Email Analysis (Phishing)

Project Description

In this project, I will be analyzing an email given from a scenario provided by the Blue Team Labs website.

Software and Tools

- Kali Linux VM
- CyberChef
- Gary Kessler Signature Files
- HxD
- Square X
- Exiftool

Walkthrough

First, I downloaded the email file given by the scenario. Then, I opened it using Notepad++. The following image shows a fraction of the email.

```
Return-Path: <billjobs@microapple.com>
Received: from localhost (emkei.cz. [93.99.104.210])
        by mx.google.com with ESMTPS id s16si170171wmj.176.2021.01.25.22.41.18
        for <themajoronearth@gmail.com>
        (version=TLS1_2 cipher=ECDHE-ECDSA-CHACHA20-POLY1305 bits=256/256);
        Mon, 25 Jan 2021 22:41:18 -0800 (PST)
Received-SPF: fail (google.com: domain of billjobs@microapple.com does not designate 93.99.104.210 as permitted sender)
Authentication-Results: mx.google.com;
       spf=fail (google.com: domain of billjobs@microapple.com does not designate 93.99.104.210 as permitted sender) sm
Received: by localhost (Postfix, from userid 33)
    id 1993E221F8; Tue, 26 Jan 2021 01:41:18 -0500 (EST)
To: themajoronearth@gmail.com
Subject: A Hope to CoCanDa
From: "Bill" <billjobs@microapple.com>
X-Priority: 3 (Normal)
Importance: Normal
Errors-To: billjobs@microapple.com
Reply-To: negeja3921@pashter.com
MIME-version: 1.0
Content-Type: multipart/mixed; boundary=BOUND_600FB98E0DCEE8.49207210
Message-Id: <20210126064118.1993E221F8@localhost>
Date: Tue, 26 Jan 2021 01:41:18 -0500 (EST)
```

Based on the image, I can already see that the sender used *emkei,* a fake mailer, as the email service. Also, there is a discrepancy with the sender email address (billjobs@microapple.com) and the reply-to email address (negeja3921@pashter.com). Another observation is that the SPF authentication protocol failed to authenticate the sender. As I continued looking at the email, I found a message encoded with base64 format as shown in the following image.

```
--BOUND_600FB98E0DCEE8.49207210
Content-Type: text/plain; charset=utf-8
Content-Transfer-Encoding: base64

SGkgVGhlTWFqb3JPbkVhcnRoLAoKVGhlIGFiZHVjdGVkIENvQ2FuRGlhbnMgYXJlIHdpdGggbWUg
aW5jbHVkaW5nIHRoZSBQcmVzaWRlbnTigJlzIGRhdWdodGVyLiBEb250IHdvcnJ5LiBUaGV5IGFy
ZSBzYWZlIGluIGEgc2VjcmV0IGxvY2F0aW9uLgpTZW5kIG1lIDEgQmlsbGlvbiBDb0NhbkRz8J+k
kSBpbiBjYXNo8J+SuCB3aXRoIGEgc3BhY2VzaGlw8J+agCBhbmQgbXkgYXV0b25vbW91cyBib3Rz
IHdpbGwgc2FmZWx5IGJyaW5nIGJhY2sgeW91ciBjaXRpemVucy4KCkgaGVhcmQgdGhhdCBDb0Nh
bkRpYW5zIGhhdmUgdGhlIGJlc3QgYnJhaW5zIGluIHRoZSBVbml2ZXJzZS4gU29sdmUgdGhlIHB1
enpsZSBJIHNlbnQgYXMgYW4gYXR0YWNobWVudCBmb3IgdGhlIG5leHQgc3RlcHMuCgpJ4oCZbSBh
cHByb3hpbWF0ZWx5IDEyLjggbGlnaHQgbWludXRlcyBhd2F5IGZyb20gdGhlIHN1biBiBhbmQgbXkg
YWR2aWNlIGZvciB0aGUgcHV6emxlIGlzIAoK4oCcRG9uJ3QgVHJ1c3QgWW91ciBFeWVz4oCdCgpM
b2zwn5iCCgpTZWUgeW91IE1ham9yLiBXYWl0aW5nIGZvciB0aGUgQ2Fzc3NoaGho8J+SsA==
```

Since the message was encoded in base64 format, I proceeded to use CyberChef to decode it. After I copied the message to CyberChef, the real message was revealed as shown in the image below.

```
Hi TheMajorOnEarth,

The abducted CoCanDians are with me including the President's daughter. Dont worry. They are safe in a
secret location.
Send me 1 Billion CoCanDs🤑 in cash💸 with a spaceship🚀 and my autonomous bots will safely bring back your
citizens.

I heard that CoCanDians have the best brains in the Universe. Solve the puzzle I sent as an attachment for
the next steps.

I'm approximately 12.8 light minutes away from the sun and my advice for the puzzle is

"Don't Trust Your Eyes"

Lol😂

See you Major. Waiting for the Cassshhhh💰
```

Continuing looking at the email, it showed another base64 encoded content which is supposed to be from a PDF file called "PuzzleToCoCanDa.pdf". Once again, I used CyberChef to decode the formatted content. Before I saved it, I changed the content into Hex format as shown below. The reason I did this is because I want to confirm if the file is really a PDF file. The first four bytes of a file makes up for what is called a file signature (or hex signature). In this case, the first four bytes of the hex signature are 50 4b 03 04.

```
--BOUND_600FB98E0DCEE8.49207210
Content-Type: application/pdf; name="PuzzleToCoCanDa.pdf"
Content-Transfer-Encoding: base64
Content-Disposition: attachment; filename="PuzzleToCoCanDa.pdf"
```

Output

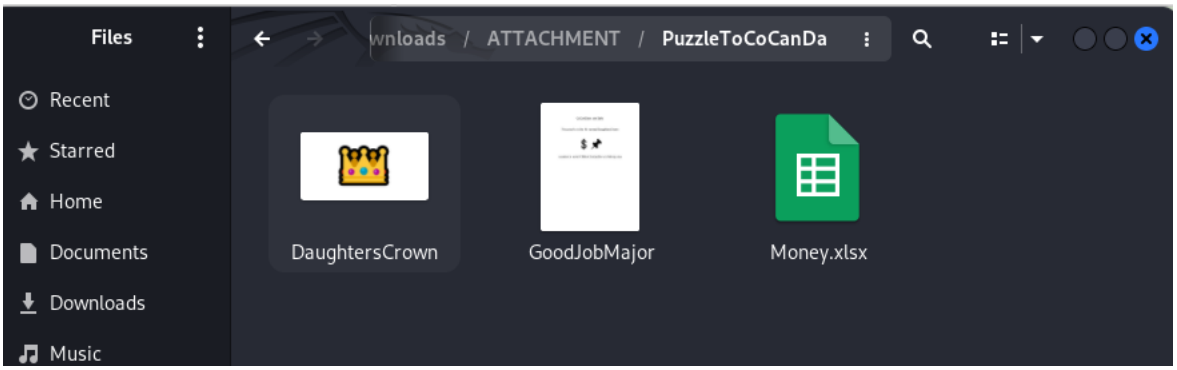
< 1: Hi TheMajorOnEarth,The abducted CoCanDians are with ...

```
50 4b 03 04 14 00 00 00 08 00 20 85 39 52 08 0f c6 28
```

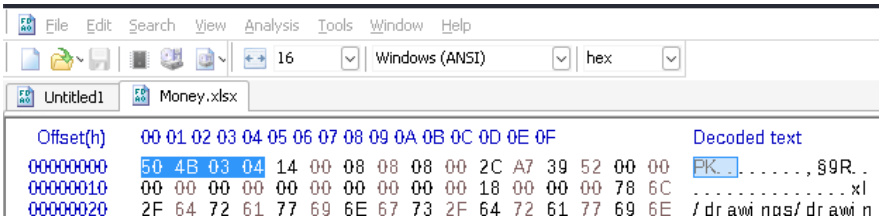
Using these four bytes, I visited the Gary Kessler Signature Files website (garykessler.net) to confirm if they correspond to a PDF file. As we can see below, PDF files have a hex signature of 25 50 44 46, which already tells me that the "PuzzleToCoCanDa.pdf" is not actually a PDF file.

25 50 44 46	%PDF	
PDF, FDF, AI	Adobe Portable Document Format	

Then, from CyberChef, I proceeded to save the decoded content from "PuzzleToCoCanDa.pdf" in a folder named *ATTACHMENT.ZIP*. Once I extracted it, it contained three items inside as shown in the image below.



One of the items has an Excel file extension named "*Money.xlsx*". This time, before I confirm if it's an Excel file, I'm going to use HxD, a hex editor, to see the byte patterns of the file. After I opened the "*Money.xlsx.*" file in HxD, it gave me the hex signature of "50 4B 03 04" as shown below.

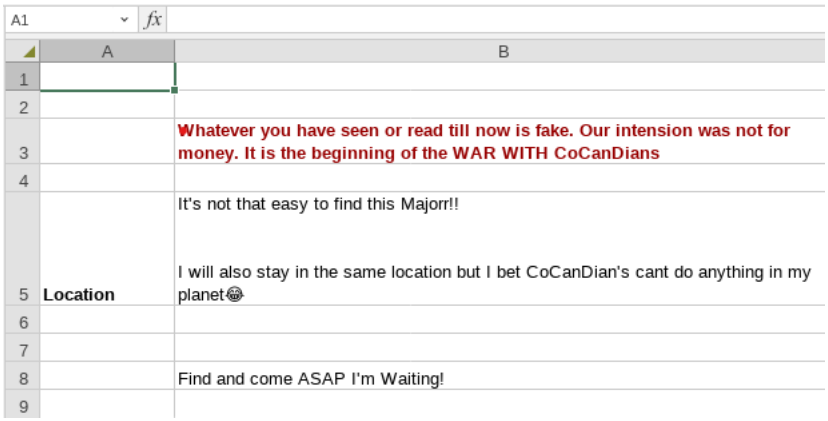


With this signature, I went back to Gary Kessler's website and confirmed that the signature identifies an Excel file extension.

```
50 4B 03 04 14 00 06 00          PK.....
```

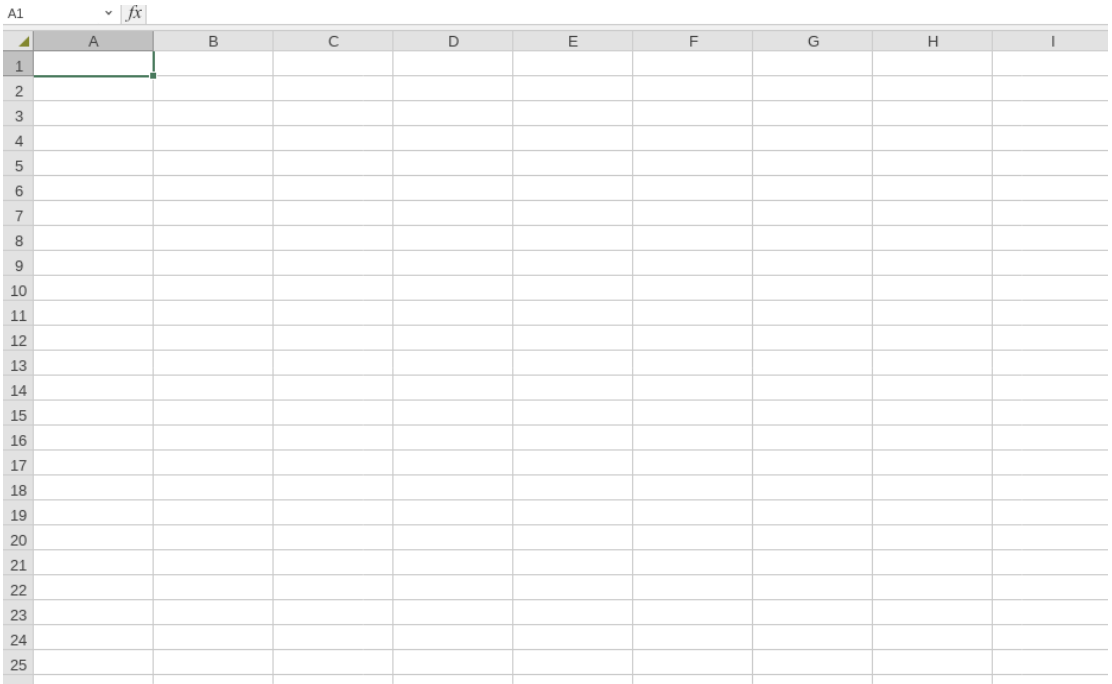
DOCX, PPTX, XLSX Microsoft Office Open XML Format (OOXML) Document

Since my VM doesn't have an Excel program, I used another tool called Square X which has a file viewer where I can drag a file there and view it. After I dragged the "*Money.xlsx" file* into Square X, it showed the following message as shown in the image below:



	A	B
1		
2		
3		**Whatever you have seen or read till now is fake. Our intension was not for money. It is the beginning of the WAR WITH CoCanDians**
4		
5	**Location**	It's not that easy to find this Majorr!! I will also stay in the same location but I bet CoCanDian's cant do anything in my planet😂
6		
7		
8		Find and come ASAP I'm Waiting!
9		

The document had two sheet tabs. Sheet 1 had the above message, while the other tab (in this case it was called Sheet 3) has nothing in it as shown below.



	A	B	C	D	E	F	G	H	I
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
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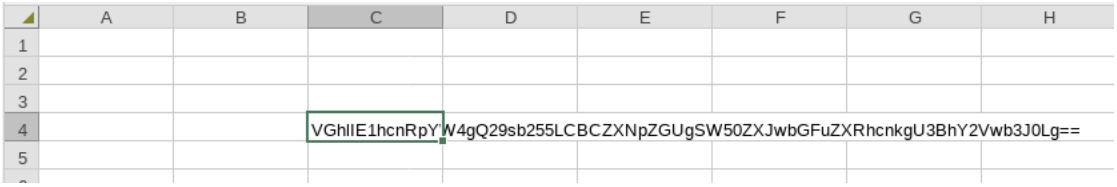
23									
24									
25									

Now, because this is a CTF (Capture the Flag) lab, a blank sheet wouldn't be put here without a reason. One possible reason could be that a text is blended in using the color white. Therefore, I proceeded in clearing the format in both sheets to see if a hidden text appeared. Sheet 1 didn't reveal anything, but Sheet 3 revealed something as shown below:



Finally, I copied this text into CyberChef to decode it to reveal the message:

Lastly, as part of the lab's objectives, I had to discover the name and last name of the malicious actor. To do that, I used *exiftool* to retrieve the metadata of the files inside the *ATTACHMENT.ZIP* folder. Of the three files, *GoodJobMajor*, revealed the author which is Pestero Negeja.