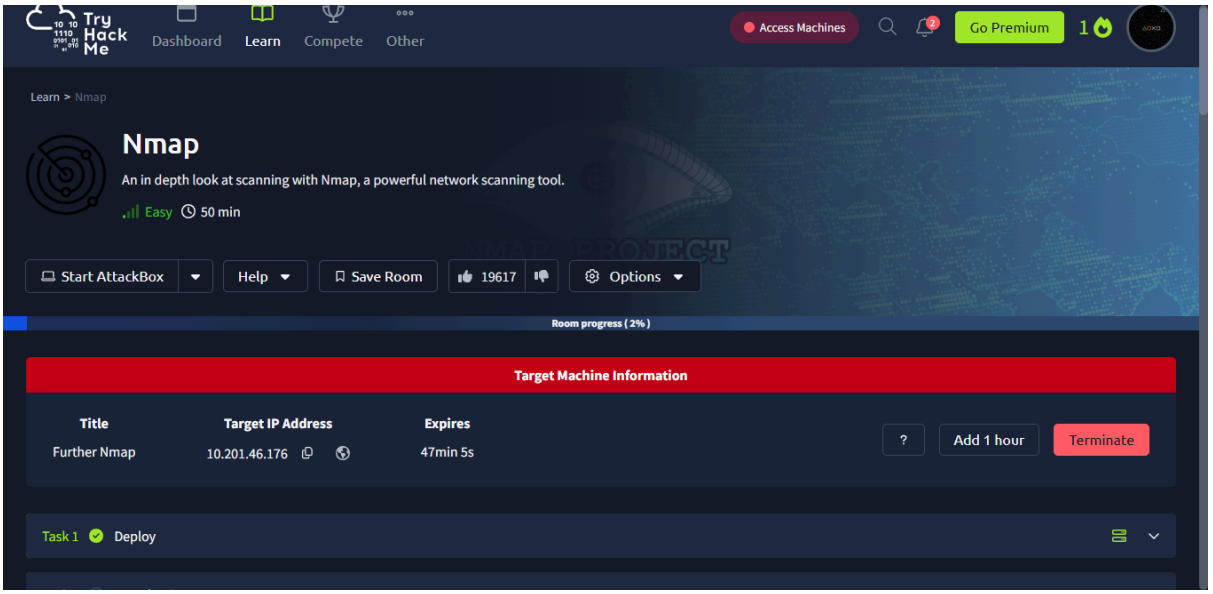
TryHackMe: Nmap CTF Walkthrough

- Nobin Sijo

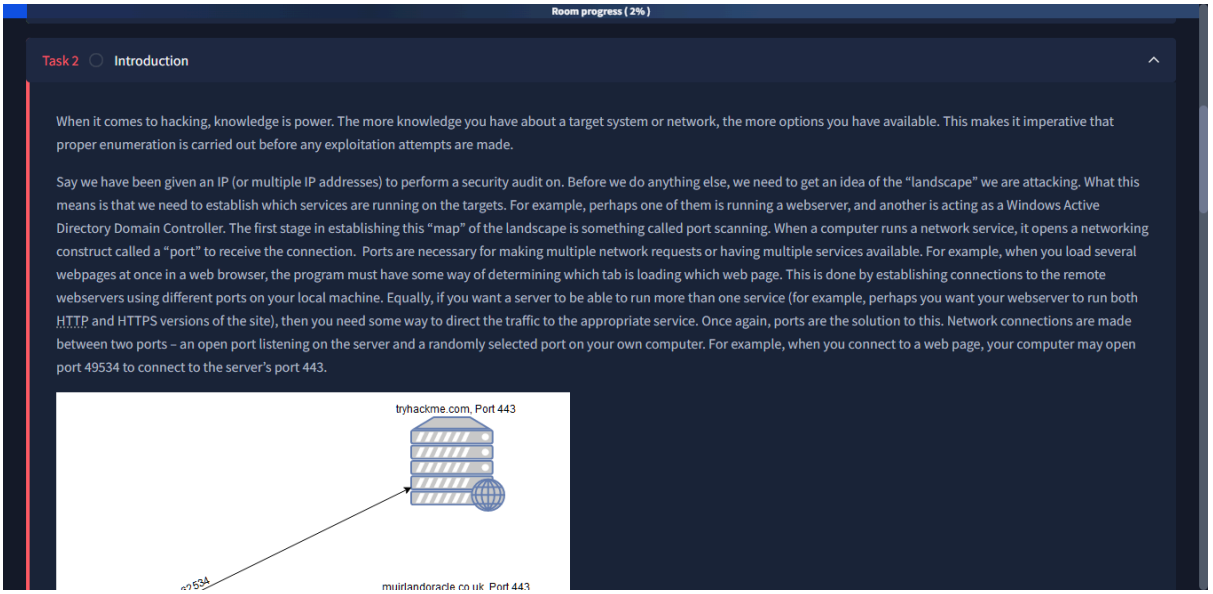
Challenge: Nmap - An in-depth look at scanning with Nmap, a powerful network scanning tool. **Target IP Address:** 10.201.46.176

Task 1: Deploy

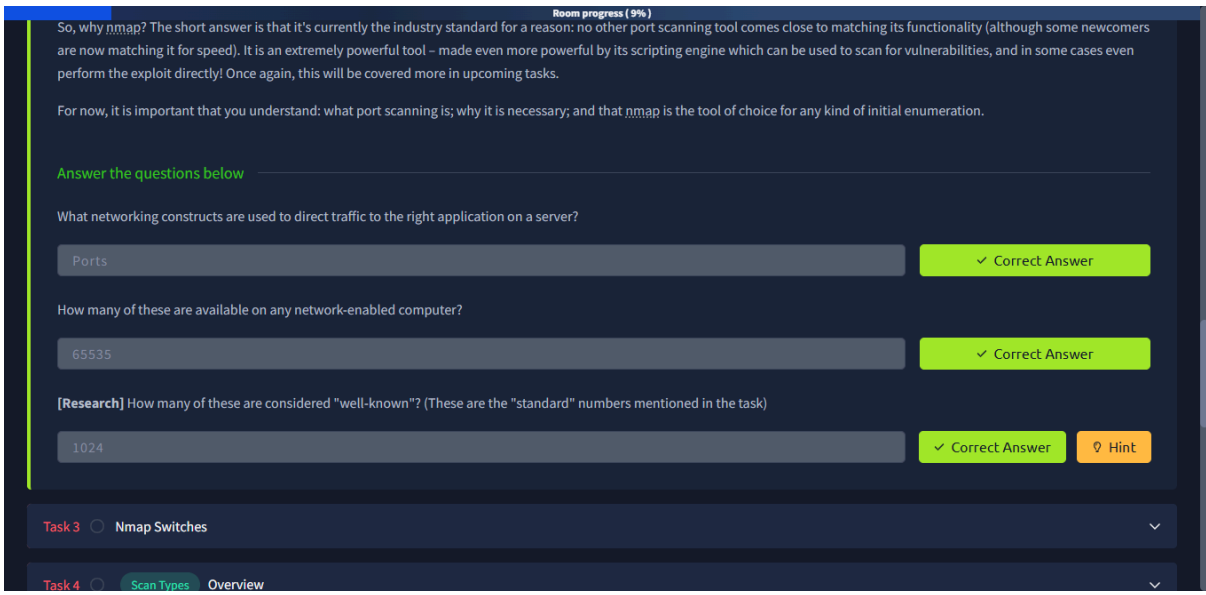


- **Objective:** First things first, we need to power on our target. This task is all about deploying the virtual machine we'll be scanning, giving us a live system to practice on.
- **Action:** The virtual machine for the challenge was deployed.

Task 2: Introduction

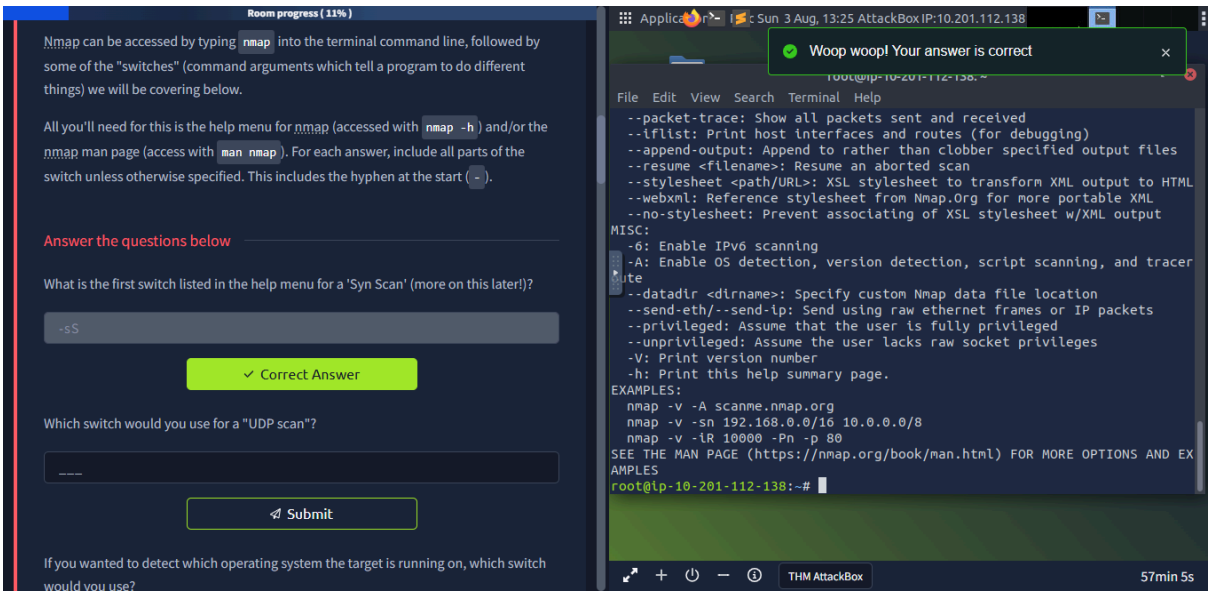


- **Objective:** Before we start scanning, it's crucial to understand the 'why'. This task covers the basics of network reconnaissance and the role of ports. Our goal is to grasp the core concepts that make tools like Nmap so powerful.
- **Question:** What networking constructs are used to direct traffic to the right application on a server?
    - **Answer:** `Ports`



- **Question:** How many of these are available on any network-enabled computer?
    - **Answer:** `65535`
- **Question:** How many of these are considered "well-known"?
    - **Answer:** `1024`

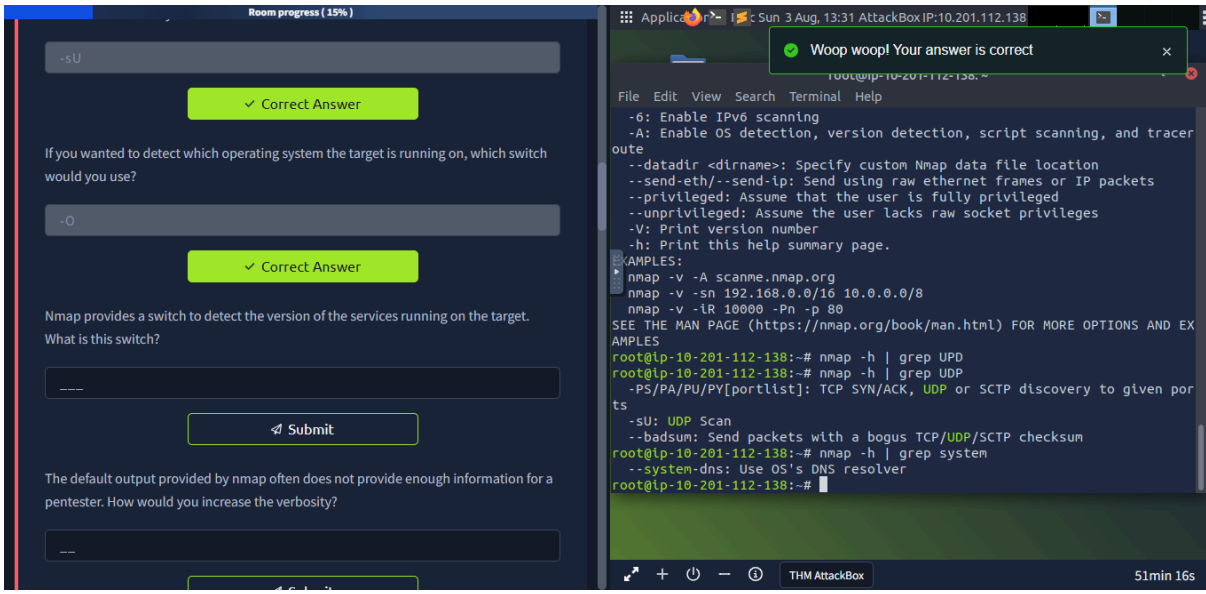
Task 3: Nmap Switches



- **Objective:** Time to learn the language of Nmap. This task is about getting comfortable with the command-line switches that control our scans. We'll use the

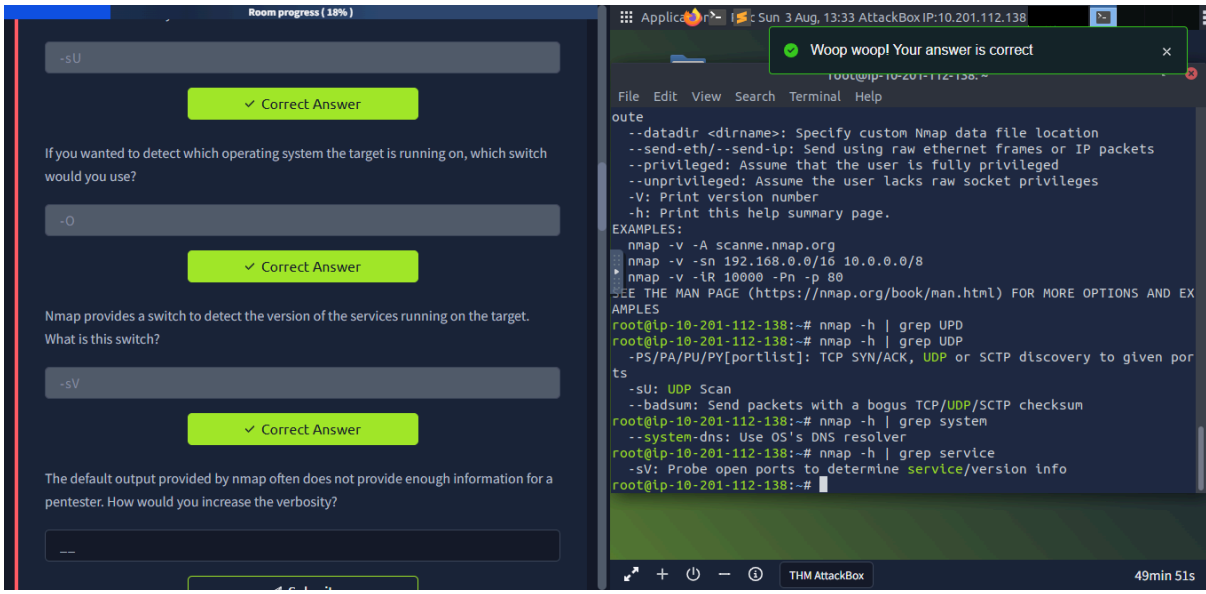
help menu to look up different options for everything from scan types to output formats.

- **Question:** What is the first switch listed in the help menu for a "Syn Scan"?
  - **Answer:** `-sS`
  - **Nmap Command Used:** `nmap -h` (to view the help menu)
- **Question:** Which switch would you use for a "UDP scan"?
  - **Answer:** `-sU`
  - **Nmap Command Used:** `nmap -h | grep UDP`
- **Question:** If you wanted to detect which operating system the target is running on, which switch would you use?
  - **Answer:** `-O`

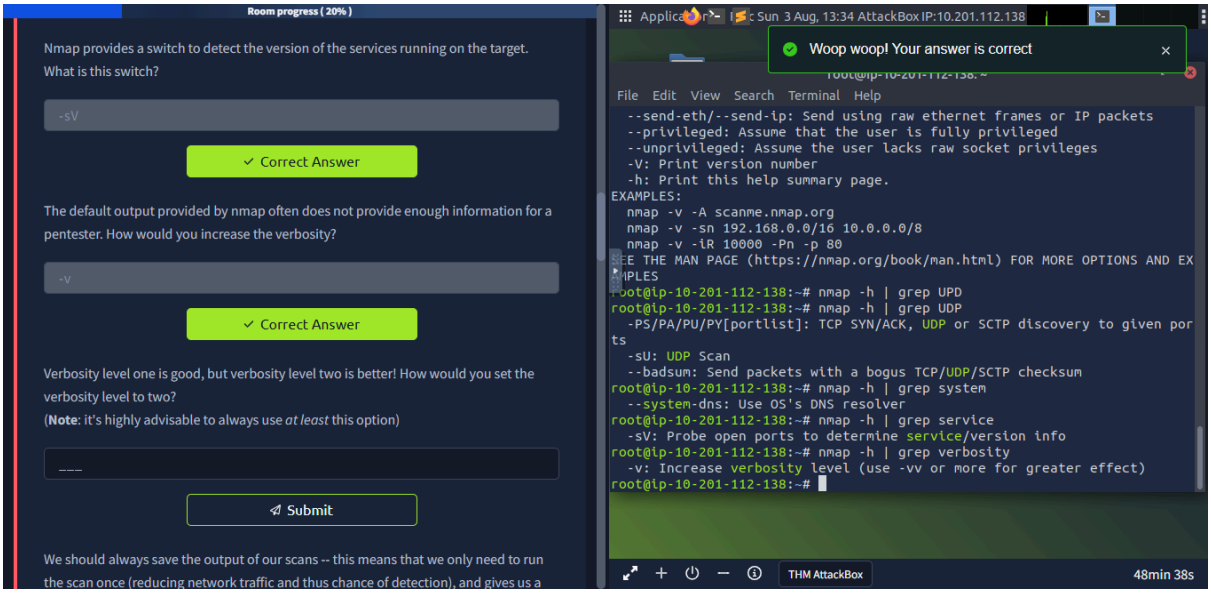


  - **Nmap Command Used:** `nmap -h | grep "OS detection"`
- **Question:** Nmap provides a switch to detect the version of the services running on the target. What is this switch?
  - **Answer:** `-sV`

- **Nmap Command Used:** `nmap -h | grep "version detection"`

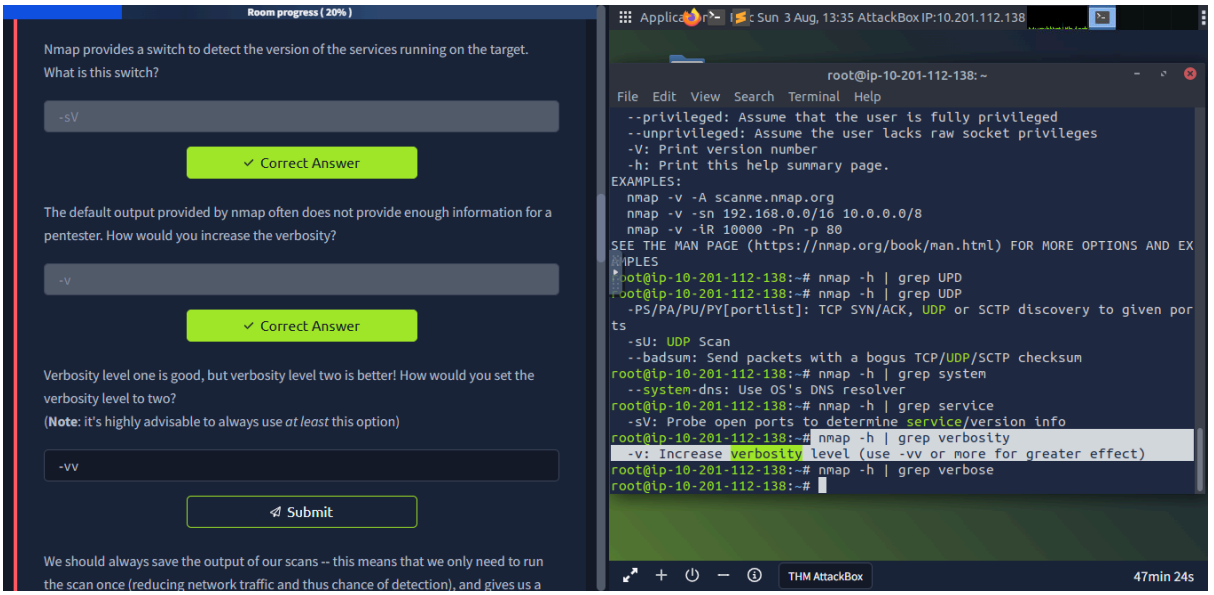


- **Question:** How would you increase the verbosity?

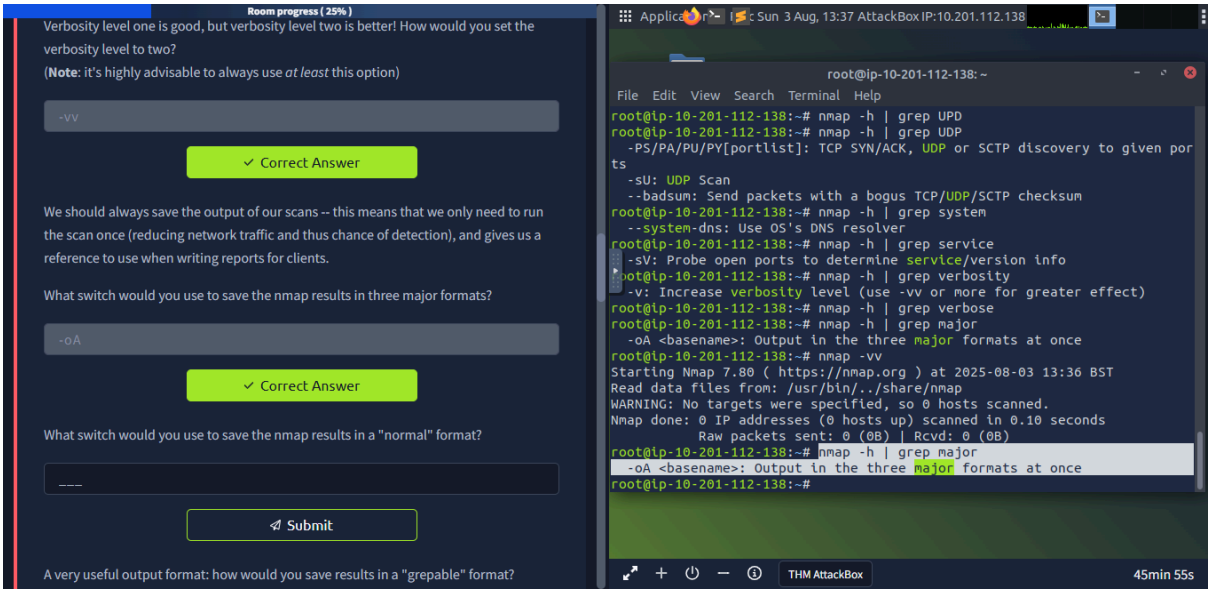


- **Answer:** `-v`
- **Nmap Command Used:** `nmap -h | grep "verbosity"`

- **Question:** How would you set the verbosity level to two?

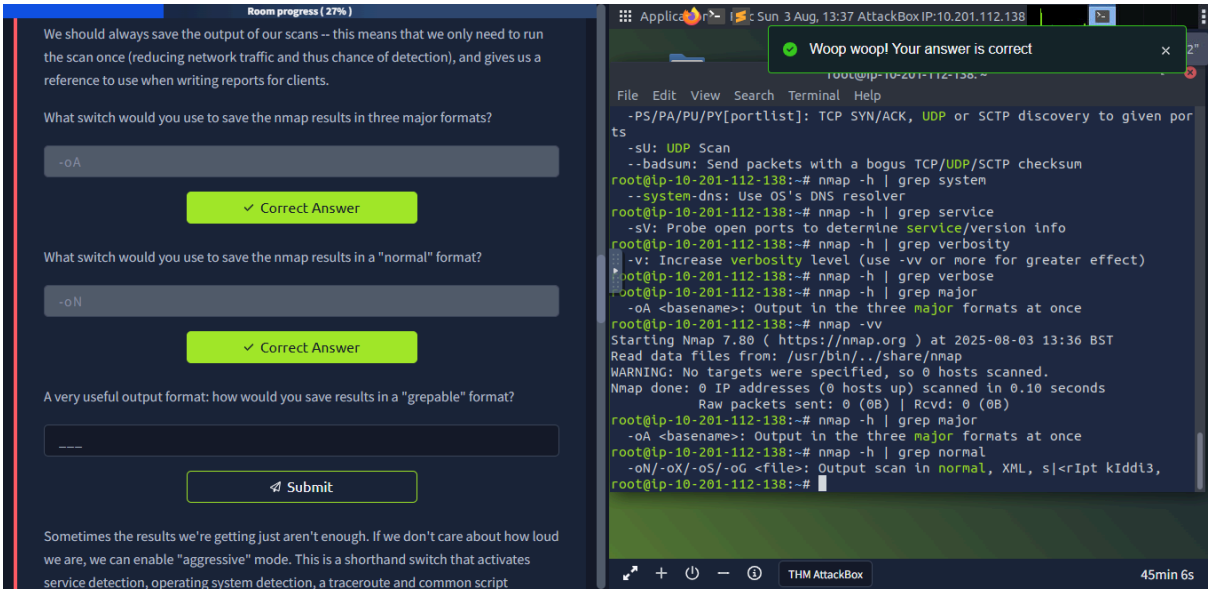


  - **Answer:** `-vv`
- **Question:** What switch would you use to save the nmap results in three major formats?

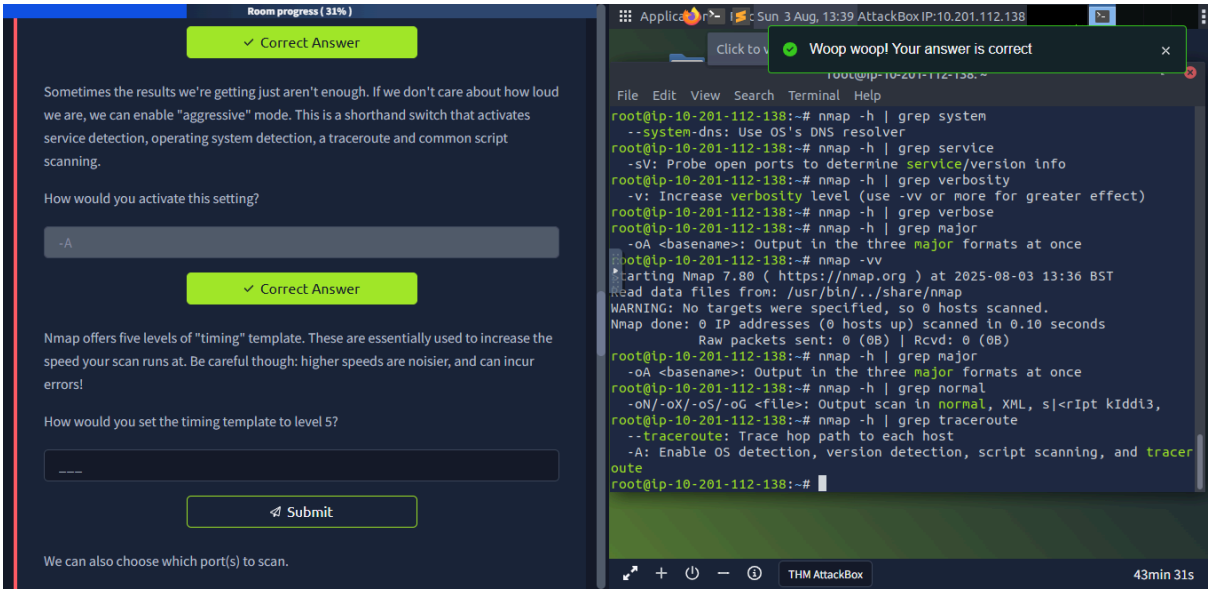


  - **Answer:** `-oA`
  - **Nmap Command Used:** `nmap -h | grep "major formats"`

- **Question:** What switch would you use to save the nmap results in a "normal" format?

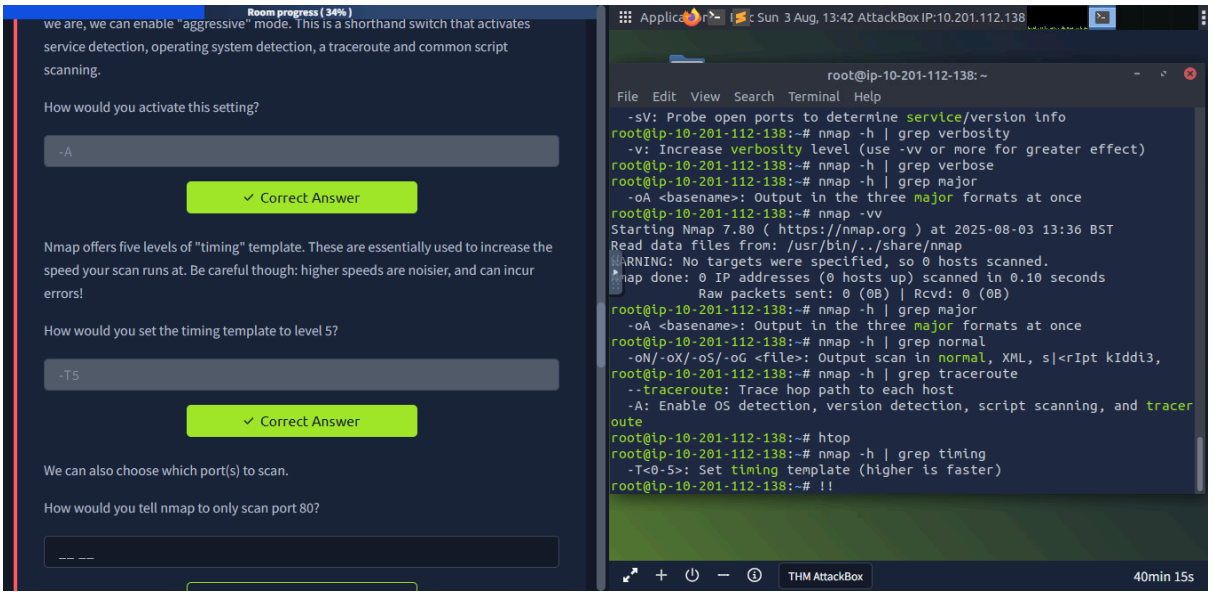


  - **Answer:** `-oN`
  - **Nmap Command Used:** `nmap -h | grep "normal"`
- **Question:** How would you save results in a "grepable" format?
  - **Answer:** `-oG`
- **Question:** How would you activate "aggressive" mode?

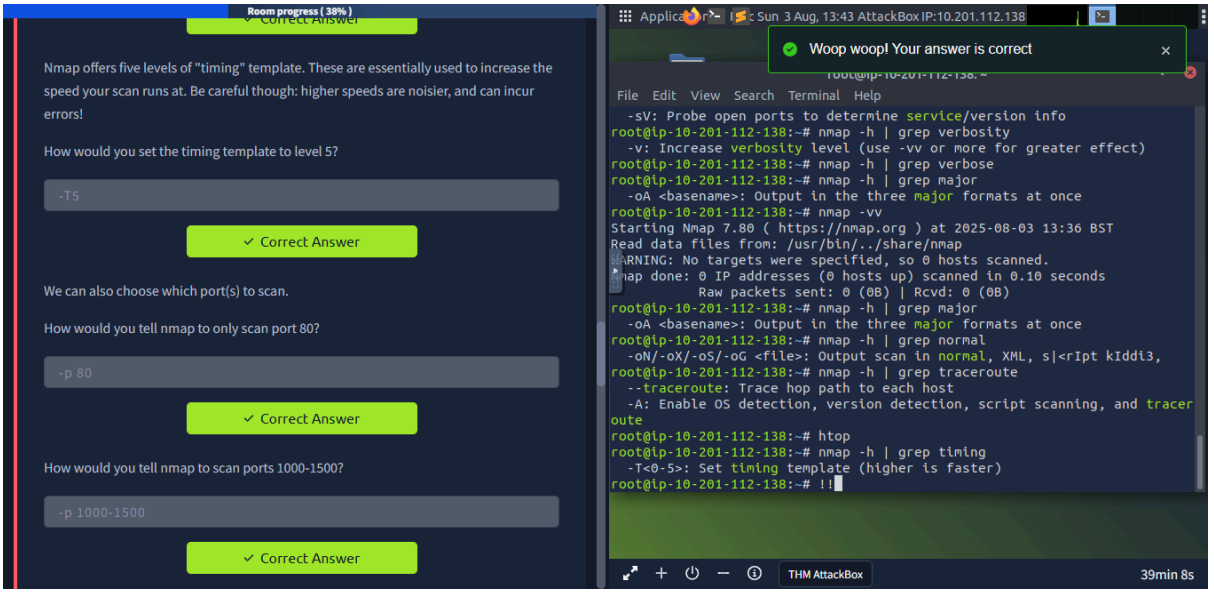


  - **Answer:** `-A`
  - **Nmap Command Used:** `nmap -h | grep "aggressive"`

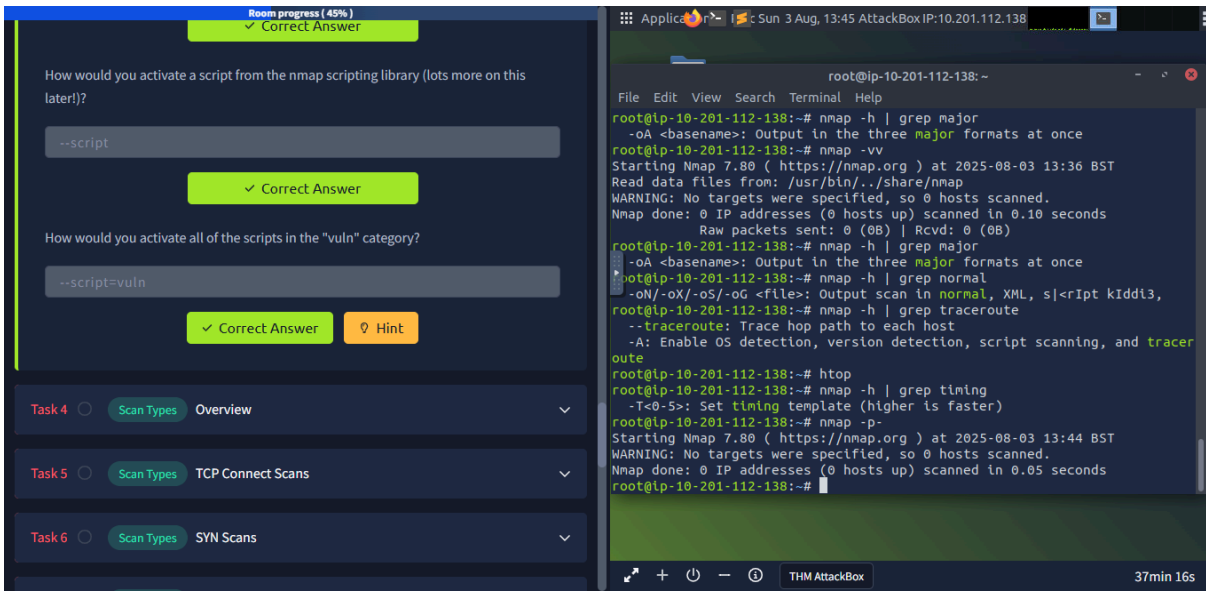
- **Question:** How would you set the timing template to level 5?



  - **Answer:** `-T5`
  - **Nmap Command Used:** `nmap -h | grep "timing template"`
- **Question:** How would you tell nmap to only scan port 80?



  - **Answer:** `-p 80`
- **Question:** How would you tell nmap to scan ports 1000-1500?
  - **Answer:** `-p 1000-1500`
- **Question:** How would you activate a script from the nmap scripting library?
  - **Answer:** `--script`



- **Question:** How would you activate all of the scripts in the "vuln" category?
  - **Answer:** `--script=vuln`

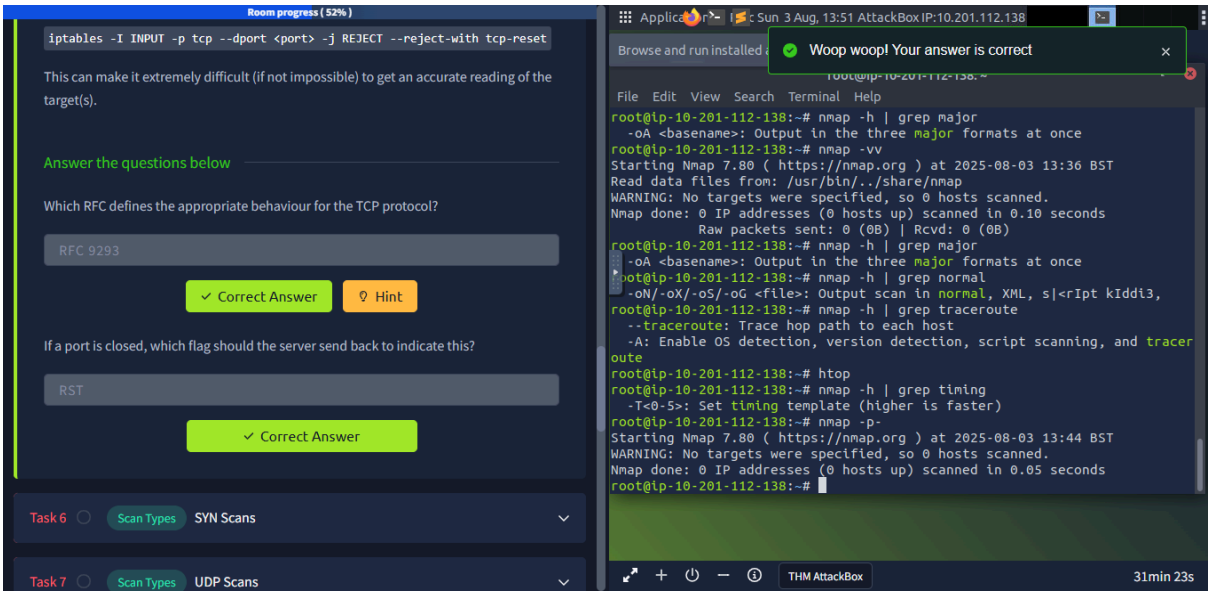
Task 4 & 5: Scan Types - TCP Connect Scans

- **Objective:** Let's start with the most fundamental scan type. Here, we'll explore the TCP Connect scan, which completes a full three-way handshake. The objective is to understand how this basic scan works and how to interpret its results based on standard TCP behavior.
- **Question:** Which RFC defines the appropriate behaviour for the TCP protocol?
  - **Answer:** `RFC 9293`
- **Question:** If a port is closed, which flag should the server send back to indicate this?
  - **Answer:** `RST`

Task 6: Scan Types - SYN Scans

- **Objective:** Now for a more subtle approach. This task introduces the SYN 'stealth' scan. Our goal is to see how this 'half-open' scan differs from a full connect scan,

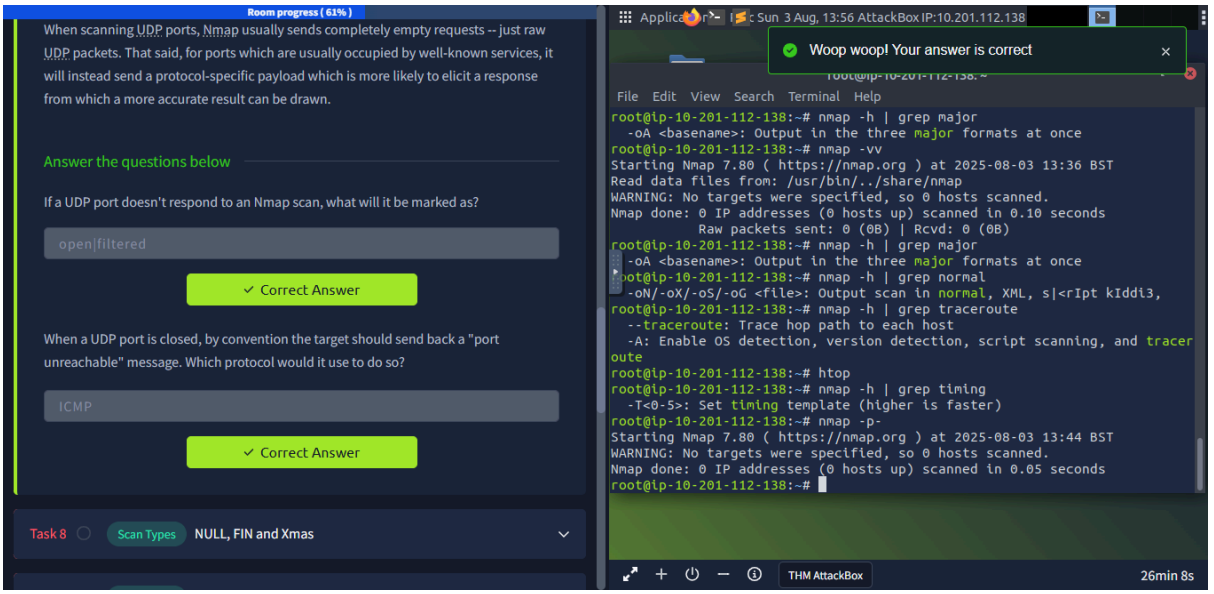
making it faster and less conspicuous on the network.



- **Question:** There are two other names for a SYN scan, what are they?
  - **Answer:** `Half-Open, Stealth`
- **Question:** Can Nmap use a SYN scan without Sudo permissions (Y/N)?
  - **Answer:** N

Task 7: Scan Types - UDP Scans

- **Objective:** Scanning UDP ports presents a unique challenge because it's a 'connectionless' protocol. The objective here is to understand the difficulties of UDP scanning and learn how Nmap interprets the responses (or lack thereof) to determine a port's state.

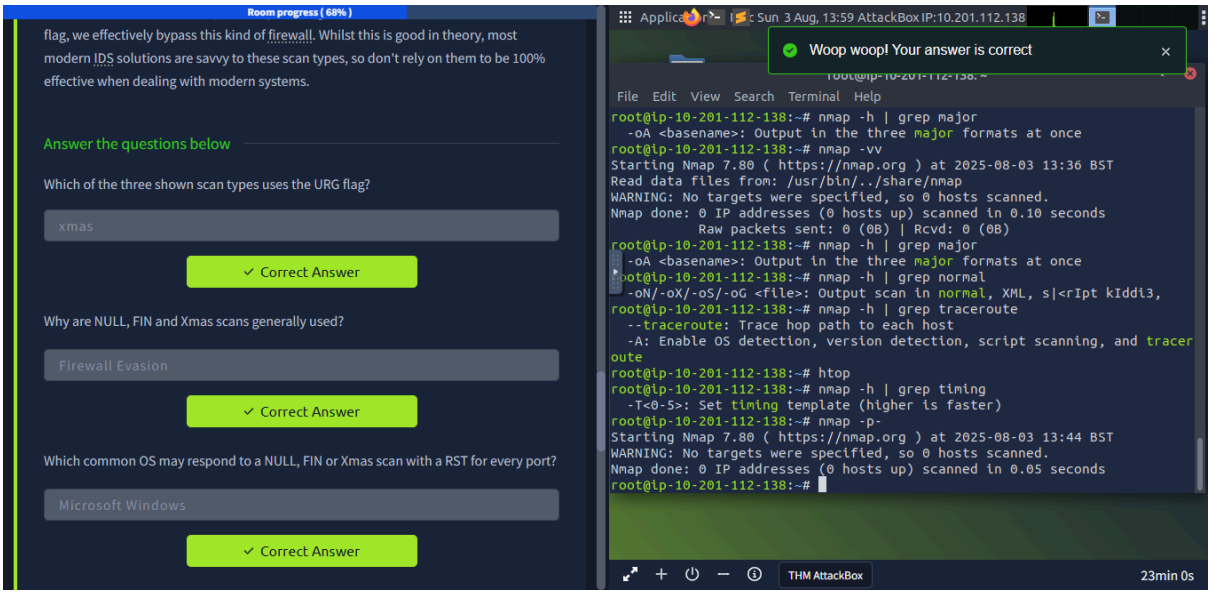


- **Question:** If a UDP port doesn't respond to an Nmap scan, what will it be marked as?
  - **Answer:** `open|filtered`

- **Question:** When a UDP port is closed, by convention the target should send back a "port unreachable" message. Which protocol would it use to do so?
    - **Answer:** `ICMP`

Task 8: Scan Types - NULL, FIN, and Xmas

- **Objective:** Let's get even stealthier. This section is about using NULL, FIN, and Xmas scans to evade firewalls. The goal is to understand the theory behind sending these non-standard packets and how they can sometimes bypass security measures that are only watching for typical SYN packets.

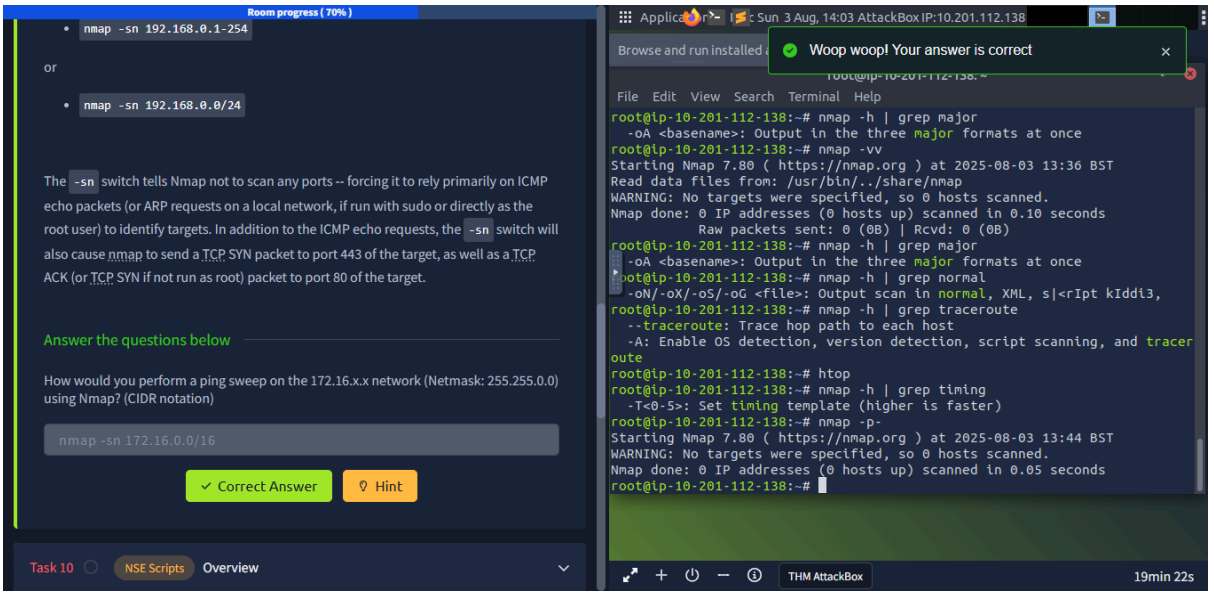


- **Question:** Which of the three shown scan types uses the URG flag?
    - **Answer:** `Xmas`
- **Question:** Why are NULL, FIN, and Xmas scans generally used?
    - **Answer:** `Firewall Evasion`
- **Question:** Which common OS may respond to a NULL, FIN, or Xmas scan with a RST for every port?
    - **Answer:** `Microsoft Windows`

Task 9: Scan Types - ICMP Network Scanning

- **Objective:** Before we scan for open ports, we need to know which hosts are even online. This task focuses on host discovery using a 'ping sweep'. Our objective is to

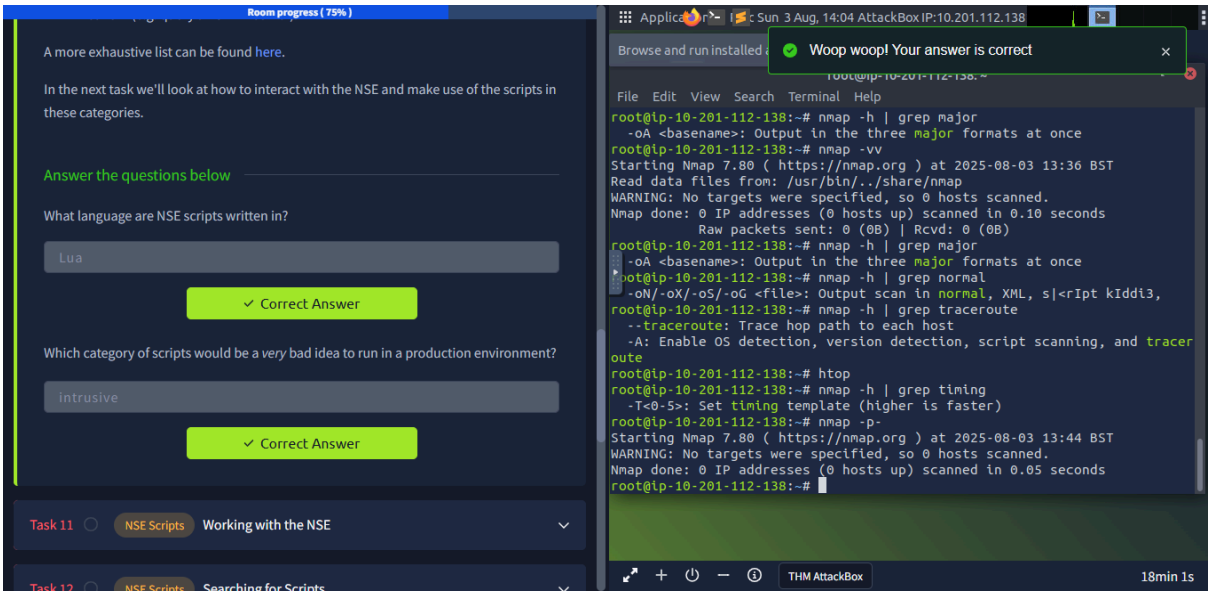
learn how to map out a network and identify live targets.



- **Question:** How would you perform a ping sweep on the 172.16.x.x network (Netmask: 255.255.0.0) using Nmap? (CIDR notation)
  - **Answer:** `nmap -sn 172.16.0.0/16`

Task 10 & 11: NSE Scripts

- **Objective:** Nmap is more than just a port scanner. Here, we'll dive into the Nmap Scripting Engine (NSE), a feature that lets us automate tasks from vulnerability scanning to advanced reconnaissance. The goal is to get a handle on what NSE is and how its scripts are categorized.



- **Question:** What language are NSE scripts written in?
  - **Answer:** `Lua`
- **Question:** Which category of scripts would be a very bad idea to run in a production environment?
  - **Answer:** `intrusive`

- **Question:** What optional argument can the `ftp-anon.nse` script take?

Download: https://svn.nmap.org/nmap/scripts/ftp-anon.nse

Script Output

Script Summary

Checks if an FTP server allows anonymous logins.

If anonymous is allowed, gets a directory listing of the root directory and highlights writeable files.

See also:

- ftp-brute.nse

Script Arguments

ftp-anon.maxlist

The maximum number of files to return in the directory listing. By default it is 20, or unlimited if verbosity is enabled. Use a negative number to disable the limit, or 0 to disable the listing entirely.

Example Usage

```
nmap -sV -sC <target>
```

Script Output

```
PORT   STATE SERVICE
21/tcp open  ftp
| ftp-anon: Anonymous FTP login allowed (FTP code 230)
| -rw-r--r--   1 1170     924            31 Mar 28  2001 .banner
| d--x--x--x   2 root     root         1024 Jan 14  2002 bin
| d--x--x--x   2 root     root         1024 Aug 10  1999 etc
```

firewall-bypass

Detects a vulnerability in netfilter and other firewalls that use helpers to dynamically open ports for protocols such as ftp and sip.

flume-master-info

Retrieves information from Flume master HTTP pages.

fox-info

Tridium Niagara Fox is a protocol used within Building Automation Systems. Based off Billy Rios and Terry McCorkle's work this Nmap NSE will collect information from A Tridium Niagara system.

freelancer-info

Detects the Freelancer game server (FLServer.exe) service by sending a status query UDP probe.

ftp-anon

Checks if an FTP server allows anonymous logins.

ftp-bounce

Checks to see if an FTP server allows port scanning using the FTP bounce method.

ftp-brute

Performs brute force password auditing against FTP servers.

ftp-libopie

Checks if an FTPd is prone to CVE-2010-1938 (OPIE off-by-one stack overflow), a vulnerability discovered by Maksymilian Arciemowicz and Adam "pi3" Zabrocki. See the advisory at https://nmap.org/r/fbsd-sa-opie. Be advised that, if launched against a vulnerable host, this script will crash the FTPd.

ftp-proftpd-backdoor

Room progress (77%)

Note that the arguments are separated by commas, and connected to the corresponding script with periods (i.e. `<script-name>.<argument>`).

A full list of scripts and their corresponding arguments (along with example use cases) can be found here.

Nmap scripts come with built-in help menus, which can be accessed using `nmap --script-help <script-name>`. This tends not to be as extensive as in the link given above, however, it can still be useful when working locally.

Answer the questions below

What optional argument can the `ftp-anon.nse` script take?

maxlist

✓ Correct Answer

Task 12 NSE Scripts Searching for Scripts

Task 13 Firewall Evasion

Sun 3 Aug, 14:08 AttackBox IP:10.201.112.138

Woop woop! Your answer is correct

File Edit View Search Terminal Help

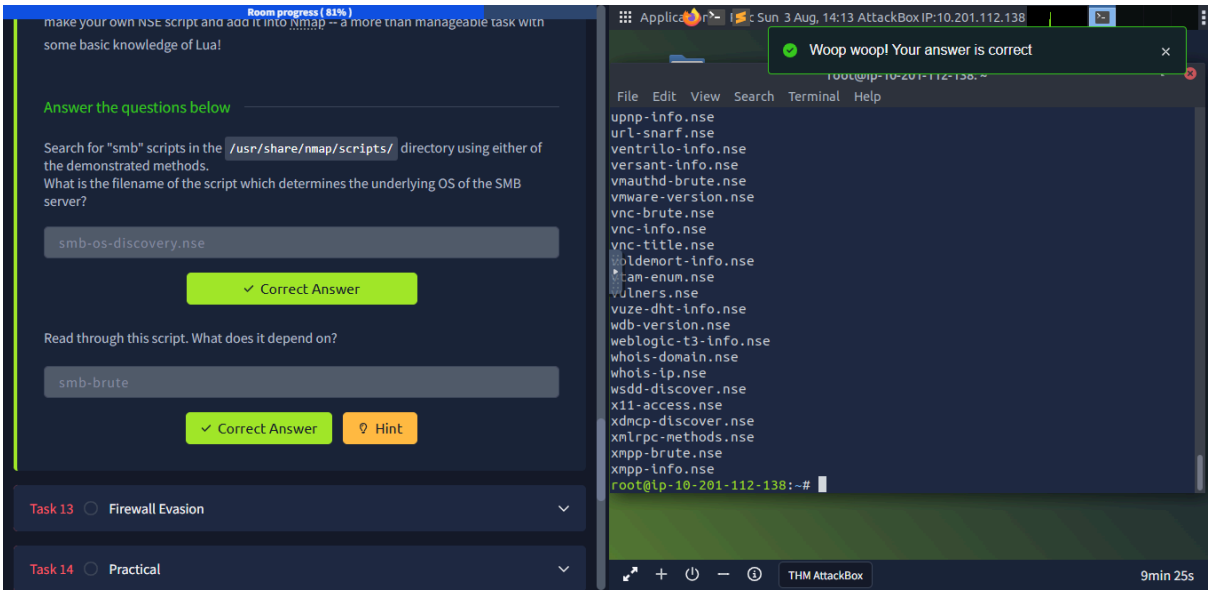
```
root@ip-10-201-112-138:~# nmap -h | grep major
  -oA <basename>: Output in the three major formats at once
root@ip-10-201-112-138:~# nmap -vv
Starting Nmap 7.80 ( https://nmap.org ) at 2025-08-03 13:36 BST
Read data files from: /usr/bin/../share/nmap
WARNING: No targets were specified, so 0 hosts scanned.
Nmap done: 0 IP addresses (0 hosts up) scanned in 0.10 seconds
           Raw packets sent: 0 (0B) | Rcvd: 0 (0B)
root@ip-10-201-112-138:~# nmap -h | grep major
  -oA <basename>: Output in the three major formats at once
root@ip-10-201-112-138:~# nmap -h | grep normal
  -oN/-oX/-oS/-oG <file>: Output scan in normal, XML, s|<rIpt kIddi3,
root@ip-10-201-112-138:~# nmap -h | grep traceroute
  --traceroute: Trace hop path to each host
  -A: Enable OS detection, version detection, script scanning, and tracer
oute
root@ip-10-201-112-138:~# htop
root@ip-10-201-112-138:~# nmap -h | grep timing
  -T<0-5>: Set timing template (higher is faster)
root@ip-10-201-112-138:~# nmap -p-
Starting Nmap 7.80 ( https://nmap.org ) at 2025-08-03 13:44 BST
WARNING: No targets were specified, so 0 hosts scanned.
Nmap done: 0 IP addresses (0 hosts up) scanned in 0.05 seconds
root@ip-10-201-112-138:~#
```

THM AttackBox 14min 4s

- **Answer:** `maxlist`

Task 12: NSE Scripts - Searching for Scripts

- **Objective:** With a massive library of scripts available, knowing how to find the right one is key. This task is focused on searching for NSE scripts locally, so we can find the perfect tool for any given situation.

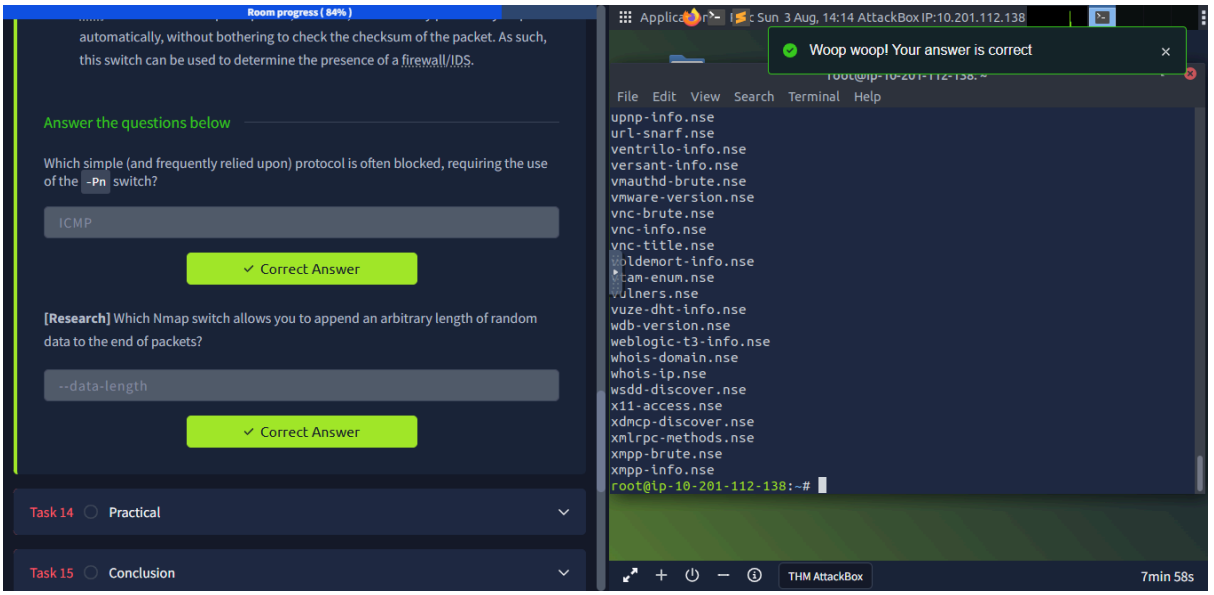


- **Question:** What is the filename of the script which determines the underlying OS of the SMB server?
  - **Answer:** `smb-os-discovery.nse`
  - **Command Used:** `ls /usr/share/nmap/scripts/smb*` or `grep "smb" /usr/share/nmap/scripts/script.db`
- **Question:** Read through this script. What does it depend on?
  - **Answer:** `smb-brute`

Task 13: Firewall Evasion

- **Objective:** Firewalls are a common obstacle. This task reinforces our firewall evasion skills, focusing on the essential `-Pn` switch. The objective is to understand why we need it and how it helps us scan targets that would otherwise appear to be

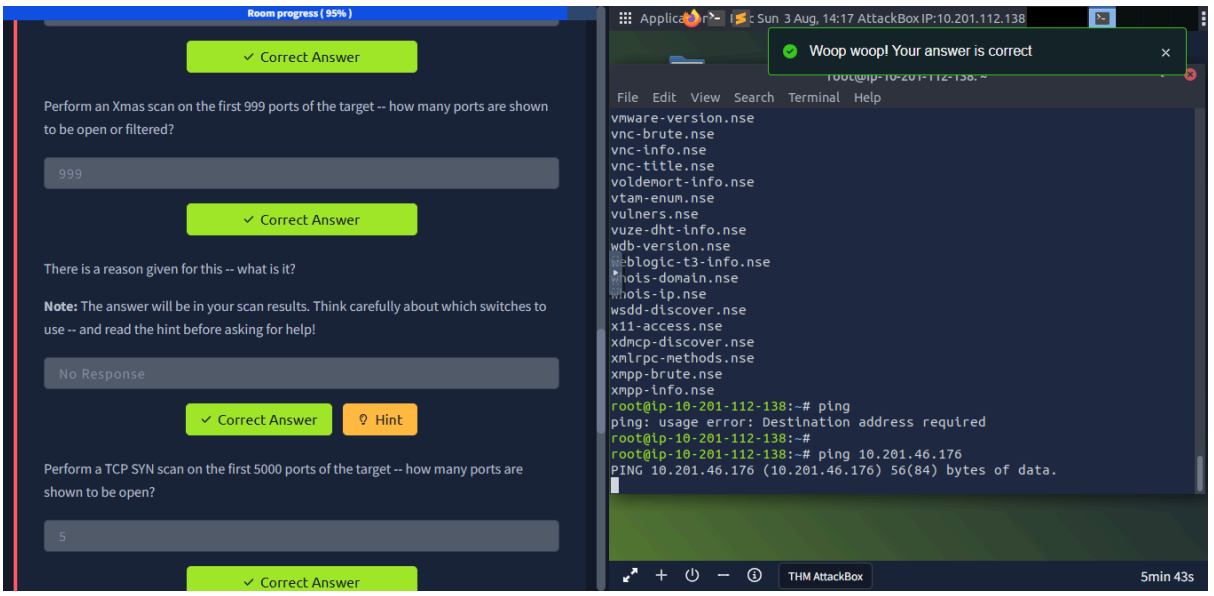
offline.



- **Question:** Which simple (and frequently relied upon) protocol is often blocked, requiring the use of the -Pn switch?
  - **Answer:** `ICMP`
- **Question:** Which Nmap switch allows you to append an arbitrary length of random data to the end of packets?
  - **Answer:** `--data-length`

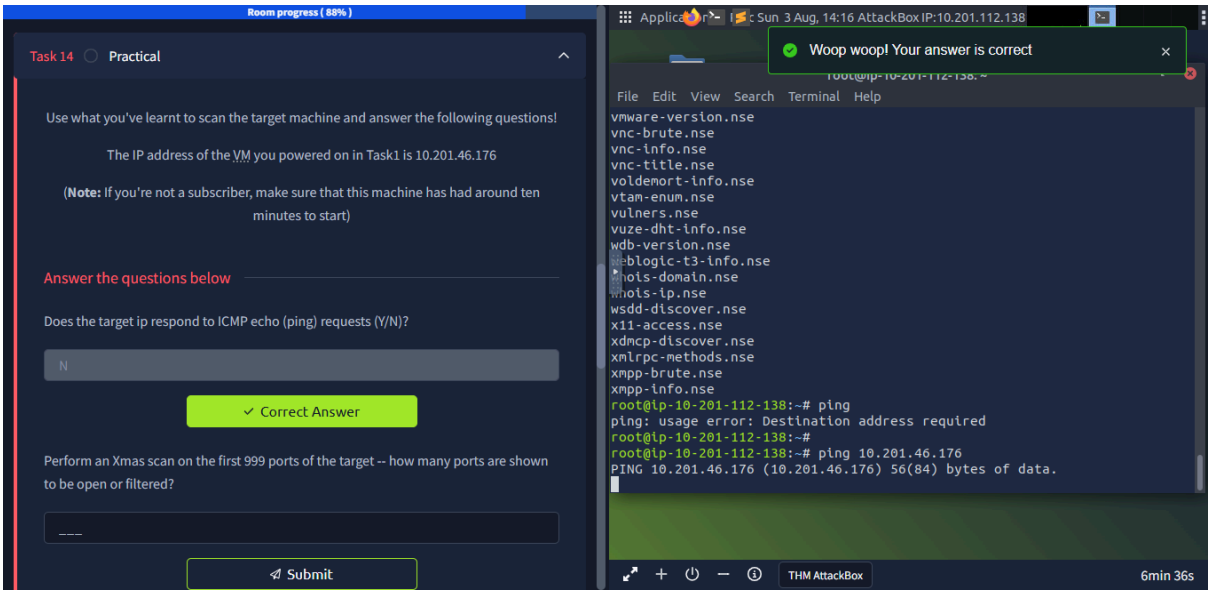
Task 14: Practical

- **Objective:** Time to put theory into practice. In this hands-on section, our goal is to use everything we've learned to scan the live target. We'll combine different scan types and scripts to gather intelligence and answer the final questions.



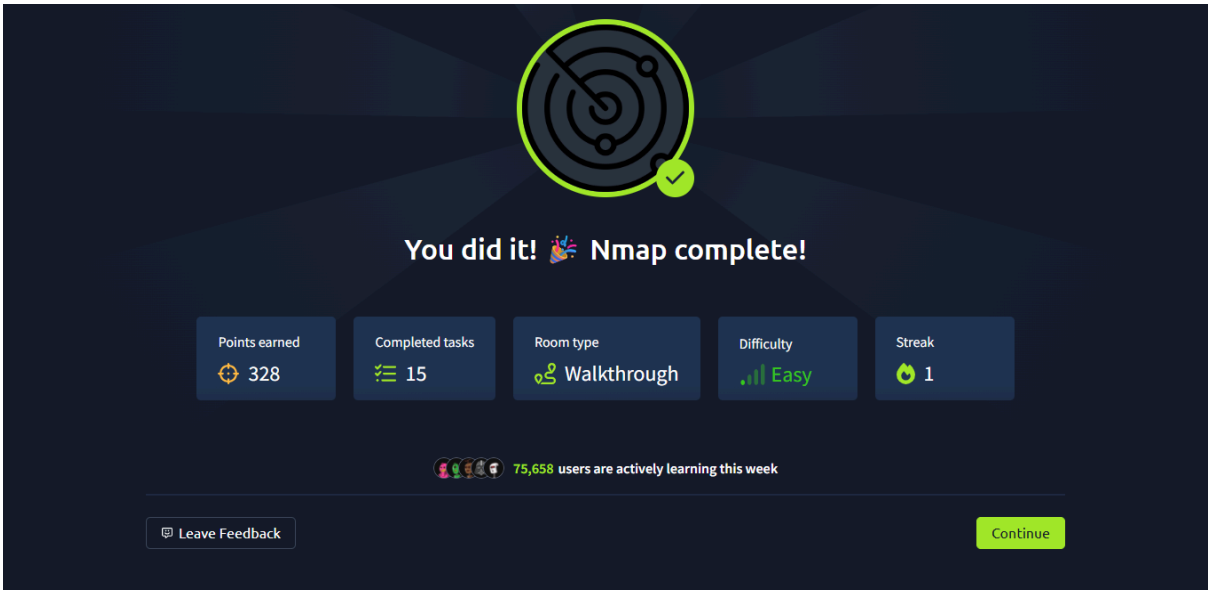
- **Question:** Does the target IP respond to ICMP echo (ping) requests (Y/N)?
  - **Answer:** `N`
  - **Command Used:** `ping 10.201.46.176`

- **Question:** Perform an Xmas scan on the first 999 ports of the target- how many ports are shown to be open or filtered?
    - **Answer:** `999`
    - **Nmap Command Used:** `nmap -sX -p 1-999 10.201.46.176`
- **Question:** There is a reason given for this- what is it?
    - **Answer:** `No Response`
- **Question:** Perform a TCP SYN scan on the first 5000 ports of the target- how many ports are shown to be open?



    - **Answer:** `5`
    - **Nmap Command Used:** `nmap -sS -p 1-5000 10.201.46.176`
- **Question:** Deploy the `ftp-anon` script against the box. Can Nmap login successfully to the FTP server on port 21? (Y/N)
    - **Answer:** `Y`
    - **Nmap Command Used:** `nmap -sC -p 21 10.201.46.176` or `nmap --script ftp-anon -p 21 10.201.46.176`

Task 15: Conclusion



- **Objective:** We've reached the end! This final step signifies the completion of the Nmap challenge, marking a solid milestone in our understanding of network scanning with this essential tool.
- **Result:** The Nmap room was successfully complete.