

# AIL Project

Practical and Efficient Data-Mining of Chats, Suspicious Websites, Forums and  
Tor Hidden-Services



**CIRCL**

Computer Incident  
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Luxembourg



**Co-funded by  
the European Union**

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CIRCL

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## Background

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- Over the past years, CIRCL has developed the AIL project<sup>1</sup> to fulfill our needs at CIRCL in intelligence gathering and analysis.
- AIL features an extensible Python-based framework for the **analysis of unstructured information**, collected either through an advanced crawler manager or from various feeders, including social networks and custom feeders.
- The AIL Project is an **open-source** framework<sup>2</sup> comprising various modules designed for the **collection, crawling, digging, and analysis of unstructured data**.



ail project

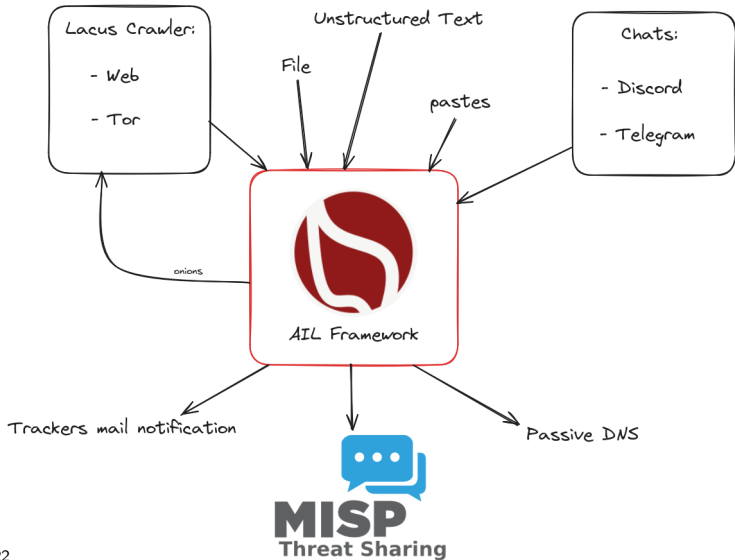
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<sup>1</sup><https://www.ail-project.org/>

<sup>2</sup><https://github.com/ail-project>

# High Level Overview

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## Collection - automate crawling

- Crawling can be a challenging task, for example, gathering all the blog posts from ransomware groups<sup>3</sup>, which can be demanding for an analyst.
- AIL offers a crawling feature that can **initiate regular crawls using a standard spawned browser**.

Crawl a Domain

Enter an url or a domain and choose what kind of option you want.

Address or Domain

Crawler Type: python

Manual Scheduler

Tags

Custom Tags (optional, space separated)

Select Tags

Tazomone Selected

Select Tags

Galaxy Selected

Send to Spider

HTML Screenshot HAR

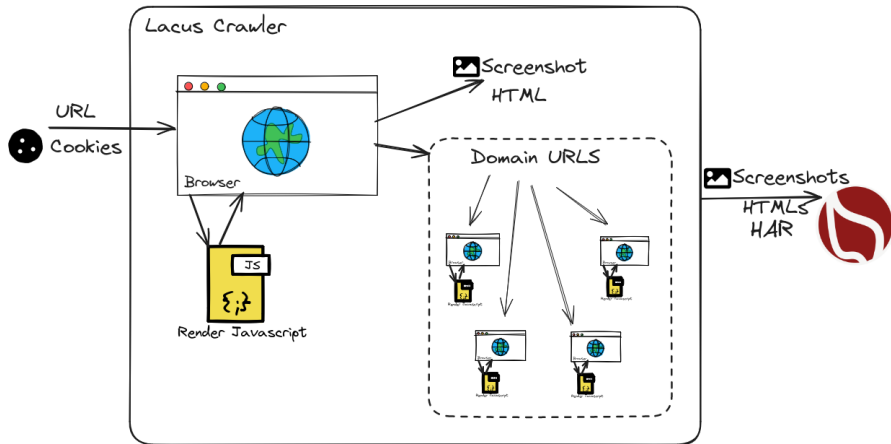
Cookiejar

Don't use any cookiejar

Depth Limit

<sup>3</sup><https://www.ransomlook.io/>

# Collection - Lacus Crawler<sup>4</sup>



<sup>4</sup><https://github.com/ail-project/lacus>

# Crawler: Cookiejar

## Use your cookies to login and bypass captcha

Edit Cookiejar



Description	Date	UUID	User
3thxemke2x7hcibu.onion	2020/03/31	90674deb-38fb-4eba-a661-18899ccb3841	admin@admin.test

Edit Description

Add Cookies

```
{
  "domain": ".3thxemke2x7hcibu.onion",
  "name": "mybb[lastactive]",
  "path": "/forum/",
  "value": "1583829465"
}
```

```
{
  "domain": ".3thxemke2x7hcibu.onion",
  "name": "loginattempts",
  "path": "/forum/",
  "value": "1"
}
```

```
{
  "domain": ".3thxemke2x7hcibu.onion",
  "name": "sid",
  "path": "/forum/",
  "value": "847ab8cd97ff5bcc77eddb6a"
}
```

```
{
  "name": "remember_token",
  "value": "12158cddd151d74d341f23"
}
```

```
{
  "domain": ".3thxemke2x7hcibu.onion",
  "name": "mybb[announcements]",
  "path": "/forum/",
  "value": ""
}
```

# Crawler: Cookiejar

3thxemke2x7hcibu.onion :



First Seen Last Check Ports

2020/03/09 2020/03/30 [80]

infoleak:automatic-detection="onion"

infoleak:automatic-detection="base64"



manual

Show Domain Correlations 139

Add to MISP Export

Decoded 1

Screenshot 134

Crawled Items

Date: 2020/03/23 - 13:10:40 PORT: 80

Show 10 entries

Search:

Crawled Pastes

Hide

Full resolution

Shere Khan

Portal Search Member List Help

Welcome back, zuluport. You last visited: 03-20-2020, 01:35 PM Log Out

User: CP

View New Posts

View Today's Posts

Private Messages (Unread 2, Total 2)

You have 2 unread private messages. The most recent is from Jack3 (ID: KEY FOR PRIVATE SECTIONS)

Shere Khan - Official Forum

Private Messages

Home

Inbox | Compose Message | Manage Folders | Empty Folders | Download Messages

1% of PM space used.

User CP Home

Composer

Inbox

Send

Send

Trash Can

Tracking

Folder

Your Profile

Go Profile

Change Password

Change Email

Change Avatar

Change Signature

Settings

MicroMentions

Group Memberships

Buddy/Ignore List

Manage Attachments

Saved Drafts

Subscribed Threads

Forum Subscriptions

View Profile

Enter Keywords Search PMs (Advanced Search)

Message Title Sender Date/Time Sent (asc)

KEY FOR PRIVATE SECTIONS Jack3 3 hours ago

Verification Jack3 03-09-2020, 11:55 AM

Move To Inbox or Delete the selected messages

Jump to Folder: Inbox Go

Forum Team Contact Us Shere Khan - Hacking group Return to Top Lite (Archiva) Mode Mark all forums read RSS Syndication

Powered by MyBB, © 2002-2020 MyBB Group.


Current Time: 03-23-2020, 01:33 PM

<http://3thxemke2x7hcibu.onion/forum/private.php>

# Collection - automate collection

- Collecting data from various chat sources can be a **tedious task for analysts**.
- AIL offers a set of feeders (e.g., Telegram, Discord, etc.) that can be used to subscribe to chat channels.
- All the **collected messages are then processed and analyzed** within the AIL's *processing* and *analysis* stages.

DDoSia Project :



Name	ID	Created at	First Seen	Last Seen	NB Sub-Channels	Participants
DDoSia Project	2125229770	2024-03-07 09:03:02	2024-03-07	2024-04-12	6	695

Tags:

[Investigations](#) [Correlations](#)

## Sub-Channels:

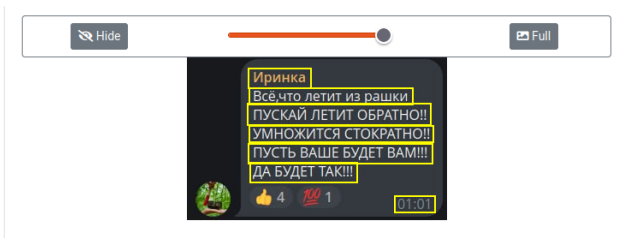
Show 10 entries

Search:

Icon	Name	ID	Created at	First Seen	Last Seen	
	General	2125229770/1	2024-03-07 06:43:47	2024-03-07	2024-04-12	4121



# Processing - OCR

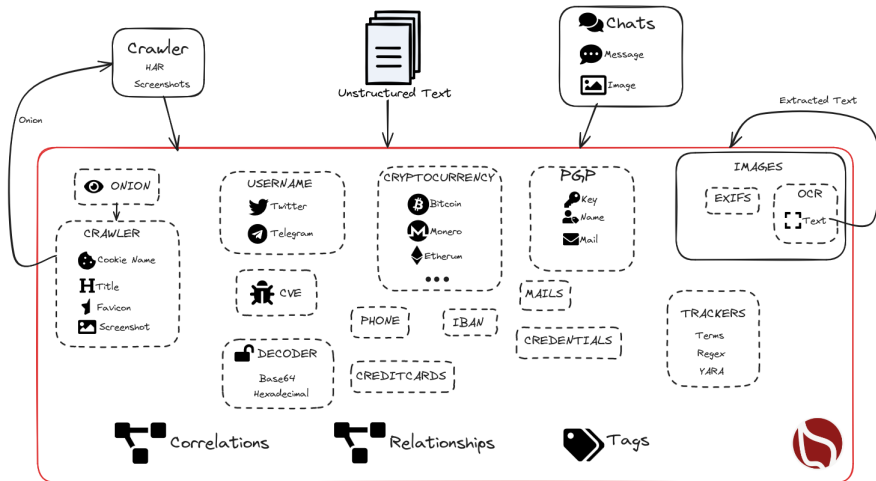


Иринка  
Всё, что летит из рашки  
ПУСКАЙ ЛЕТИТ ОБРАТНО!!  
УМНОЖИТСЯ СТОКРАТНО!!  
ПУСТЬ ВАШЕ БУДЕТ ВАМ!!!  
ДА БУДЕТ ТАКИ  
01.01

Irinka  
Everything that flies from Russia  
LET IT FLY BACK  
IT WILL MULTIPLY A HUNDRED TIMES!  
LET YOURS BE YOURS!  
LET IT BE SO  
01.01



# Analysis of unstructured information



## AIL Framework: Features

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- Extracting **credit card numbers, credentials, phone numbers, ...**
- Extracting and validating potential **hostnames**
- Keeps track of **duplicates**
- Submission to threat sharing and incident response platforms (**MISP** and **TheHive**)
- **Full-text indexer** to index unstructured information
- **Tagging** for classification and searches
- Terms, sets, regex, and YARA **tracking, occurrences, and history**
- Archives, files, and raw **submission** from the UI
- Correlation engine based on PGP ID, cryptocurrencies, decoded (Base64, ...), usernames, cookie names, and many selectors to find relationships
- And many more

# Trackers - Retro Hunt


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- Search and monitor specific keywords/patterns
  - Automatic tagging
  - Email/webhook notifications
- Track Word
  - ddos
- Track Set
  - booter, ddos, stresser; 2
- Track Regex
  - circl\lu
- YARA rules
  - <https://github.com/ail-project/ail-yara-rules>

Live Demo

# YARA Tracker

**Certificate**



**Type**  yara

**Tracked** all-yara-rules/rules/crypto/certificate.yar

**Date** 2023/05/12

**Level** Global

**Creator** admin@admin.test

**First Seen** 2023 / 05 / 12

**Last Seen** 2023 / 05 / 31



**Tags**

**Mails**

**Webhook**

**Filters** No Filters

**Objects Match** decoded 0  
item 00

[Edit Tracker](#)  

## Yara Rule:

```
rule certificates
{
  meta:
    author = "@kevTheHermit"
    info = "Part of Pastehunter"
    reference = "https://github.com/kevthehermit/Pastehunter"

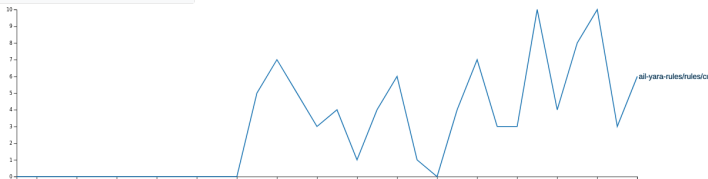
  strings:
    $ssh_priv = "BEGIN RSA PRIVATE KEY" wide ascii nocase
    $openssh_priv = "BEGIN OPENSSH PRIVATE KEY" wide ascii nocase
    $dsa_priv = "BEGIN DSA PRIVATE KEY" wide ascii nocase
    $ec_priv = "BEGIN EC PRIVATE KEY" wide ascii nocase
    $pgp_priv = "BEGIN PGP PRIVATE KEY" wide ascii nocase
    $pem_cert = "BEGIN CERTIFICATE" wide ascii nocase
    $pkcs7 = "BEGIN PKCS7"

  condition:
    any of them
}
```

 2023-05-12

 2023-05-31

 [Tracked Objects](#)



# Retro Hunt

test completed

Date2023/05/10

DescriptionNone

Tags

Creatoradmin@admin.test

Filters

item: {  
"date\_from": "20230304",  
"date\_to": "20230601"  
}

Objects Match

item 3

Show Objects

```
rule certificates
{
  meta:
    author = "@KevTheHermit"
    info = "Part of PasteHunter"
    reference = "https://github.com/kevthehermit/PasteHunter"

  strings:
    $ssh_priv = "BEGIN RSA PRIVATE KEY" wide ascii nocase
    $openssh_priv = "BEGIN OPENSSH PRIVATE KEY" wide ascii nocase
    $dsa_priv = "BEGIN DSA PRIVATE KEY" wide ascii nocase
    $ec_priv = "BEGIN EC PRIVATE KEY" wide ascii nocase
    $pgp_priv = "BEGIN PGP PRIVATE KEY" wide ascii nocase
    $pem_cert = "BEGIN CERTIFICATE" wide ascii nocase
    $pkcs7 = "BEGIN PKCS7"

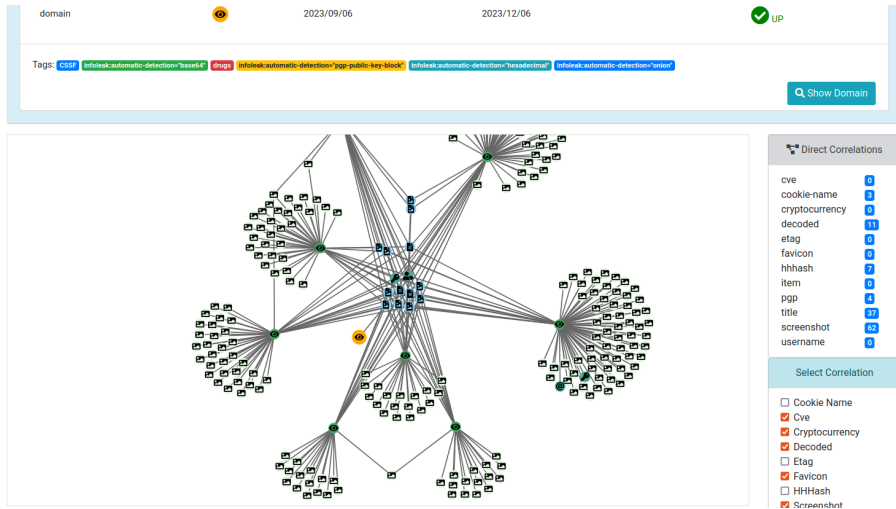
  condition:
    any of them
}
```

Show 10 entries

Search:

Type	Id	Tags
	archive/gist.github.com/2023/04/14/huizmiranda7_3b3d1133a3d3842092c5fc5fb39e84f2.gz	infoleak:automatic-detection="private-key" test23 test12 infoleak:automatic-detection="certificate"
	submitted/2023/04/20/submitted_cc9190ab-80d2-4d2b-9c9e-97c51e69a855.gz	infoleak:submission="manual" test12 infoleak:automatic-detection="rsa-private-key" infoleak:automatic-detection="vpn-static-key" test23 infoleak:automatic-detection="certificate" infoleak:automatic-detection="onion"
	archive/gist.github.com/2023/04/13/chipzoller_d8d6d2d737d02ad4fe9d30a897170761.gz	test12 test23 infoleak:automatic-detection="certificate"

# Correlations and relationship





# Investigations

Tor Coin Mixer

UUID	9189d0e7c04c47a2985666e9507e0a5
Creator	admin@admin.test
Tags	<a href="#">dark-web:torpcr:mixer</a>
Date	2023-05-31
Threat Level	medium
Analysis	initial
Info	Tor Coin Mixer
# Objects	6
Timestamp	2023-05-31 12:50:45
Last change	2023-05-31 12:54:20

Delete

Edit

Export as Event

## Objects

Show 10 entries

Search:

Type	ID	Tags	
onion	jambler72gxnhybmj3mhdaajmyddqxbuif6vsa32h5w4otux3crqd.onion	<a href="#">infoleak-automatic-detection==anon</a> <a href="#">infoleak-automatic-detection==ygg-public-key-block</a>	<div></div>
onion	btmxihtf4cpncluhwflussk23t1vowswebe4tridree74qxjnz2vyqgd.onion	<a href="#">infoleak-automatic-detection==anon</a>	<div></div>
key	0xD3B280956F0E7CAF		<div></div>
mail	support@jambler.io		<div></div>
telegram	jambler		<div></div>
name	Jambler.io		<div></div>

## AIL Framework: Extensible Capabilities

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- Extending AIL to add a new **analysis module** can be done in 50 lines of Python.
- The framework **supports multi-processors/cores by default**. Any analysis module can be started multiple times to support faster processing during peak times or bulk import.
- **Multiple** concurrent **data inputs**.
- Tor Crawler (handles cookies and authentication).
- Feeders: Discord, Telegram, ...

## Ongoing Developments

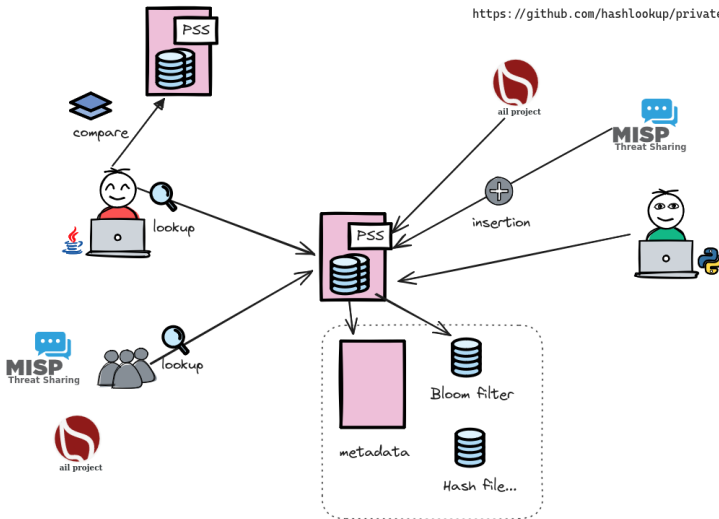
---

- Two-Factor Authentication (2FA) - One-Time Password (OTP)
- Bloom Filter Filtering - Private Search Set (PSS)
- Relationships and activity between chats: message forwards, replies, etc.

# Private Search Set (PSS)

Private Search Set (PSS)

<https://github.com/hashlookup/private-search-set/>



## Links

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- AIL project website <https://ail-project.org>
- AIL project open source framework  
<https://github.com/ail-project>
- Training materials  
<https://github.com/ail-project/ail-training>
- Online chat <https://gitter.im/ail-project/community>



# MISP - LEA

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- Law Enforcement Agency Information Sharing Community
- AIL-LEA instance hosted by CIRCL
- Request access by sending an email to **info@misp-lea.org** or **info@circl.lu**
- Request free training at **info@misp-lea.org** or **info@circl.lu**

