CIRCL
Computer Incident
Response Center
Luxembourg

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

CIRCL - Virtual Summer School 2025

https://ail-project.org/

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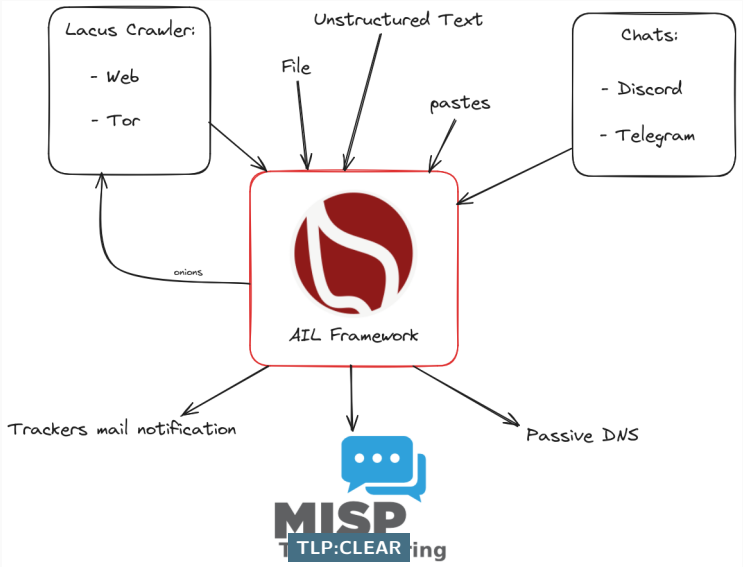
Background

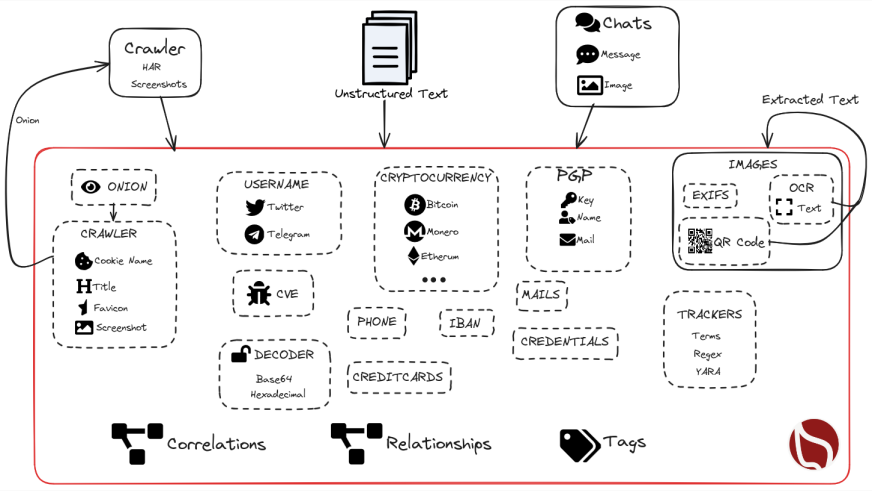
- Over the past years, CIRCL has developed the AIL project[1] to fulfill our needs at CIRCL in intelligence gathering and analysis.
- AIL features an extensible Python-based framework for the **analysis of unstructured information**, collected either through an advanced crawler manager or from various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

[1] https://www.ail-project.org/
[2] https://github.com/ail-project

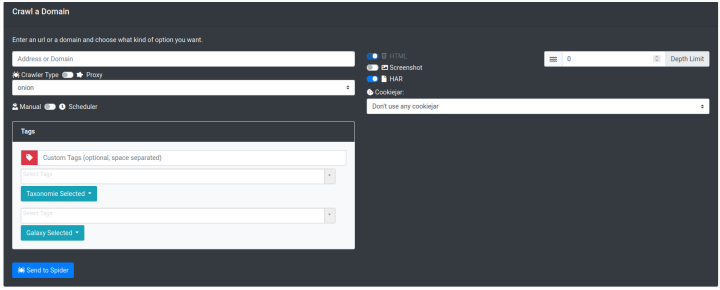
High Level Overview



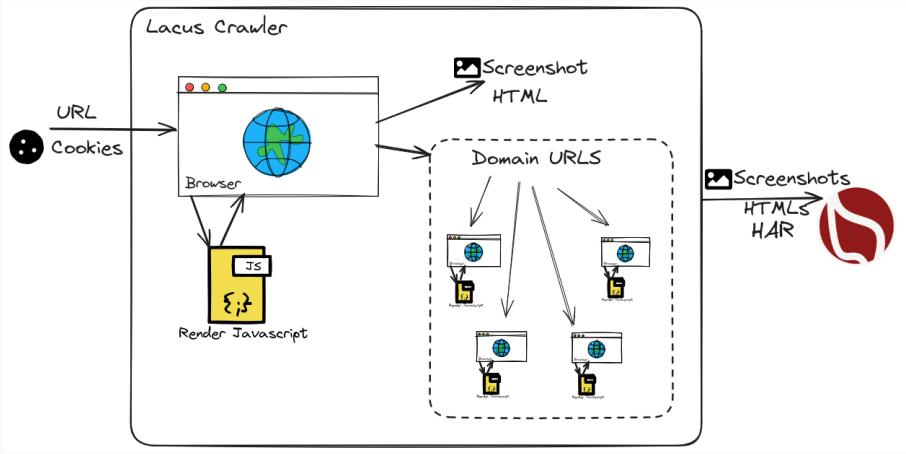
Analysis of unstructured information



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



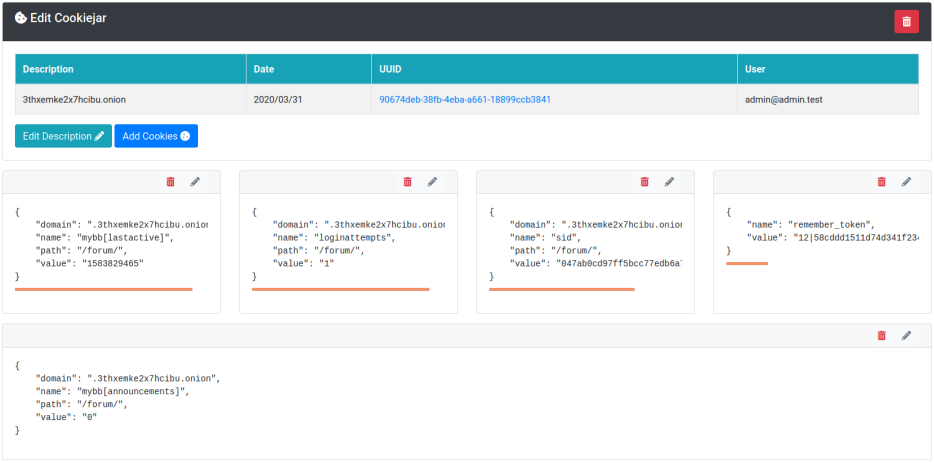
[3] https://www.ransomlook.io/



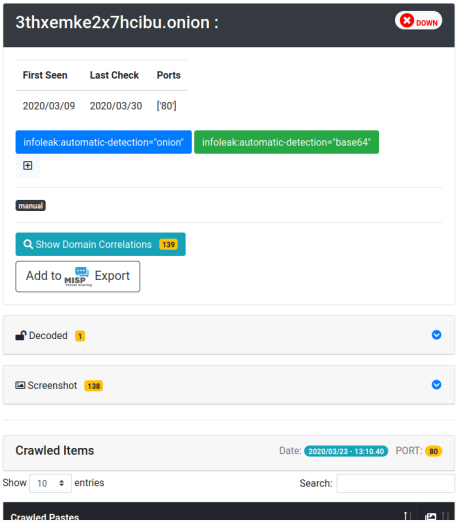
[4] https://github.com/ail-project/lacus

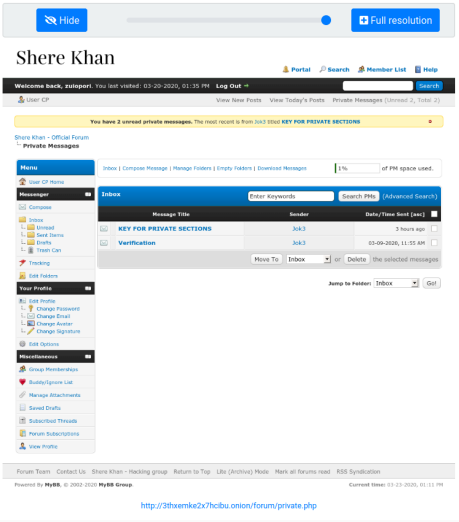
Crawler: Cookiejar

Use your cookies to login and bypass captcha



Crawler: Cookiejar





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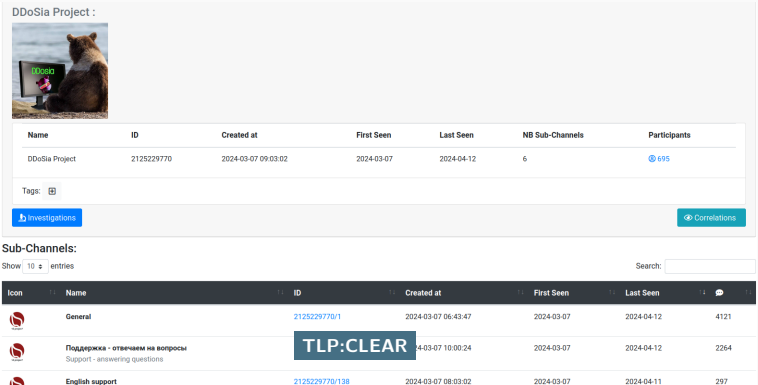
Collection - Automate Collection

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



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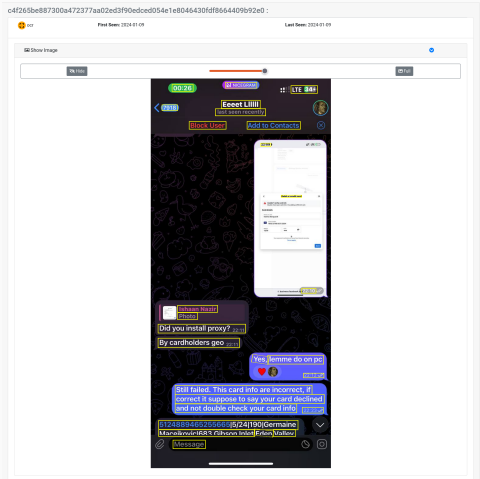
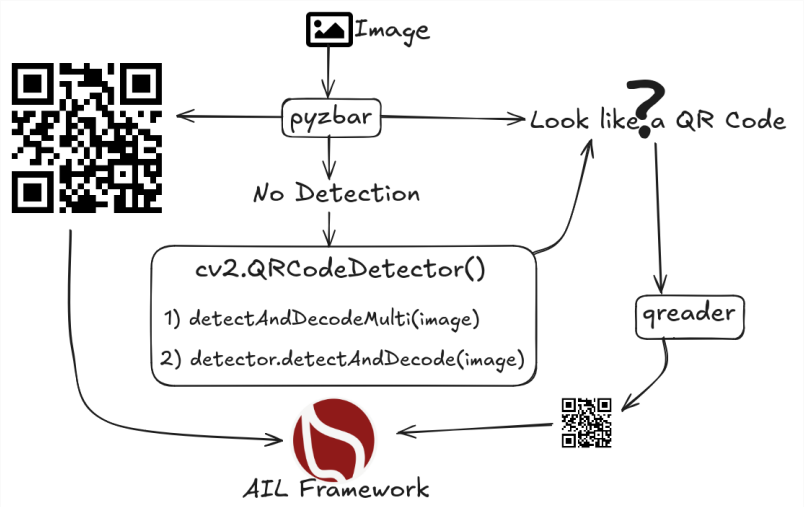
OCR: Optical Character Recognition

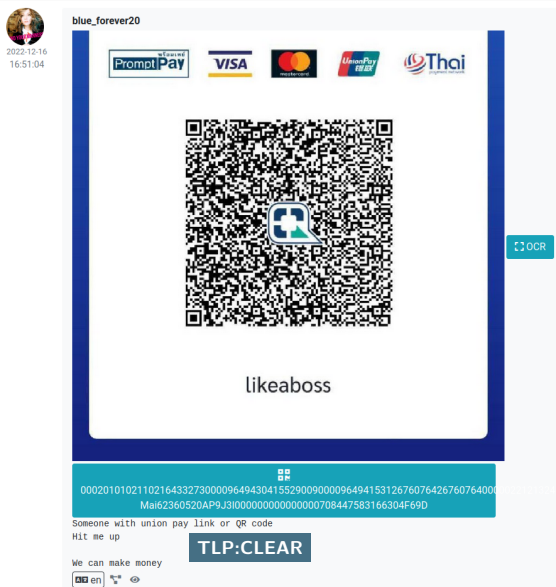


- Threat actors are often verbose and frequently **share extensive details in private channels**.
- Many messages contain screenshots and images.
- Text detection and extraction are performed across 80+ languages using a CRNN (Convolutional Recurrent Neural Network).
- **Enables keyword-based matching and detection**.

QR Code Extractor



QR Codes



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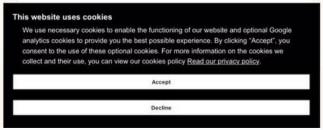
Bar Codes

OCR 8745860537300061927671300649 13



Cool man its done as always , I appreciate for all you do beloved❤️ .
You have brought a lot of ppl to riches and I will forever be loyal, God bless you ..I wish I knew this earlier...🏦

en

AIL Framework: Features

- Extracting **credit card numbers, credentials, phone numbers, . . .**
- Extracting and validating potential **hostnames**
- Submission to threat sharing and incident response platforms (**MISP** and **FlowIntel**[5])
- **Tagging**[6] 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

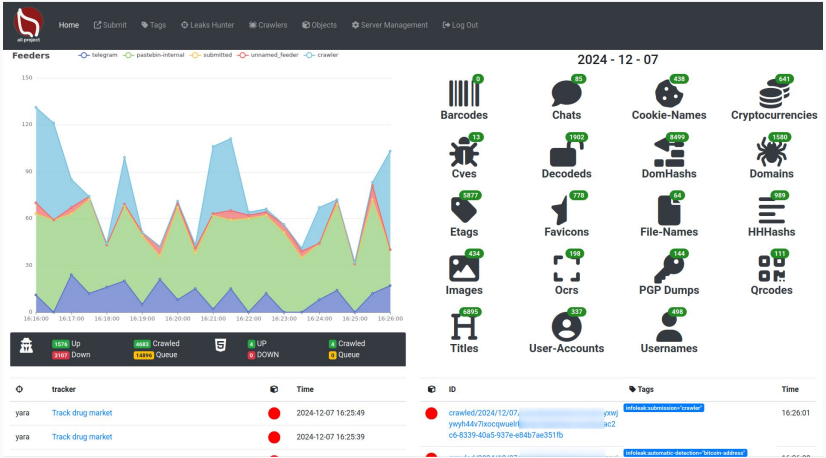
[5] https://github.com/flowintel/flowintel
[6] Relying on MISP taxonomies and galaxy

Live Trackers & Retro Hunt

- 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

Dashboard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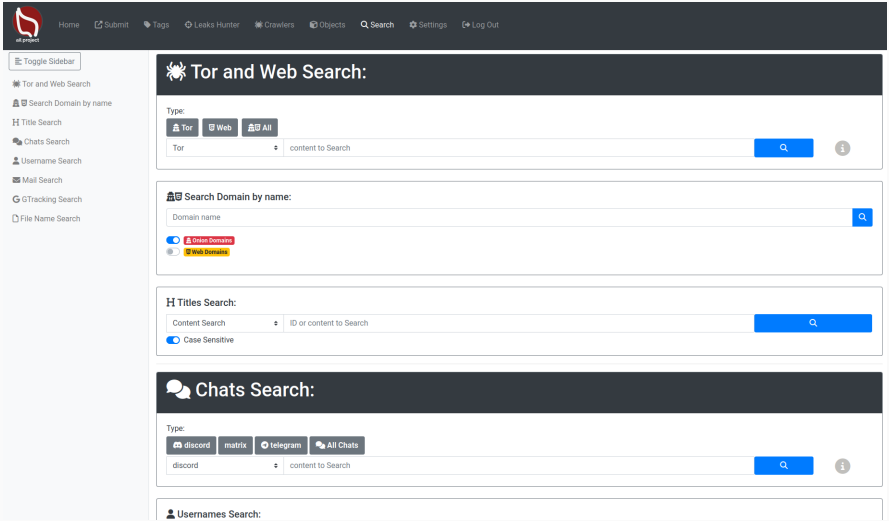
Search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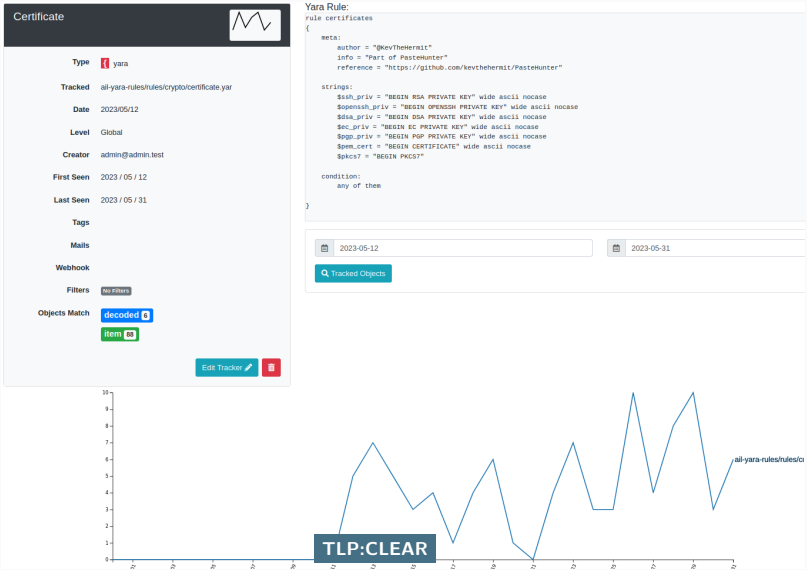
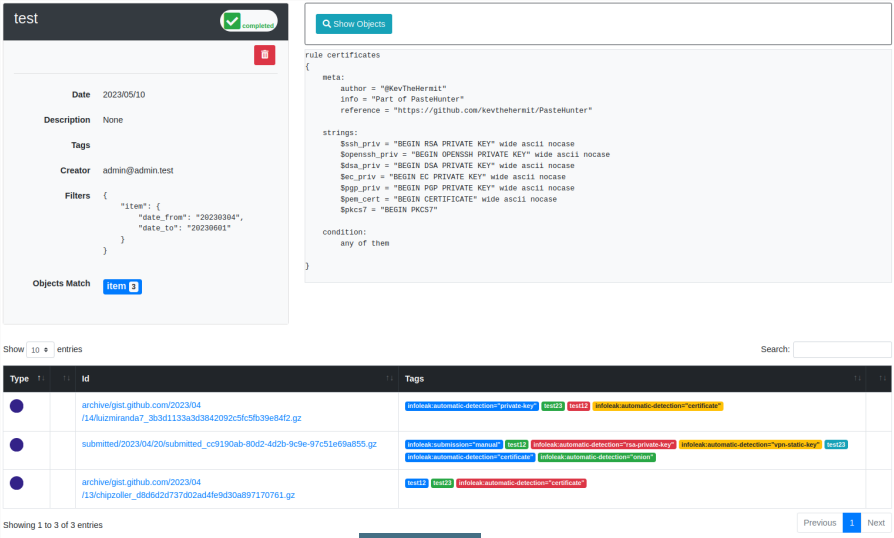


Retro Hunt



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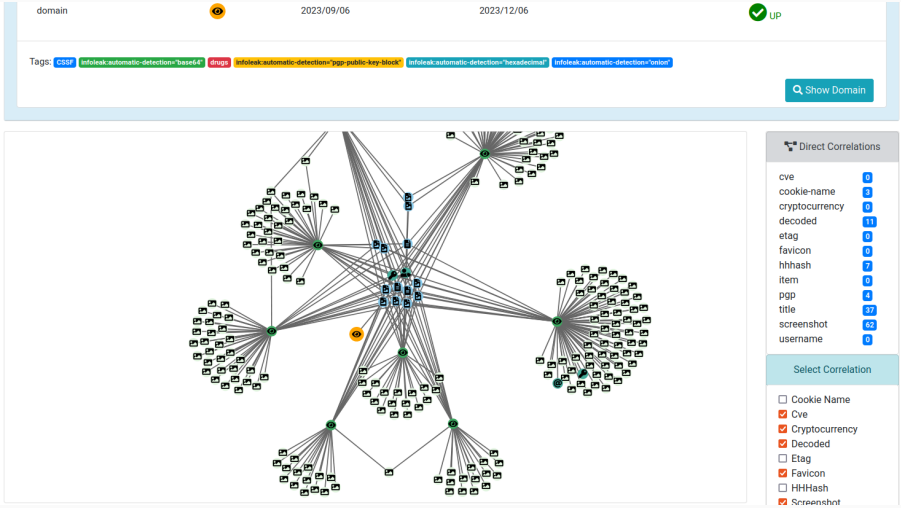
Correlations and relationship



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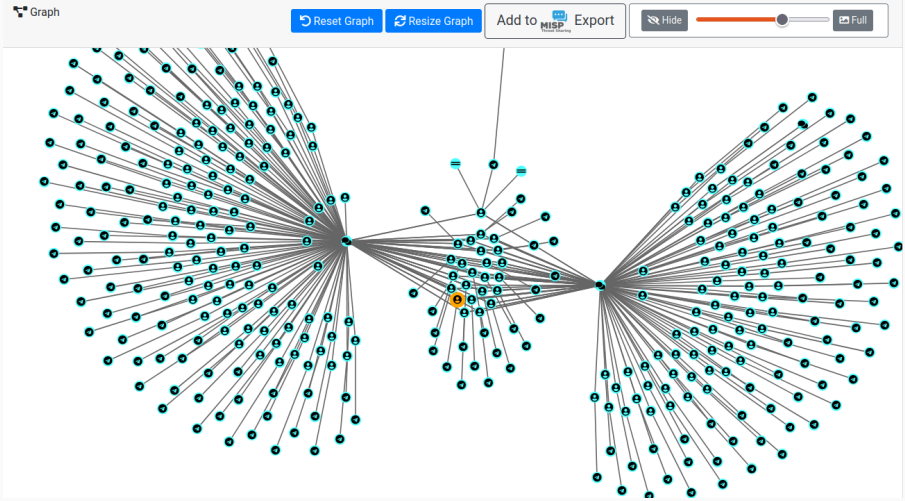
User Correlation - Common Chats



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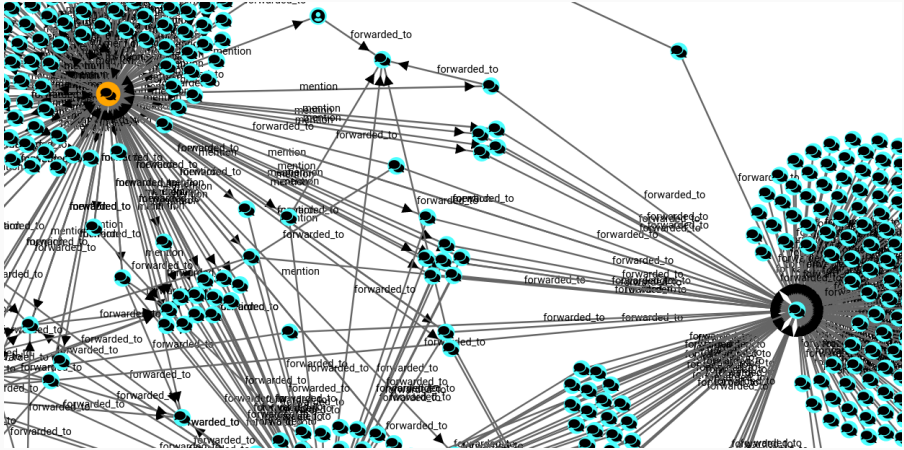
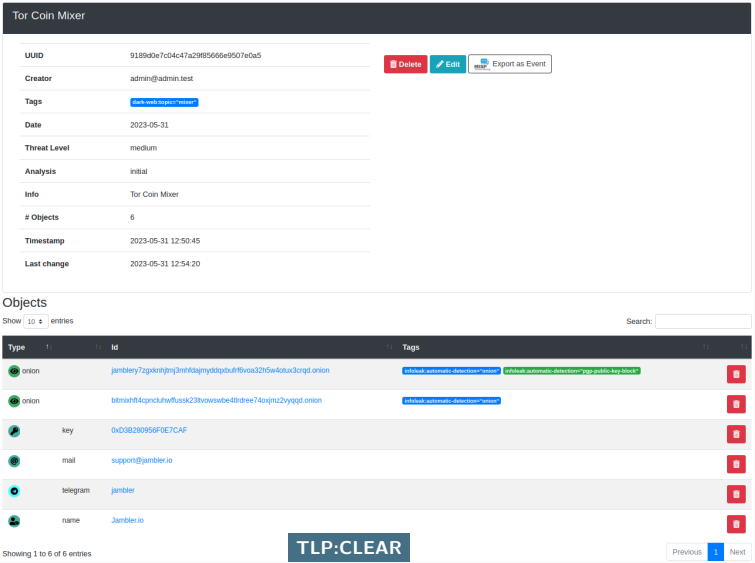
What are the Relationships Between Chats Group?



Investigations



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AIL Framework: Extensible Capabilities

- 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

- **Mail Search – Next Release**
- **Lacus crawler improvements:** proxy selection, local cache, and cookie state transfer
- **Translate search:** support for searching in other languages
- **Advanced video processing and extraction**
- **MISP export with new correlation types**
- **Automatic geolocation**

Links

- 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`

Thank you for your attention

- AIL project[7] : `https://github.com/ail-project/ail-framework`
- For questions, contact: info@circl.lu

[7] All techniques and indicators mentioned in these slides are implemented in the AIL project, using an instance backed by a three-year dataset collected from Tor hidden services and various social networks.