

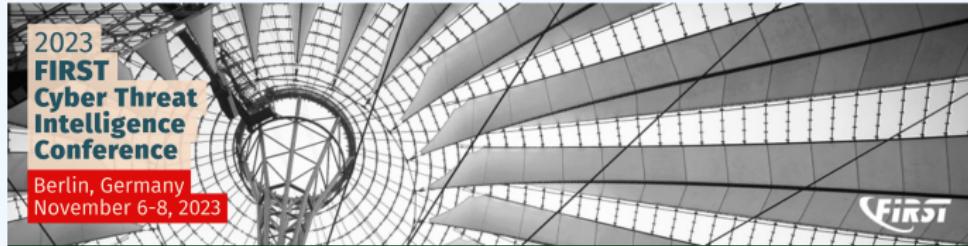
# MISP 3 - Teaching an Old Dog New Tricks

Paving the way forward

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MISP Project

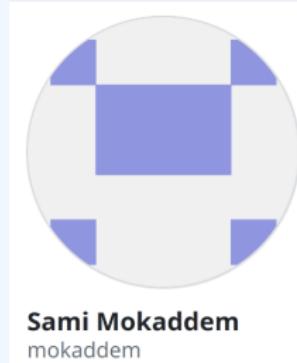
<https://www.misp-project.org/>





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# AGENDA



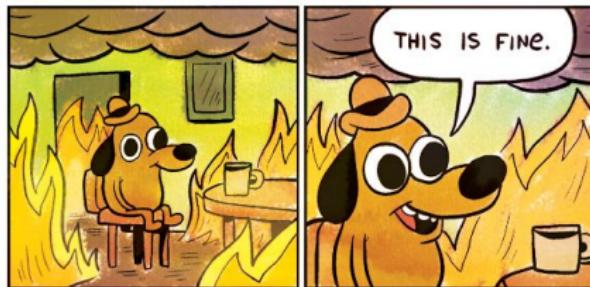
- Why MISP 3?
- The plan
- Considerations

# WHY MISP 3?

## > AN OUTDATED VERSION OF THE FRAMEWORK



- MISP is based on CakePHP 2.x
  - ▶ End of Security Support in **June 2021**
  - ▶ Maintained fork [github.com:MISP/cakephp.git](https://github.com/MISP/cakephp.git)
- CakePHP supports PHP version **<=7.4**
  - ▶ End of Security Support in **November 2022**



# > TACKED ON MECHANICS

- MISP supports a wide range of use cases...
- ... meaning loads of feature-clutter the interface
- All options visible regardless of the user profile
- Lack of coherent page navigation



The screenshot shows the MISP web application interface. At the top, there is a horizontal navigation bar with links: Home, Event Actions, Dashboard, Galaxies, Input Filters, Global Actions (which is currently selected and highlighted in black), Sync Actions, Administration, Logs, and API. Below the navigation bar, on the left, is a sidebar with a tree view of categories like General, Events, Decaying Models, User Guide, and Help. The main content area displays a list of 'Events' with various details and icons. A vertical dropdown menu is open under the 'Global Actions' tab, listing numerous options such as News, My Profile, My Settings, Set Setting, Organisations, Role Permissions, List Object Templates, List Sharing Groups, Add Sharing Group, List Sharing Groups Blueprints, Add Sharing Group Blueprint, Decaying Models Tool, List Decaying Model, User Guide, Categories & Types, Terms & Conditions, Statistics, List Discussions, and Start Discussion.

## > SHORTCOMINGS DUE TO INITIAL DESIGN CHOICES

To list a few..

- Sub-optimal database structure
- Start with something small, build it out has its disadvantages
  - ▶ Attribute type, value not a first-class citizen
  - ▶ Logs all in one place
  - ▶ Indexing rework (performance and moving validation to the DB)
- Confusing mess of multiple graphing interfaces
- Files - Especially tricky with dockerised and load balanced setups
- Tagging



## > THE ONGOING PLAN FORWARD

- Port of the codebase to a new stack
  - ▶ CakePHP 2.x → CakePHP 5
- Rework of old baggage
  - ▶ Database updates
  - ▶ Front-end libraries (Bootstrap, Graphing, ...)
  - ▶ Background jobs & Scheduled tasks
  - ▶ Purging old libraries

## > PRUNING UNUSED / DEAD END FUNCTIONALITIES

- Populate using the templating system
- Deprecated export functionalities
- Discussion / Posts
- ...



# **STEP I - PREPARING THE GROUNDS**

## STEP I - PREPARING THE GROUNDS

Refactoring the codebase for improved portability using factories

- Framework-agnostic
- Reusable code for front and back-end
- Extracting and encapsulating specialised functionalities into libraries

# STEP I - PREPARING THE GROUNDS

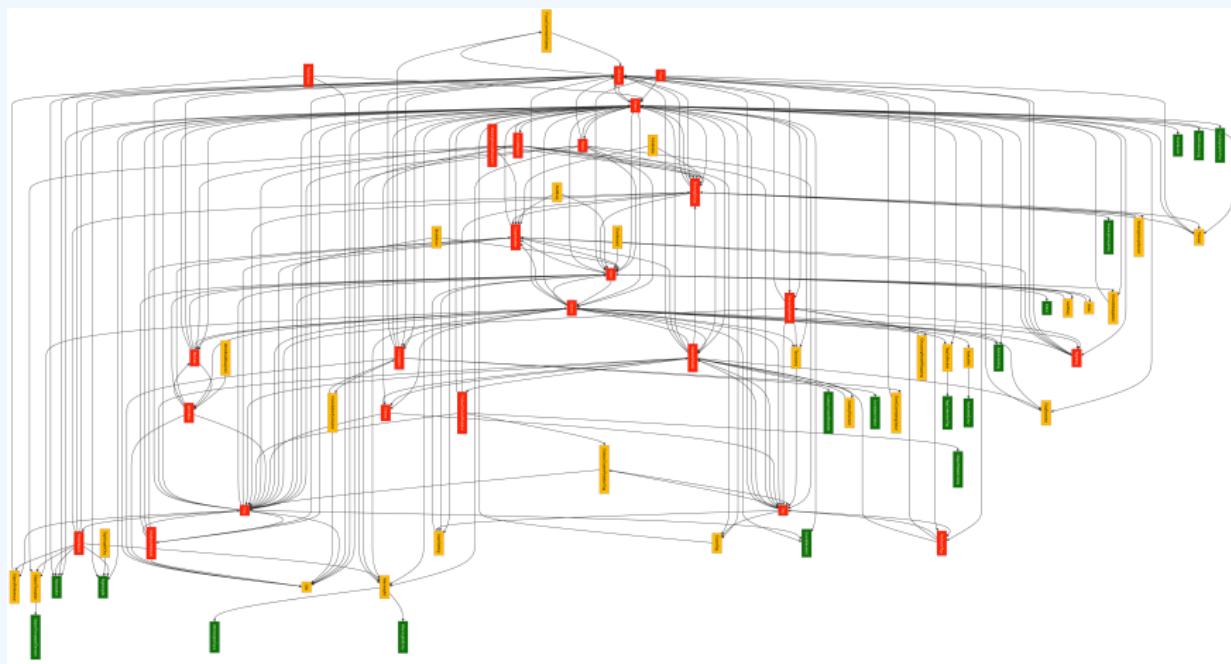


## Setting the stage with Cerebrate

- Dev started in May 2020, built on MISP3's stack
- Application built on top of ported MISP libraries
- New UI laying the foundation for MISP 3
- Streamlined integration of new features into MISP3
  - ▶ Tagging, Inbox system, Settings, ...

# STEP I - IDENTIFYING INTER-DEPENDENCIES

Migrate least connected part first



# **STEP II - PORTING THE CODEBASE**

# > STEP II - ROADMAP FOR A 3-WAVE PORTING

⌚ MISP 3.x

Task list Progress board Timeline + New View

Filter by keyword or by field

⌚ Todo 9  
This item hasn't been started

- MISP #8881 TagCollectionTag
- MISP #8885 Inbox
- MISP #8886 ObjectRelationship
- MISP #8887 NotificationLog
- MISP #8890 GalaxyClusterBlocklist
- MISP #8891 EventLock
- MISP #8892 EventBlocklist

⌚ In Progress 1  
This is actively being worked on

- MISP #8882 Sightingdb

⌚ Done 8  
This has been completed

- MISP #8879 AdminSettings
- MISP #8880 WarninglistEntry
- MISP #8883 SharingGroups
- MISP #8884 ObjectTemplates
- MISP #8888 Noticelists
- MISP #8889 AllowedList
- MISP #8893 CryptographicKey
- MISP #9209 Authkeys

## > STEP II - ROADMAP FOR A 3-WAVE PORTING

**Wave 1** Least complex/inter-connected models

- ▶ E.g. Blocklist, Warninglist, Object-template, User

**Wave 2** More glue relying on component already migrated

- ▶ E.g. Authkey, \*-Tag, Taxonomy

**Wave 3** The actual meat of the application

- ▶ E.g. Attribute, Event, Workflow

## > STEP II - TEST DRIVEN DEVELOPMENT

```
$ composer test
> sh ./tests/Helper/wiremock/start.sh
WireMock 1 started on port 8080
> phpunit
[ * ] Running DB migrations, it may take some time ...

The WireMock server is started .....
port:                      8080
enable-browser-proxying:   false
disable-banner:            true
no-request-journal:       false
verbose:                   false

PHPUnit 8.5.22 by Sebastian Bergmann and contributors.
```



- Complementary to PyMISP test
- In-framework **Unit Tests** and **Endpoint Tests**
- Improved CI pipeline and enforced code standard

# > CODEBASE MIGRATION: WHERE WE STAND I

Migration officially started in January 2023

The screenshot shows a GitHub commit history for a repository. At the top, there are summary statistics: 333 commits, 2,467 files changed, and 5 contributors. Below this, a specific commit is highlighted:

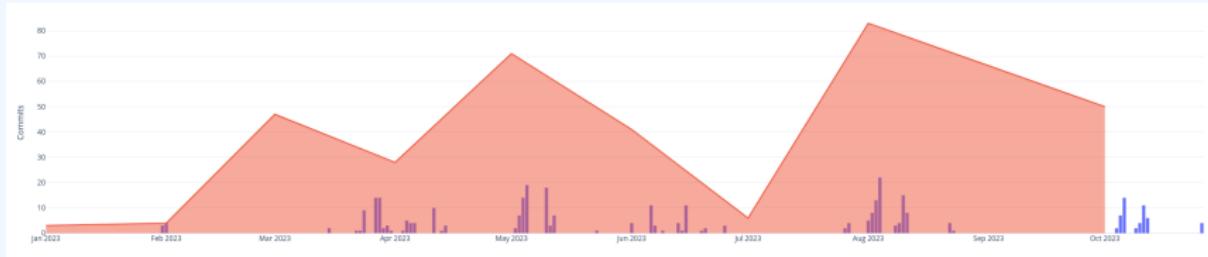
**new: [3.x] initial skeleton added** ...  
iglokska committed on Jan 31

This commit is marked as **Verified**. To the right of the commit message are buttons for copy, commit ID (35932db), and refresh. The commit message itself includes a link to the commit details.

- Around **27 tables** have been moved
- Some partially, others completely

Name	Last commit message	Last commit date
...		
<code>billingHeaders</code>	No depreciation notices	7 months ago
<code>glueApp</code>	new [3.x] initial skeleton added	10 months ago
<code>adminCategories.php</code>	New migration AdminCategory model moved	10 months ago
<code>adminCategoriesTable.php</code>	Drop renamed table for consistency	8 months ago
<code>AppTables.php</code>	No merge conflicts	3 months ago
<code>AvatarLogTable.php</code>	New [3.x] initial skeleton added	10 months ago
<code>AvatarTable.php</code>	Add app tests	4 months ago
<code>CryptographicKeyTable.php</code>	No use -remove(dlg)	3 months ago
<code>EventBuddyListTable.php</code>	No cs	3 months ago
<code>EventTable.php</code>	Add basic crud app tests for sharing groups	5 months ago
<code>InvitationTable.php</code>	Add basic user tests, remove contribute part code from ...	7 months ago
<code>JobsTable.php</code>	Drop reference to use migration	last month
<code>LogsTable.php</code>	Add migrate command to test jobs	last month
<code>InvitationAnswersTable.php</code>	Add post notifications	3 months ago
<code>Individuals.php</code>	No cs	3 months ago
<code>ObjectCategoriesTable.php</code>	No properly/valid requirements	3 months ago
<code>ObjectCategoriesVersionTable.php</code>	New: migrate object template	3 months ago
<code>ObjectCategoriesTable.php</code>	No parsing poor values	3 months ago
<code>OrganizationsTable.php</code>	Add more tests, No bugs	5 months ago
<code>AvatarTable.php</code>	New [3.x] initial skeleton added	10 months ago
<code>ServerTable.php</code>	Drop reference to use migration	last month
<code>UserLogTable.php</code>	No merge conflicts	3 months ago
<code>UserLogTimestampTable.php</code>	No merge conflicts	3 months ago
<code>UserLogTimestampTable.php</code>	No merge conflicts	3 months ago
<code>SignatureTable.php</code>	No use -remove(dlg) instead of constructor	8 months ago
<code>TagCollectorLogTable.php</code>	Drop TagCollector models added	8 months ago
<code>UsersTable.php</code>	Drop TagCollector model added	8 months ago
<code>WarmingElementTable.php</code>	Add (empty) post of SonarCloud tool and related docker adjustments	last month
	New [user/reorg] entry] migration - first revision. Fixes #1000	8 months ago

## > CODEBASE MIGRATION: WHERE WE STAND II



- Migration speed ramping up. The more we port, the faster we go

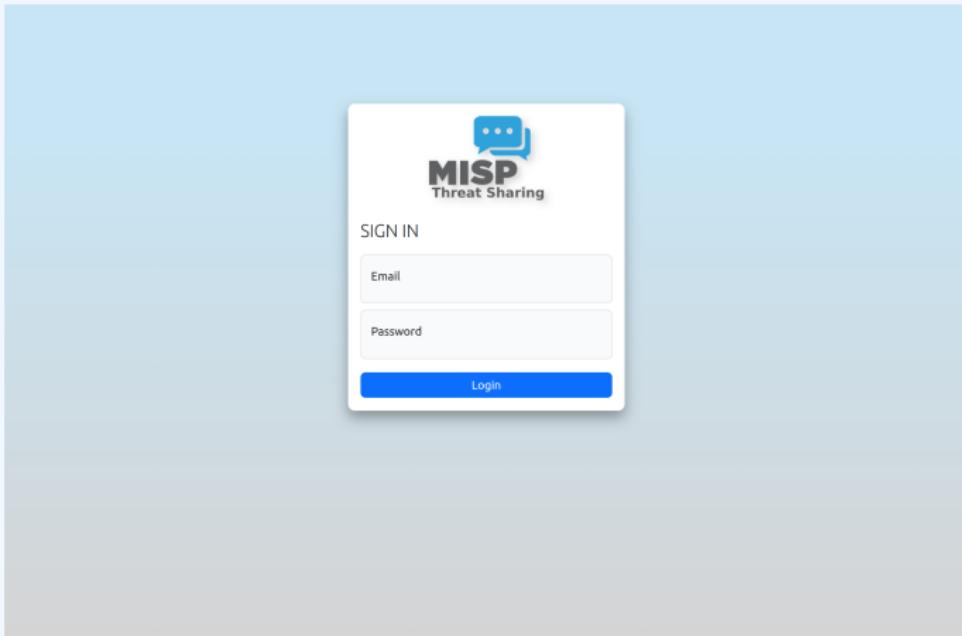
This branch is 333 commits ahead, 914 commits behind 2.4.

- Even while supporting and improving 2.4

# **LOOK AND FEEL**

# CODEBASE MIGRATION: LOOK AND FEEL I

- Most of the changes are **invisible**
- Some user interfaces can still be displayed



# CODEBASE MIGRATION: LOOK AND FEEL II

MISP

Organisations index

Contact Organisation

Organisation Index<sup>1</sup>

Nationalities: 

Sectors: No data

Previous Next

+ Add organisation All Local orgs External orgs Country: Luxembourg

#	Name	UUID	Members	URL	Nationality	Sector	Type	Actions
1	ORGNAME	7e9251cb-3b15-417a-9e92-e508479c5b4d	2		Luxembourg		ADMIN	  
2	CERT-FR_1510	56bdff779-46f9-4353-bd99-2bb95bce2212	0		France			 

Page 1 of 1, showing 2 organisations out of 2 total, starting on record 1, ending on 2

Previous Next

17

# CODEBASE MIGRATION: LOOK AND FEEL II

MISP

Organisations index > ORGNAME

Search MISP...

**Organisation View**

ID	1
Name	ORGNAME
UUID	7e0251cb-3b15-417a-9e92-a508479c5b4d
URL	
Nationality	Luxembourg
Sector	
Type	ADMIN
Contacts	

[Users](#)

User index<sup>1</sup>

Previous Next

[+ Add User](#) [All](#) [Active](#) [Disabled](#) [Roles](#)  [Search](#) [Actions](#)

<input type="checkbox"/>	ID	Org	Role	Email					Last Login	Created						
<input type="checkbox"/>	1	ORGNAME	admin	admin@admin.test					4000000	2023-03-08 07:15:14						
<input type="checkbox"/>	2	ORGNAME	Syncuser	sync@admin.test					3367861	✓ 0	2022-03-17 10:19:40					

Page 1 of 1, showing 2 users out of 2 total, starting on record 1, ending on 2

Previous Next

# CODEBASE MIGRATION: LOOK AND FEEL II

MISP

Users Index > admin@admin.test

Search MISP...

[View](#) [Edit](#) [Account settings](#) [User Setting \[1\]](#)

[Delete](#)

User admin@admin.test

ID	1
Email	admin@admin.test
Organisation	GRCNAME
Role	admin
Email notifications	Event published notification Daily notifications Weekly notifications Monthly notifications
Contact alert enabled	
NIDS Start SID	4000000
Terms accepted	
Must change password	
PGP key	N/A
S/MIME Public certificate	
Disabled	

[Authentication keys](#)

[Events](#)

# CODEBASE MIGRATION: LOOK AND FEEL II

The screenshot shows the MISP SharingGroups Index page. The top navigation bar includes the MISP logo, a search bar, and user icons for View and Edit. The main content area is titled "New Sharing Group". It has three tabs: General (selected), Organisations, and Instances. The General tab contains fields for Local Organisations (dropdown placeholder: "Select a local organisation") and Remote Organisations (dropdown placeholder: "Select a remote organisation"). Below these is a table:

Type	Name	UUID	Extend	Actions
local	ORIONAME	7e9251c8-3b15-417a-9e92-a508479c5b4d	<input checked="" type="checkbox"/>	
remote	CERT-FR_1510	56bdf779-4ef8-4353-bd79-2bb95bce2212	<input type="checkbox"/>	

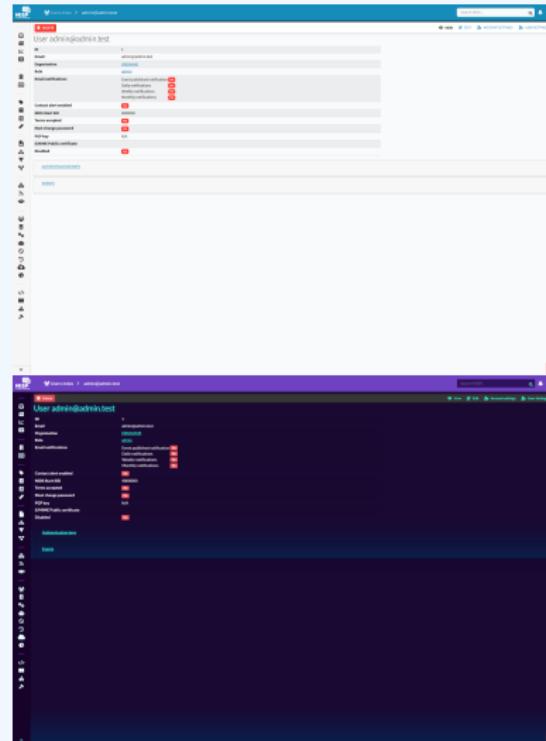
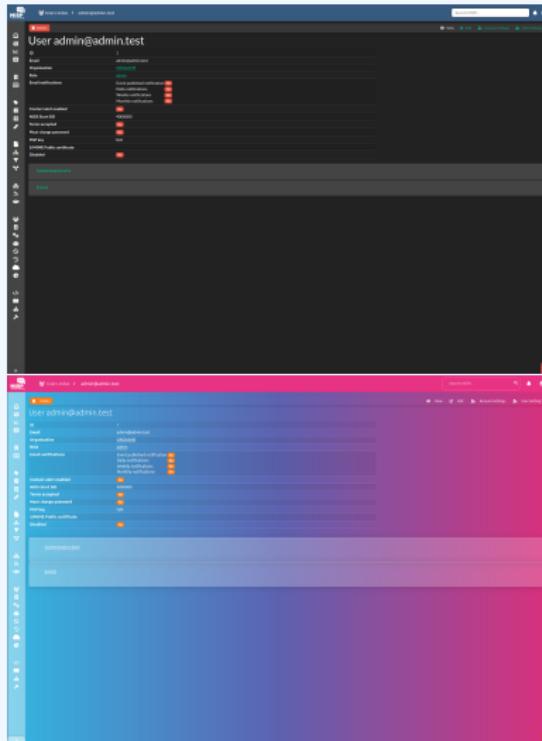
At the bottom left of the table is a "Next page" button. The left sidebar contains a vertical list of icons representing various MISP modules and functions.

# CODEBASE MIGRATION: LOOK AND FEEL II

- Updating Bootstrap greatly improves aesthetics
- And allow us to integrate themes seamlessly



# CODEBASE MIGRATION: LOOK AND FEEL II

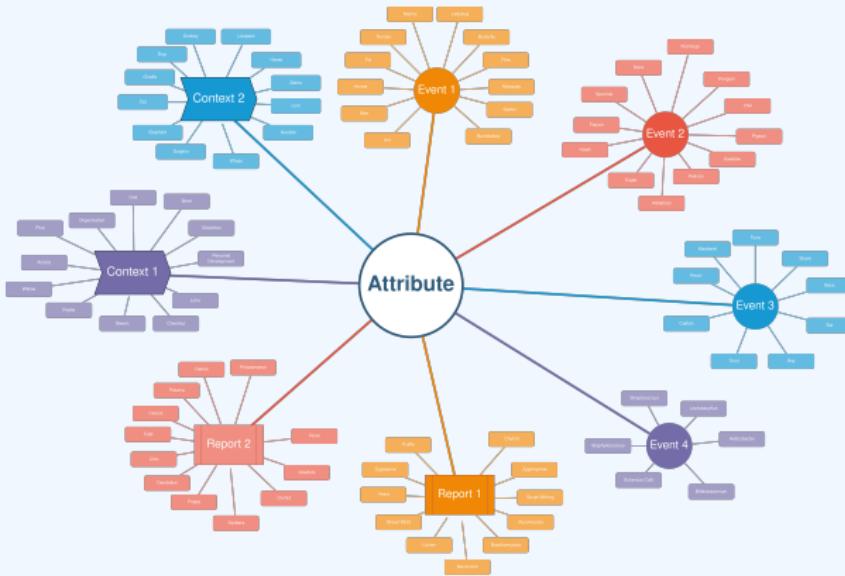


# **STEP III - THE TODOS**

# > REDEFINE HOW WE INTERACT WITH DATA I

## ■ Indicator centric perspective

- ▶ Unified view of everything we know about a given Indicator
- ▶ Allows us to take better decisions
- ▶ Enable users to manage their IoC working set
- ▶ Start an investigation more easily from a single indicator



> REDEFINE HOW WE INTERACT WITH DATA II

## ■ Unified search mechanics

- ▶ Code deduplication
  - ▶ Streamlined way to search for data
  - ▶ Opening up the full power of the API searches to UI users
  - ▶ Translation layer for the deprecated endpoints

## > REDEFINE HOW WE INTERACT WITH DATA III

### ■ Refactor the Event view

- ▶ Key Elements at first glance
- ▶ Emphasis on the context (Insights, Taxonomies, Galaxies, Correlation, .)
- ▶ Massive performance gains by moving to the composition of separate atomic endpoints
- ▶ Sneak peak ? 😊

# SNEAK PEAK OF THE NEW EVENT VIEW - WIP

Events index > [id] Search MSP... X

Add Object + Publish + Event Actions + Import/Export + View Edit View History Explore

Spear-phishing attempt targeting telco sector

critical notice like delegation requests, tag conflicts, ...

Event ID	46	Threat Level	2
UUID	c5168000-740b-4e2b-8b85-2f4562b116fe	Analysis	1
Creator org	ORNAME	Tags	<span>spam</span> <span>phishing</span> <span>phishing techniques</span> <span>email-spoofing</span> <span>phishing distribution</span> <span>spear-phishing</span> <span>phishing state</span> <span>active</span> <span>phishing psychological acceptability</span> <span>medium</span> <span>executive language</span> <span>bad mood probability</span> <span>very likely</span>
Owner org	ORNAME	Galaxies	<span>misp-galaxy-target-information</span> <span>"Leverage"</span> <span>misp-galaxy-country</span> <span>"Germany"</span> <span>misp-galaxy-mitre-attack-pattern</span> <span>"Spear-phishing messages with malicious attachments - T1337"</span> <span>misp-galaxy-mitre-attack-pattern</span> <span>"Spearphishing Attachment - T1386.001"</span> <span>misp-galaxy-mitre-attack-pattern</span> <span>"Phishing - T1360"</span>
Contributors		Extends	Extended by 46
Creator user	admin@admin.test	Related Events	<a href="#">5 related hits</a>
Protected Event		Feed Hits	<a href="#">3 feed hits</a>
Date	2023-02-07	Server Hits	<a href="#">0 server hits</a>
Distribution	1	Warninglist Hits	<a href="#">2 warninglist hits</a>
Published	No		

Event activity

0 PROPOSALS	2 SIGHTINGS
0 EXTENSIONS	0 DELETED
1 FEED HITS	1 WARNINGLIST HITS
6 RELATIONSHIPS	17 5% IOCS

0 PROPOSALS 2 SIGHTINGS

0 EXTENSIONS 0 DELETED

1 FEED HITS 1 WARNINGLIST HITS

6 RELATIONSHIPS 17 5% IOCS

Distribution

Objects 6

Attributes 31

Recent sightings

27 Oct 29 Oct 31 Oct 02 Nov

Relevant correlations go here

- Events with some context overlap
- Events created by other orgs
- ...

notice for empty event, ... X

Objects 13 Attributes 13 Reports 1 Event Graph Event Timeline ATTACK® Discussion 1

objects

# **CONSIDERATIONS**

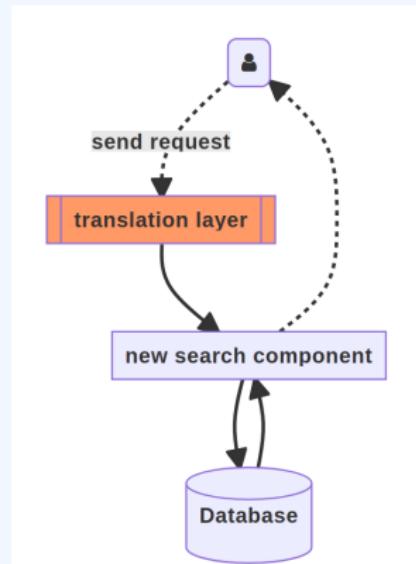
## > MISP CORE FORMAT



- Created in **2012**, Officially became a standard in 2016
- **No breaking changes** since its birth, And we'll maintain this streak
- Format will keep evolving to support new functionalities

## > API COMPATIBILITY

- The aim is to achieve a **near 100% compatibility** with the old API
- "Near" only due to the functionalities removed as a result of deprecation.
- Strategy: Mapping with a translation layer



## > SYNCHRONISATION COMPATIBILITY

- API Compatibility means Synchronisation compatibility
- MISP 3 servers will be able to sync with MISP 2.4 and vice versa

BUT

- MISP **2.4 → 3**
  - ▶ Full support
- MISP **3 → 2.4**
  - ▶ Lossy when sharing new types of datapoints
  - ▶ E.g: Tags on Objects

## > SUPPORT FOR MISP 2.4



- MISP 2.4 will be **supported for a limited time**
- **6 months** support post MISP 3 release
  - ▶ Potential changes/improvements on 2.4 to better support MISP 3 interactions

## > MIGRATION SUPPORT FOR 2.4 → 3



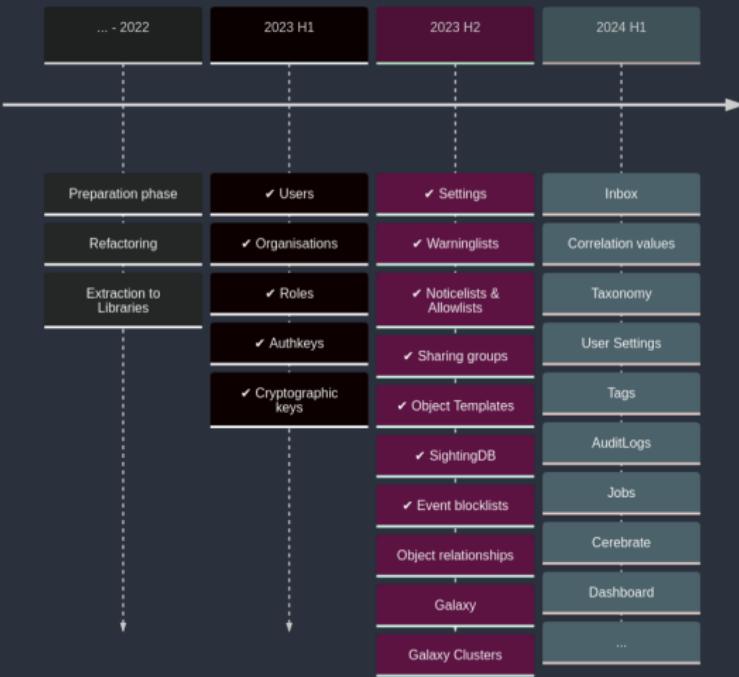
- No one-click update; manual script execution required
- Migration tools will be included in MISp 3 to help you
- This allows us to make underlying changes such as
  - ▶ Database changes
  - ▶ Libraries changes (e.g supervisor in favour of cake-resque)

## > INSTALLATION FOR NEW INSTANCES

- Simplified installation based on package managers
- Upstream Docker installer
- OS targets: **Ubuntu** and **RHEL**



## Model migration timeline



## > OUR HOPES AND EXPECTATIONS FOR THE FIRST COMMUNITY



- We will list features marked for culling
  - ▶ If you're using any of them, please let us know!
- We will be launching a beta phase in the future
  - ▶ Feedback & improvements are more than welcome!
- Want to get involved?
  - ▶ 3.x branch - MISP/MISP/tree/3.x
  - ▶ Project for migration - [github.com/orgs/MISP/projects/2](https://github.com/orgs/MISP/projects/2)