details about this vulnerability, which exist in Internet Relay Chat server. Moreover, you can Google this vulnerability and check out if there exist an exploit for this specific vulnerability and how to use it. (More on this later)
- Click another critical vulnerability, *NFS Exported Share Information Disclosure* (CVE-1999-0629) having a CVSS of 10.0, to check out the details about this vulnerability. Moreover, you can Google this vulnerability and check out if there exist an exploit for this specific vulnerability and how to use it. (More on this later)
- Click *VNC Server 'password' Password*, (CVE-1999-0503) having a CVSS of 10.0. It says that the VNC server running on the remote host is secured with a weak password. Nessus was able to login using VNC authentication and a password of 'password'. A remote unauthenticated attacker could exploit this to take control of the system.
- Click *Bind Shell Backdoor Detection*, (CVE-2001-0500) having a CVSS of 9.8. This is a buffer overflow vulnerability, which says that a shell is listening on the remote port without any authentication being required. An attacker may use it by connecting to the remote port and sending commands directly.

To Do:

- Students should visit https://www.cve.org/ and check out the details of the detected CVEs
- Students are also advised to run a basic `nessus` scan on some Windows machine as well (which has not been updated for a bit of time).

OpenVAS

Documentation Link: Documentation
OpenVAS (Open Vulnerability Assessment System) is an open-source framework used for network vulnerability scanning and management. It is designed to identify security vulnerabilities in networked systems and services, providing comprehensive reporting and remediation guidance. OpenVAS is widely used by security professionals for vulnerability assessment, compliance auditing, and network security monitoring.

Installing and Running OpenVAS

Installing OpenVAS on Kali Linux is the fastest and recommended way. On other distributions OpenVAS needs to be compiled from source, that is error prone and cumbersome. On Kali Linux you can install OpenVAS with the following commands:

```
$ sudo apt install gvm -y
$ sudo apt install openvas -y
$ sudo gvm-setup // This will do automatic OpenVAS configuration
```

Note: A password will be printed on the screen. Make sure to save that.

```
$ sudo gvm-check-setup // to verify installation
```

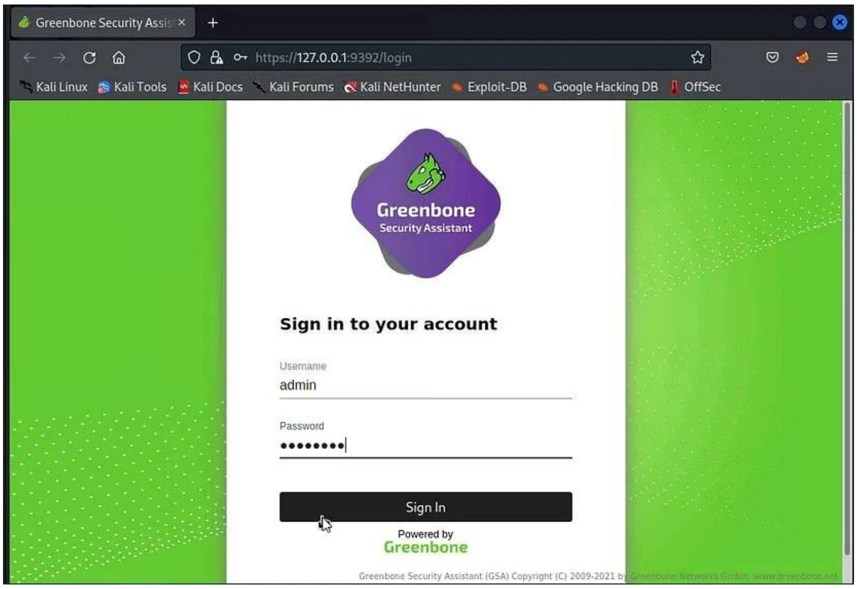
Run OpenVAS using command:

```
$ sudo systemctl start gvmd.service
$ sudo gvm-start
```

This will start OpenVAS and can be accessed from **https://127.0.0.1:9392**

Login by entering username: `admin` and password: printed on the screen while gvm-setup is running. In case if you want to change the password to admin, use following command:

```
$ sudo -E -u _gvm -g _gvm gvmd -user=admin -new-password=admin
```



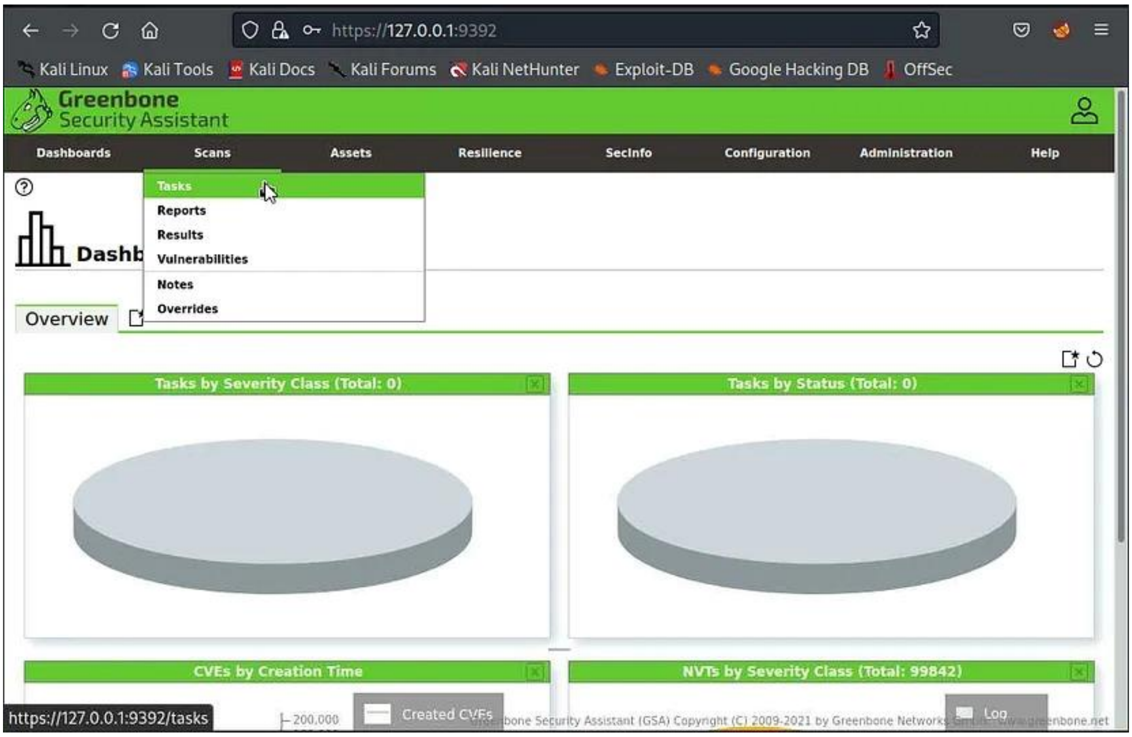
https://127.0.0.1:9392/login

Sign in to your account

Username: admin

Password: ••••••••

- Click **Scans** menu and select **Tasks**.



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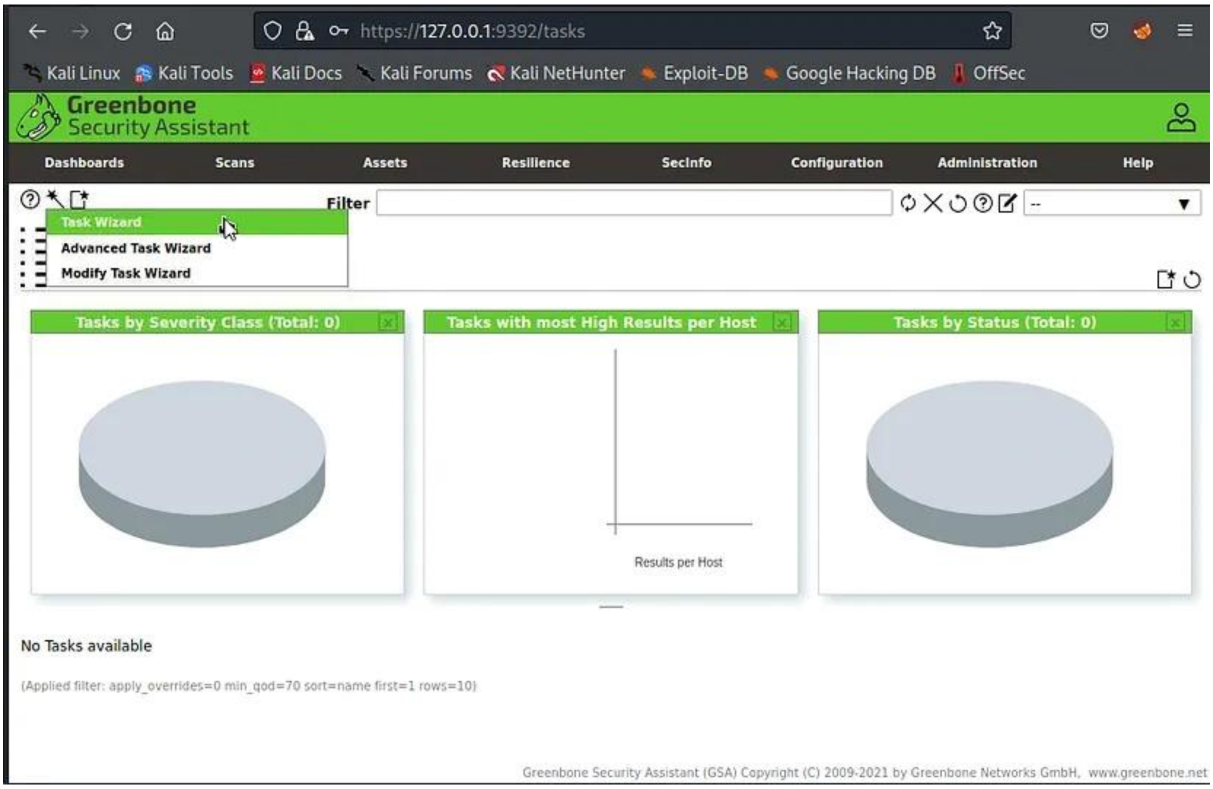
- The Tasks page is displayed. Click Task Wizard on the upper left side.



No Tasks available

(Applied filter: apply_overrides=0 min_qod=70 sort=name first=1 rows=10)

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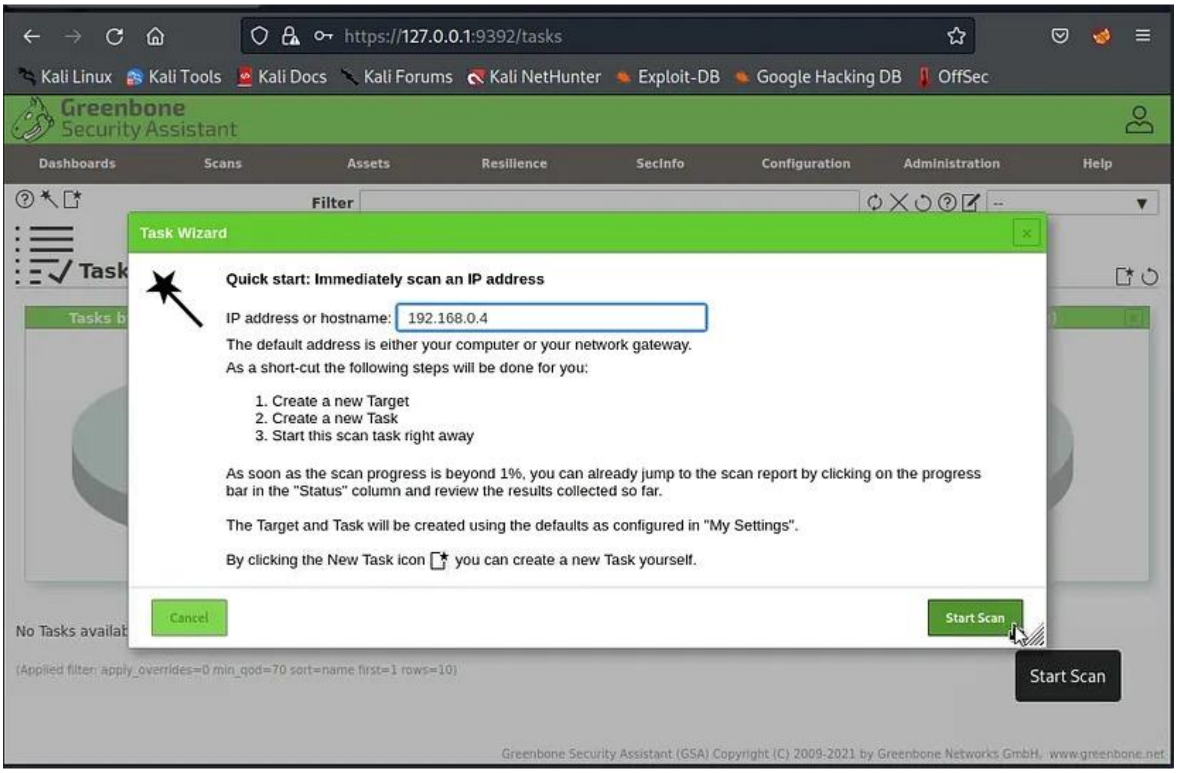
- In the **Task Wizard** pop-up window, enter the following in the IP address or hostname field: `<target-IP>` and click **Start Scan**



Quick start: Immediately scan an IP address

IP address or hostname: 192.168.0.4

The default address is either your computer or your network gateway.

As a short-cut the following steps will be done for you:

1. Create a new Target
2. Create a new Task
3. Start this scan task right away

As soon as the scan progress is beyond 1%, you can already jump to the scan report by clicking on the progress bar in the "Status" column and review the results collected so far.

The Target and Task will be created using the defaults as configured in "My Settings".

By clicking the New Task icon you can create a new Task yourself.

(Applied filter: apply_overrides=0 min_qod=70 sort=name first=1 rows=10)

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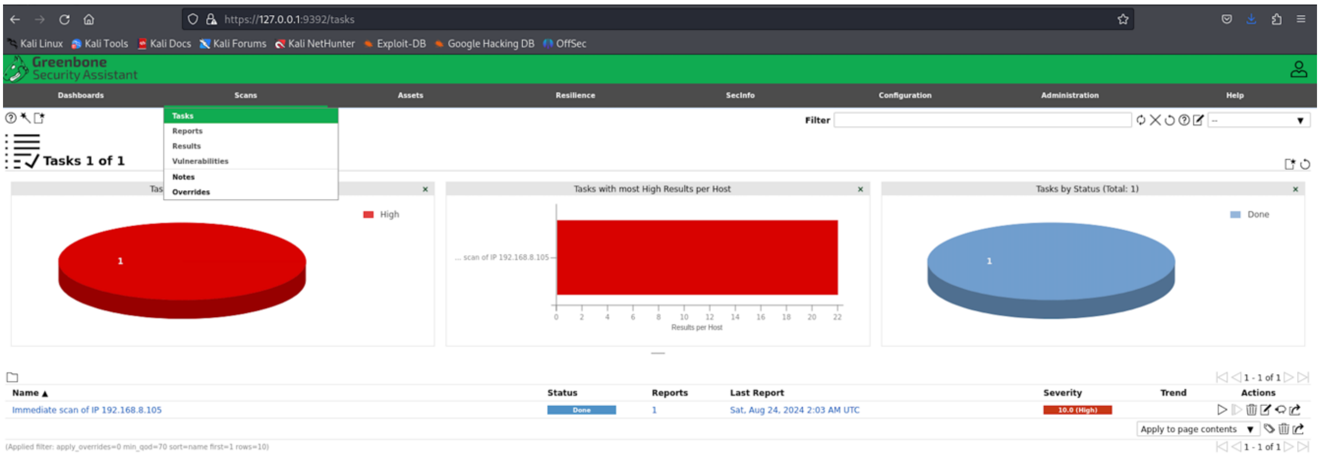
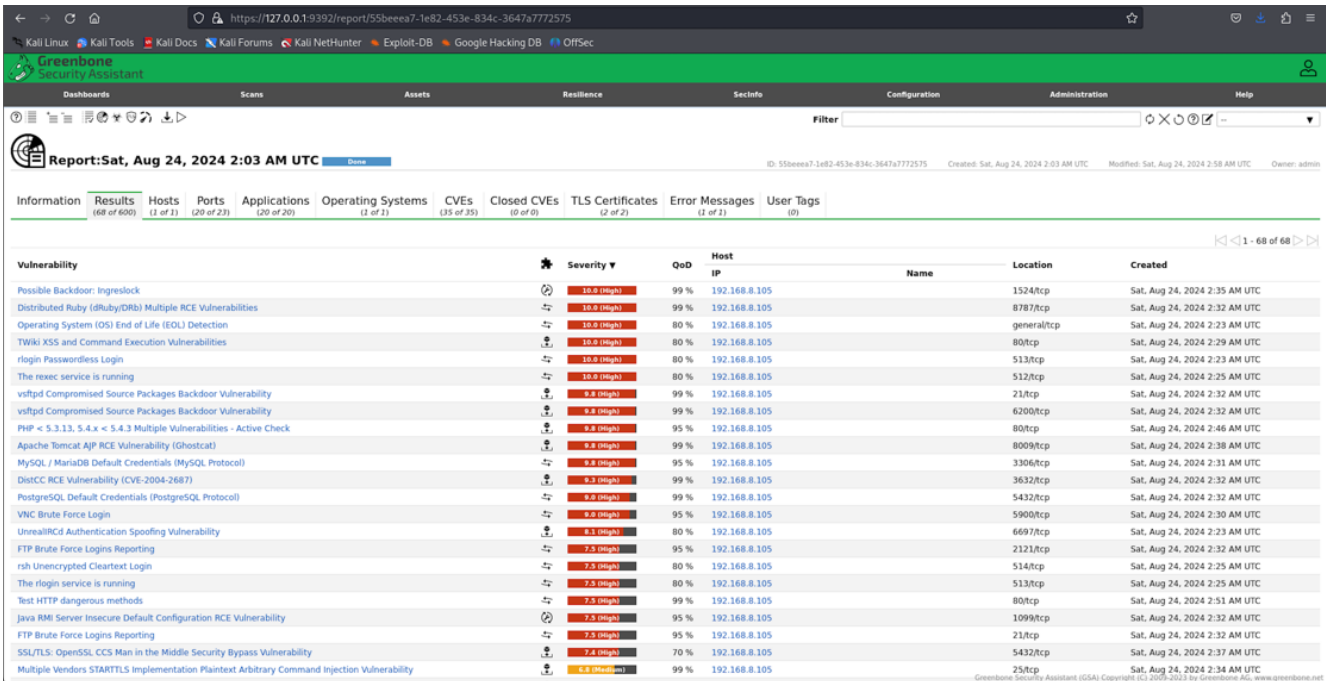
- The task will be created and run. It may take some time to run all the tests. Finally, on Task 1 of 1, under the Scans menu click the **Tasks** field.



Name ▲	Status	Reports	Last Report	Severity	Trend	Actions
Immediate scan of IP 192.168.8.105	Done	1	Sat, Aug 24, 2024 2:03 AM UTC	10.0 (High)		

(Applied filter: apply_overrides=0 min_qod=70 sort=name first=1 rows=10)

- You click the Done button and it will give you a detailed Report, having multiple tabs. Play with it to learn more about vulnerabilities. This is shown in the following screenshot



Report:Sat, Aug 24, 2024 2:03 AM UTC Done

ID: 55beeea7-1e82-453e-834c-3647a7772575 Created: Sat, Aug 24, 2024 2:03 AM UTC Modified: Sat, Aug 24, 2024 2:58 AM UTC Owner: admin

Information | Results (68 of 600) | Hosts (1 of 1) | Ports (20 of 23) | Applications (20 of 20) | Operating Systems (1 of 1) | CVEs (35 of 35) | Closed CVEs (0 of 0) | TLS Certificates (2 of 2) | Error Messages (1 of 1) | User Tags (0)

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Vulnerability		Severity ▼	QoD	Host		Location	Created
				IP	Name		
Possible Backdoor: Ingreslock		10.0 (High)	99 %	192.168.8.105		1524/tcp	Sat, Aug 24, 2024 2:35 AM UTC
Distributed Ruby (dRuby/DRb) Multiple RCE Vulnerabilities	⇆	10.0 (High)	99 %	192.168.8.105		8787/tcp	Sat, Aug 24, 2024 2:32 AM UTC
Operating System (OS) End of Life (EOL) Detection	⇆	10.0 (High)	80 %	192.168.8.105		general/tcp	Sat, Aug 24, 2024 2:23 AM UTC
TWiki XSS and Command Execution Vulnerabilities		10.0 (High)	80 %	192.168.8.105		80/tcp	Sat, Aug 24, 2024 2:29 AM UTC
rlogin Passwordless Login	⇆	10.0 (High)	80 %	192.168.8.105		513/tcp	Sat, Aug 24, 2024 2:23 AM UTC
The rexec service is running	⇆	10.0 (High)	80 %	192.168.8.105		512/tcp	Sat, Aug 24, 2024 2:25 AM UTC
vsftpd Compromised Source Packages Backdoor Vulnerability		9.8 (High)	99 %	192.168.8.105		21/tcp	Sat, Aug 24, 2024 2:32 AM UTC
vsftpd Compromised Source Packages Backdoor Vulnerability		9.8 (High)	99 %	192.168.8.105		6200/tcp	Sat, Aug 24, 2024 2:32 AM UTC
PHP < 5.3.13, 5.4.x < 5.4.3 Multiple Vulnerabilities - Active Check		9.8 (High)	95 %	192.168.8.105		80/tcp	Sat, Aug 24, 2024 2:46 AM UTC
Apache Tomcat AJP RCE Vulnerability (Ghostcat)		9.8 (High)	99 %	192.168.8.105		8009/tcp	Sat, Aug 24, 2024 2:38 AM UTC
MySQL / MariaDB Default Credentials (MySQL Protocol)	⇆	9.8 (High)	95 %	192.168.8.105		3306/tcp	Sat, Aug 24, 2024 2:31 AM UTC
DistCC RCE Vulnerability (CVE-2004-2687)		9.3 (High)	99 %	192.168.8.105		3632/tcp	Sat, Aug 24, 2024 2:32 AM UTC
PostgreSQL Default Credentials (PostgreSQL Protocol)	⇆	9.0 (High)	99 %	192.168.8.105		5432/tcp	Sat, Aug 24, 2024 2:32 AM UTC
VNC Brute Force Login	⇆	9.0 (High)	95 %	192.168.8.105		5900/tcp	Sat, Aug 24, 2024 2:30 AM UTC
UnrealIRCd Authentication Spoofing Vulnerability		8.1 (High)	80 %	192.168.8.105		6697/tcp	Sat, Aug 24, 2024 2:23 AM UTC
FTP Brute Force Logins Reporting	⇆	7.5 (High)	95 %	192.168.8.105		2121/tcp	Sat, Aug 24, 2024 2:32 AM UTC
rsh Unencrypted Cleartext Login	⇆	7.5 (High)	80 %	192.168.8.105		514/tcp	Sat, Aug 24, 2024 2:25 AM UTC
The rlogin service is running	⇆	7.5 (High)	80 %	192.168.8.105		513/tcp	Sat, Aug 24, 2024 2:25 AM UTC
Test HTTP dangerous methods	⇆	7.5 (High)	99 %	192.168.8.105		80/tcp	Sat, Aug 24, 2024 2:51 AM UTC
Java RMI Server Insecure Default Configuration RCE Vulnerability		7.5 (High)	95 %	192.168.8.105		1099/tcp	Sat, Aug 24, 2024 2:32 AM UTC
FTP Brute Force Logins Reporting	⇆	7.5 (High)	95 %	192.168.8.105		21/tcp	Sat, Aug 24, 2024 2:32 AM UTC
SSL/TLS: OpenSSL CCS Man in the Middle Security Bypass Vulnerability		7.4 (High)	70 %	192.168.8.105		5432/tcp	Sat, Aug 24, 2024 2:37 AM UTC
Multiple Vendors STARTTLS Implementation Plaintext Arbitrary Command Injection Vulnerability		6.8 (Medium)	99 %	192.168.8.105		25/tcp	Sat, Aug 24, 2024 2:34 AM UTC

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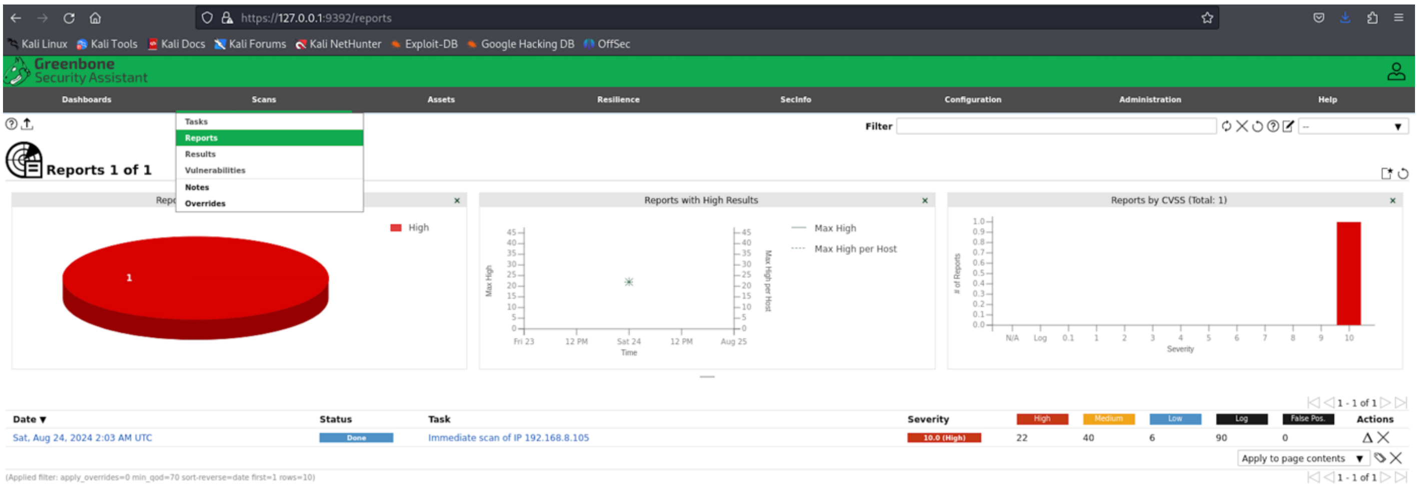
- **Reports** field.



Reports 1 of 1

1 - 1 of 1

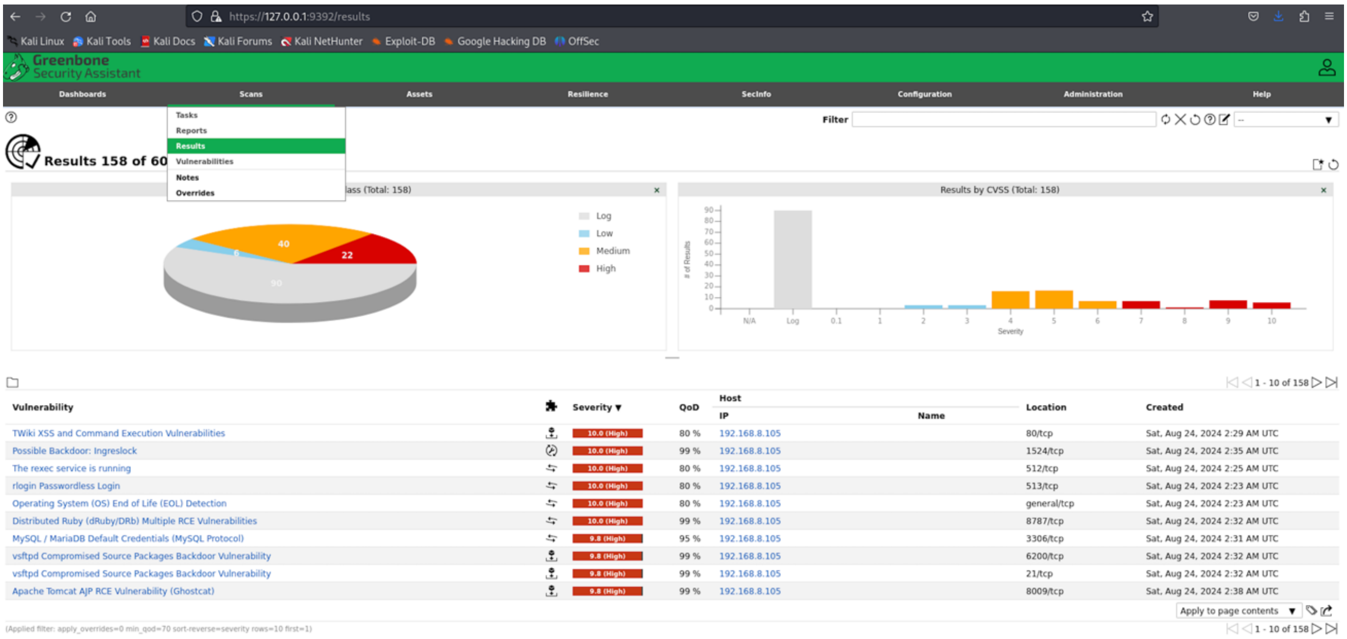
Date ▼	Status	Task	Severity	High	Medium	Low	Log	False Pos.	Actions
Sat, Aug 24, 2024 2:03 AM UTC	Done	Immediate scan of IP 192.168.8.105	10.0 (High)	22	40	6	90	0	

Apply to page contents

(Applied filter: apply_overrides=0 min_qod=70 sort-reverse=date first=1 rows=10)

1 - 1 of 1

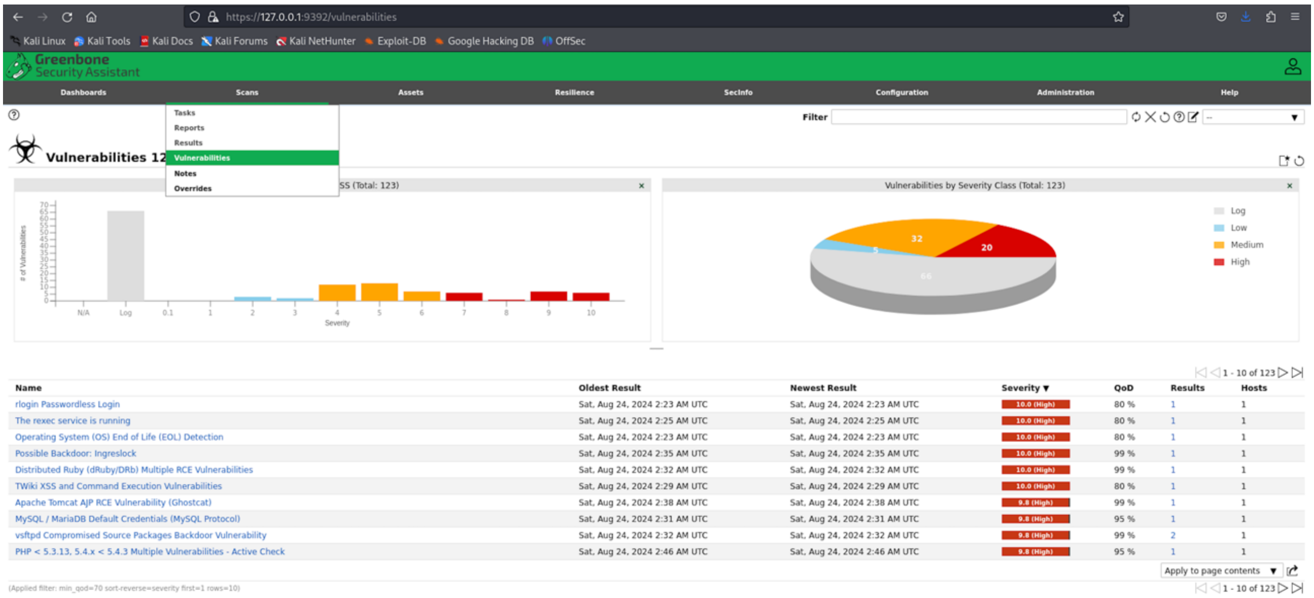
- **Results** field.



Vulnerability	Severity ▼	QoD	Host IP	Host Name	Location	Created
TWiki XSS and Command Execution Vulnerabilities	10.0 (High)	80 %	192.168.8.105		80/tcp	Sat, Aug 24, 2024 2:29 AM UTC
Possible Backdoor: Ingreslock	10.0 (High)	99 %	192.168.8.105		1524/tcp	Sat, Aug 24, 2024 2:35 AM UTC
The rexec service is running	10.0 (High)	80 %	192.168.8.105		512/tcp	Sat, Aug 24, 2024 2:25 AM UTC
rlogin Passwordless Login	10.0 (High)	80 %	192.168.8.105		513/tcp	Sat, Aug 24, 2024 2:23 AM UTC
Operating System (OS) End of Life (EOL) Detection	10.0 (High)	80 %	192.168.8.105		general/tcp	Sat, Aug 24, 2024 2:23 AM UTC
Distributed Ruby (dRuby/DRb) Multiple RCE Vulnerabilities	10.0 (High)	99 %	192.168.8.105		8787/tcp	Sat, Aug 24, 2024 2:32 AM UTC
MySQL / MariaDB Default Credentials (MySQL Protocol)	9.8 (High)	95 %	192.168.8.105		3306/tcp	Sat, Aug 24, 2024 2:31 AM UTC
vsftpd Compromised Source Packages Backdoor Vulnerability	9.8 (High)	99 %	192.168.8.105		6200/tcp	Sat, Aug 24, 2024 2:32 AM UTC
vsftpd Compromised Source Packages Backdoor Vulnerability	9.8 (High)	99 %	192.168.8.105		21/tcp	Sat, Aug 24, 2024 2:32 AM UTC
Apache Tomcat AJP RCE Vulnerability (Ghostcat)	9.8 (High)	99 %	192.168.8.105		8009/tcp	Sat, Aug 24, 2024 2:38 AM UTC

(Applied filter: apply_overrides=0 min_qod=70 sort-reverse=severity rows=10 first=1)

- **Vulnerabilities** field.



Name	Oldest Result	Newest Result	Severity ▼	QoD	Results	Hosts
rlogin Passwordless Login	Sat, Aug 24, 2024 2:23 AM UTC	Sat, Aug 24, 2024 2:23 AM UTC	10.0 (High)	80 %	1	1
The rexec service is running	Sat, Aug 24, 2024 2:25 AM UTC	Sat, Aug 24, 2024 2:25 AM UTC	10.0 (High)	80 %	1	1
Operating System (OS) End of Life (EOL) Detection	Sat, Aug 24, 2024 2:23 AM UTC	Sat, Aug 24, 2024 2:23 AM UTC	10.0 (High)	80 %	1	1
Possible Backdoor: Ingreslock	Sat, Aug 24, 2024 2:35 AM UTC	Sat, Aug 24, 2024 2:35 AM UTC	10.0 (High)	99 %	1	1
Distributed Ruby (dRuby/DRb) Multiple RCE Vulnerabilities	Sat, Aug 24, 2024 2:32 AM UTC	Sat, Aug 24, 2024 2:32 AM UTC	10.0 (High)	99 %	1	1
TWiki XSS and Command Execution Vulnerabilities	Sat, Aug 24, 2024 2:29 AM UTC	Sat, Aug 24, 2024 2:29 AM UTC	10.0 (High)	80 %	1	1
Apache Tomcat AJP RCE Vulnerability (Ghostcat)	Sat, Aug 24, 2024 2:38 AM UTC	Sat, Aug 24, 2024 2:38 AM UTC	9.8 (High)	99 %	1	1
MySQL / MariaDB Default Credentials (MySQL Protocol)	Sat, Aug 24, 2024 2:31 AM UTC	Sat, Aug 24, 2024 2:31 AM UTC	9.8 (High)	95 %	1	1
vsftpd Compromised Source Packages Backdoor Vulnerability	Sat, Aug 24, 2024 2:32 AM UTC	Sat, Aug 24, 2024 2:32 AM UTC	9.8 (High)	99 %	2	1
PHP < 5.3.13, 5.4.x < 5.4.3 Multiple Vulnerabilities - Active Check	Sat, Aug 24, 2024 2:46 AM UTC	Sat, Aug 24, 2024 2:46 AM UTC	9.8 (High)	95 %	1	1

(Applied filter: min_qod=70 sort-reverse=severity first=1 rows=10)

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