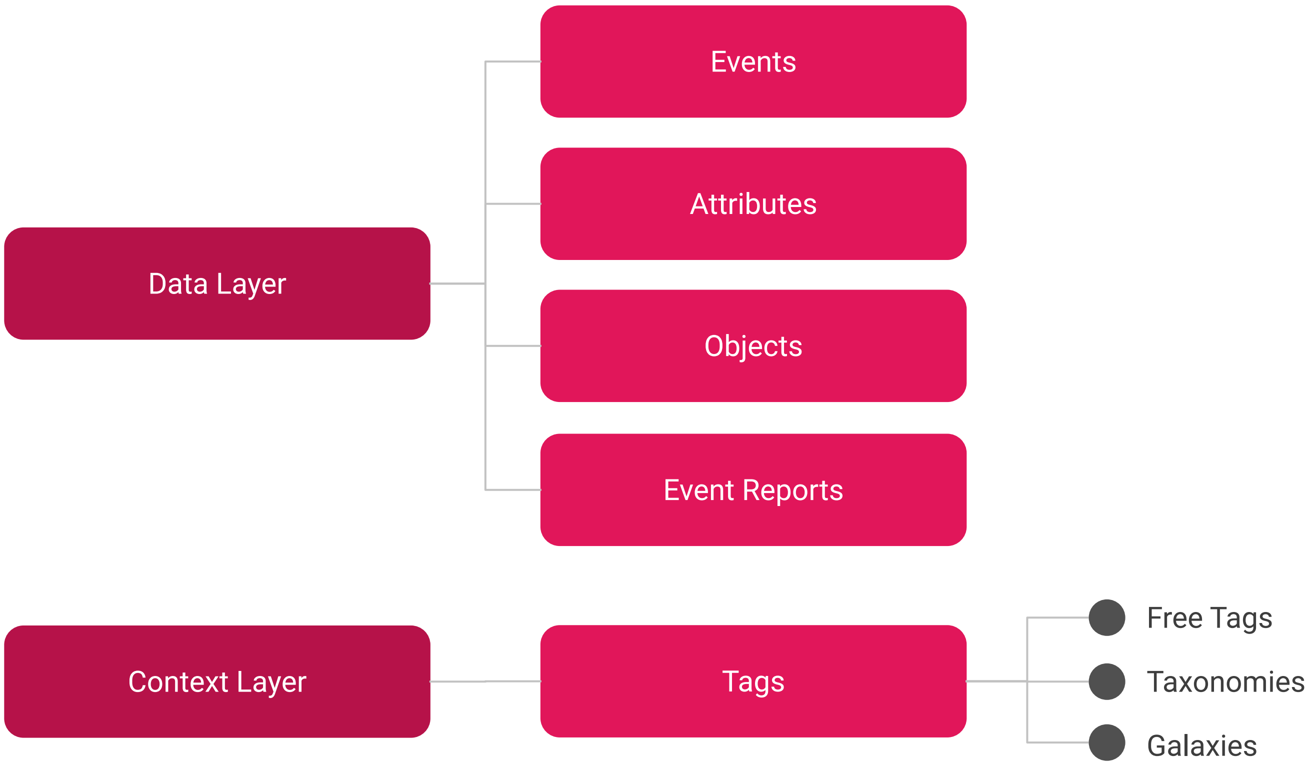
MISP Data model overview

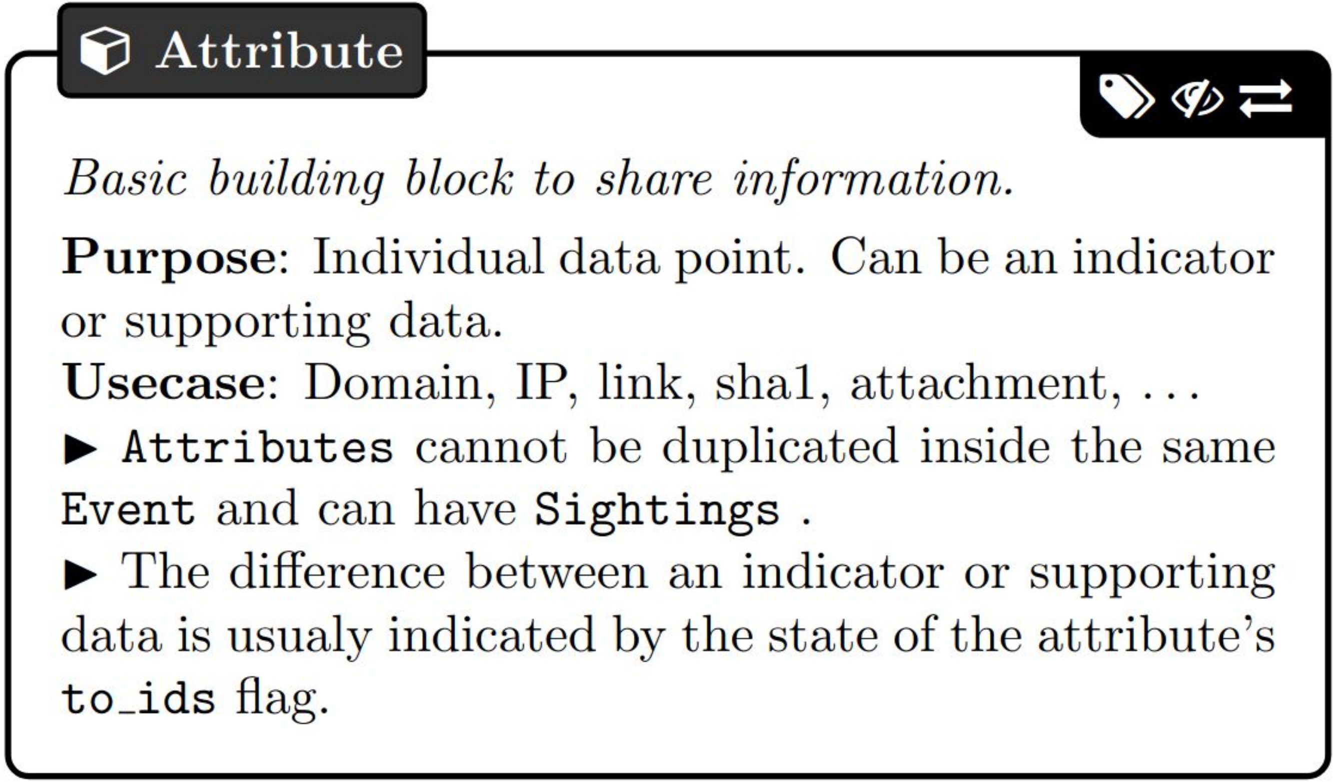
MISP
Threat Sharing

Type of Data model



Data Layer

MISP Attributes



Attribute

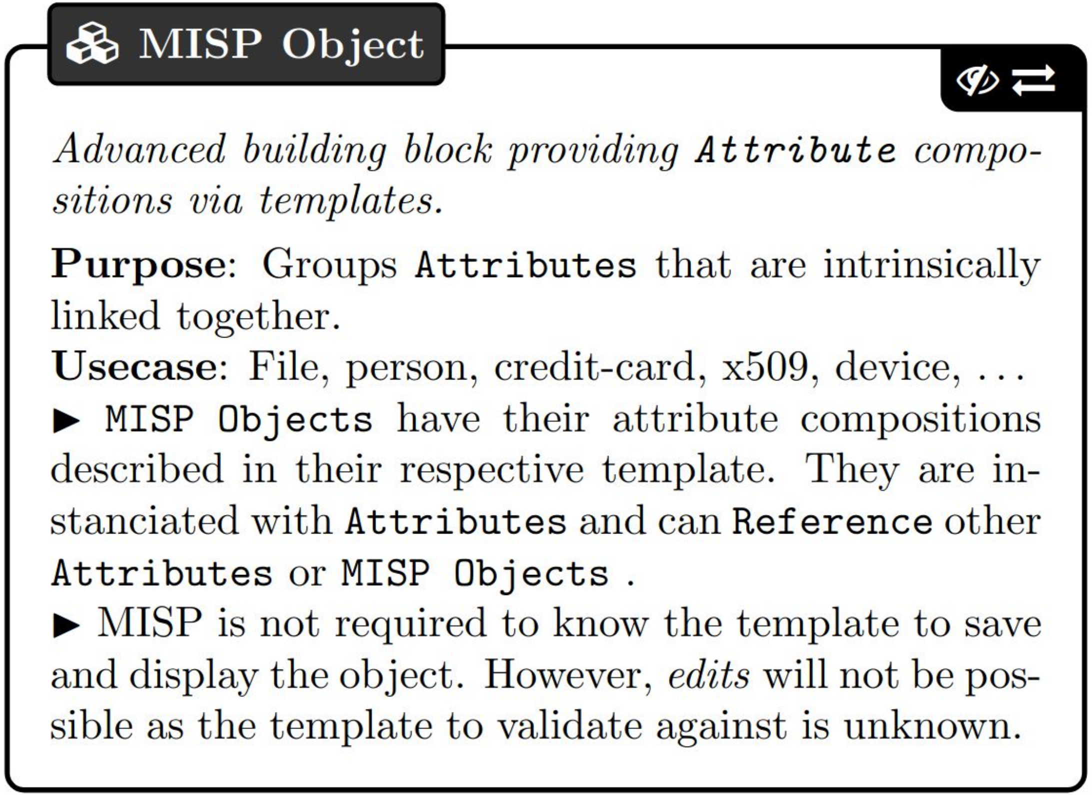
Basic building block to share information.

Purpose: Individual data point. Can be an indicator or supporting data.
Usecase: Domain, IP, link, sha1, attachment, . . .

▶ `Attributes` cannot be duplicated inside the same `Event` and can have `Sightings` .

▶ The difference between an indicator or supporting data is usualy indicated by the state of the attribute's `to_ids` flag.

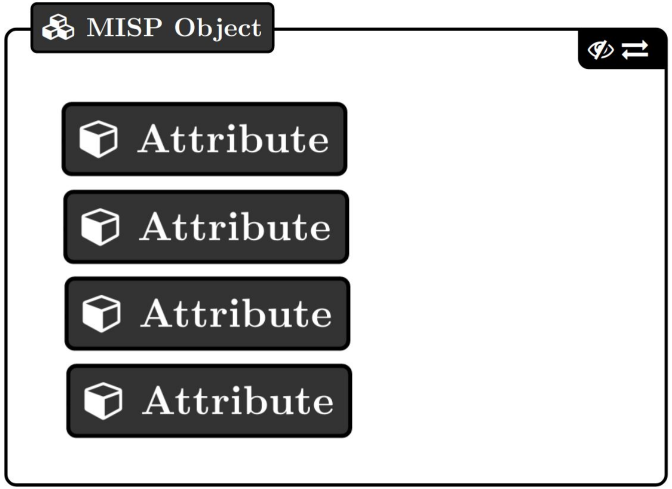
MISP Objects



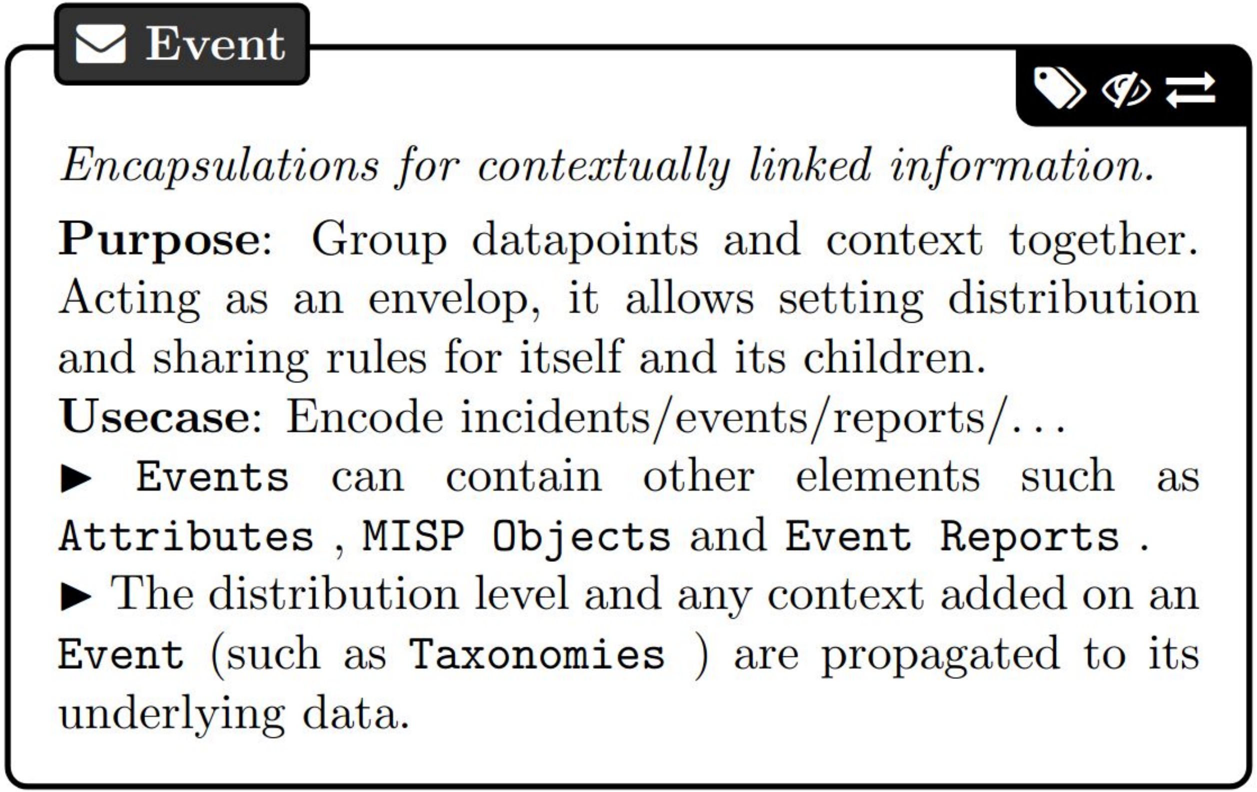
MISP Object

Advanced building block providing `Attribute` *compositions via templates.*

Purpose: Groups `Attributes` that are intrinsically linked together.
Usecase: File, person, credit-card, x509, device, . . .
▶ `MISP Objects` have their attribute compositions described in their respective template. They are instanciated with `Attributes` and can `Reference` other `Attributes` or `MISP Objects` .
▶ MISP is not required to know the template to save and display the object. However, *edits* will not be possible as the template to validate against is unknown.



MISP Events



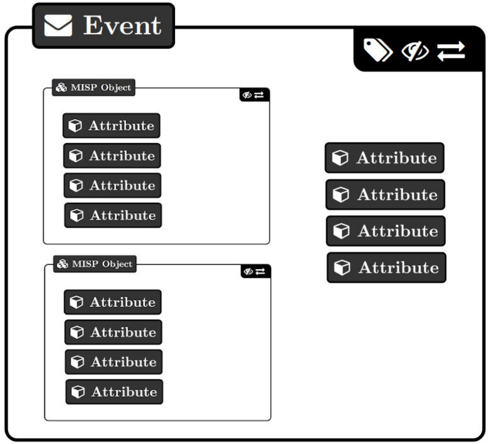
Event

Encapsulations for contextually linked information.

Purpose: Group datapoints and context together. Acting as an envelop, it allows setting distribution and sharing rules for itself and its children.

Usecase: Encode incidents/events/reports/...

- ▶ `Events` can contain other elements such as `Attributes` , `MISP Objects` and `Event Reports` .
- ▶ The distribution level and any context added on an `Event` (such as `Taxonomies`) are propagated to its underlying data.



MISP Event Report

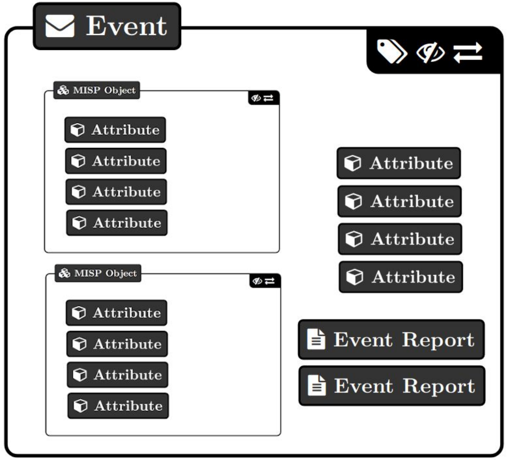
Event Report

Advanced building block containing formated text.

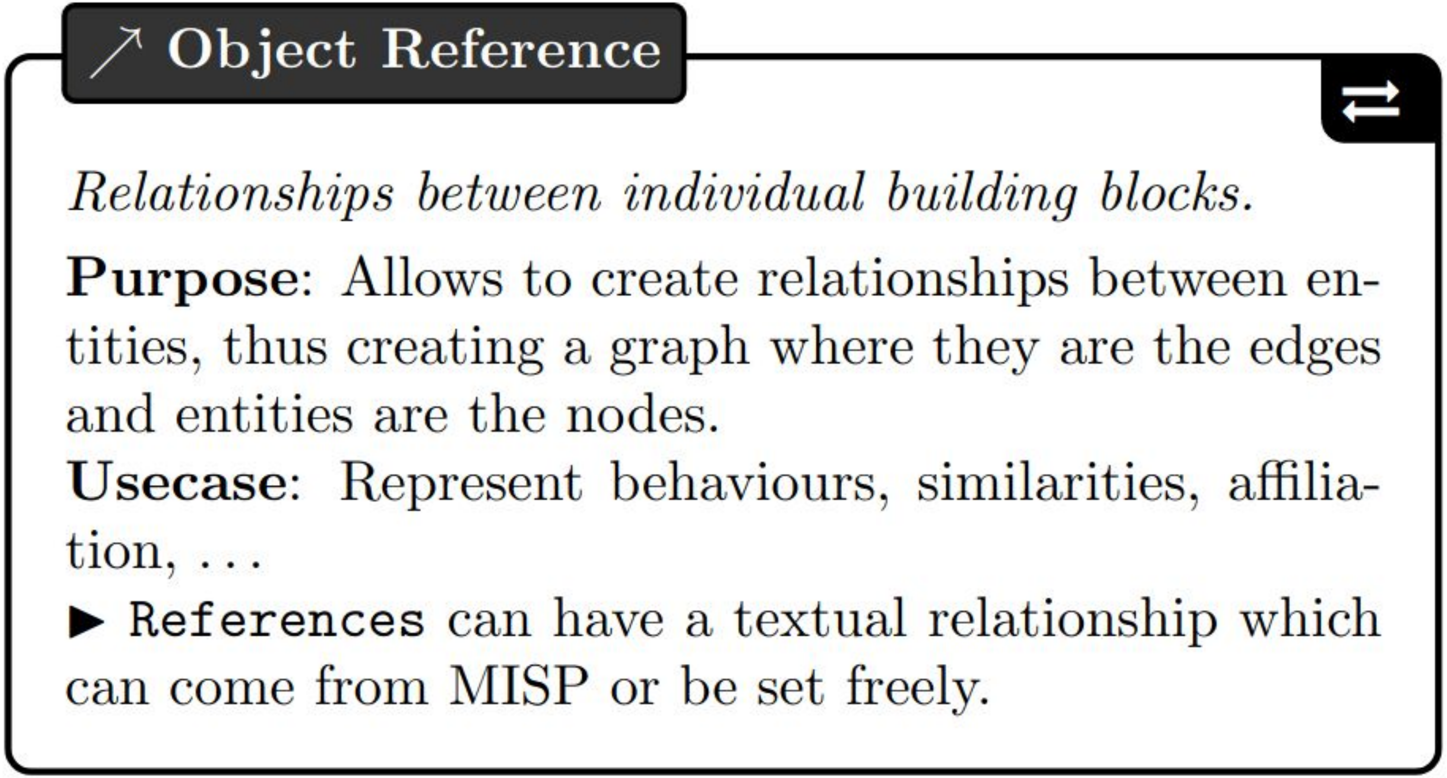
Purpose: Supporting data point to describe events or processes.

Usecase: Encode reports, provide more information about the `Event` , . . .

▶ `Event Reports` are markdown-aware and include a special syntax to reference data points or context.



Object Reference



↗ **Object Reference** ⇄

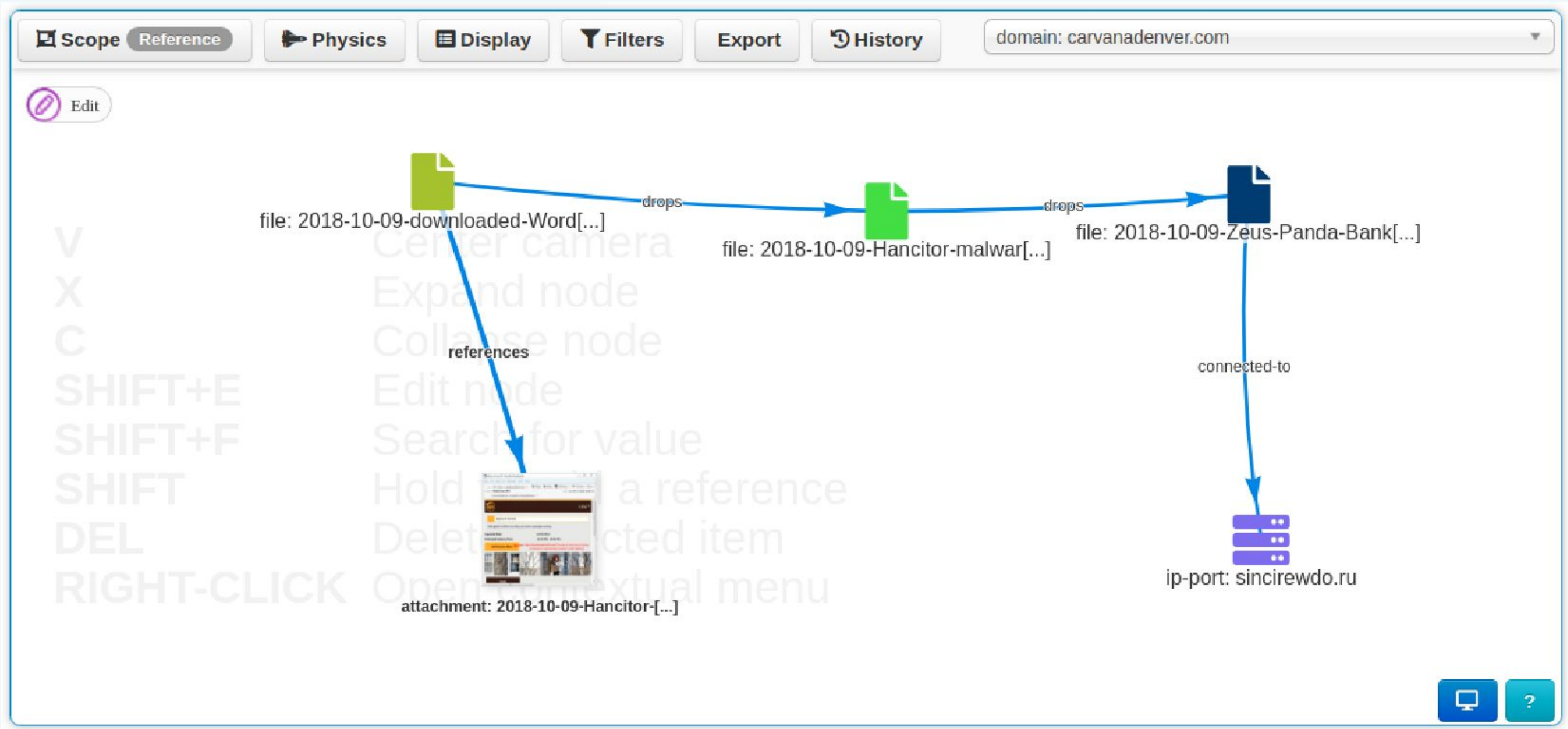
Relationships between individual building blocks.

Purpose: Allows to create relationships between entities, thus creating a graph where they are the edges and entities are the nodes.

Usecase: Represent behaviours, similarities, affiliation, ...

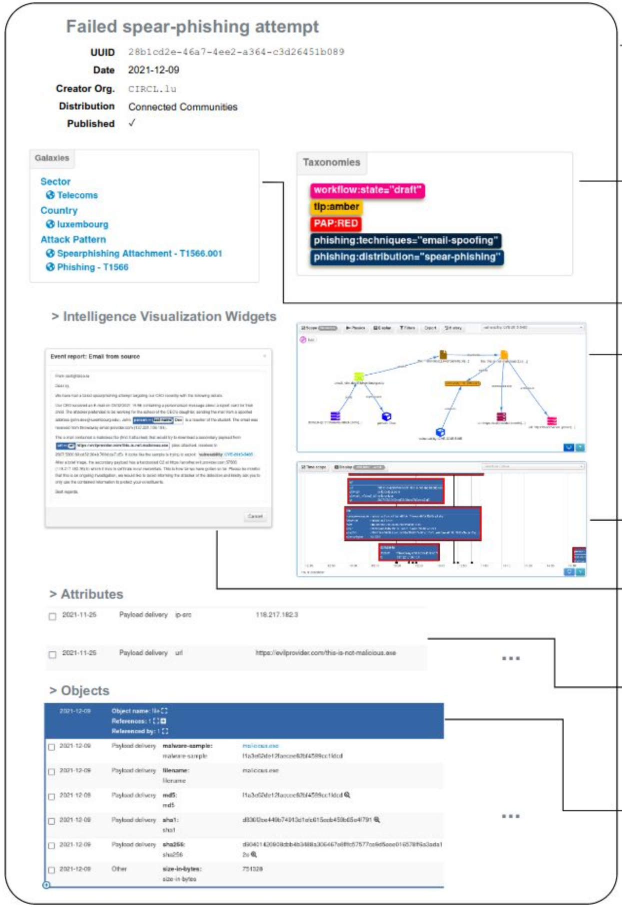
▶ `References` can have a textual relationship which can come from MISP or be set freely.

Object References


Scope
Reference
Physics
Display
Filters
Export
History
domain: carvanadenver.com
Edit
file: 2018-10-09-downloaded-Word[...]
drops
file: 2018-10-09-Hancitor-malwar[...]
drops
file: 2018-10-09-Zeus-Panda-Bank[...]
references
connected-to
attachment: 2018-10-09-Hancitor-[...]
ip-port: sincirewdo.ru
?

V	Center camera
X	Expand node
C	Collapse node
SHIFT+E	Edit node
SHIFT+F	Search for value
SHIFT	Hold to add a reference
DEL	Delete selected item
RIGHT-CLICK	Open contextual menu

Anatomy of an Event



Failed spear-phishing attempt

UUID 28b1cd2e-46a7-4ee2-a364-c3d26451b089

Date 2021-12-09

Creator Org. CIRCL.lu

Distribution Connected Communities

Published ✓

Galaxies

Sector
Telecoms

Country
luxembourg

Attack Pattern
Spearphishing Attachment - T1566.001
Phishing - T1566

Taxonomies

workflow:state="draft"
tlp:amber
PAP:RED
phishing:techniques="email-spoofing"
phishing:distribution="spear-phishing"

> Intelligence Visualization Widgets

Event report: Email from source

From: [illegible]

Dear [illegible],

We have had a failed spearphishing attempt targeting our CEO recently with the following details.

Our CEO received an E-mail on [illegible] containing a personalized message about a report card for their child. The attacker pretended to be working for the school of the CEO's daughter, sending the mail from a spoofed address john.doe@luxembourg.edu. John person last-name Doe is a teacher of the student. The email was received from throwaway-email-provider.com ([illegible]).

The e-mail contained a malicious file (find it attached) that would try to download a secondary payload from url https://evilprovider.com/this-is-not-malicious.exe (also attached, resolves to [illegible]). It looks like the sample is trying to exploit vulnerability CVE-[illegible].

After a brief triage, the secondary payload has a hardcoded C2 at https://another-evil-provider.com:57666 (118.217.182.36) to which it tries to exfiltrate local credentials. This is how far we have gotten so far. Please be mindful that this is an ongoing investigation, we would like to avoid informing the attacker of the detection and kindly ask you to only use the contained information to protect your constituents.

Best regards,

Cancel

> Attributes

□	2021-11-25	Payload delivery	ip-src	118.217.182.3
□	2021-11-25	Payload delivery	url	https://evilprovider.com/this-is-not-malicious.exe

...

> Objects

2021-12-09 Object name: file
References: 1
Referenced by: 1

□	2021-12-09	Payload delivery	**malware-sample:** malware-sample	malicious.exe f1a3e62de12faccee62bf4589cc1fdcd
□	2021-12-09	Payload delivery	**filename:** filename	malicious.exe
□	2021-12-09	Payload delivery	**md5:** md5	f1a3e62de12faccee62bf4589cc1fdcd
□	2021-12-09	Payload delivery	**sha1:** sha1	d8360be449b74913d1e6c615ecb459b65e4f791
□	2021-12-09	Payload delivery	**sha256:** sha256	d9040142090 8dbb4b3488a306467e8ffc57577ce9d5eee01657 8f6a3ada12e
□	2021-12-09	Other	**size-in-bytes:** size-in-bytes	751328

...

Representation of an incident in MISP

Event: Encapsulates contextually linked information.
Events also have basic information including ownership and access-control
Here: Contains all the information related to the spear-phishing incident.

Taxonomies: Simple label standardised on common set of vocabularies.
Here: Usage of labels to classify the current completeness of the Event, what recipient can do with the information and the category of the incident.

Galaxies & Galaxy-Clusters: Advanced label containing meta-data
Here: The sector affected by the incident as well as the country. The kill-chain of the attack can be described using the MITRE ATT&CK framework

Event Graph: Visualization of the relationships between entities contained in the Event.
Here: The whole story of the attack can be described with relationships defined between Attributes and Objects

Event Timeline: Visualization of the temporality of the data contained in the event.
Here: A timeline of the steps performed during the attack. The time data is taken directly from the Attributes and Objects belonging to the Event.

Event Report: Markdown-aware supporting text document to describe events or incidents
Here: The report describe the steps taken by the attacker and provide additional contextual information. It also contains references to Attributes and Object encoded in the Event

Attributes: Basic building block to represent information.
They can have context such as taxonomy and express if they are supportive data or meant for automation. An Event can have multiple Attributes
Here: Two Attributes representing payload delivery. One is an IP address, the other is an URL.

Objects: Advanced building block allowing Attribute composition via predefined templates.
As an Object is an instantiation of its template, it is composed of Attributes that make sense Together. They can also have relationship to other entity contained in the Event
Here: A file object composed of Attributes such as the filename, size and hashes. It also have a relationship

Context Layer

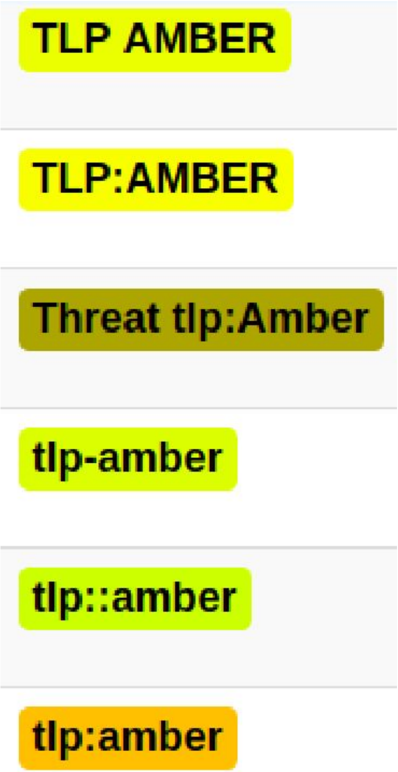
Tags

Tags
Free Tags
Taxonomies
Galaxies

- **Free Tags**: Label where the text can be set without restriction
- **Taxonomies**: Normalized classification to express the same vocabulary
- **Galaxies**: Normalized classification boosted by meta-data

Free Tags

- Label where the text can be set without restriction
- Simplest form of contextualization
- Can make automation and understanding difficult



TLP AMBER

TLP:AMBER

Threat tlp:Amber

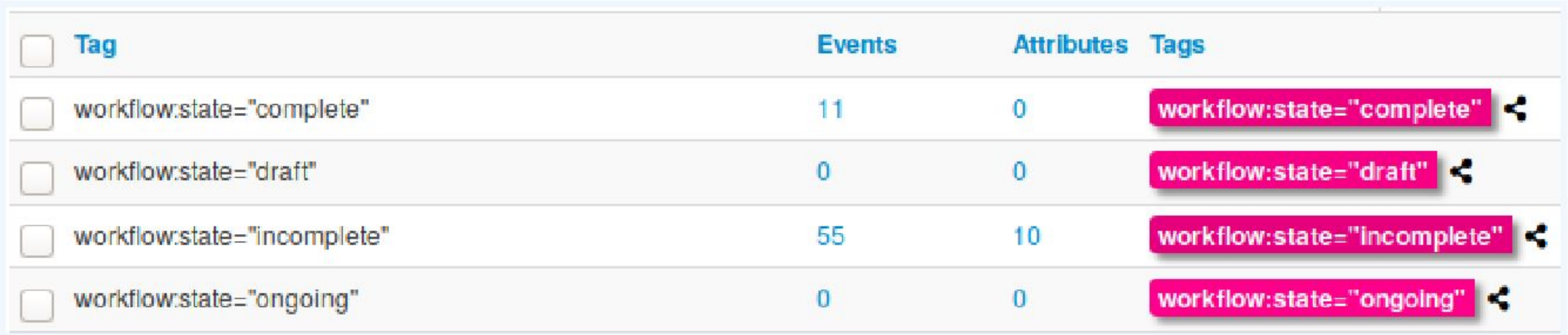
tlp-amber

tlp::amber

tlp:amber

Taxonomies

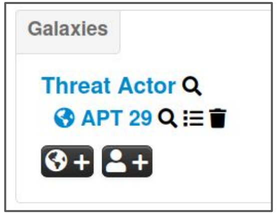
- Simple label standardised on common set of vocabularies
- Efficient classification globally understood
- Ease consumption and automation

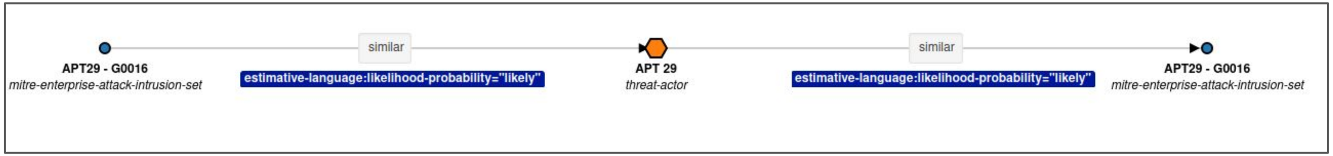


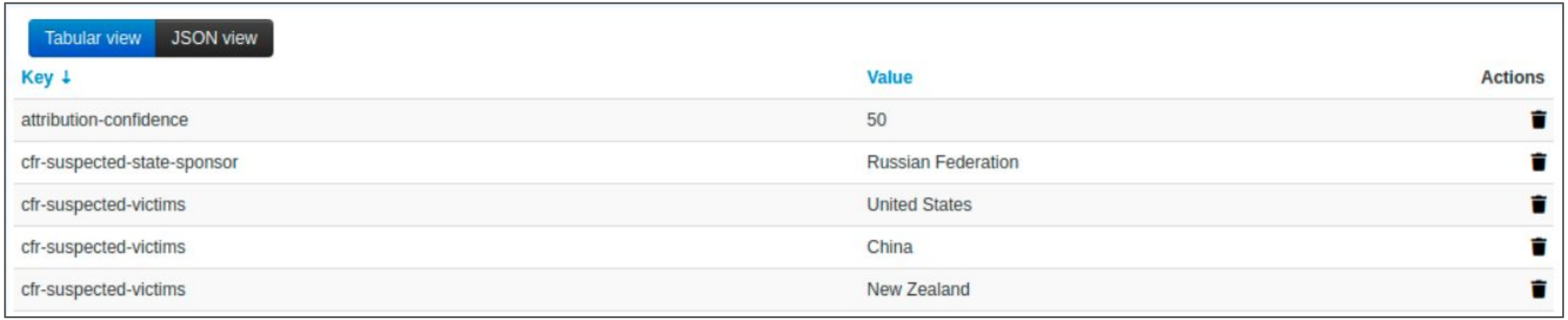
□	Tag	Events	Attributes	Tags
□	workflow:state="complete"	11	0	workflow:state="complete"
□	workflow:state="draft"	0	0	workflow:state="draft"
□	workflow:state="incomplete"	55	10	workflow:state="incomplete"
□	workflow:state="ongoing"	0	0	workflow:state="ongoing"

Galaxies

- Normalized classification boosted by meta-data
- Enable description of complex high-level information
- Used internally to represent the MITRE ATT&CK Framework




APT29 - G0016
mitre-enterprise-attack-intrusion-set
similar
estimative-language:likelihood-probability="likely"
APT 29
threat-actor
similar
estimative-language:likelihood-probability="likely"
APT29 - G0016
mitre-enterprise-attack-intrusion-set

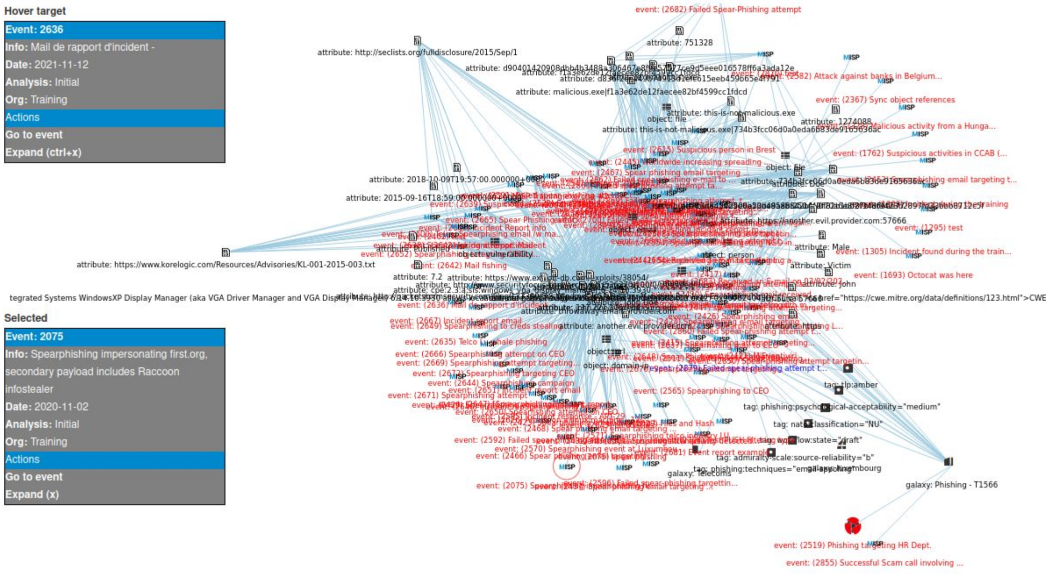


Key ↓	Value	Actions
attribution-confidence	50	🗑
cfr-suspected-state-sponsor	Russian Federation	🗑
cfr-suspected-victims	United States	🗑
cfr-suspected-victims	China	🗑
cfr-suspected-victims	New Zealand	🗑

Correlation in MISP

Correlation in MISP

- Correlations
  - ○ Links created automatically whenever an Attribute is created or modified. They allow interconnection between Events based on their attributes
- Correlation Engine
  - ○ Is the system used by MISP to create correlations between Attribute ’s value



Hover target

Event: 2636

Info: Mail de rapport d'incident -

Date: 2021-11-12

Analysis: Initial

Org: Training

Actions

Go to event

Expand (ctrl+x)

Selected

Event: 2075

Info: Spearphishing impersonating first.org, secondary payload includes Raccoon infostealer

Date: 2020-11-02

Analysis: Initial

Org: Training

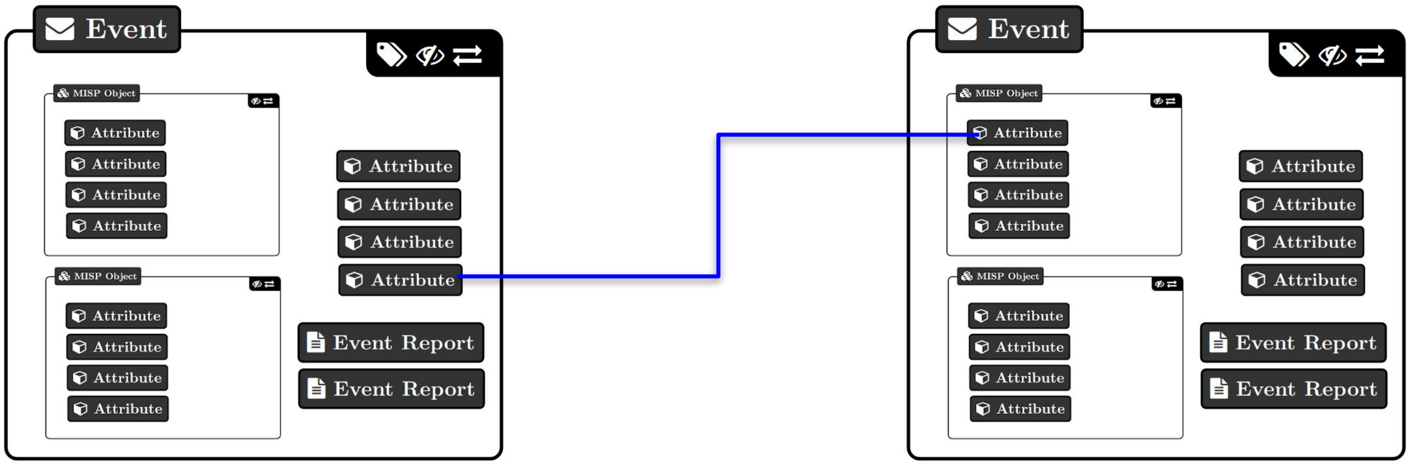
Actions

Go to event

Expand (x)

event: (2682) Failed Spear-Phishing attempt
attribute: 751328
attribute: http://seclists.org/fulldisclosure/2015/Sep/1
event: (2582) Attack against banks in Belgium...
attribute: malicious.exe|f1a3e62de12faecee82bf4599cc1fdcd
event: (2367) Sync object references
attribute: this-is-not-malicious.exe
object: file
attribute: 1274088
attribute: this-is-not-malicious.exe|734b3fcc06d0a0eda6b83de9165636ac
event: (2615) Suspicious person in Brest
event: (1762) Suspicious activities in CCAB (...
event: (2467) Spear phishing email targeting
attribute: 2018-10-09T19:57:00.000000+0000
attribute: 2015-09-16T18:59:00.000000+0000
event: (2665) Spear Phishing
attribute: https://another.evil.provider.com:57666
event: (1295) test
attribute: Male
event: (1305) Incident found during the train...
attribute: https://www.korelogic.com/Resources/Advisories/KL-001-2015-003.txt
event: (2642) Mail fishing
attribute: Victim
object: person
attribute: 7.2
event: (1693) Octocat was here
attribute: John
tegrated Systems WindowsXP Display Manager (aka VGA Driver Manager and VGA Display Manager)
event: (2636) Mail de rapport d'incident
event: (2667) Incident report email
event: (2635) Telco whale phishing
event: (2666) Spearphishing attempt on CEO
event: (2669) Spearphishing attempt targeting...
event: (2644) Spearphishing campaign
event: (2565) Spearphishing to CEO
tag: tlp:amber
event: (2671) Spearphishing attempt
tag: phishing:psychological-acceptability="medium"
tag: nato:classification="NU"
event: (2468) Spear phishing email targeting
event: (2592) Failed spear...
tag: workflow:state="draft"
event: (2570) Spearphishing event at Luxembourg
event: (2466) Spear phishing
tag: admiralty-scale:source-reliability="b"
galaxy: Telecoms
tag: phishing:techniques="email-spoofing"
galaxy: Luxembourg
event: (2075) Spearphishing...
galaxy: Phishing - T1566
event: (2519) Phishing targeting HR Dept.
event: (2855) Successful Scam call involving ...

Correlation in MISP



01 **String Value**

- Exact match on the value
- DEADBEEF <-> DEADBEEF

02 **CDIR Block**

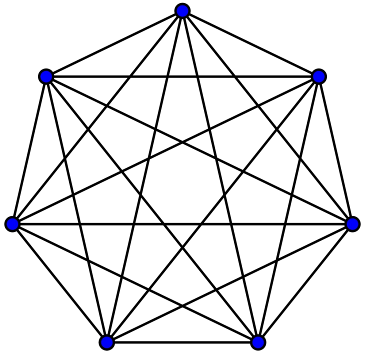
- If an IP is contained in the CIDR block
- 1.1.1.0/24 <-> 1.1.1.128

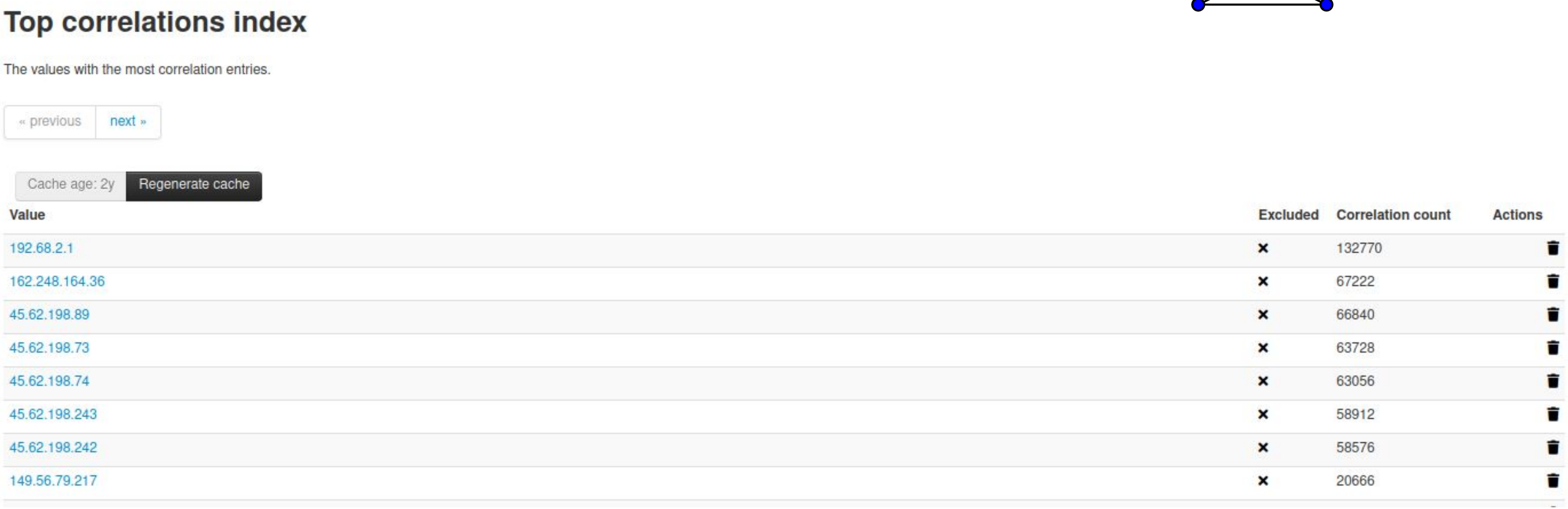
03 **SSDEEP Hash**

- Algorithm computing fuzzy-hashes
- 3:q8wK6FuFWcEqlv:3wK6FN1I,"stdin"
- ssdeep-1.1/cycles.c matches md5deep-1.12/cycles.c (94)
- Setting: MISP.ssdeep_correlation_threshold

Correlation in MISP

- Correctly clustering data is important
  - Use extended events if applicable
  - Split data per incident or based on time
- Be careful when configuring non-MISP feed





Top correlations index

The values with the most correlation entries.

Value	Excluded	Correlation count	Actions
192.68.2.1	×	132770	🗑
162.248.164.36	×	67222	🗑
45.62.198.89	×	66840	🗑
45.62.198.73	×	63728	🗑
45.62.198.74	×	63056	🗑
45.62.198.243	×	58912	🗑
45.62.198.242	×	58576	🗑
149.56.79.217	×	20666	🗑