# Fail frequently to avoid disaster

## or how to organically build a threat intel sharing standard

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MISP
Threat Sharing

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*TLP:WHITE*

Pass The Salt, Lille - 2018

*There was never a plan. There was just a series of mistakes.*

Robert Caro, journalist.

# What the hell is the MISP project?

- MISP[1] is a threat information sharing platform - free and open source software.
- MISP has **a host of functionalities** that assist users in creating, collaborating on, automating and sharing threat information - e.g. flexible sharing groups, **automatic correlation**, free-text import helper, event distribution and proposals.
- Many export formats which support IDSes / IPSes (e.g. Suricata, Bro, Snort), SIEMs (eg CEF), Host scanners (e.g. OpenIOC, STIX, STIX2, CSV, yara), analysis tools (e.g. Maltego), DNS policies (e.g. RPZ)
- The MISP project also includes collaborative common vocabularies such as taxonomies, galaxies (e.g. threat-actors or ATT&CK), common object templates and many sub-projects (more than 40 repositories and +300 contributors).

[1] https://github.com/MISP/MISP

# MISP project history

- Long history of usage - MISP **since 2012** open source and used by many organisations worldwide (inluding n/g CSIRT/CERTs, military organisations, intelligence organisation and private organisations).
- MISP Project is a community-based development lead by CIRCL for the past years
- CIRCL uses MISP for CERT activities (such as incident response, notification of constituency or sharing threat intelligence with sharing communities) actively practices **eating your own dog food**
- How do you "manage" the development of MISP?

# Model of "governance"

- Dictatorship instead of democracy (especially dishonest democracies)
- Gathering ideas, issues, use-cases, code from the community is key, listen to them but reserve the **right to veto**
  - Prevents malevolent community members from blocking the process/imposing tunnel-visioned ideas
- **Don't wait for the perfect implementation**, start small extend it later
- If the idea doesn't seem suitable for the above, shelf it as soon as possible

# The dangers of dishonest democracies

- Can easily become a pay to play governed body
  - **Having to pay for membership is a massive red flag**
  - Voluntary participation in meetings locks out smaller players that **can't afford full time dedicated people**
- Decision making processes still have to exist, though they often carry dangers
  - Process becoming too cumbersome if true consensus is sought
  - **Decision making restricted to those with more resources** to be constantly present for voting processes
  - Without dictatorship-like veto powers, malicious loud voices with often nefarious agendas have disproportional weight

# Our initial failures with democracies

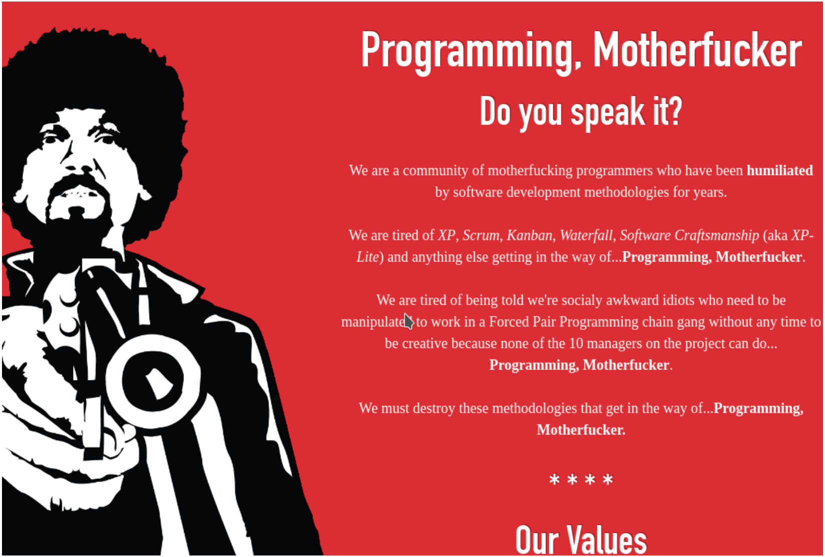
- **Caving to political pressure**
  - Several organisations fighting for MISP to not include context early on (2012-2013) as it wasn't their use-case
  - Took us until 2014-2015 to recover from the set-back
  - Fun fact: Since then the users mostly resistant to the inclusion of these features are heavy users of said features
- **Accepting bad ideas "as is" from organisations to be more inclusive**
  - Even insignificant modifications will hurt the integrity and conventions of your tooling / format
  - The impact might not reveal itself until years down the road
- Why in the end it was helpful for us: It revealed early on that this model isn't for us.

# Why standardise at all?

- More and more requests from **other tools/vendors to integrate with MISP**
  - Complaints about having to go through a jungle of PHP or Python code to figure out how to do it
- Validation from 3rd parties on the format and overall design
- Describing the scope of the native MISP formats
- Help other projects use a sane and broad exchange - and most importantly, adaptable set of standards

# Development process based on failures

- All ideas need **real-world and practical validation**
- Be willing to throw away features that "sure seemed like a good idea at the time"
- Fail as early as possible (and be proud of your failures)
- Failures can often be used to pinpoint better alternatives
- Format follows the implementation (**code is law**)



# Programming, Motherfucker

## Do you speak it?

We are a community of motherfucking programmers who have been **humiliated** by software development methodologies for years.

We are tired of *XP*, *Scrum*, *Kanban*, *Waterfall*, *Software Craftsmanship* (aka *XP-Lite*) and anything else getting in the way of...**Programming, Motherfucker**.

We are tired of being told we're socialy awkward idiots who need to be manipulated to work in a Forced Pair Programming chain gang without any time to be creative because none of the 10 managers on the project can do... **Programming, Motherfucker**.

We must destroy these methodologies that get in the way of...**Programming, Motherfucker.**

* * * *

## Our Values

[2]

[2] https://github.com/adulau/pmf/blob/master/raw.md.txt Programming Methodology Framework aka PMF

# Staying with theoretical models for too long...

- The same mistakes will be made anyway
- **Piling mistakes on shaky foundations** will be more difficult to undo later
  - Technical reasons (inheritance of the *crap*)
  - Sunk cost fallacy *mistakes seen as failure with any suggestion to rectify it being taboo*
- We generally had two main design goals when it comes to the format:
  - **Design the format, in a way, to be as simple as possible** to be able to map whatever information we want to convey
  - Every field, every setting, every relation that doesn't have an immediately useful use is a **failure**
  - Enhance the format when it's needed instead of planning ahead - **code is law**

# Piling mistakes on shaky foundations (another view)

## Scoping the format

- One of the most challenging tasks is having a **clear scope** and a unified vision on what problems we intend to solve
- This can be fluid over time, but the format should stay coherent at any specific point in time with the other components
- Our guiding principle as **a sharing format was to keep complexity levels at a minimum but cover a large spectrum of use-cases**
- We are firm believers that our multi-purpose nature will hinder us at ever being as good at specialised tasks as the relevant specialised formats in the field (Suricata, Bro, Snort, Yara, Sigma or Gene)
- Don't be oblivious to other developments. Being a "follower" and aligning yourself is not a sign of weakness but rather one of being co-operative.

# Designing a standard with sharing in mind (an organic approach)

- The original sharing aspects of the MISP format (in 2011) were quite limited (private flag)
  - If I want to keep it within my organisation, simply set the flag
  - If not set any organisation can see it on the MISP instance
- Utterly simplistic, only worked on communities using a hosted MISP
- **Not known practical cyber security sharing models** known at that time

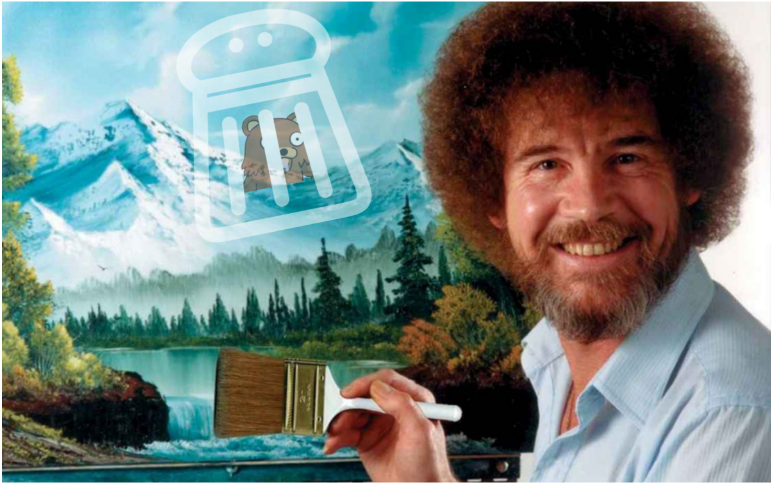
# Designing a standard with sharing in mind (an organic approach)

- The second step of sharing (in late 2012) based on feedback from the previous iteration
- Needed to be extended once communities started self-hosting MISP **to be able to control the distance of the data-flow**
- Distribution levels
  - Organisation only (private)
  - Community
  - Connected community
  - All

# Designing a standard with sharing in mind (going all out)

- Still not covering all use-cases, certain types of users wanting more granularity
- **Extending the current sharing models with a mixed sharing model** via sharing groups (in 2015)
  - Sharing groups (distribution lists)
  - Complex system for persistent and special ad-hoc use-cases (e.g. short-term information exchange)
- Next step: Multiple sharing groups/nested sharing groups

# A little bit about human creativity...



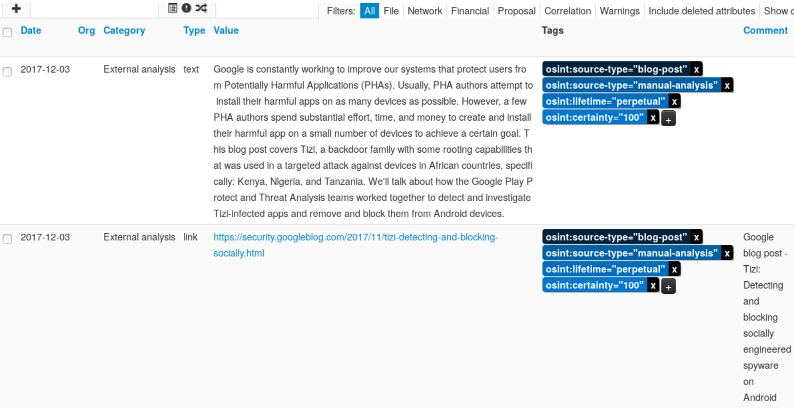
# The great failure of free-text tagging

- **Humans can be very creative** especially when they have a playground
- Free-text tagging was a nifty feature in early version of MISP but we underestimated the creativity of the human mind
- "TLP AMBER", "TLPAMBER", "TLP-amber", "TLP:AMBER", "TLP=AMBER" and "TLP/AMBER", "tlp:amber"
- Classifications must be globally used to be efficient. In November 2015, we designed a complete taxonomy system to initially support TLP
- As of Today, we have **more than 40 taxonomies**[3] (from markings, classification taxonomies or even crowdsourced support to allow collaborative analysis)

[3] https://www.misp-project.org/taxonomies.html

# Taxonomy

- It solved the "creativity issue" but we were only allowing tagging at event level. Attribute level tagging was then introduced in 2016.



+ Filters: All File Network Financial Proposal Correlation Warnings Include deleted attributes Show c

| ☐ | Date | Org | Category | Type | Value | Tags | Comment |
|---|---|---|---|---|---|---|---|
| ☐ | 2017-12-03 | | External analysis | text | Google is constantly working to improve our systems that protect users from Potentially Harmful Applications (PHAs). Usually, PHA authors attempt to install their harmful apps on as many devices as possible. However, a few PHA authors spend substantial effort, time, and money to create and install their harmful app on a small number of devices to achieve a certain goal. This blog post covers Tizi, a backdoor family with some rooting capabilities that was used in a targeted attack against devices in African countries, specifically: Kenya, Nigeria, and Tanzania. We'll talk about how the Google Play Protect and Threat Analysis teams worked together to detect and investigate Tizi-infected apps and remove and block them from Android devices. | osint:source-type="blog-post"<br>osint:source-type="manual-analysis"<br>osint:lifetime="perpetual"<br>osint:certainty="100" | |
| ☐ | 2017-12-03 | | External analysis | link | https://security.googleblog.com/2017/11/tizi-detecting-and-blocking-socially.html | osint:source-type="blog-post"<br>osint:source-type="manual-analysis"<br>osint:lifetime="perpetual"<br>osint:certainty="100" | Google blog post - Tizi: Detecting and blocking socially engineered spyware on Android |

# Ongoing effort to standardise MISP

- IETF draft document for the MISP core format
- IETF draft documents for the MISP supporting formats
  - Ensuring a separation between the core format and the **extensible and reusable** formats such as taxonomies, galaxies, warninglists and objects.
- Available at `https://github.com/MISP/misp-rfc`
- The standard documents are written from the software implementation in MISP (in other words, we don't like committee meeting).

# A list of the currently described MISP formats

- MISP core format: basically the exchange format of MISP (Events, Attributes, Objects, Tags, Sharing Groups, Proposals...)
- MISP JSON formats:
    - MISP taxonomies
    - MISP galaxies
    - MISP warninglists
    - MISP object-templates

# The MISP core format

- Describes the format used to exchange information between MISP instances
- Includes descriptions of all structures that get exchanged between MISPs
  - Events
  - Objects, Object References
  - Attributes, Proposals
  - Tags, Galaxies
  - Organisations

# The MISP taxonomy, galaxy and warninglist formats

- Describes the formats used to create the JSON structures for the respective objects
- Due to the wealth of categorisation/contextual information, used by more and more organisations even outside of MISP (such as Alienvault OTX)
- The standards aim to make life for content creators easier
- Unlike technical information meant for machine ingestion, higher level threat intelligence structure aimed at human analysts can be much more lax in terms of structure
- The format uses a **freely definable key-value store system** to describe data not directly foreseen in the format itself

# The MISP object template format

- Since the release of MISP objects, users have started building their own object templates
- These templates are then used to create individual objects based on the pre-defined patterns
- Also includes a vocabulary containing the default relationships to be used for object references and soon galaxy referenced

*Theory and practice sometimes clash. And when that happens, theory loses. Every single time.*

Linus Torvalds

# Q&A

- 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://www.circl.lu/services/misp-malware-information-sharing-platform/`
- `https://github.com/MISP/` - `https://www.misp-project.org/`