Information Sharing and Taxonomies

Practical Classification of Threat Indicators us-

CIRCL / Team MISP Project

http://www.misp-project.org/
Twitter: @MISPProject

NSPA

2022-08-05

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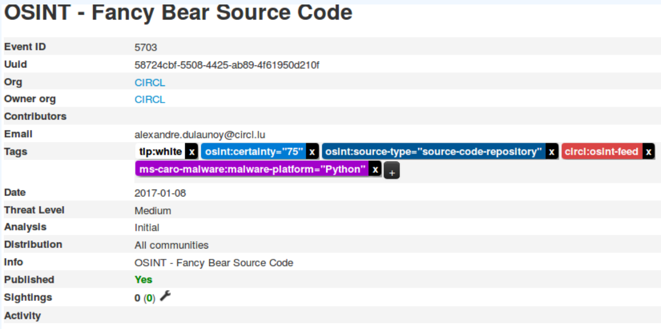
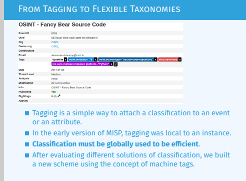
From Tagging to Flexible Taxonomies



OSINT - Fancy Bear Source Code

Event ID	5703
Uuid	58724cbf-5508-4425-ab89-4f61950d210f
Org	CIRCL
Owner org	CIRCL
Contributors	
Email	alexandre.dulaunoy@circl.lu
Tags	tlp:white x osint:certainty="75" x osint:source-type="source-code-repository" x circl:osint-feed x ms-caro-malware:malware-platform="Python" x +
Date	2017-01-08
Threat Level	Medium
Analysis	Initial
Distribution	All communities
Info	OSINT - Fancy Bear Source Code
Published	Yes
Sightings	0 (0)
Activity	

- 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.



From Tagging to Flexible Taxonomies

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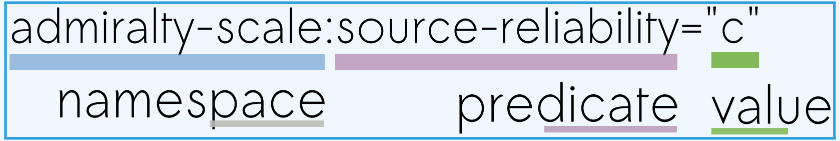
Machine Tags

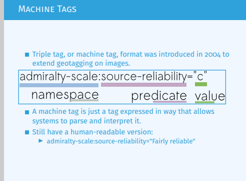
- Triple tag, or machine tag, format was introduced in 2004 to extend geotagging on images.



admiralty-scale:source-reliability="c"

namespace predicate value

- 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"



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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 repository[1].
- 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.

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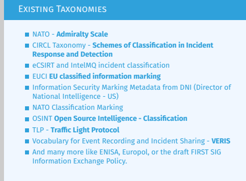
Existing Taxonomies

- 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.



Existing Taxonomies

- NATO - **Admiralty Scale**
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- 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**
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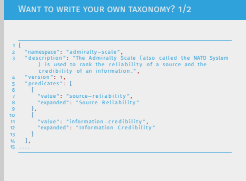
Want to write your own taxonomy? 1/2

```
{
  "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": [
    {
      "value": "source-reliability",
      "expanded": "Source Reliability"
    },
    {
      "value": "information-credibility",
      "expanded": "Information Credibility"
    }
  ],
....
```



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....
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Want to write your own taxonomy? 2/2

```
{
  "values": [
    {
      "predicate": "source—reliability",
      "entry": [
        {
          "value": "a",
          "expanded": "Completely reliable"
        },
....
```

- Publishing your taxonomy is as easy as a simple git pull request on misp-taxonomies[2].

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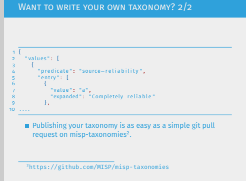

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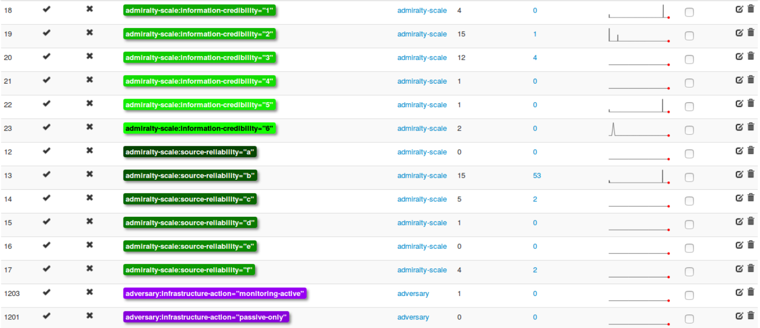
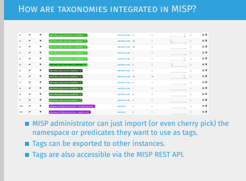
How are taxonomies integrated in MISP?



18	✓	✖	admiralty-scale:information-credibility="1"	admiralty-scale	4	0		☐
19	✓	✖	admiralty-scale:information-credibility="2"	admiralty-scale	15	1		☐
20	✓	✖	admiralty-scale:information-credibility="3"	admiralty-scale	12	4		☐
21	✓	✖	admiralty-scale:information-credibility="4"	admiralty-scale	1	0		☐
22	✓	✖	admiralty-scale:information-credibility="5"	admiralty-scale	1	0		☐
23	✓	✖	admiralty-scale:information-credibility="6"	admiralty-scale	2	0		☐
12	✓	✖	admiralty-scale:source-reliability="a"	admiralty-scale	0	0		☐
13	✓	✖	admiralty-scale:source-reliability="b"	admiralty-scale	15	53		☐
14	✓	✖	admiralty-scale:source-reliability="c"	admiralty-scale	5	2		☐
15	✓	✖	admiralty-scale:source-reliability="d"	admiralty-scale	1	0		☐
16	✓	✖	admiralty-scale:source-reliability="e"	admiralty-scale	0	0		☐
17	✓	✖	admiralty-scale:source-reliability="f"	admiralty-scale	4	2		☐
1203	✓	✖	adversary:infrastructure-action="monitoring-active"	adversary	1	0		☐
1201	✓	✖	adversary:infrastructure-action="passive-only"	adversary	0	0		☐

- 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.



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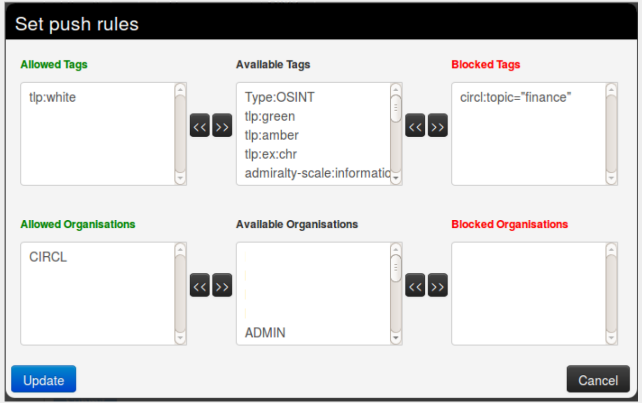
Filtering the distribution of events among MISP instances

- Applying rules for distribution based on tags:



Set push rules

Allowed Tags

tlp:white

Available Tags

Type:OSINT
tlp:green
tlp:amber
tlp:ex:chr
admiralty-scale:informatic

Blocked Tags

circl:topic="finance"

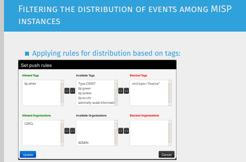
Allowed Organisations

CIRCL

Available Organisations

ADMIN

Blocked Organisations



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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).

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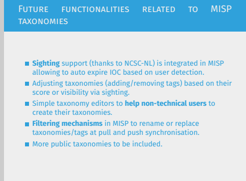
Future functionalities related to MISP taxonomies

- **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.



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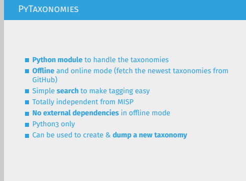
PyTaxonomies

- **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**



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PyTaxonomies

```
from pytaxonomies import Taxonomies
taxonomies = Taxonomies()
taxonomies.version
# => '20160725'
taxonomies.description
# => 'Manifest file of MISP taxonomies available.'
list(taxonomies.keys())
# => ['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="sql—injection"
# ....
print(taxonomies.get('circl').machinetags_expanded())
# circl:incident—classification="Phishing"
# circl:incident—classification="Malware"
# circl:incident—classification="XSS"
# circl:incident—classification="Copyright issue"
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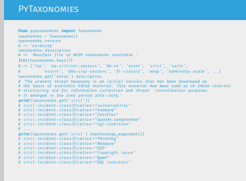
└PyTaxonomies



PyTaxonomies

The dilemma of false-positives

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

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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

```
{
  "name": "List of known public DNS resolvers",
  "version": 2,
  "description": "Event contains one or more public DNS resolvers
      as attribute with an IDS flag set",
  "matching_attributes": [
    "ip−src",
    "ip−dst"
  ],
  "list": [
    "8.8.8.8",
    "8.8.4.4", ... ]
}
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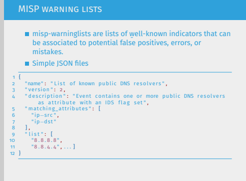
Information Sharing and Taxonomies

└MISP warning lists



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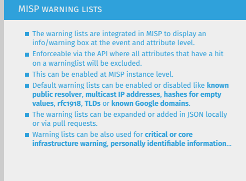
- Enforceable via the API where all attributes that have a hit on a warninglist will be excluded.
- This can be enabled at MISP instance level.
- Default warning lists can be enabled or disabled like **known public resolver**, **multicast IP addresses**, **hashes for empty values**, **rfc1918**, **TLDs** 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**...



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Q&A

MISP
Threat Sharing

- 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 C002 4E06 BA70 BE89 EAAD CFFC 22BD 4CD5

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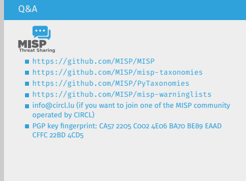
Information Sharing and Taxonomies

└Q&A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