

MISP GALAXY

CIRCL / TEAM MISP PROJECT

[HTTP://WWW.MISP-PROJECT.ORG/](http://www.misp-project.org/)
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MISP PROJECT



2022-09-16

MISP Galaxy

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MISP PROJECT



- MISP started out as a platform for technical indicator sharing
- The need for a way to describe threat actors, tools and other commonalities became more and more pressing
- **Taxonomies quickly became essential for classifying events**
- The weakness of the tagging approach is that it's not very descriptive
- We needed a way to attach **more complex structures to data**
- Also, with the different naming conventions for the same "thing" attribution was a mess
- This is where the Galaxy concept came in

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MISP Galaxy

└─ MISP Galaxies

MISP GALAXIES

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- This is where the Galaxy concept came in

- Pre-crafted galaxy "clusters" via GitHub project
- Attach them to an event and attribute(s)
- The main design principle was that these higher level informations are meant for human consumption
- This means flexibility - key value pairs, describe them dynamically
- Technical indicators remain strongly typed and validated, galaxies are loose key value lists

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└ Solution

SOLUTION

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- This means flexibility - key value pairs, describe them dynamically
- Technical indicators remain strongly typed and validated, galaxies are loose key value lists

- **Galaxy:** The type of data described (Threat actor, Tool, ...)
- **Cluster:** An individual instance of the galaxy (Sofacy, Turla, ...)
- **Element:** Key value pairs describing the cluster (Country: RU, Synonym: APT28, Fancy Bear)
- **Reference:** Referenced galaxy cluster (Such as a threat actor using a specific tool)

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└─ The galaxy object stack

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- **Exploit-Kit:** An enumeration of known exploitation kits used by adversaries
- **Microsoft activity group:** Adversary groups as defined by Microsoft
- **Preventive measure:** Potential preventive measures against threats
- **Ransomware:** List of known ransoms
- **TDS:** Traffic Direction System used by adversaries
- **Threat-Actor:** Known or estimated adversary groups
- **Tool:** Tools used by adversaries (from Malware to common tools)
- **MITRE ATT&CK:** Adversarial Tactics, Techniques, and Common Knowledge (ATT&CK™)

└ (some) Existing galaxies

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WHAT A CLUSTER LOOKS LIKE

Galaxies

Threat Actor 🔍

- Sofacy 🔍 🗃️ 🗃️

Description

The Sofacy Group (also known as APT28, Pawn Storm, Fancy Bear and Sednit) is a cyber espionage group believed to have ties to the Russian government. Likely operating since 2007, the group is known to target government, military, and security organizations. It has been characterized as an advanced persistent threat.

Synonyms

APT 28
APT28
Pawn Storm
Fancy Bear
Sednit
TzarTeam
TG-4127
Group-4127
STRONTIUM
Grey-Cloud

Source

MISP Project

Authors

Alexandre Dulaunoy
Florian Roth
Thomas Schreck
Timo Steffens
Various

Country

🇷🇺 RU

Refs

https://en.wikipedia.org/wiki/Sofacy_Group

Add new cluster

└─What a cluster looks like



- Internally simply using a taxonomy-like tag to attach them to events
- Example: `misp-galaxy:threat-actor="Sofacy"`
- **Synchronisation works out of the box** with older instances too. They will simply see the tags until they upgrade.
- Currently, as mentioned we rely on the community's contribution of galaxies

└ Attaching clusters to events

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- Example: `misp-galaxy:threat-actor="Sofacy"`
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└ Attaching clusters

■ Use a searchable synonym database to find what you're after

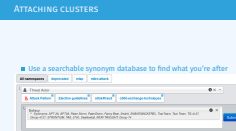
All namespaces **deprecated** **misp** **mitre-attack**

Threat Actor ⓘ ✕ ▾

& Attack Pattern ⓘ Election guidelines ⓘ attck4fraud ⓘ o365-exchange-techniques ⓘ

Sofacy ⓘ ✕ ▾
Synonyms: APT 28, APT28, Pawn Storm, PawnStorm, Fancy Bear, Sednit, SNAKEMACKEREL, TsarTeam, Tsar Team, TG-4127, Group-4127, STRONTIUM, TAG_0700, Swallowtail, IRON TWILIGHT, Group 74

Submit



- Creating galaxy clusters has to be straightforward to get the community to contribute
- Building on the prior success of the taxonomies and warninglists
- Simple JSON format in similar fashion
- Just drop the JSON in the proper directory and let MISP ingest it
- We always look forward to contributions to our galaxies repository

└─ Creating your own galaxy

- Creating galaxy clusters has to be straightforward to get the community to contribute
- Building on the prior success of the taxonomies and warninglists
- Simple JSON format in similar fashion
- Just drop the JSON in the proper directory and let MISP ingest it
- We always look forward to contributions to our galaxies repository

■ If you want to create a completely new galaxy instead of enriching an existing one

```
1 {  
2   "name" : "Threat Actor",  
3   "type" : "threat-actor",  
4   "description": "Threat actors are characteristics of malicious  
   actors (or adversaries) representing a cyber attack threat  
   including presumed intent and historically observed  
   behaviour.",  
5   "version": 1,  
6   "uuid": "698774c7-8022-42c4-917f-8d6e4f06ada3"  
7 }
```

```
■ If you want to create a completely new galaxy instead of  
enriching an existing one  
1 {  
2   "name" : "Threat Actor",  
3   "type" : "threat-actor",  
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   behaviour.",  
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7 }
```

- Clusters contain the meat of the data

- Skeleton structure as follows

```
1 {  
2   "values": [  
3     {  
4       "meta": {},  
5       "description": "",  
6       "value": "",  
7       "related_clusters": [{}],  
8     }  
9   ]  
10 }
```

└ Cluster JSON

- Clusters contain the meat of the data

- Skeleton structure as follows

```
1 {  
2   "values": [  
3     {  
4       "meta": {},  
5       "description": "",  
6       "value": "",  
7       "related_clusters": [{}],  
8     }  
9   ]  
10 }
```

CLUSTER JSON VALUE EXAMPLE

```
1 {
2   "meta": {
3     "synonyms": [
4       "APT 28", "APT28", "Pawn Storm", "Fancy Bear",
5       "Sednit", "TsarTeam", "TG-4127", "Group-4127",
6       "STRONTIUM", "Grey-Cloud"
7     ],
8     "country": "RU",
9     "refs": [
10      "https://en.wikipedia.org/wiki/Sofacy_Group"
11    ]
12  },
13  "description": "The Sofacy Group (also known as APT28,
14    Pawn Storm, Fancy Bear and Sednit) is a cyber
15    espionage group believed to have ties to the
16    Russian government. Likely operating since 2007,
17    the group is known to target government, military,
18    and security organizations. It has been
19    characterized as an advanced persistent threat.",
20  "value": "Sofacy"
21 }
```

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└ Cluster JSON value example

```
1 {
2   "meta": {
3     "synonyms": [
4       "APT 28", "APT28", "Pawn Storm", "Fancy Bear",
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14    Pawn Storm, Fancy Bear and Sednit) is a cyber
15    espionage group believed to have ties to the
16    Russian government. Likely operating since 2007,
17    the group is known to target government, military,
18    and security organizations. It has been
19    characterized as an advanced persistent threat.",
20  "value": "Sofacy"
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```

- Reusing existing values such as **complexity, effectiveness, country, possible_issues, colour, motive, impact, refs, synonyms, derivated_from, status, date, encryption, extensions, ransomnotes, cfr-suspected-victims, cfr-suspected-state-sponsor, cfr-type-of-incident, cfr-target-category, kill_chain.**
- Or adding your own meta fields.

└ meta best practices

- Reusing existing values such as **complexity, effectiveness, country, possible_issues, colour, motive, impact, refs, synonyms, derivated_from, status, date, encryption, extensions, ransomnotes, cfr-suspected-victims, cfr-suspected-state-sponsor, cfr-type-of-incident, cfr-target-category, kill_chain.**
- Or adding your own meta fields.

META BEST PRACTICES - A SAMPLE

```
1 {
2   "description": "Putter Panda were the subject of an
   extensive report by CrowdStrike, which stated: 'The
   CrowdStrike Intelligence team has been tracking this
   particular unit since2012, under the codename PUTTER
   PANDA, and has documented activity dating back to 2007.
   The report identifies Chen Ping, aka cpy, and the
   primary location of Unit 61486.'",
3   "meta": {
4     "cfr-suspected-state-sponsor": "China",
5     "cfr-suspected-victims": [
6       "U.S. satellite and aerospace sector"
7     ],
8     "cfr-target-category": [
9       "Private sector",
10      "Government"
11    ],
12    "cfr-type-of-incident": "Espionage",
13    "country": "CN",
14    "refs": [
15      "http://cdno.vox-cdn.com/assets/4589853/crowdstrike-
      intelligence-report-putter-panda.original.pdf",
16      "https://www.cfr.org/interactive/cyber-operations/putter-
      -panda"
```

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meta best practices - a sample

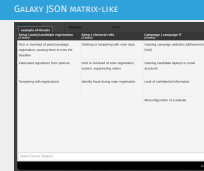
```
1 {
2   "description": "Putter Panda were the subject of an
   extensive report by CrowdStrike, which stated: 'The
   CrowdStrike Intelligence team has been tracking this
   particular unit since2012, under the codename PUTTER
   PANDA, and has documented activity dating back to 2007.
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16      "https://www.cfr.org/interactive/cyber-operations/putter-
      -panda"
```

GALAXY JSON MATRIX-LIKE

Propose Attribute	Analysis	Initial
example-of-threats Setup party/candidate registration (3 items)	Setup electoral rolls (3 items)	Campaign campaign IT (4 items)
DoS or overload of party/campaign registration, causing them to miss the deadline	Deleting or tampering with voter data	Hacking campaign websites (defacement, DoS)
Fabricated signatures from sponsor	DoS or overload of voter registration system, suppressing voters	Hacking candidate laptops or email accounts
Tampering with registrations	Identity fraud during voter registration	Leak of confidential information
		Misconfiguration of a website
<input type="text" value="Select Some Options"/>		

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Galaxy JSON matrix-like



```
1  {
2  "description": "Universal Development and Security Guidelines as
3  Applicable to Election Technology.",
4  "icon": "map",
5  "kill_chain_order": {           \\Tab in the matrix
6    "example-of-threats": [      \\Column in the matrix
7      "setup | party/candidate-registration",
8      "setup | electoral-rolls",
9      "campaign | campaign-IT",
10     "all-phases | government-IT",
11     "voting | election-technology",
12     "campaign/public-communication | media/press"
13   ]
14 },
15 "name": "Election guidelines",
16 "namespace": "misp",
17 "type": "guidelines",
18 "uuid": "c1dc03b2-89b3-42a5-9d41-782ef726435a",
19 "version": 1
}
```

└─ Galaxy JSON matrix-like

```
1  {
2  "description": "Universal Development and Security Guidelines as
3  Applicable to Election Technology.",
4  "icon": "map",
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17 "type": "guidelines",
18 "uuid": "c1dc03b2-89b3-42a5-9d41-782ef726435a",
19 "version": 1
}
```



```
1 {
2   "description": "DoS or overload of party/campaign
3     registration, causing them to miss the deadline",
4   "meta": {
5     "date": "March 2018.",
6     "kill_chain": [ \\Define in which column the cluster should be placed
7       "example-of-threats:setup | party/candidate-registration"
8     ],
9     "refs": [
10      "https://www.ria.ee/sites/default/files/content-editors/
11        kuberturve/cyber_security_of_election_technology.pdf"
12    ]
13  },
14  "uuid": "154c6186-a007-4460-a029-ea23163448fe",
15  "value": "DoS or overload of party/campaign registration,
16    causing them to miss the deadline"
17 }
```

Cluster JSON matrix-like

```
1 "description": "DoS or overload of party/campaign
2   registration, causing them to miss the deadline",
3 "meta": {
4   "date": "March 2018.",
5   "kill_chain": [ \\Define in which column the cluster should be placed
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8   "refs": [
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12 },
13 "uuid": "154c6186-a007-4460-a029-ea23163448fe",
14 "value": "DoS or overload of party/campaign registration,
15   causing them to miss the deadline"
16 }
```

- Cluster can be related to one or more clusters using default relationships from MISP objects and a list of tags to classify the relation.

```
1  "related": [  
2  {  
3    "dest-uuid": "5ce5392a-3a6c-4e07-9df3-9b6a9159ac45",  
4    "tags": [  
5      "estimative-language:likelihood-probability=\"likely  
6        \",  
7    "type": "similar"  
8  }  
9  ],  
10 "uuid": "0ca45163-e223-4167-b1af-f088ed14a93d",  
11 "value": "Putter Panda"
```

Expressing relation between clusters

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```
1  "related": [  
2  {  
3    "dest-uuid": "5ce5392a-3a6c-4e07-9df3-9b6a9159ac45",  
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8  }  
9  ],  
10 "uuid": "0ca45163-e223-4167-b1af-f088ed14a93d",  
11 "value": "Putter Panda"
```

```

from pymispgalaxies import Clusters
c = Clusters()
list(g.keys())
# ['threat-actor', 'ransomware', 'exploit-kit', 'tds', 'tool', 'rat', 'mitre-attack-pattern',
#  'mitre-tool', 'microsoft-activity-group', 'mitre-course-of-action', 'mitre-malware',
#  'mitre-intrusion-set', 'preventive-measure']
print(c.get("rat"))
# misp-galaxy:rat="Brat"
# misp-galaxy:rat="Loki RAT"
# misp-galaxy:rat="join.me"
# misp-galaxy:rat="Setro"
# misp-galaxy:rat="drat"
# misp-galaxy:rat="Plasma RAT"
# misp-galaxy:rat="NanoCore"
# misp-galaxy:rat="DarkTrack"
# misp-galaxy:rat="Theef"
# misp-galaxy:rat="Greame"
# misp-galaxy:rat="Nuclear RAT"
# misp-galaxy:rat="DameWare Mini Remote Control"
# misp-galaxy:rat="ProRat"
# misp-galaxy:rat="death"
# misp-galaxy:rat="Dark DDoSeR"
# ....
print(c.get("rat").description)
# remote administration tool or remote access tool (RAT), also called sometimes remote
# access trojan, is a piece of software or programming that allows a remote "operator"
# to control a system as if they have physical access to that system.
    
```

PyMISPGalaxies

```

New pymispgalaxies Import Clusters
c = Clusters()
MISP Galaxy()
# ['threat-actor', 'ransomware', 'exploit-kit', 'tds', 'tool', 'rat', 'mitre-attack-pattern',
#  'mitre-tool', 'microsoft-activity-group', 'mitre-course-of-action', 'mitre-malware',
#  'mitre-intrusion-set', 'preventive-measure']
pGalaxy.get("rat")
# misp-galaxy:rat="Brat"
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# misp-galaxy:rat="join.me"
# misp-galaxy:rat="Setro"
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# misp-galaxy:rat="Plasma RAT"
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pGalaxy.get("rat").description
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# access trojan, is a piece of software or programming that allows a remote "operator"
# to control a system as if they have physical access to that system.
    
```

- info@circl.lu (if you want to join the CIRCL MISP sharing community)
- OpenPGP fingerprint: 3B12 DCC2 82FA 2931 2F5B 709A 09E2 CD49 44E6 CBCD
- <https://github.com/MISP/> - <http://www.misp-project.org/>
- We welcome any contributions to the project, be it pull requests, ideas, github issues,...

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