MISP workshop

Introduction into Information Sharing using MISP for CSIRTs

CIRCL
Computer Incident
Response Center
Luxembourg

Team CIRCL

TLP:WHITE

Univ. Lorraine

20181124

Plan for this session

- Explanation of the CSIRT use case for information sharing and what CIRCL does
- Building an information sharing community and best practices

Communities operated by CIRCL

- As a CSIRT, CIRCL operates a wide range of communities
- We use it as an **internal tool** to cover various day-to-day activities
- Whilst being the main driving force behind the development, we're also one of the largest consumers
- Different communities have different needs and restrictions

Communities operated by CIRCL

- Private sector community
  - Our largest sharing community
  - Over **900 organisations**
  - **2000 users**
  - Functions as a central hub for a lot of sharing communities
  - Private organisations, Researchers, Various SoCs, some CSIRTs, etc
- CSIRT community
  - Tighter community
  - National CSIRTs, connections to international organisations, etc

Communities operated by CIRCL

- Financial sector community
  - Banks, payment processors, etc.
  - Sharing of **mule accounts** and **non-cyber threat infomartion**
- X-ISAC
  - **Bridging the gap** between the various sectorial and georgraphical ISACs
  - New, but ambitious initiative
  - Goal is to **bootstrap the cross-sectorial sharing** along with building the infrastructure to enable sharing when needed

Communities operated by CIRCL

- Coming up - the ATT&CK EU community
  - Work on attacker modelling
  - With the assistance of Mitre themselves
  - Unique opportunity to **standardise on TTPs**
  - Looking for organisations that want to get involved!

Communities supported by CIRCL

- FIRST.org's MISP community
- Telecom and Mobile operators' community
- Various ad-hoc communities for exercises for example
  - Most recently for example for the ENISA exercise a few weeks ago

Sharing Scenarios in MISP

- Sharing can happen for **many different reasons**. Let's see what we believe are the typical CSIRT scenarios
- We can generally split these activities into 4 main groups when we're talking about traditional CSIRT tasks:
  - Core services
  - Proactive services
  - Advanced services
  - Sharing communities managed by CSIRTs for various tasks

CSIRT core services

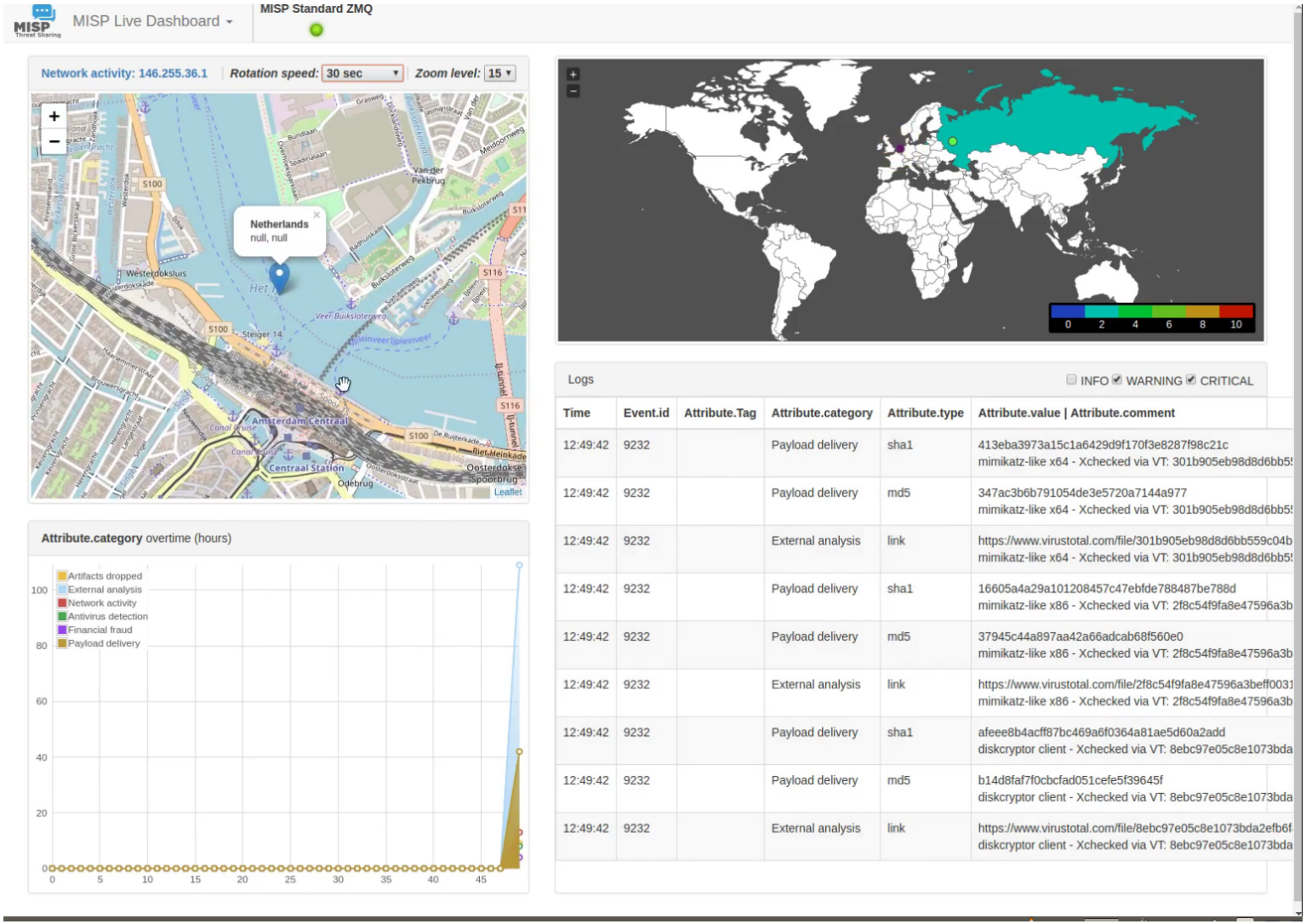
- Incident response
  - **Internal storage** of incident response data
  - Sharing of indicators **derived from incident response**
  - **Correlating data** derived and using the built in analysis tools
  - **Enrichment** services
  - **Collaboration** with affected parties via MISP during IR
  - **Co-ordination** and collaboration
  - **Takedown** requests
- Alerting of information leaks (integration with **AIL**[1])

[1] https://github.com/CIRCL/AIL-framework

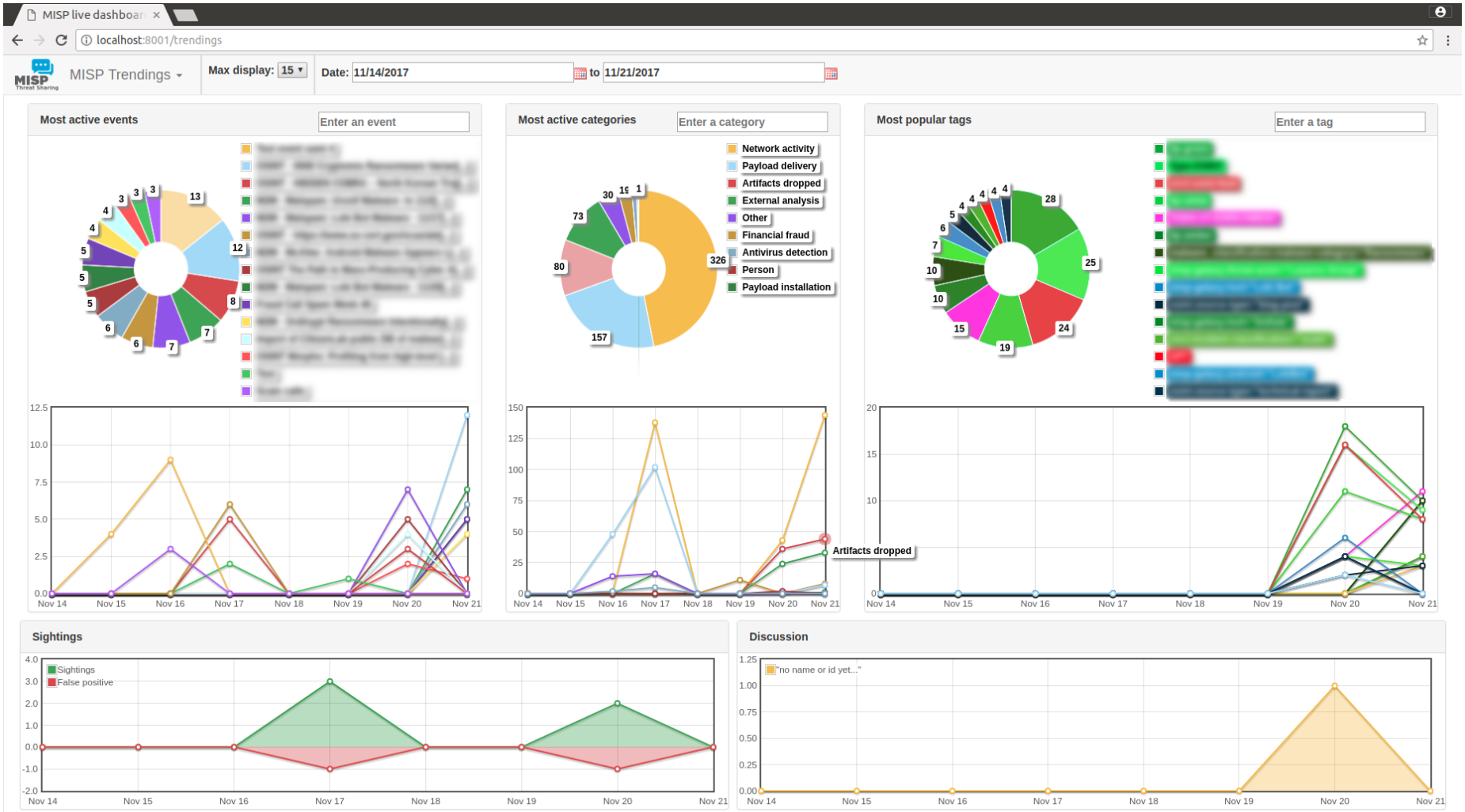
CSIRT proactive services

- **Contextualising** both internal and external data
- **Collection** and **dissimination** of data from various sources (including OSINT)
- Storing, correlating and sharing own manual research (**reversing, behavioural analysis**)
- Aggregating automated collection (**sandboxing, honeypots, spamtraps, sensors**)
  - MISP allows for the creation of **internal MISP "clouds"**
  - Store **large specialised datasets** (for example honeypot data)
  - MISP has **interactions with** a large set of such **tools** (Cuckoo, Mail2MISP, etc)
- **Situational awareness** tools to monitor trends and adversary TTPs within my sector/geographical region (MISP-dashboard, built in statistics)

CSIRT proactive services - MISP dashboard



CSIRT proactive services - MISP dashboard



CSIRT advanced services

- Supporting **forensic analysts**
- Collaboration with **law enforcement**
- **Vulnerability** information sharing
  - **Notifications** to the constituency about relevant vulnerabilities
  - **Co-ordinating** with vendors for notifications (*)
  - Internal / closed community sharing of pentest results
  - We're planning on starting a series of hackathons to find

CSIRTs' management of sharing communities for constituent actions:

- **Reporting** non-identifying information about incidents (such as outlined in NISD)
- **Seeking** and engaging in **collaboration** with CSIRT or other parties during an incident
- Pre-sharing information to **request for help** / additional information from the community
- **Pseudo-anonymised sharing** through 3rd parties to **avoid attribution** of a potential target
- Building processes for **other types of sharing** to get the community engaged and acquainted with the methodologies of sharing (mule account information, border control, etc)

A quick note on compliance...

- Collaboration with Deloitte as part of a CEF project for creating compliance documents
  - Information sharing and cooperation **enabled by GDPR**
  - How MISP enables stakeholders identified by the **NISD** to perform key activities
  - **AIL** and MISP
- For more information: https://github.com/CIRCL/compliance

Bringing different sharing communities together

- We generally all **end up sharing with peers that face similar threats**
- Division is either **sectorial or geographical**
- So why even bother with trying to bridge these communities?

Advantages of cross sectorial sharing

- **Reuse of TTPs** across sectors
- Being hit by something that **another sector has faced before**
- **Hybrid threats** - how seemingly unrelated things may be interesting to correlate
- Prepare other communities for the capability and **culture of sharing** for when the need arises for them to reach out to CSIRT
- Generally our field is ahead of several other sectors when it comes to information sharing, might as well **spread the love**

Getting started with building your own sharing community

- Starting a sharing community is **both easy and difficult** at the same time
- Many moving parts and most importantly, you'll be dealing with a diverse group of people
- Understanding and working with your constituents to help them face their challenges is key

Getting started with building your own sharing community

- When you are starting out - you are in a unique position to drive the community and set best practices...

Running a sharing community using MISP - How to get going?

- Different models for constituents
  - Connecting to a MISP instance hosted by a CSIRT
  - Hosting their own instance and connecting to CSIRT's MISP
  - Becoming member of a sectorial MISP community that is connected to CSIRT's community
- Planning ahead for future growth
  - Estimating requirements
  - Deciding early on common vocabularies
  - Offering services through MISP

Rely on our instincts to immitate over expecting adherence to rules

- Lead by example - the power of immitation
- Encourage improving by doing instead of blocking sharing with unrealistic quality controls
  - What should the information look like?
  - How should it be contextualise
  - What do you consider as useful information?
  - What tools did you use to get your conclusions?
- Side effect is that you will end up raising the capabilities of your constituents

What counts as valuable data?

- Sharing comes in many shapes and sizes
  - Sharing results / reports is the classical example
  - Sharing enhancements to existing data
  - Validating data / flagging false positives
  - Asking for support from the community
- Embrace all of them. Even the ones that don't do either, you'll never know when they change their minds...

How to deal with organisations that only "leech"?

- From our own communities, only about 30% of the organisations actively share data
- We have come across some communities with sharing requirements
- In our experience, this sets you up for failure because:
  - Organisations will lose protection who would possibly benefit the most from it
  - Organisations that want to stay above the thresholds will start sharing junk / fake data
  - You lose organisations that might turn into valuable contributors in the future

So how does one convert the passive organisations into actively sharing ones?

- Rely on organic growth
- Help them increase their capabilities
- As mentioned before, lead by example
- Rely on the inherent value to one's self when sharing information (validation, enrichments, correlations)
- Give credit where credit is due, never steal the accolades of your community (that is incredibly demotivating)

Dispelling the myths around blockers when it comes to information sharing

- Sharing difficulties are not really technical issues but often it's a matter of **social interactions** (e.g. **trust**).
  - You can play a role here: organise regular workshops, conferences, have face to face meetings
- Legal restrictions
  - "Our legal framework doesn't allow us to share information."
  - "Risk of information leak is too high and it's too risky for our organization or partners."
- Practical restrictions
  - "We don't have information to share."
  - "We don't have time to process or contribute indicators."
  - "Our model of classification doesn't fit your model."
  - "Tools for sharing information are tied to a specific format, we use a different one."

Contextualising the information

- Sharing technical information is a great start
- However, to truly create valueable information for your community, always consider the context:
  - Your IDS might not care why it should alert on a rule
  - But your analysts will be interested in the threat landscape and the "big picture"
- Classify data to make sure your partners understand why it is important for them
- Massively important once an organisation has the maturity to filter the most critical subsets of information for their own defense

Choice of vocabularies

- MISP has a verify versatile system (taxonomies) for classifying and marking data
- However, this includes different vocabularies with obvious overlaps
- MISP allows you to pick and choose vocabularies to use and enforce in a community
- Good idea to start with this process early
- If you don't find what you're looking for:
  - Create your own (JSON format, no coding skills required)
  - If it makes sense, share it with us via a pull request for redistribution

Shared libraries of meta-information (Galaxies)

- The MISPProject in co-operation with partners provides a curated list of galaxy information
- Can include information packages of different types, for example:
  - Threat actor information
  - Specialised information such as Ransomware, Exploit kits, etc
  - Methodology information such as preventative actions
  - Classification systems for methodologies used by adversaries - ATT&CK
- Consider improving the default libraries or contributing your own (simple JSON format)
- If there is something you cannot share, run your own galaxies and share it out of bound with partners
- Pull requests are always welcome

False-positive handling

- You might often fall into the trap of discarding seemingly "junk" data
- Besides volume limitations (which are absolutely valid, fear of false-positives is the most common reason why people discard data) - Our recommendation:
  - Be lenient when considering what to keep
  - Be strict when you are feeding tools
- MISP allows you to filter out the relevant data on demand when feeding protective tools
- What may seem like junk to you may be absolutely critical to other users

Many objectives from different user-groups

- Sharing indicators for a **detection** matter.
  - 'Do I have infected systems in my infrastructure or the ones I operate?'
- Sharing indicators to **block**.
  - 'I use these attributes to block, sinkhole or divert traffic.'
- Sharing indicators to **perform intelligence**.
  - 'Gathering information about campaigns and attacks. Are they related? Who is targeting me? Who are the adversaries?'
- $\rightarrow$ These objectives can be conflicting (e.g. False-positives have different impacts)

False-positive handling

- Analysts will often be interested in the modus operandi of threat actors over long periods of time
- Even cleaned up infected hosts might become interesting again (embedded in code, recurring reuse)
- Use the tools provided to eliminate obvious false positives instead and limit your data-set to the most relevant sets

Warning: Potential false positives

List of known IPv4 public DNS resolvers

Managing sub-communities

- Often within a community smaller bubbles of information sharing will form
- For example: Within a national private sector sharing community, specific community for financial institutions
- Sharing groups serve this purpose mainly
- As a CSIRT running a national community, consider bootstraping these sharing communities
- Organisations can of course self-organise, but you are the ones with the know-how to get them started

Managing sub-communities

- Consider compartmentalisation - does it make sense to move a secret squirrel club to their own sharing hub to avoid accidental leaks?
- Use your best judgement to decide which communities should be separated from one another
- Create sharing hubs with manual data transfer
- Some organisations will even have their data air-gapped - Feed system
- Create guidance on what should be shared outside of their bubbles - organisations often lack the insight / experience to decide how to get going. Take the initiative!

Get in touch if you need some help to get started

- Getting started with building a new community can be daunting. Feel free to get in touch with us if you have any questions!
- Contact: info@circl.lu
- `https://www.circl.lu/`
- `https://github.com/MISP` - `https://gitter.im/MISP/MISP` - `https://twitter.com/MISPProject`