#IntelCon2020

IntelCon
by Ginseg

Scrapeando Foros Hacking para CTI

Santiago Rocha

Congreso Online de Ciberinteligencia
Julio 2020

IntelCon
by Ginseg

- Especialista en Seguridad Informática por la SFEDU
- Actualmente curso el Máster en Ciberseguridad en la UC3M
- Colaborador en IntelCon
- Interés en desarrollo de herramientas de CiberInteligencia


@sarvmetal


https://github.com/santiagorocha

santiago.infsec@gmail.com

Índice

1)Definición de Scraping y Crawling

2)Análisis de estructura típica de un Foro Hacking

3)Técnicas y herramientas de Scraping

4)Medidas anti-bots implementadas en Foros y cómo evitarlas

5)Ejemplos de generación de CTI proactivo

Disclaimer

Las técnicas y herramientas usadas en esta ponencia tienen fines informativos y educativos. No me hago responsable de un uso indebido de estas técnicas o herramientas ya que pueden llegar a ser ilegales si se usan para atacar, dañar, penetrar o perjudicar de alguna forma sistemas de terceros y puede conllevar a sanciones o violaciones de la ley. No se mostrará explícitamente los foros analizados por cuestiones de anonimato.

Scraping y Crawling

IntelCon
by Ginseg

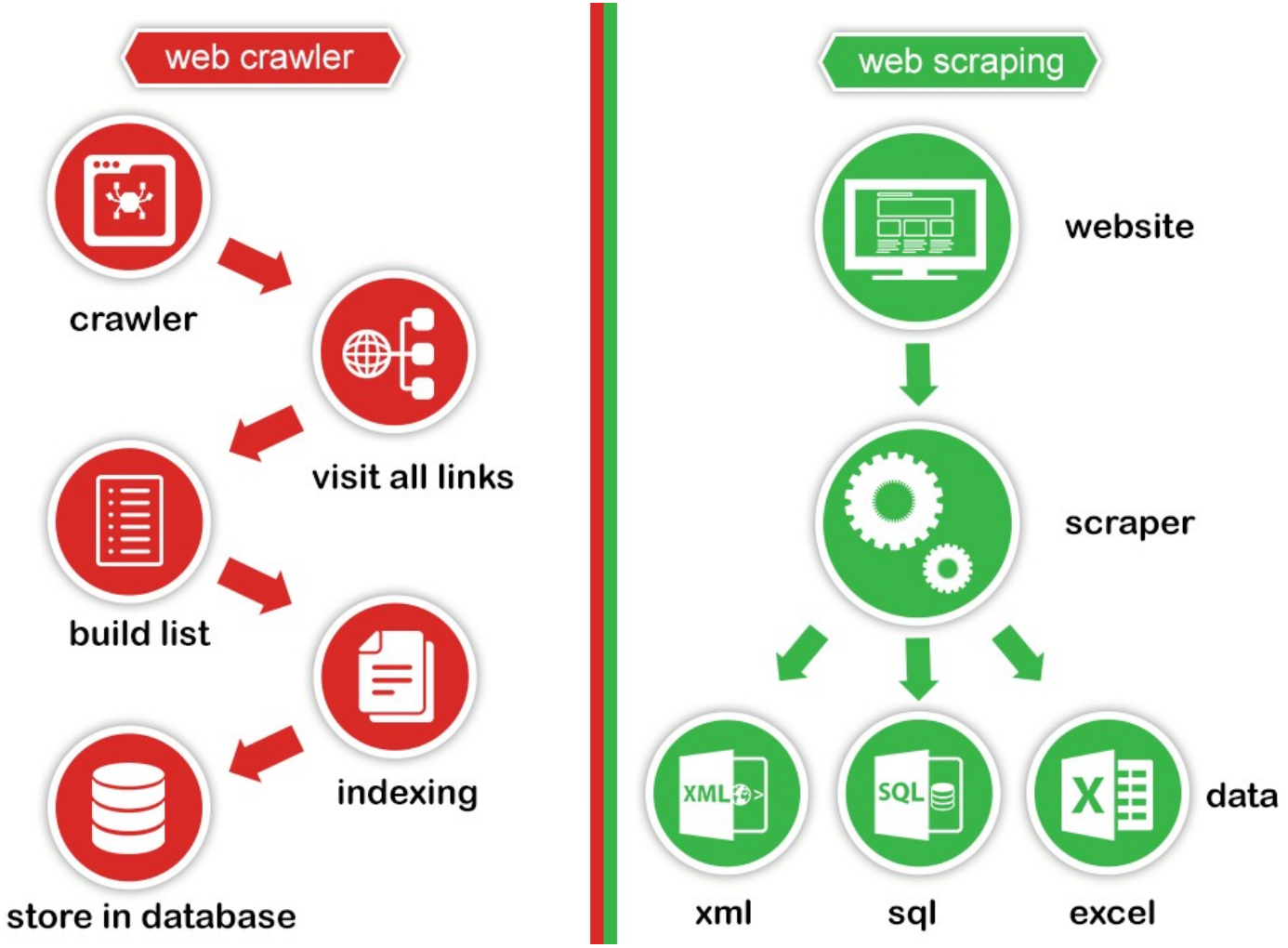
#IntelCon2020

Web scraping, **web harvesting**, or **web data extraction** is data scraping used for extracting data from websites. Web scraping software may access the World Wide Web directly using the Hypertext Transfer Protocol, or through a web browser. While web scraping can be done manually by a software user, the term typically refers to automated processes implemented using a bot or web crawler. It is a form of copying, in which specific data is gathered and copied from the web, typically into a central local database or spreadsheet, for later retrieval or analysis.

A **Web crawler**, sometimes called a **spider** or **spiderbot** and often shortened to **crawler**, is an Internet bot that systematically browses the World Wide Web, typically for the purpose of Web indexing (*web spidering*).

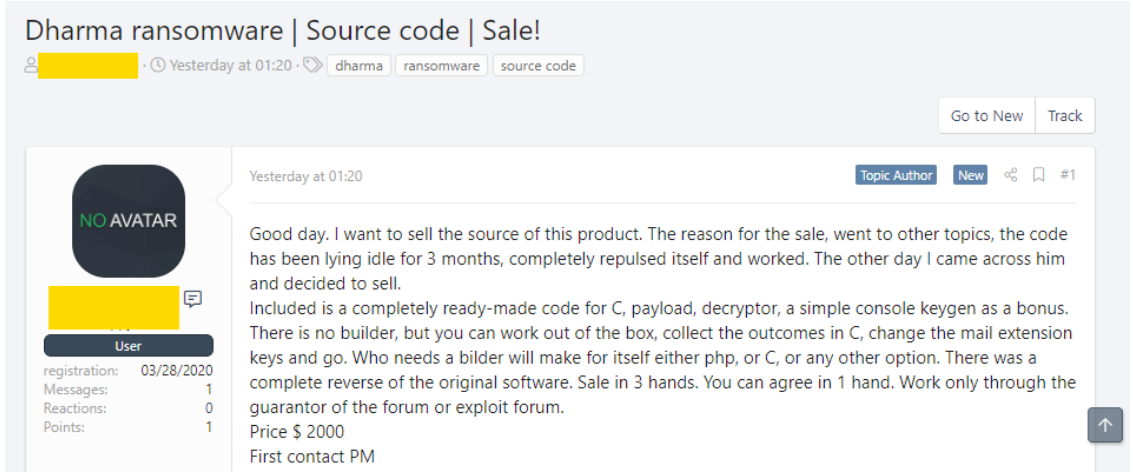
Web search engines and some other sites use Web crawling or spidering software to update their web content or indices of others sites' web content. Web crawlers copy pages for processing by a search engine which indexes the downloaded pages so users can search more efficiently.

Scraping vs Crawling

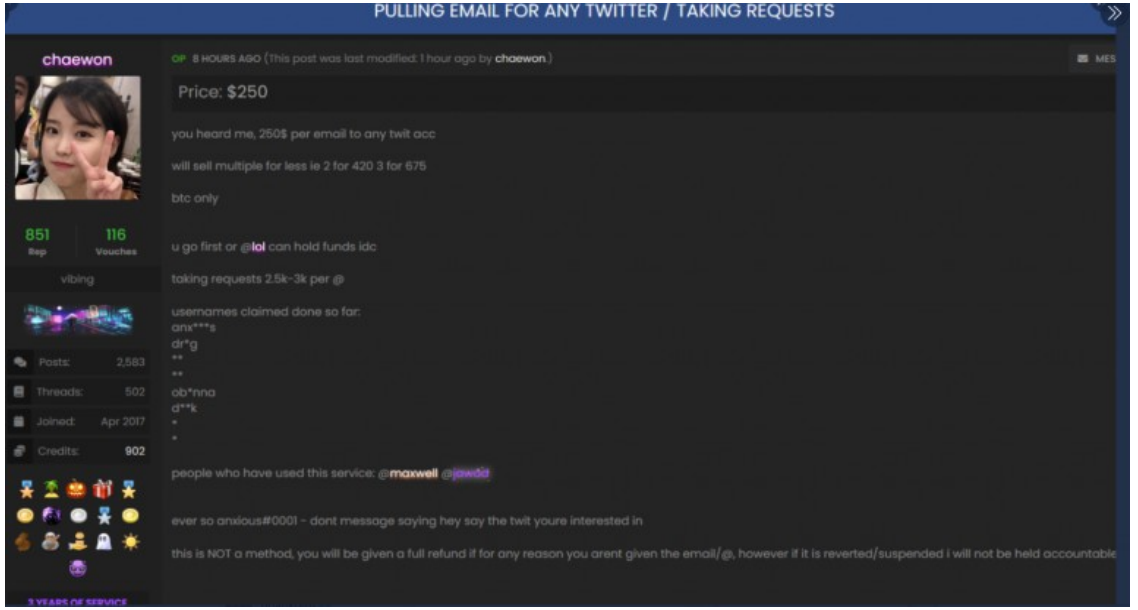


* https://prowebscraping.com/web-scraping-vs-web-crawling/

¿Por qué un Foro Hacking?



* https://www.zdnet.com/article/source-code-of-dharma-ransomware-pops-up-for-sale-on-hacking-forums/



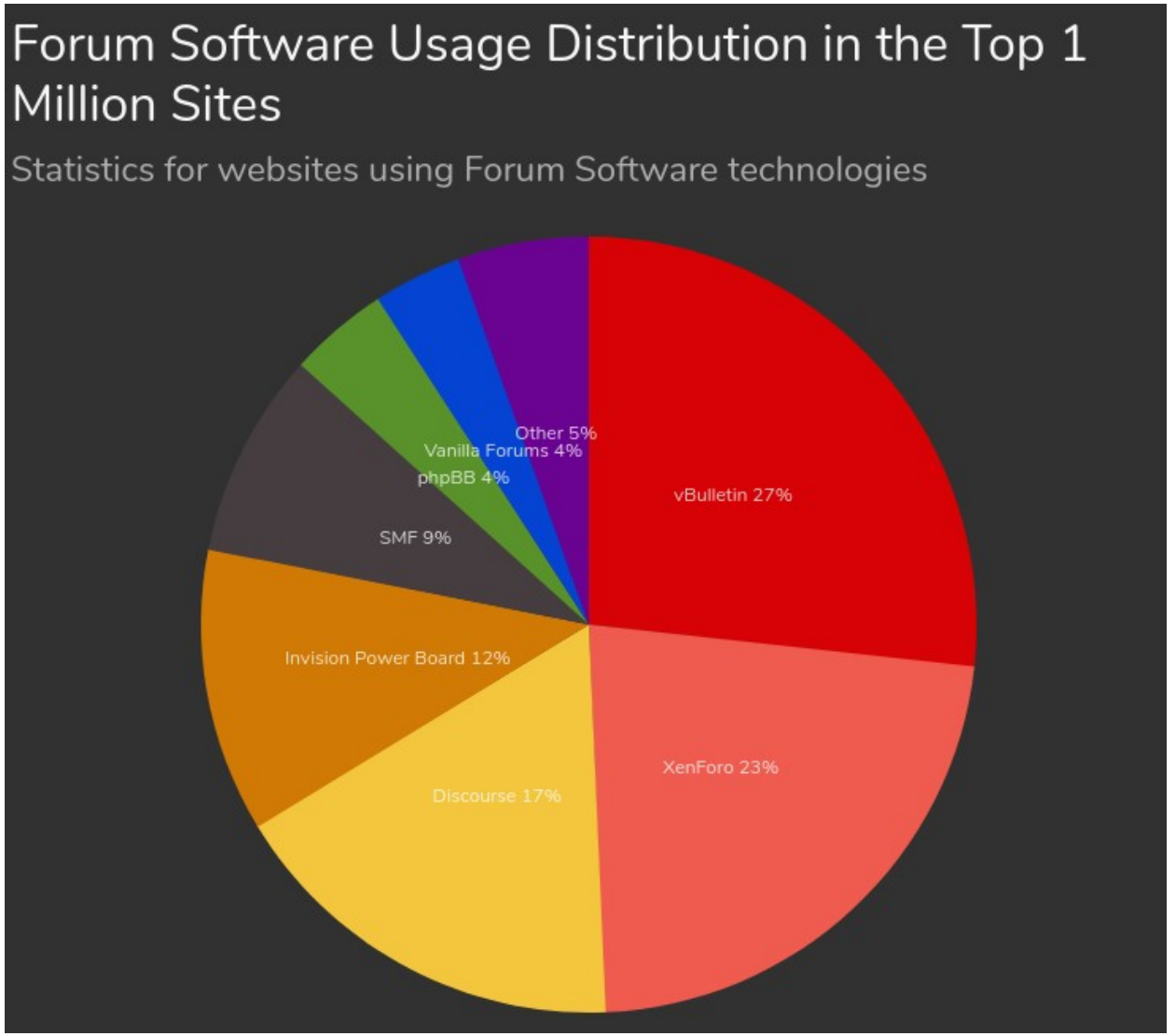
* https://krebsonsecurity.com/2020/07/whos-behind-wednesdays-epic-twitter-hack/

IntelCon
by Ginseg

1

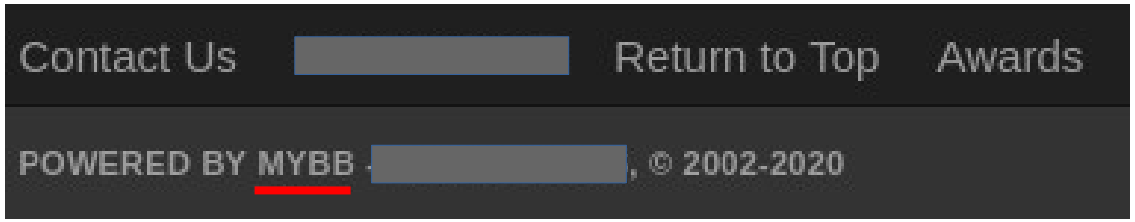
Análisis de la estructura de los foros

Softwares de foros de internet



* https://trends.builtwith.com/cms/forum-software

Identificando el software usado




```
▼ <head>
    <link rel="preconnect" href="https://www.birdiecdn.com">
    <link rel="preconnect" href="https://www.google-analytics.com">
    <meta http-equiv="Content-Type" content="text/html; charset=ISO
    <meta id="e_vb_meta_bburl" name="vb_meta_bburl" content="https:/
    <base href="https://www.[redacted]/forum/">
    <!--[if IE]></base><![endif]-->
    <meta name="generator" content="vBadvanced, vBulletin 4.2.3">
```

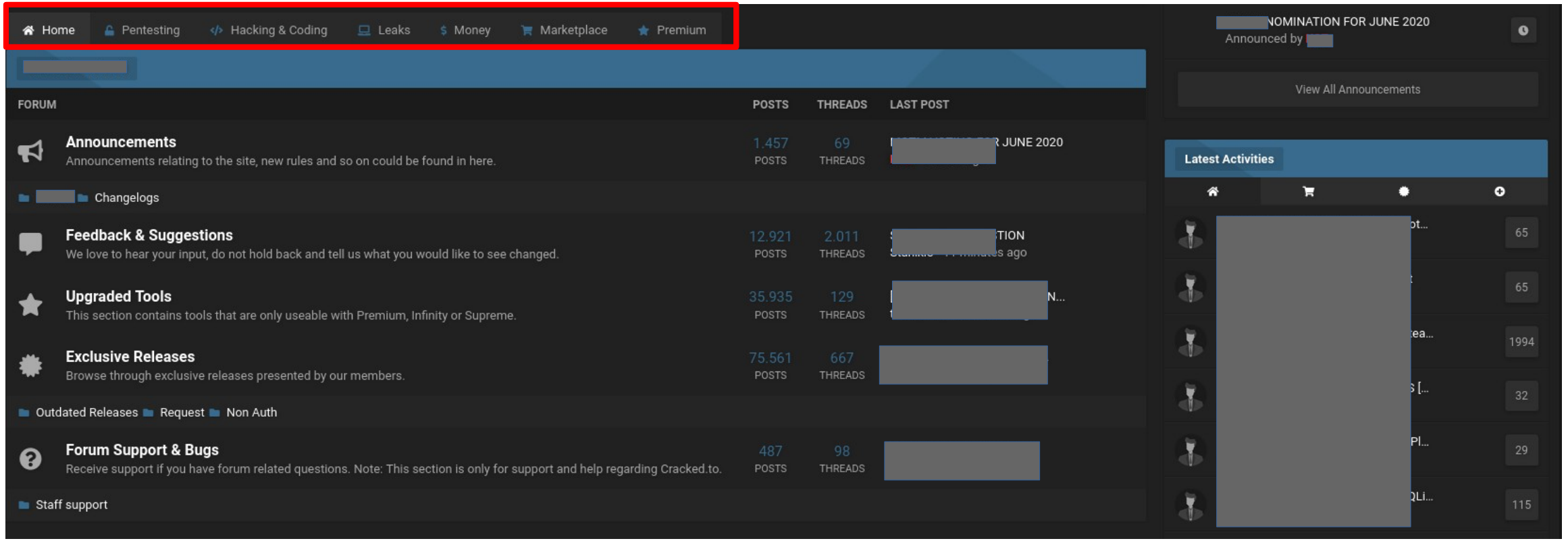
Inspector | Console | Debugger | Network | Style Editor | Performance | Memory | Storage | Accessibility

Search HTML

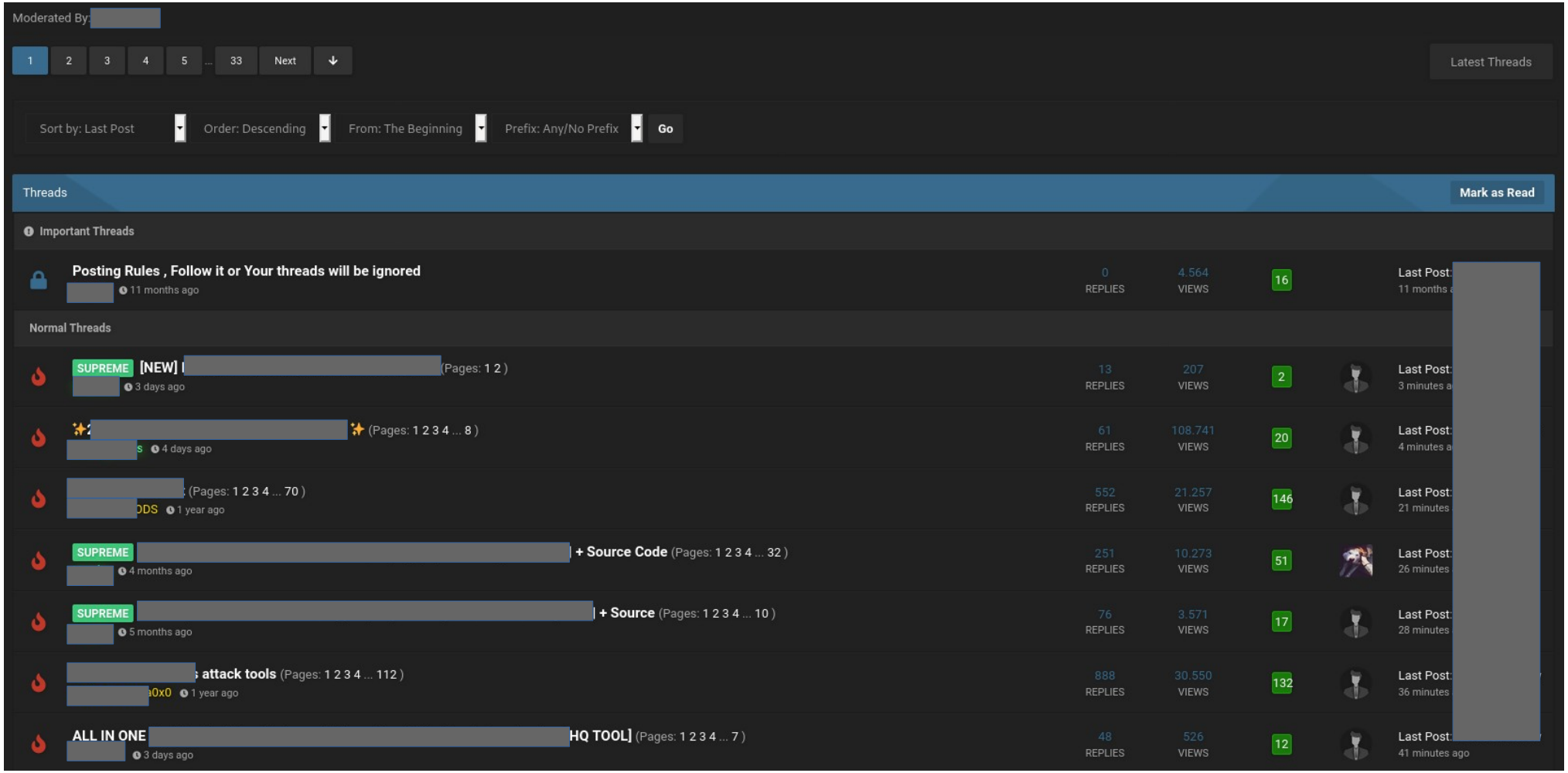
```
<!DOCTYPE html>
<html id="XenForo" class="Public XenBase LoggedOut Sidebar RightSidebar Responsive hasJs NoTouch HasDragDrop" dir="LTR"
xmlns:fb="http://www.facebook.com/2008/fbml" lang="ru-RU"> event scroll
  <script type="text/javascript" async="" src="https://mc.yandex.ru/metrika/tag.js"></script>
```

* https://trends.builtwith.com/cms/forum-software

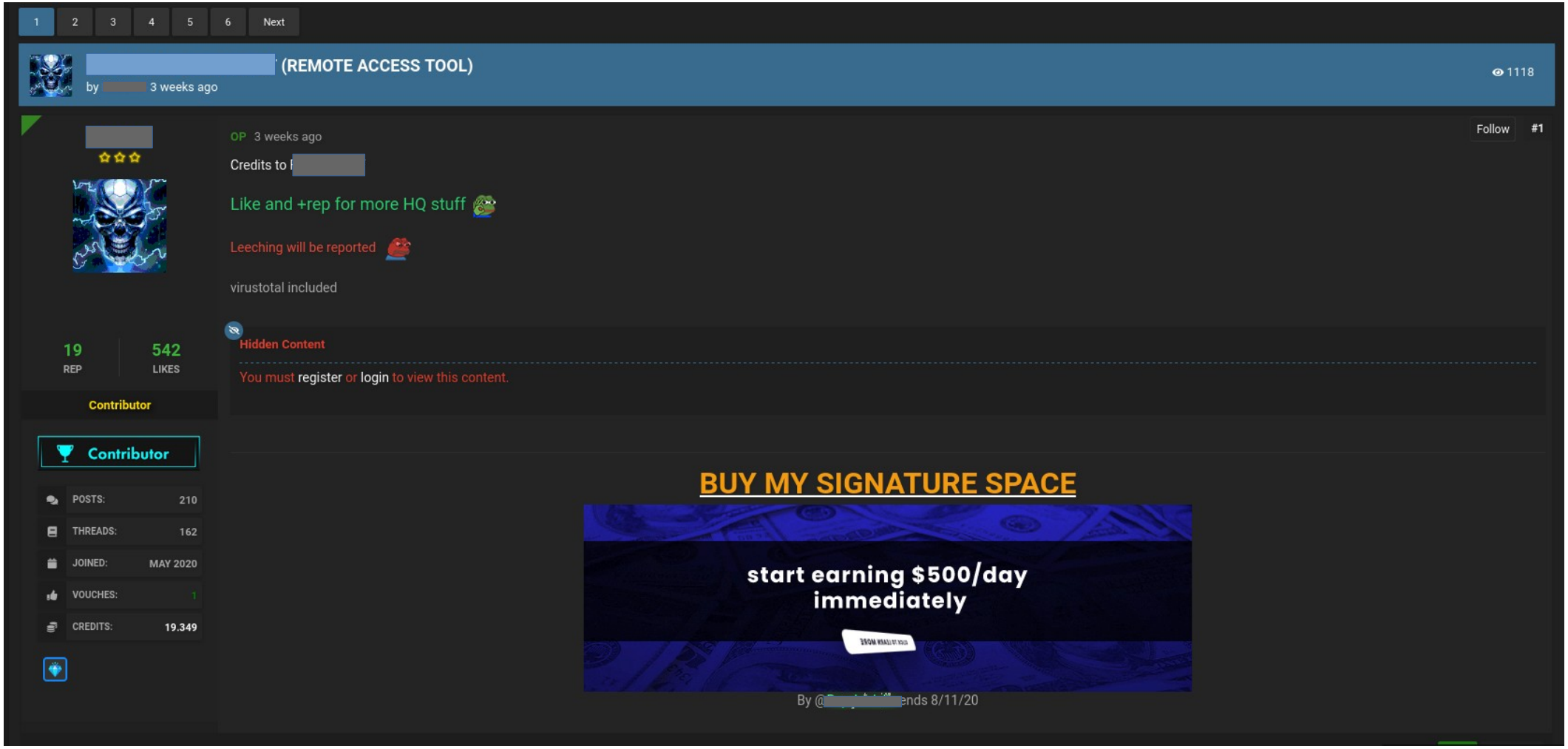
Estructura de un Foro



Threads


Moderated By:
1 2 3 4 5 ... 33 Next
Latest Threads
Sort by: Last Post
Order: Descending
From: The Beginning
Prefix: Any/No Prefix
Go
Threads
Mark as Read
Important Threads
Posting Rules , Follow it or Your threads will be ignored
11 months ago
0 REPLIES
4.564 VIEWS
16
Last Post:
11 months a
Normal Threads
SUPREME [NEW] I (Pages: 1 2)
3 days ago
13 REPLIES
207 VIEWS
2
Last Post:
3 minutes a
(Pages: 1 2 3 4 ... 8)
4 days ago
61 REPLIES
108.741 VIEWS
20
Last Post:
4 minutes a
(Pages: 1 2 3 4 ... 70)
1 year ago
552 REPLIES
21.257 VIEWS
146
Last Post:
21 minutes
SUPREME + Source Code (Pages: 1 2 3 4 ... 32)
4 months ago
251 REPLIES
10.273 VIEWS
51
Last Post:
26 minutes
SUPREME + Source (Pages: 1 2 3 4 ... 10)
5 months ago
76 REPLIES
3.571 VIEWS
17
Last Post:
28 minutes
attack tools (Pages: 1 2 3 4 ... 112)
1 year ago
888 REPLIES
30.550 VIEWS
132
Last Post:
36 minutes
ALL IN ONE HQ TOOL] (Pages: 1 2 3 4 ... 7)
3 days ago
48 REPLIES
526 VIEWS
12
Last Post:
41 minutes ago

Post


1 2 3 4 5 6 Next
(REMOTE ACCESS TOOL)
by 3 weeks ago
1118
OP 3 weeks ago
Follow #1
Credits to
Like and +rep for more HQ stuff
Leeching will be reported
virustotal included
19 REP
542 LIKES
Hidden Content
You must register or login to view this content.
Contributor
Contributor
POSTS: 210
THREADS: 162
JOINED: MAY 2020
VOUCHES: 1
CREDITS: 19.349
BUY MY SIGNATURE SPACE
start earning $500/day immediately
By
ends 8/11/20

IntelCon
by Ginseg

2

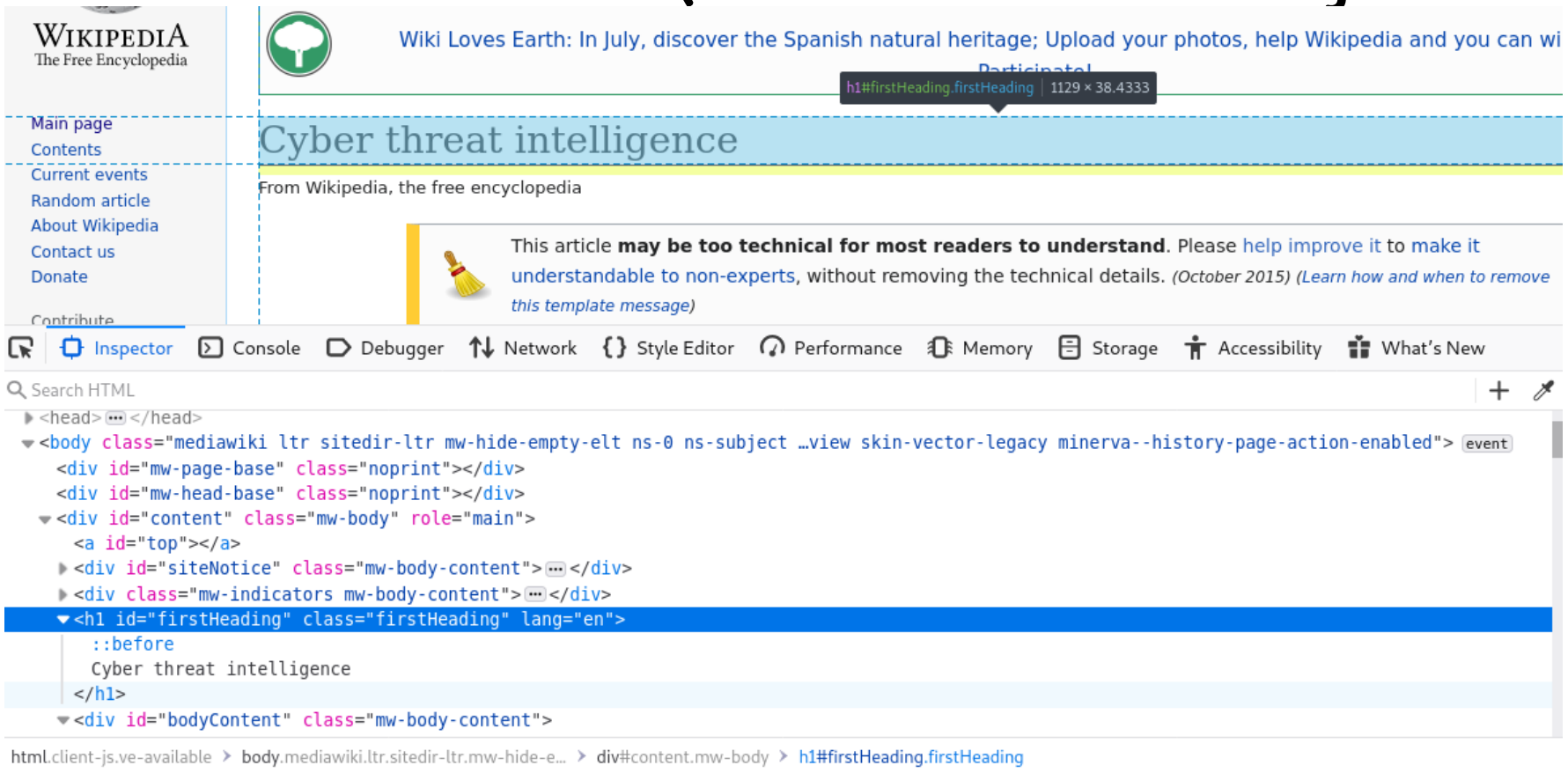
Escogiendo las tecnologías/herramientas necesarias

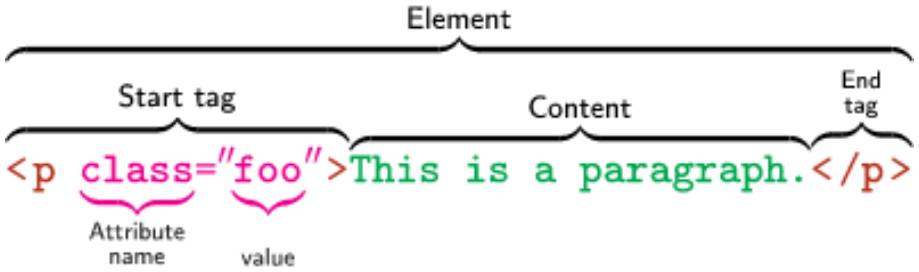
Web-Crawling Framework

Scrapy

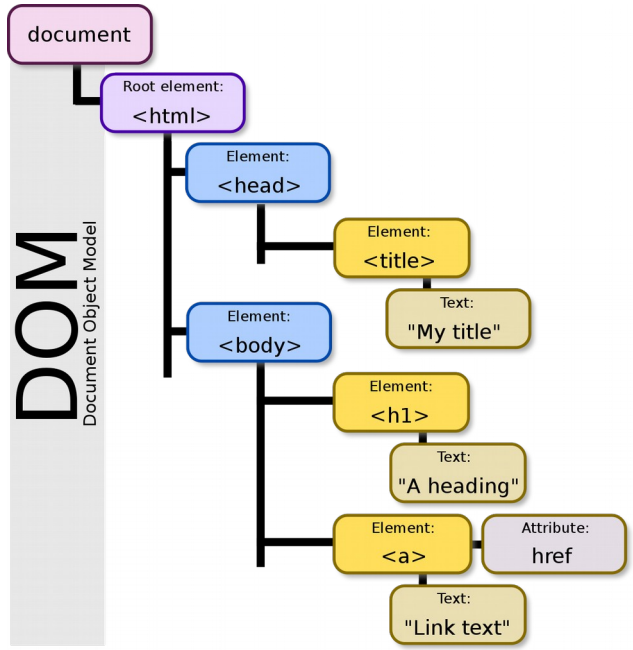
```python
from scrapy.spiders import CrawlSpider, Rule
from wikiSpider.items import Article
from scrapy.linkextractors import LinkExtractor

class ArticleSpider(CrawlSpider):
    name = "article"
    allowed_domains = ["en.wikipedia.org"]
    start_urls = ["https://en.wikipedia.org/wiki/Cyber_threat_intelligence"]
    rules = [
        Rule(LinkExtractor(allow=('(/wiki/)((?!:).)*$'),), callback="parse_item", follow=True)
    ]

    def parse_item(self, response):
        item = Article()
        title = response.xpath('//h1/text()')[0].extract()
        print("Title is: "+title)
        item['title'] = title
        return item
```

HTML DOM (Document Object Model)





XPath uses path expressions to select nodes or node-sets in an XML document.



Usando Librerías de Python

Selenium

- Originalmente diseñado para testeo de paginas web
- Necesario descargar el driver del navegador a usar
- Múltiples posibilidades para navegar en la página a analizar
- Opción headless
- Tomar capturas de pantalla
- Manejador de cookies, JavaScript, cabeceras, etc.

* https://selenium-python.readthedocs.io

Usando Librerías de Python

IntelCon by Ginseg

#IntelCon2020

Beautiful Soup

- Forma fácil de encontrar la información necesaria
- Diferentes opciones de parsers para una mejor extracción del HTML DOM
- Efectivo en Foros con una estructura HTML que no esté perfectamente formada
- Depende de alguna librería que se encargue de hacer las peticiones al Foro

BeautifulSoup

* https://www.crummy.com/software/BeautifulSoup/bs4/doc/

IntelCon
by Ginseg

3

“Scrapeando” información

VS

* https://selenium-python.readthedocs.io/locating-elements.html

```
title = firefox.find_element_by_id("firstHeading").text
title = firefox.find_element_by_class_name("firstHeading").text

title = firefox.find_elements_by_id("firstHeading")[0].text
title = firefox.find_elements_by_class_name("firstHeading")[0].text
```

* https://www.crummy.com/software/BeautifulSoup/bs4/doc/

```
title = bs_obj.find("h1", {"id":"firstHeading"}).get_text()
title = bs_obj.find("h1", {"class":"firstHeading"}).get_text()

title = bs_obj.findAll("h1", {"id":"firstHeading"})[0].get_text()
title = bs_obj.findAll("h1", {"class":"firstHeading"})[0].get_text()
```

```
<!DOCTYPE html>
<html class="client-js ve-available" dir="ltr" lang="en"> event scroll
  <head> ••• </head>
  <body class="mediawiki ltr sitedir-ltr mw-hide-empty-elt ns-0 ns-subject …view
  page-action-enabled"> event
    <div id="mw-page-base" class="noprint"></div>
    <div id="mw-head-base" class="noprint"></div>
    <div id="content" class="mw-body" role="main">
      <a id="top"></a>
      <div id="siteNotice" class="mw-body-content"> ••• </div>
      <div class="mw-indicators mw-body-content"> ••• </div>
      <h1 id="firstHeading" class="firstHeading" lang="en">
        ::before
        Cyber threat intelligence
      </h1>
```

```
title = firefox.find_element_by_xpath("/html/body/div[@id='content']/h1[@id='firstHeading']").text
```

Combinando el poder de interacción de Selenium y el parser de Beautiful Soup

```
firefox = webdriver.Firefox()
firefox.get("https://en.wikipedia.org/wiki/Cyber_threat_intelligence")
page_source = firefox.page_source
bs_obj = BeautifulSoup(page_source, "html.parser")
title = bs_obj.find("h1", {"id":"firstHeading"}).get_text()
print(title)
firefox.close()
```

- Esperas explícitas e implícitas
- Rellenado de formularios
- Drag and Drop
- Moverse entre ventanas
- Popup
- Historial
- Cookies
- Acciones con el cursor:
  - click()
  - click_and_hold()
  - release()
  - double_click()

+

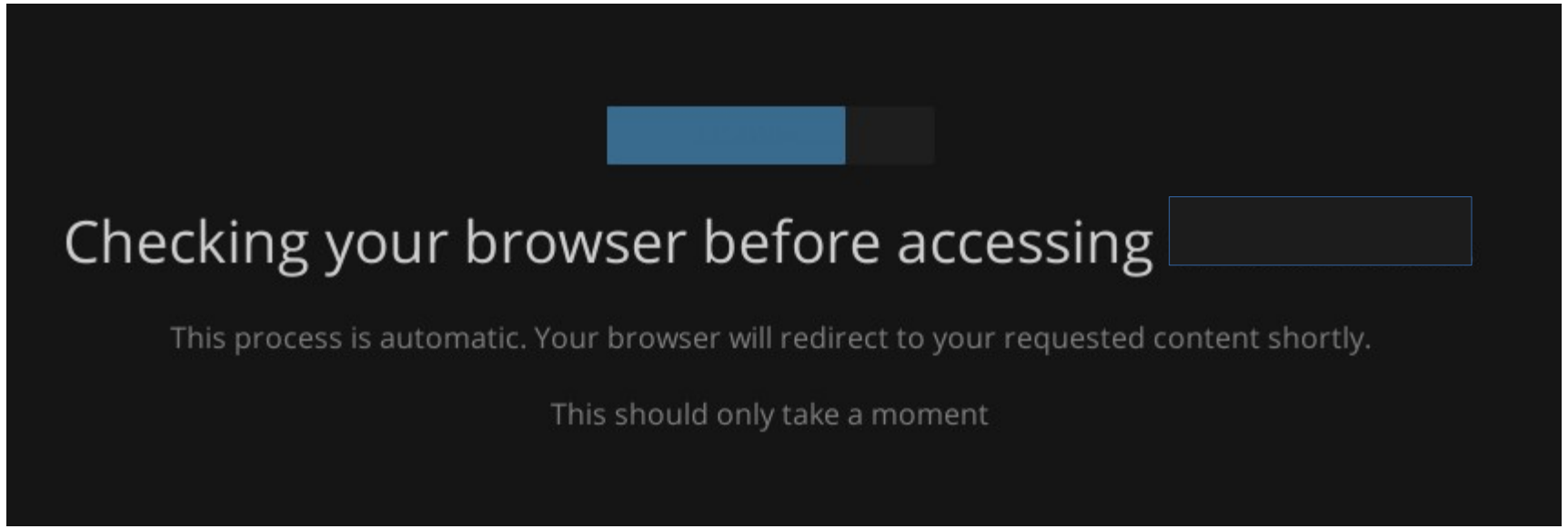
- Manejo de diferentes Parsers
  - html.parser
  - xml
  - lxml
  - Html5lib
- Multiples opciones para navegar
- por el HTML DOM
  - .children
  - .descendants
  - .parent
  - .next_sibling
  - Etc…

IntelCon
by Ginseg

4

Medidas anti-bots

Verificación del Browser



- Bloqueo de User-agent

```
WebDriverWait(firefox, 10).until(EC.presence_of_element_located((By.ID, "id_name"))):
```

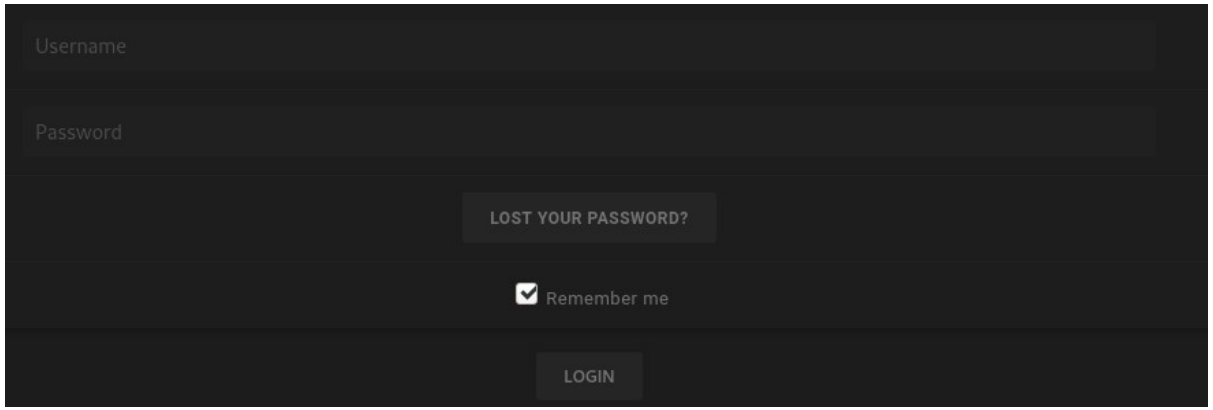
- ✓ Espera explicita e implicita
- ✓ Ajuste de Cabeceras
- ✓ Límite de peticiones

Verificación del Browser

- Ajustando las cabeceras con requests

```
import requests

TOR_SESSION = requests.session()
HEADER = {"User-Agent":"Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:78.0) Gecko/20100101 Firefox/78.0",
          "Accept":"text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8",
          "Accept-language":"es-ES,es;q=0.8,en-US;q=0.5,en;q=0.3",
          "Connection":"keep-alive"
        }

req = TOR_SESSION.get("www.                    ", headers = HEADER)
bs_obj = BeautifulSoup(req.text, "html.parser")
```

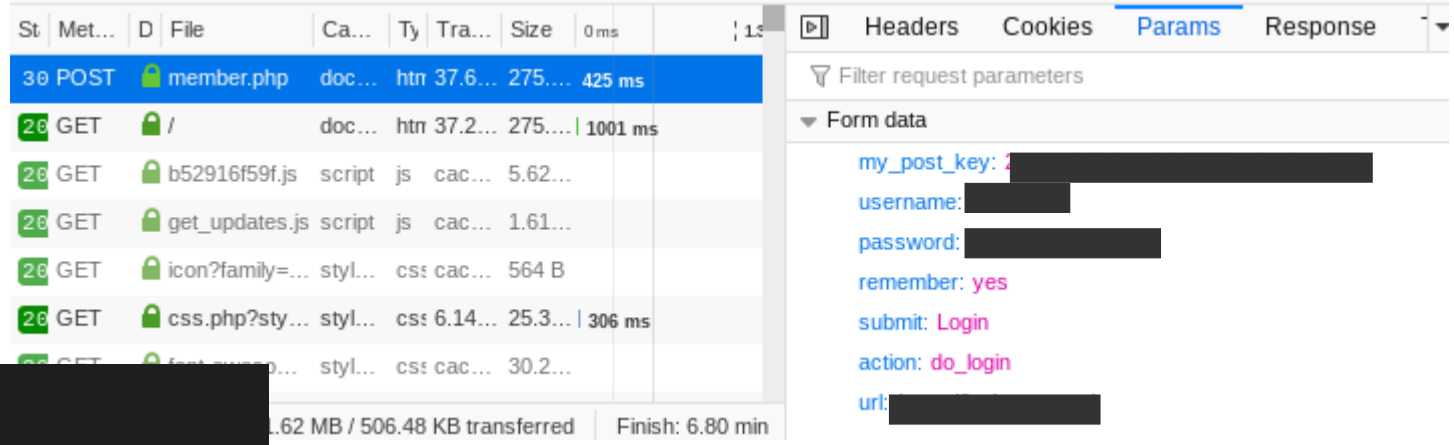
Autenticación de usuarios (Selenium)




```
if WebDriverWait(firefox, 25).until(EC.presence_of_element_located((By.ID, "id_name"))):

    username = firefox.find_element_by_name("username")
    password = firefox.find_element_by_name("password")
    log_button = firefox.find_element_by_name("submit")

    username.send_keys(config.USERNAME)
    firefox.implicitly_wait(5)
    password.send_keys(config.PASSWORD)
    log_button.click()
```

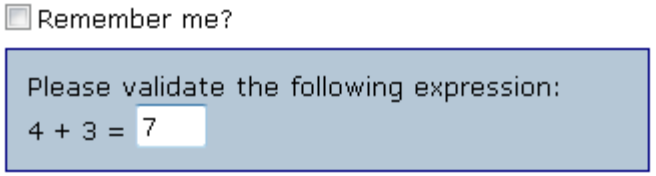
Autenticación de usuarios (BS4)

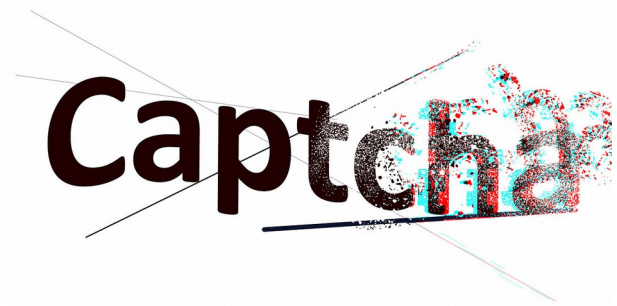

```
fields = firefox.find_elements_by_tag_name("input")
for field in fields:
    if not field.is_displayed():
        HIDDEN_INPUT[field.get_attribute("name")] = field.get_attribute("value")
    elif field.is_displayed():
        INPUTS[field.get_attribute("name")] = field.get_attribute("value")
```




```
PARAMS = {
        "username":
        "password":
        "remember":"yes",
        "submit":"Login",
        "action":"do_login",
        "url":"
        }

SESSION.post("https:/                    , data=PARAMS, headers=HEADER)

res = SESSION.get(                )
```

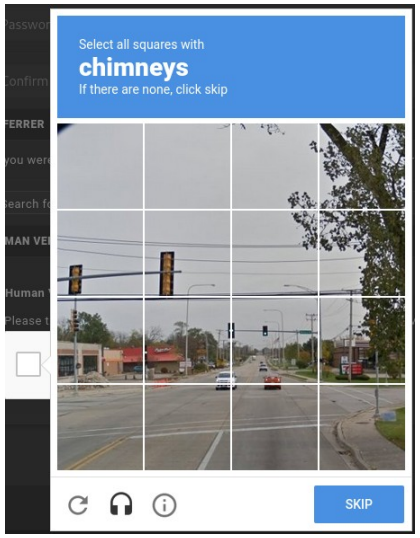
Captcha





- Reconocimiento OCR
  - Pytesseract
- ML
  - Tesseract
  - Tensorflow

```
import pytesseract, PIL

value = pytesseract.image_to_string(PIL.Image.open("captcha.jpeg"))
print("The Capcha value is --> " + value)
```



- NonoCAPTCHA
  - Basado en resolver CAPTCHA usando
  - Mozilla DeepSpeech, PocketSphinx,
  - Microsoft Azure y Amazon Transcribe

[* https://github.com/mikeyy/nonoCAPTCHA](https://github.com/mikeyy/nonoCAPTCHA)

- Image Captcha
- Google Recaptcha
- FunCaptcha
- GeeTest/Distil
- hCaptcha

[* https://anti-captcha.com/apidoc/](https://anti-captcha.com/apidoc/)

Evadiendo Captchas

IntelCon by Ginseg

#IntelCon2020

Registro

- ✓ Registrarse manualmente
- ✓ Reusar credenciales

Autenticación

- ✓ Autenticación manual
- ✓ Reuso de Cookies

Carga de páginas

- ✓ Captcha Solver
- ✓ Look like human

Evitar invocar una petición de CAPTCHA

Prueba y error

! COOKIES !

Honeypots

Links que no pueden ser vistos por una persona navegando en el foro

“display:none”, “visibility:hidden”, “color:#fff”

Producen:

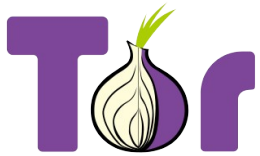
- Redireccionamiento a otras páginas
- Ejecución de Scripts sobre el navegador
- Banning

```
links = firefox.find_elements_by_tag_name("a")
print("[!] Possible trap links: ")
for link in links:
    if not link.is_displayed():
        if link.get_attribute("href") is not None:
            print(link.get_attribute("href"))
```

Anonimato y red Tor

Stem

+



- ✓ Evitar IP banning
- ✓ Scraping paralelamente

Beautiful Soup

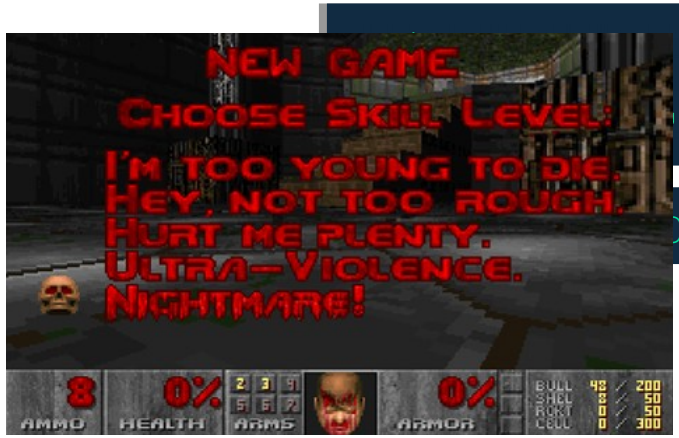
```
TOR_SESSION = requests.session()

TOR_SESSION.proxies = {'http': 'socks5://127.0.0.1:9050',
                       'https': 'socks5://127.0.0.1:9050'}

res = TOR_SESSION.get("https://www.facebookcorewwwi.onion/")
```

Selenium

```
profile = webdriver.FirefoxProfile()
profile.set_preference("network.proxy.type", 1)
profile.set_preference("network.proxy.socks", "127.0.0.1")
profile.set_preference("network.proxy.socks_port", 9150)

firefox = webdriver.Firefox(options=options, firefox_profile=profile)
```

- Acceso a todos los contenidos
- Sin registro o autenticación
- Sin límite de peticiones
- Sin CAPTCHA

- Acceso a contenido mediante
- registro y autenticación
- CAPTCHA en registro o autenticación
- Baneo Usuarios bot
- Ofuscación de contenido



- Contenido restringido a invitación
- Captcha tanto en registro como
- en autenticación
- Analiza comportamiento usuarios
  - Acceso diferentes IP
  - Acceso a contenido antiguo
- Baneo Usuarios bot
- Cambio tags y atributos en el
- DOM HTML

IntelCon
by Ginseg

5

Cyber Threat Intelligence

Análisis a partir de foros underground

IntelCon by Ginseg

#IntelCon2020

CrimeBB: Enabling Cybercrime Research on Underground Forums at Scale

Sergio Pastrana
Cambridge Cybercrime Centre, Computer Laboratory
University of Cambridge
Sergio.Pastrana@cl.cam.ac.uk

Daniel R. Thomas
Cambridge Cybercrime Centre, Computer Laboratory
University of Cambridge
Daniel.Thomas@cl.cam.ac.uk

Alice Hutchings
Cambridge Cybercrime Centre, Computer Laboratory
University of Cambridge
Alice.Hutchings@cl.cam.ac.uk

Richard Clayton
Cambridge Cybercrime Centre, Computer Laboratory
University of Cambridge
Richard.Clayton@cl.cam.ac.uk

*https://www.cl.cam.ac.uk/~drt24/papers/2018-crimebb.pdf

Let Me Cheat!
An analysis of anti-cheat bypass techniques on videogames

Author: David Rodríguez Regueira
Universidad Carlos III de Madrid
Leganés, Spain
100434170@alumnos.uc3m.es

Supervisor: Sergio Pastrana
Universidad Carlos III de Madrid
Leganés, Spain
Sergio.Pastrana@uc3m.es

*https://github.com/90n20/LetMeCheat

IntelCon by Ginseg

#IntelCon2020

SOC4IoCs: Scraping Online Community for Indicators of Compromise

Santiago Rocha
Universidad Carlos III de Madrid
100422588@alumnos.uc3m.es

Marcos Arjona (Supervisor)
Eleven Paths, Telefónica Digital
marcos.arjonafernandez@telefonica.com

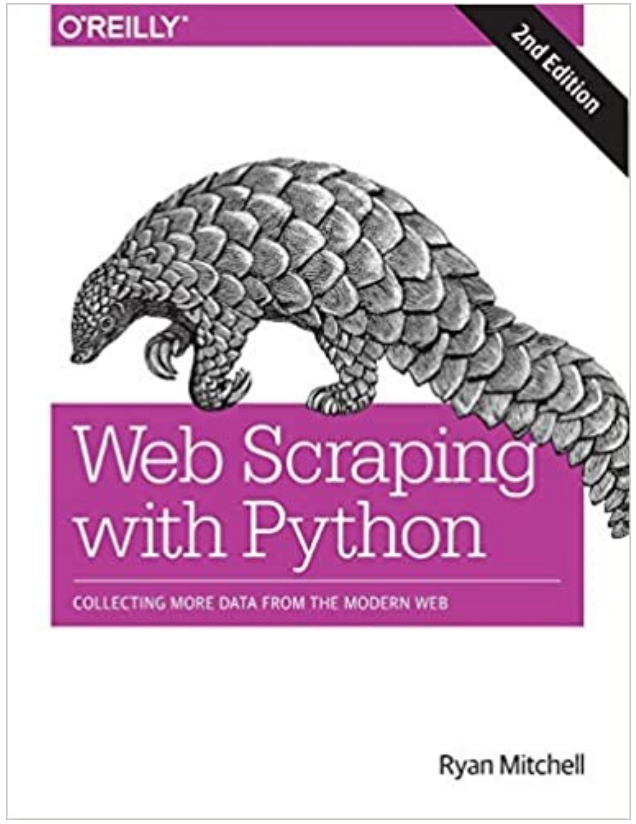
Pedro Reviriego (Supervisor)
Universidad Carlos III de Madrid
revirieg@it.uc3m.es

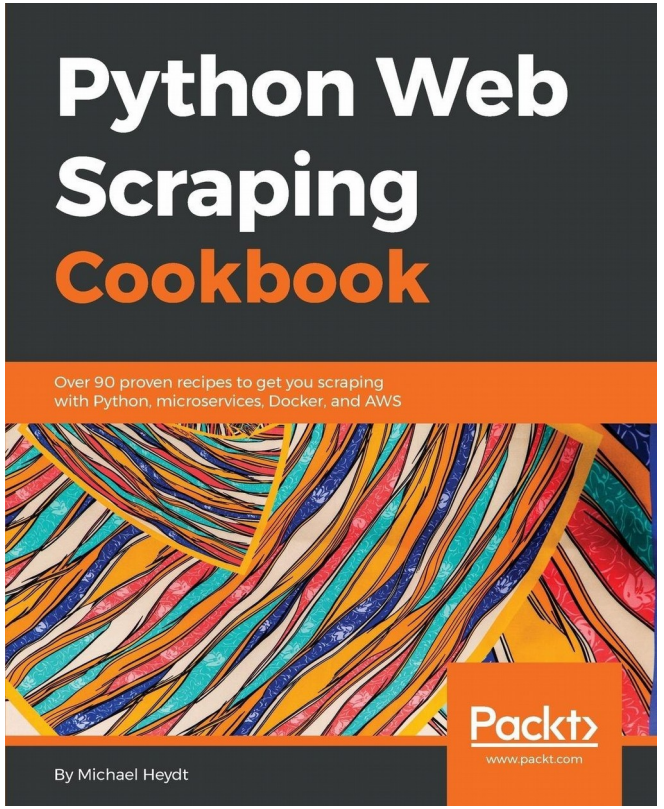
Eleven Paths

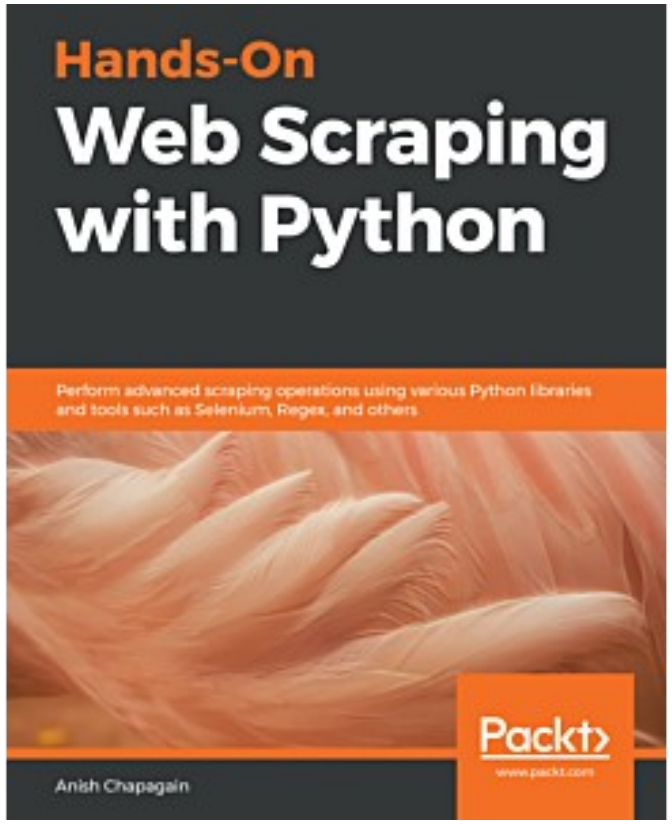
dinoflux

Identifying Mobile Malware and Key Threat Actors in Online Hacker Forums for Proactive Cyber Threat Intelligence

John Grisham, Sagar Samtani, Mark Patton, Hsinchun Chen
Department of Management Information Systems
The University of Arizona
Tucson, AZ 85721
{johncgrisham93, sagars, mpatton}@email.arizona.edu, hchen@eller.arizona.edu


O'REILLY
2nd Edition
Web Scraping with Python
COLLECTING MORE DATA FROM THE MODERN WEB
Ryan Mitchell


Python Web Scraping Cookbook
Over 90 proven recipes to get you scraping with Python, microservices, Docker, and AWS
By Michael Heydt
Packt
www.packt.com


Hands-On Web Scraping with Python
Perform advanced scraping operations using various Python libraries and tools such as Selenium, Regex, and others
Anish Chapagain
Packt
www.packt.com

- Tianjun Fu, Ahmed Abbasi, and Hsinchun Chen. A focused crawler for dark web forums.
- Journal of the American Society for Information Science and Technology, 61(6):1213–1231, 2010.

- Kieron Turk, Sergio Pastrana and Ben Collier. A tight scrape: methodological approaches to cybercrime
- research data collection in adversarial environments. https://www.cl.cam.ac.uk/~bjc63/tight_scrape.pdf

- Richard Frank, Mitch Macdonalds, and Bryan Monk. Location, Location, Location: Mapping Potential
- Canadian Targets in Online Hacker Discussion Forums. 2016 European Intelligence and Security
- Informatics Conference

#IntelCon2020

IntelCon
by Ginseg

Gracias por la atención

@sarvmetal

https://github.com/santiagorocha

santiago.infsec@gmail.com