# **Information Sharing and Tax- ONOMIES**

PRACTICAL CLASSIFICATION OF THREAT INDICATORS US-

CIRCL / TEAM MISP PROJECT

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CIRCL - UNILLU



#### FROM TAGGING TO FLEXIBLE TAXONOMIES



- Tagging is a simple way to attach a classification to an event or an attribute.
- In the early version of MISP, tagging was local to an instance.
- Classification must be globally used to be efficient.
- After evaluating different solutions of classification, we built a new scheme using the concept of machine tags.

#### MACHINE TAGS

■ Triple tag, or machine tag, format was introduced in 2004 to extend geotagging on images.

- A machine tag is just a tag expressed in way that allows systems to parse and interpret it.
- Still have a human-readable version:
  - admiralty-scale:source-reliability="Fairly reliable"

#### **MISP TAXONOMIES**

- Taxonomies are implemented in a simple JSON format.
- Anyone can create their own taxonomy or reuse an existing one.
- The taxonomies are in an independent git repository¹.
- These can be freely reused and integrated into other threat intel tools.
- Taxonomies are licensed under Creative Commons (public domain) except if the taxonomy author decided to use another license.

https://www.github.com/MISP/misp-taxonomies/

#### **EXISTING TAXONOMIES**

- NATO Admiralty Scale
- CIRCL Taxonomy Schemes of Classification in Incident Response and Detection
- eCSIRT and IntelMQ incident classification
- EUCI EU classified information marking
- Information Security Marking Metadata from DNI (Director of National Intelligence - US)
- NATO Classification Marking
- OSINT Open Source Intelligence Classification
- **■** TLP **Traffic Light Protocol**
- Vocabulary for Event Recording and Incident Sharing VERIS
- And many more like ENISA, Europol, or the draft FIRST SIG Information Exchange Policy.

### WANT TO WRITE YOUR OWN TAXONOMY? 1/2

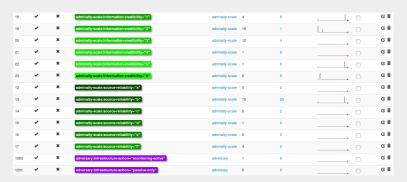
```
"namespace": "admiralty-scale".
     "description": "The Admiralty Scale (also called the NATO System
         ) is used to rank the reliability of a source and the
         credibility of an information.",
     "version": 1.
     "predicates": [
6
         "value": "source-reliability",
8
         "expanded": "Source Reliability"
9
10
         "value": "information-credibility",
11
         "expanded": "Information Credibility"
12
13
14
15
```

## WANT TO WRITE YOUR OWN TAXONOMY? 2/2

Publishing your taxonomy is as easy as a simple git pull request on misp-taxonomies<sup>2</sup>.

<sup>2</sup>https://github.com/MISP/misp-taxonomies

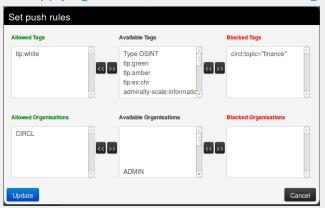
#### HOW ARE TAXONOMIES INTEGRATED IN MISP?



- MISP administrator can just import (or even cherry pick) the namespace or predicates they want to use as tags.
- Tags can be exported to other instances.
- Tags are also accessible via the MISP REST API.

# FILTERING THE DISTRIBUTION OF EVENTS AMONG MISP INSTANCES

Applying rules for distribution based on tags:



#### OTHER USE CASES USING MISP TAXONOMIES

- Tags can be used to set events or attributes for **further processing by external tools** (e.g. VirusTotal auto-expansion using Viper).
- Ensuring a classification manager classifies the events before release (e.g. release of information from air-gapped/classified networks).
- Enriching IDS export with tags to fit your NIDS deployment.
- Using **IntelMQ** and MISP together to process events (tags limited per organization introduced in MISP 2.4.49).

# FUTURE FUNCTIONALITIES RELATED TO MISP TAXONOMIES

- **Sighting** support (thanks to NCSC-NL) is integrated in MISP allowing to auto expire IOC based on user detection.
- Adjusting taxonomies (adding/removing tags) based on their score or visibility via sighting.
- Simple taxonomy editors to **help non-technical users** to create their taxonomies.
- **Filtering mechanisms** in MISP to rename or replace taxonomies/tags at pull and push synchronisation.
- More public taxonomies to be included.

#### **PYTAXONOMIES**

- Python module to handle the taxonomies
- Offline and online mode (fetch the newest taxonomies from GitHub)
- Simple **search** to make tagging easy
- Totally independent from MISP
- No external dependencies in offline mode
- Python3 only
- Can be used to create & dump a new taxonomy

#### **PYTAXONOMIES**

```
from pytaxonomies import Taxonomies
taxonomies = Taxonomies()
taxonomies, version
# => '20160725'
taxonomies.description
# => 'Manifest file of MISP taxonomies available.'
list (taxonomies.kevs())
# => ['tlp', 'eu-critical-sectors', 'de-vs', 'osint', 'circl', 'veris',
          'ecsirt', 'dhs-ciip-sectors', 'fr-classif', 'misp', 'admiralty-scale', ...]
taxonomies.get('enisa').description
# 'The present threat taxonomy is an initial version that has been developed on
# the basis of available ENISA material. This material has been used as an ENISA-internal
# structuring aid for information collection and threat consolidation purposes.
# It emerged in the time period 2012-2015.'
print(taxonomies.get('circl'))
# circl:incident-classification="vulnerability"
# circl:incident-classification="malware"
# circl:incident-classification="fastflux"
# circl:incident-classification="system-compromise"
# circl:incident-classification="sal-injection"
print(taxonomies.get('circl').machinetags_expanded())
# circl:incident-classification="Phishing"
# circl:incident-classification="Malware"
# circl:incident-classification="XSS"
# circl:incident-classification="Copyright issue"
# circl:incident-classification="Spam"
# circl:incident-classification = "SQL Injection"
```

#### THE DILEMMA OF FALSE-POSITIVES

- False-positives are a **common issue** in threat intelligence sharing.
- It's often a contextual issue:
  - ► False-positives might be different per community of users sharing information.
  - Organizations might have their own view on false-positives.
- Based on the success of the MISP taxonomy model, we built misp-warninglists.

#### MISP WARNING LISTS

- misp-warninglists are lists of well-known indicators that can be associated to potential false positives, errors, or mistakes.
- Simple JSON files

#### MISP WARNING LISTS

- The warning lists are integrated in MISP to display an info/warning box at the event and attribute level.
- Enforceable via the API where all attributes that have a hit on a warninglist will be excluded.
- This can be enabled at MISP instance level.
- Default warning lists can be enabled or disabled like **known** public resolver, multicast IP addresses, hashes for empty values, rfc1918, TLDs or known Google domains.
- The warning lists can be expanded or added in JSON locally or via pull requests.
- Warning lists can be also used for **critical or core** infrastructure warning, personally identifiable information...

### Q&A



- https://github.com/MISP/MISP
- https://github.com/MISP/misp-taxonomies
- https://github.com/MISP/PyTaxonomies
- https://github.com/MISP/misp-warninglists
- info@circl.lu (if you want to join one of the MISP community operated by CIRCL)
- PGP key fingerprint: CA57 2205 COO2 4E06 BA70 BE89 EAAD CFFC 22BD 4CD5