

## Práctica 2: Uso avanzado de Shodan y ZoomEye para reconocimiento pasivo

### Objetivo

Utilizar motores de búsqueda especializados en dispositivos y servicios expuestos en Internet (**Shodan** y **Zoomeye**) para recopilar información crítica sobre una infraestructura empresarial simulada.

## 1. Entorno virtualizado recomendado

### Máquina atacante

- **SO:** *Kali Linux 2025.2*
- **Requisitos:**
  - *Navegador Firefox o Chromium*
  - *Python3 y pip*
  - *Cuenta gratuita en Shodan y ZoomEye*

## 2. Instalación de herramientas y API

Usar un entorno virtual aislado y no ejecutar como root si se puee (mejor con un usuario normal):

```
# como usuario normal (recomendado).  
python3 -m venv ~/osint-venv  
source ~/osint-venv/bin/activate
```



```
(kali@kali)-[~]  
$ python3 -m venv ~/osint-venv  
  
(kali@kali)-[~]  
$ source ~/osint-venv/bin/activate  
  
(osint-venv)-(kali@kali)-[~]  
$
```

```
# actualiza herramientas del venv  
python -m pip install --upgrade pip setuptools wheel
```

```
(osint-venv)-(kali@kali)-[~]
$ python -m pip install --upgrade pip setuptools wheel
Requirement already satisfied: pip in ./osint-venv/lib/python3.13/site-packages (25.2)
Collecting setuptools
  Downloading setuptools-80.9.0-py3-none-any.whl.metadata (6.6 kB)
Collecting wheel
  Downloading wheel-0.45.1-py3-none-any.whl.metadata (2.3 kB)
  Downloading setuptools-80.9.0-py3-none-any.whl (1.2 MB)
    1.2/1.2 MB 8.8 MB/s 0:00:00
  Downloading wheel-0.45.1-py3-none-any.whl (72 kB)
Installing collected packages: wheel, setuptools
Successfully installed setuptools-80.9.0 wheel-0.45.1

(osint-venv)-(kali@kali)-[~]
$
```

### 3) Instala Shodan y ZoomEyeAI dentro del venv

```
pip install shodan zoomeyeai
```

```
(osint-venv)-(kali@kali)-[~]
$ pip install shodan zoomeye
Collecting shodan
  Downloading shodan-1.31.0.tar.gz (57 kB)
  Preparing metadata (setup.py) ... done
Collecting zoomeye
  Downloading zoomeye-3.0.0-py3-none-any.whl.metadata (11 kB)
Collecting click (from shodan)
  Downloading click-8.2.1-py3-none-any.whl.metadata (2.5 kB)
Collecting click_plugins (from shodan)
  Downloading click_plugins-1.1.1.2-py2.py3-none-any.whl.metadata (6.5 kB)
Collecting colorama (from shodan)
  Downloading colorama-0.4.6-py2.py3-none-any.whl.metadata (17 kB)
Collecting requests ≥ 2.2.1 (from shodan)
  Downloading requests-2.32.5-py3-none-any.whl.metadata (4.9 kB)
Collecting XlsxWriter (from shodan)
```

```
(osint-venv)-(kali@kali)-[~]
$ pip3 install zoomeyeai
Collecting zoomeyeai
  Downloading zoomeyeai-3.0.1-py3-none-any.whl.metadata (8.3 kB)
Requirement already satisfied: certifi=2021.10.8 in ./osint-venv/lib/python3.13/site-packages (from zoomeyeai) (2021.10.8)
Requirement already satisfied: charset-normalizer=2.0.8 in ./osint-venv/lib/python3.13/site-packages (from zoomeyeai) (2.0.8)
Requirement already satisfied: colorama=0.4.4 in ./osint-venv/lib/python3.13/site-packages (from zoomeyeai) (0.4.4)
Requirement already satisfied: graphviz=0.19 in ./osint-venv/lib/python3.13/site-packages (from zoomeyeai) (0.19)
Requirement already satisfied: idna=3.3 in ./osint-venv/lib/python3.13/site-packages (from zoomeyeai) (3.3)
Requirement already satisfied: requests=2.26.0 in ./osint-venv/lib/python3.13/site-packages (from zoomeyeai) (2.26.0)
Requirement already satisfied: urllib3<1.27, ≥1.21.1 in ./osint-venv/lib/python3.13/site-packages (from requests=2.26.0→zoomeyeai) (1.26.7)
Downloading zoomeyeai-3.0.1-py3-none-any.whl (23 kB)
Installing collected packages: zoomeyeai
Successfully installed zoomeyeai-3.0.1

(osint-venv)-(kali@kali)-[~]
$ zoomeyeai init -apikey [REDACTED]
Role: Free
Points: 3000
Zoomeye Points: 0
successfully initialized
```

```
shodan version
zoomeyeai -help
```

```
(osint-venv)-(kali@kali)-[~]  
$ zoomeyeai --version  
  
ZoomEyeAI {v3.0.1}  
  
https://www.zoomeye.ai/doc  
  
(osint-venv)-(kali@kali)-[~]  
$
```

Inicia sesión Shodan / configura:

```
shodan init TU_API_KEY
```

```
(osint-venv)-(kali@kali)-[~]  
$ shodan init [REDACTED]  
Successfully initialized  
  
(osint-venv)-(kali@kali)-[~]  
$
```

Cada vez que quieras usar estas herramientas, activa el venv:

```
source ~/osint-venv/bin/activate
```

Para salir del entorno virtual (venv):

```
deactivate
```

## 3. SHODAN

### 1 - Búsqueda básica desde web

Ir a <https://www.shodan.io>

Buscar: `org:"tesla" o hostname:"vpn.tesla.com"`

SHODAN Explore Downloads Pricing & org:"tesla" Account

TOTAL RESULTS 1,705

TOP COUNTRIES

United States	687
Germany	170
Russian Federation	107
France	98
Netherlands	80

More...

TOP PORTS

443	655
161	600
80	135

View Report Download Results Historical Trend View on Map Advanced Search

Product Spotlight: Free, Fast IP Lookups for Open Ports and Vulnerabilities using InternetDB

84.14.170.184  
164.170.14.64 rpe.cofrance.com  
TESLA FRANCE  
France, Paris

SWAP:  
Versions:  
Enginid format: mac  
Enginid Boots: 10  
Enginid Data: cc:6a:33:1d:98:00  
Enterprise: 9  
Enginid Time: 28 days, 10:02:27  
Enterprise Name: ciscodsystems

199.120.48.131  
Tesla Motors, Inc.  
United States, Washington

HTTP/1.1 403 Forbidden  
Server: Tesla Edge  
Connection: close  
Content-Length: 0

403 Not allowed  
199.120.51.147  
Tesla Motors, Inc.  
Germany, Frankfurt am Main

HTTP/1.1 403 Not allowed  
Date: Wed, 10 Sep 2025 19:52:57 GMT  
Server: Varnish  
X-Varnish: 838639123  
Content-Type: text/html; charset=utf-8  
Retry-After: 5

SHODAN Explore Downloads Pricing & hostname:"www.tesla.com" Account

TOTAL RESULTS 1,965

TOP COUNTRIES

United States	625
India	171
Japan	121
Germany	111
United Kingdom	62

More...

TOP PORTS

443	1,964
8443	1

TOP ORGANIZATIONS

View Report Download Results Historical Trend View on Map Advanced Search

Product Spotlight: Keep track of what you have connected to the Internet. Check out Shodan Monitor

Invalid URL  
2.19.168.64  
www.tesla.com  
mfs-supplier-eng.mo.tesla.cn  
www.teslamotors.com  
mfs-supplier.mo.tesla.cn  
teslamotors.com  
Akamai Technologies  
United Kingdom, London

SSL Certificate  
Issued By:  
Common Name  
GeoTrust TLS RSA CA G1  
Organization:  
Digicert Inc.  
Issued To:  
Common Name  
www.teslamotors.com  
Organization:  
TESLA, INC.  
Supported SSL Versions:  
TLSv1.2

HTTP/1.0 400 Bad Request  
Server: AkamaiGHost  
Mime-Version: 1.0  
Content-Type: text/html  
Content-Length: 308  
Expires: Wed, 10 Sep 2025 20:11:21 GMT  
Date: Wed, 10 Sep 2025 20:11:21 GMT  
Connection: close

Invalid URL  
23.220.124.144  
www.tesla.com  
mfs-supplier-eng.mo.tesla.cn  
www.teslamotors.com  
mfs-supplier.mo.tesla.cn  
teslamotors.com  
Akamai Technologies, Inc.  
United States, Ashburn

SSL Certificate  
Issued By:  
Common Name  
GeoTrust TLS RSA CA G1  
Organization:  
Digicert Inc.  
Issued To:

HTTP/1.0 400 Bad Request  
Server: AkamaiGHost  
Mime-Version: 1.0  
Content-Type: text/html  
Content-Length: 310  
Expires: Wed, 10 Sep 2025 20:04:53 GMT  
Date: Wed, 10 Sep 2025 20:04:53 GMT  
Connection: close

2.19.168.64 Regular View Raw Data Timeline

Tags: csn

General Information

a2-19-168-64.deploy.static.akamaitechnologies.com  
events.tesla.cn  
mfs-supplier.mo.tesla.cn  
mfs-supplier-eng.mo.tesla.cn  
static-assets.tesla.cn  
www.tesla.cn  
serviceapp.tesla.com  
www.tesla.com  
teslaautomation.de  
www.teslaautomation.de  
teslamotors.com  
www.teslamotors.com  
ts.la  
www.ts.la

Hostnames

Domains

akamaitechnologies.com tesla.cn tesla.com  
teslaautomation.de teslamotors.com ts.la

Country

United Kingdom

Open Ports

80 443

80 / TCP

AkamaiGHost

Invalid URL

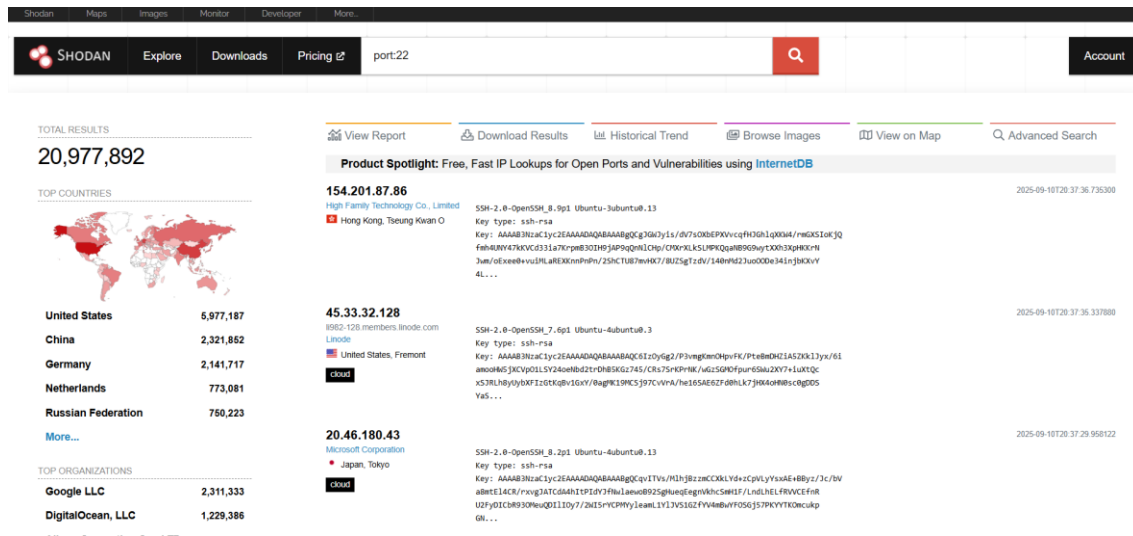
HTTP/1.0 400 Bad Request  
Server: AkamaiGHost  
Mime-Version: 1.0  
Content-Type: text/html  
Content-Length: 308  
Expires: Wed, 10 Sep 2025 19:33:44 GMT  
Date: Wed, 10 Sep 2025 19:33:44 GMT  
Connection: close

443 / TCP

AkamaiGHost

## Filtros útiles:

- ❖ port:22
- ❖ country:"ES"
- ❖ http.title:"Login"
- ❖ product:"Apache"
- ❖ ssl:"expired"



## 2 - Búsqueda por CLI

```
# Buscar servidores SSH en la red simulada
shodan search "port:22 org:'tesla'"
```

```
# Buscar cámaras IP (IoT)
shodan search "netcam" --fields ip_str,port,org,os
```

```
120.79.16.132 9696 Aliyun Computing Co., LTD
121.43.109.88 447 Aliyun Computing Co., LTD
101.200.156.251 8112 Aliyun Computing Co., LTD
8.138.125.130 9026 Aliyun Computing Co.LTD
47.90.204.194 10083 Alibaba Cloud - US
8.213.222.157 9205 Alibaba Cloud (Singapore) Private Limited
124.70.205.56 9002 Huawei Public Cloud Service (Huawei Software Technologies Ltd.Co)
47.237.113.119 21317 Alibaba Cloud LLC
39.102.208.149 12229 Aliyun Computing Co., LTD
110.238.109.146 8086 Huawei Cloud Singapore Region
47.109.52.147 8556 Aliyun Computing Co., LTD
47.252.27.174 8086 Alibaba Cloud - US
8.134.157.2 5229 Aliyun Computing Co.LTD
8.215.59.238 12229 Alibaba Cloud (Singapore) Private Limited
115.29.151.41 9026 Aliyun Computing Co., LTD
39.102.210.222 17778 Aliyun Computing Co., LTD
119.13.103.211 9943 Huawei Cloud Singapore Region
39.104.71.183 8385 Aliyun Computing Co., LTD
47.254.153.78 17778 Alibaba Cloud - DE
119.13.103.211 44303 Huawei Cloud Singapore Region
95.85.77.33 9943 G-Core Labs Customer assignment
45.82.102.43 9002 G-Core Labs Customer assignment
8.220.135.123 30007 Alibaba Cloud (Singapore) Private Limited
47.112.15.44 5083 Aliyun Computing Co., LTD
47.121.129.129 5083 Aliyun Computing Co., LTD
8.208.85.34 8475 Aliyun Computing Co.LTD
8.213.195.191 2058 Alibaba Cloud (Singapore) Private Limited
95.85.77.33 9002 G-Core Labs Customer assignment
8.134.140.97 9026 Aliyun Computing Co.LTD
123.57.1.78 646 Aliyun Computing Co., LTD
198.11.175.192 646 Alibaba Cloud LLC
47.238.134.126 9529 Alibaba Cloud LLC
114.55.144.85 44303 Aliyun Computing Co., LTD
```







The screenshot shows the ZoomEye search interface. The search bar contains the query `vul.cve="CVE-2025-54236"`. The results page displays a critical vulnerability (9.1) titled "CVE-2025-54236" with the description "Adobe Commerce | Improper Input Validation (CWE-20)". The description text states: "Adobe Commerce versions 2.4.9-alpha2, 2.4.8-p2, 2.4.7-p7, 2.4.6-p12, 2.4.5-p14, 2.4.4-p15 and earlier are affected by an Improper Input Validation vulnerability. A successful attacker can abuse this to achieve session takeover, increasing the confidentiality, and integrity impact to high. Exploitation of this issue does not require user interaction." Below the description is a "Show More Details" button. The search results summary indicates "About 134,140 results (Nearly year: 56,927 results) 3.561 seconds". There are various icons representing different file types and a "Download All" button for \$134.15. The interface also includes a "Search Description" link and a "SearchTool" button.

The screenshot shows the ZoomEye search interface with the query `port="80" && country="ES"`. The results page displays "About 7,005,540 results (Nearly year: 646,350 results) 1.018 seconds". The search results are categorized by "Result", "Report", and "Maps". A "Download All" button is available for \$500. The interface also includes a "Search Description" link and a "SearchTool" button. The results list includes entries for `trovit.ae:80` and `campusadministraciondejusticia.com:80`. The details for `trovit.ae:80` show the header information: "HTTP/1.1 301 Moved Permanently", "Date: Wed, 10 Sep 2025 20:55:53 GMT", "Content-Type: text/html", "Content-Length: 178", "Connection: keep-alive", "Location: http://www.trovit.ae/", and "Vary: Accept-Encoding, User-Agent". The details for `campusadministraciondejusticia.com:80` show the header information: "HTTP/1.1 301 Moved Permanently", "Date: Wed, 10 Sep 2025 20:55:53 GMT", "Content-Type: text/html", "Content-Length: 178", "Connection: keep-alive", "Location: http://www.trovit.ae/", and "Vary: Accept-Encoding, User-Agent".

## 2 - CLI

```
# Buscar hosts en España con HTTP
zoomeyai search 'port:80 && country:ES'
```

```
# Buscar dispositivos con SSL expuesto
zoomeyai search 'ssl:expired'
```



```
(osint-venv)-(kali@kali)-[~]
$ zoomeyai search 'ssl:expired'
Traceback (most recent call last):
  File "/home/kali/osint-venv/bin/zoomeyai", line 7, in <module>
    sys.exit(main())
    ~~~~~^
  File "/home/kali/osint-venv/lib/python3.13/site-packages/zoomeyai/cli.py", line 106, in main
    args.func(args)
    ~~~~~^
  File "/home/kali/osint-venv/lib/python3.13/site-packages/zoomeyai/core.py", line 95, in search
    data = zm.search(dork, page=page, pagesize=pagesize, facets=facets, fields=fields, sub_type=sub_type)
  File "/home/kali/osint-venv/lib/python3.13/site-packages/zoomeyai/sdk.py", line 156, in search
    resp = self._request(self.search_api,
                      method='POST',
                      params=params,
                      headers=headers)
  File "/home/kali/osint-venv/lib/python3.13/site-packages/zoomeyai/sdk.py", line 88, in _request
    raise ValueError(resp.json().get('message'))
ValueError: resource credits is insufficient

(osint-venv)-(kali@kali)-[~]
$
```

Es posible que si no disponemos de créditos (plan Free) sólo podamos utilizar las búsquedas a través de la web

## 5. Actividades de evaluación

Actividad	Detalle
Captura de datos de Shodan	Lista de IPs, servicios, versiones
Captura de datos de Zoomeye	Certificados, metadatos SSL/TLS
Informe de riesgos	Análisis de posibles vectores de ataque
Recomendaciones	Qué servicios deberían ocultarse o reforzarse

## 6. Dominio simulado sugerido

- vpn.example-corp.com
- mail.example-corp.com
- camera.example-corp.com (IoT simulado)

Puedes simular IPs o configurar máquinas locales y exponer servicios en una red controlada (por ejemplo, con **VirtualBox Host-only Adapter**), aunque para búsquedas reales se usará el entorno público.