Threat Intelligence: MISP Lab Setup

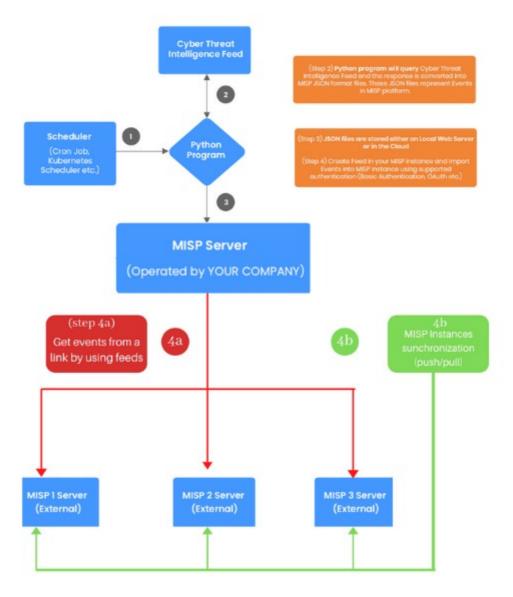
hackingarticles.in/threat-intelligence-misp-lab-setup

Raj August 19, 2020

MISP is an open-source Threat intelligence and sharing platform (formerly known as Malware Information Sharing Platform) that is used for collecting, storing distributing and sharing cybersecurity indicators and threats about cybersecurity incidents & malware analysis.

MISP provides facilities to support the exchange of information but also the consumption of information by network intrusion detection systems (NIDS), a Log-based intrusion detection system (LIDS), but also by log analysis tools, SIEMs.

- MISP provides storage of technical and non-technical information about seen malware and attacks.
- Creates automatically relations between malware and their attributes.
- It Stores all of the intelligence and threat attributes data in a structured format.
- It Shares threat attributes & malware data by default with other trust-groups.
- MISP able to Improve malware detection and reversing to promote information exchange among organizations (e.g. avoiding duplicate works).
- MISP Stores all information from other instances locally (ensuring confidentiality on queries).



To configure MISP in your Ubuntu platform, there are some prerequisites required for installation.

Ubuntu 20.04.1

Mysql

Non-root user

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Install MISP and All Dependencies

Let's begin installation with system update and upgrade.

sudo apt-get update -y && sudo apt-get upgrade -y

```
raj@ubuntu:~$ sudo apt-get update -y && sudo apt-get upgrade -y [sudo] password for raj:

Hit:1 http://us.archive.ubuntu.com/ubuntu focal InRelease

Get:2 http://us.archive.ubuntu.com/ubuntu focal-updates InRelease [111 kB]

Get:3 http://security.ubuntu.com/ubuntu focal-security InRelease [107 kB]

Get:4 http://us.archive.ubuntu.com/ubuntu focal-backports InRelease [98.3 kB]

Get:5 http://security.ubuntu.com/ubuntu focal-security/main amd64 DEP-11 Meta

Get:6 http://us.archive.ubuntu.com/ubuntu focal-updates/main amd64 DEP-11 Meta

Get:7 http://us.archive.ubuntu.com/ubuntu focal-updates/universe amd64 DEP-11

Get:9 http://us.archive.ubuntu.com/ubuntu focal-updates/universe i386 Package

Get:10 http://us.archive.ubuntu.com/ubuntu focal-updates/universe Translation

Get:11 http://us.archive.ubuntu.com/ubuntu focal-updates/universe amd64 DEP-1
```

MISP requires Mysql-client available in our machine. Install Mysql-client using the below command.

sudo apt-get install mysql-client -y

```
raj@ubuntu:~$ sudo apt-get install mysql-client -y
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer
   libfprint-2-tod1 libllvm9
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
   mysql-client-8.0 mysql-client-core-8.0
The following NEW packages will be installed:
   mysql-client mysql-client-8.0 mysql-client-core-8.0
0 upgraded, 3 newly installed, 0 to remove and 4 not upgraded.
Need to get 4.239 kB of archives.
```

To install MISP on fresh ubuntu 20.04.1, all you need to do is the following. Just remember one thing this is an automated bash script that can't run with Root privileges run this script with Non-root users.

Install MISP with install.sh

curl https://raw.githubusercontent.com/MISP/MISP/2.4/INSTALL/INSTALL.sh -o misp_install.sh

```
raj@ubuntu:~$ curl https://raw.githubusercontent.com/MISP/MISP/2.4/INSTALL/INSTALL.sh -o misp_install.sh % Total % Received % Xferd Average Speed Time Time Time Current

Dload Upload Total Spent Left Speed

100 130k 100_ 130k 0 0 111k 0 0:00:01 0:00:01 --:--:- 111k
```

Change the permission of file misp_install.sh and make it executable. To do this run the following command. The script will need some time to install MISP on your Ubuntu platform.

```
chmod +x misp_install.sh
./misp_install.sh -A
```

```
raj@ubuntu:~$ chmod +x misp_install.sh
raj@ubuntu:~$ ./misp_install.sh -A
           Checking if we are run as the installer template
           Checking Linux distribution and flavour...
           We detected the following Linux flavour: Ubuntu 20.04
           Checking if we are uptodate and checksums match
sha1 matches
sha256 matches
sha384 matches
sha512 matches
           Setting MISP variables
           Setting generic MISP variables shared by all flavours
groups: 'misp': no such user
The following DB Passwords were generated...
Admin (root) DB Password: a974314b7c6afa56fe31e95e8e9aaabb681ded70564
      (misp) DB Password: df8d18ff31ba5705f1ed595e51c3f1a62b8277d1429
User
           Checking for parameters or Unattended Kali Install
           Setting install options with given parameters.
all
Install on Ubuntu 20.04 LTS fully supported.
Please report bugs/issues here: https://github.com/MISP/MISP/issues
```

In the middle of installation Enter "Y" to create MISP user

Now, we are going to add a rule to firewall this will allow port 80/tcp and 443/tcp

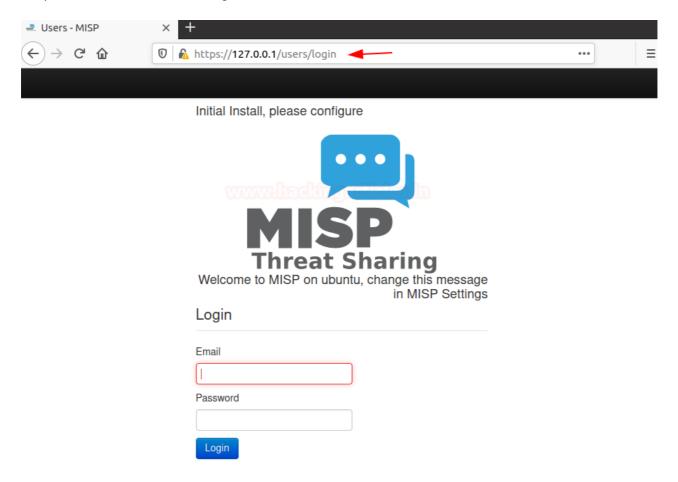
```
sudo ufw allow 80/tcp
sudo ufw allow 443/tcp
```

```
misp@ubuntu:~$ sudo ufw allow 80/tcp
Rules updated
Rules updated (v6)
misp@ubuntu:~$ sudo ufw allow 443/tcp
Rules updated
Rules updated
Rules updated (v6)
misp@ubuntu:~$
```

After, the installation of MISP we can use a browser to connect to MISP.

By Default, MISP is listening on loopback address or Base URL To access MISP on your Browser browse the following URL

https://127.0.0.1/users/login



Default Credentials

For the MISP web interface -> admin@admin.test:admin

For the system -> misp:Password1234

Initial Install, please configure

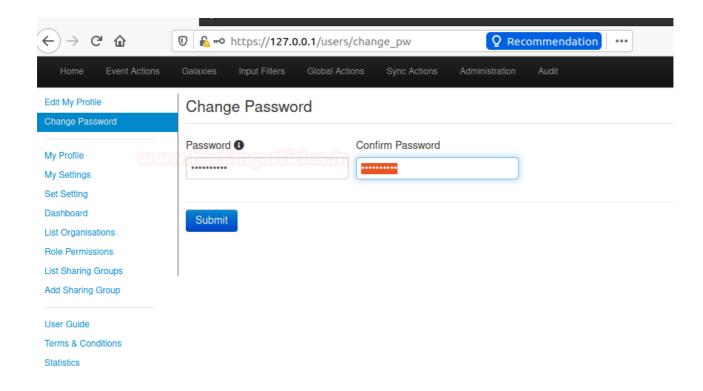


Change Admin Password

Enter new Password

The password must be in standard form. Minimum Length of password is at least 12 words that contain upper case & lowercase alphabet, special character and a numerical value

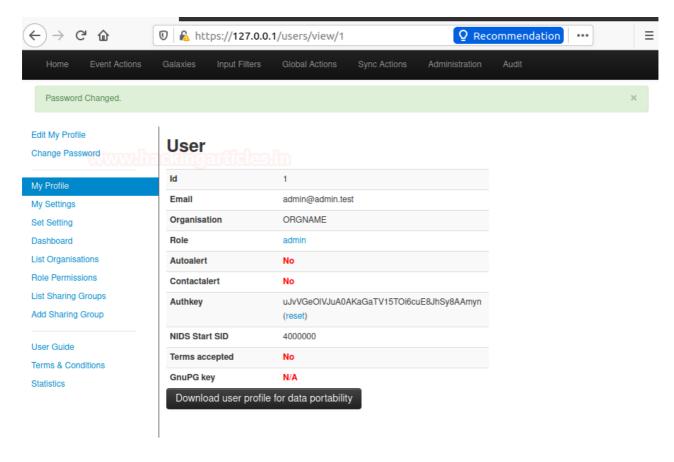
For example - Ignite@12345



You can verify your credentials by a head over to

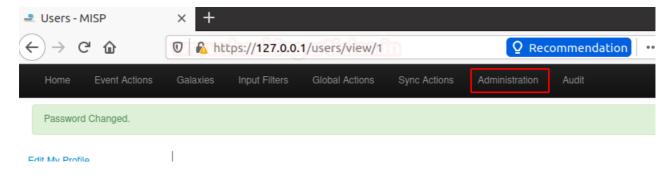
https://127.0.0.1/users/view/1

or also by going in my profile section of MISP Administration panel

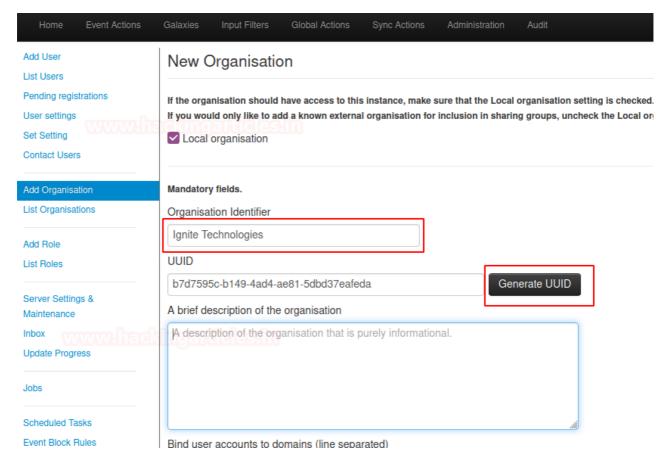


Create an organization

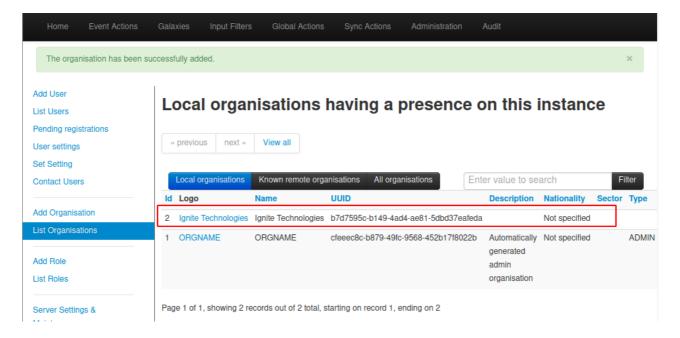
GO to Administration section head over to Add Organisations



- Select Administration > add Organisations
- Enter "< organization name >" into organization identifier
- Select "Generate UUID"
- Select "submit" button at the bottom



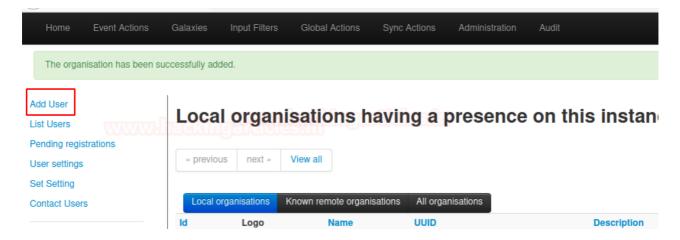
You can also check the instance presence of your local organizations by heading over to List organizations under the section of Administration



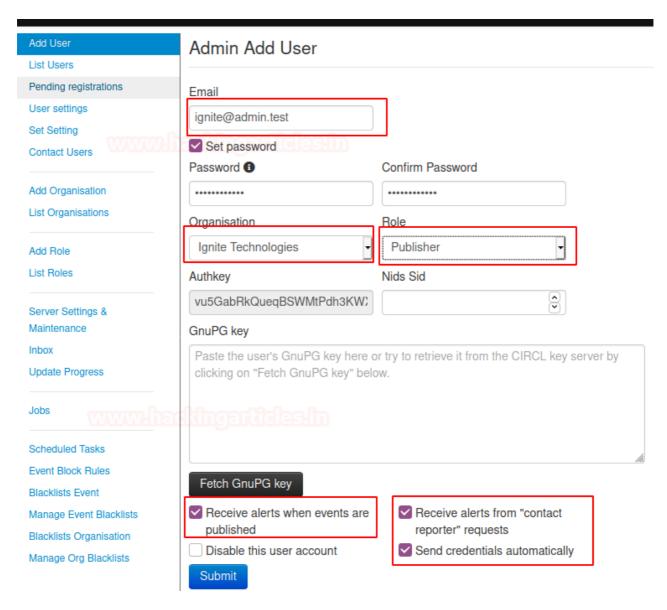
Create Admin for New Organisation

we have successfully created an organization let's assign an Admin role to the organization all you need to do is head over to "Add User" under the section of "Administration"

Administration > Add user



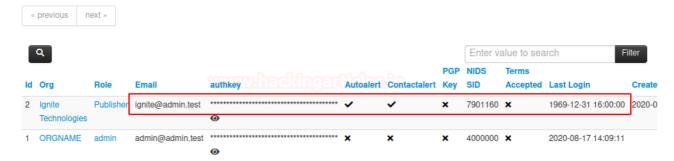
- Enter "ignite@<fqdn>" for email
- Check the "set password" password should be in a standard form that satisfies the minimum requirements.
- Select "<new org name>" for organization
- Select "Role" for the new organization
- · Select "submit" button at the bottom



You can also check the instance Rights of your local organizations by heading over to List organizations under the section of Administration

Users index

Click here to reset the API keys of all sync and org admin users in one shot. This will also automatically inform them of their new API keys.



Create an API user for the new organization

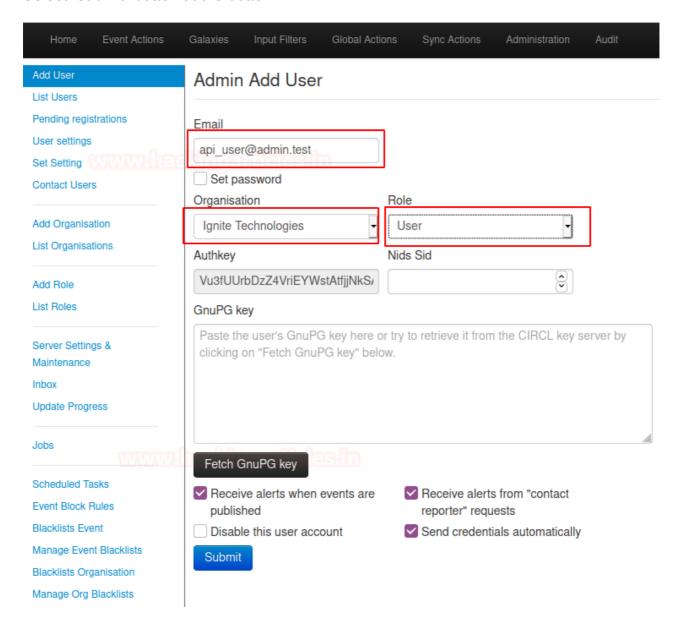
Administration > Add user

Enter "api_user@<fqdn>" for email

Select "<new organization name >" for organization

Select the "user" role for the new organization

Select "submit" button at the bottom



Enable Threat intel feeds

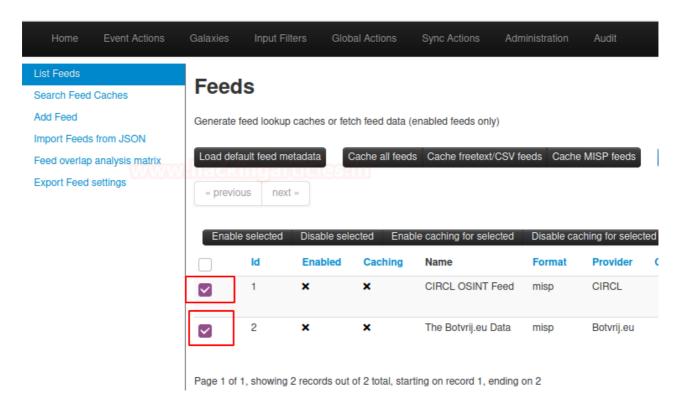
To enable feeds you will need to login to MISP console with the superuser account which is admin@admin.test account.

This one is a little bit special, as we can go into the "Sync actions" tab to build our panel.



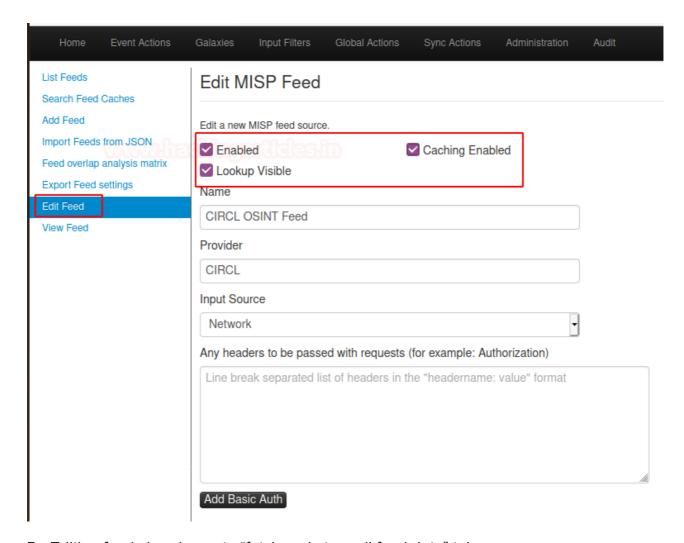
When entering the Sync actions tab, select the list feeds tab.

From there find feeds such as CIRCL osint and check feeds tab

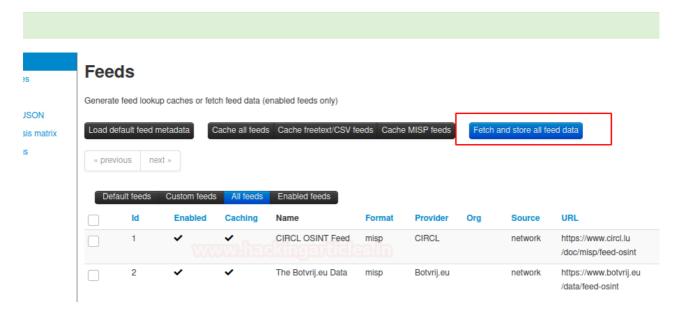


And then head over to the "Edit" icon

- · Check "Enabled"
- Check "Lookup Visible"
- · Check "Caching Enabled"
- · Select "Edit" at the bottom



By Editing feeds head over to "fetch and store all feed data" tab



Great! we have successfully Enabled threat intel feeds.

Setup Ipython+PyMISP

PyMISP is a python library to access MISP platforms via there REST API.

PyMISP allows you to fetch events, add or update events/attributes, add or update samples or search for attributes. PyMISP API is used to store indicators of compromise (IOCs) in MISP and query IOCs from MISP.

In the MISP console head over to Administration and select List Users

Look for "api_user@<fqdn>" and copy "auth key"

Let's open the terminal and begin setup of Ipython & PyMISP

To do this run the following command

```
pip3 install ipython
pip3 install -U pymisp
```

```
misp@ubuntu:~$ pip3 install ipython
Requirement already satisfied: ipython in /usr/local/lib/python3.8/d
Requirement already satisfied: traitlets>=4.2 in /usr/local/lib/pyth
Requirement already satisfied: decorator in /usr/local/lib/python3.8
Requirement already satisfied: prompt-toolkit!=3.0.0,!=3.0.1,<3.1.0,
Requirement already satisfied: pygments in /usr/local/lib/python3.8/
Requirement already satisfied: setuptools>=18.5 in /usr/lib/python3/
Requirement already satisfied: pickleshare in /usr/local/lib/python3
Requirement already satisfied: backcall in /usr/local/lib/python3.8/
Requirement already satisfied: pexpect; sys platform != "win32" in /
Requirement already satisfied: jedi>=0.10 in /usr/local/lib/python3.
Requirement already satisfied: ipython-genutils in /usr/local/lib/py
Requirement already satisfied: six in /usr/lib/python3/dist-packages
Requirement already satisfied: wcwidth in /usr/local/lib/python3.8/d
Requirement already satisfied: parso<0.8.0,>=0.7.0 in /usr/local/lib
misp@ubuntu:~$ pip3 install -U pymisp
Collecting pymisp
  Downloading pymisp-2.4.128-py3-none-any.whl (411 kB)
                                      | 411 kB 230 kB/s
Collecting python-dateutil<3.0.0,>=2.8.1
  Using cached python_dateutil-2.8.1-py2.py3-none-any.whl (227 kB)
Requirement already satisfied, skipping upgrade: requests<3.0.0,>=2.
Collecting deprecated<2.0.0,>=1.2.7
  Using cached Deprecated-1.2.10-py2.py3-none-any.whl (8.7 kB)
Collecting jsonschema<4.0.0,>=3.2.0
  Using cached jsonschema-3.2.0-py2.py3-none-any.whl (56 kB)
Requirement already satisfied, skipping upgrade: six>=1.5 in /usr/li
Processing ./.cache/pip/wheels/5f/fd/9e/b6cf5890494cb8ef0b5eaff72e5d
Requirement already satisfied, skipping upgrade: setuptools in /usr/
```

Connect MISP instance with PyMISP

Ipython

Ipython is an alterative python interpreter it is an interactive shell used for computing in python. Let's load the Ipython interpreter and start scripting to do this follow the below commands. Just remind one thing don't leave or exit from python interpreter till the end

```
(e.g ipython).
```

```
ipython
from pymisp import ExpandedPyMISP
misp_url = 'https://<FQDN of MISP>'
misp_key = "<Enter MISP API key>"
misp_verifycert = False
misp = ExpandedPyMISP(misp_url, misp_key, misp_verifycert)
```

```
misp@ubuntu:~S ipvthon
Python 3.8.2 (default, Jul 16 2020, 14:00:26)
Type 'copyright', 'crédits' or 'license' for more information IPython 7.17.0 -- An enhanced Interactive Python. Type '?' for help.
In [1]: from pymisp import ExpandedPyMISP
In [2]: misp_url = 'https://127.0.0.1'
In [3]: misp_key = "Vu3fUUrbDzZ4VriEYWstAtfjjNkSAfz8Bo9ewN5I"
In [4]: misp verifycert = False 🔫
In [5]: misp = ExpandedPyMISP(misp_url, misp_key, misp_verifycert)
/usr/lib/python3/dist-packages/urllib3/connectionpool.py:999: InsecureRequestWarn
 https://urllib3.readthedocs.io/en/latest/advanced-usage.html#ssl-warnings
  warnings.warn(
/usr/lib/python3/dist-packages/urllib3/connectionpool.py:999: InsecureRequestWarn
 https://urllib3.readthedocs.io/en/latest/advanced-usage.html#ssl-warnings
  warnings.warn(
/usr/lib/python3/dist-packages/urllib3/connectionpool.py:999: InsecureRequestWarn
 https://urllib3.readthedocs.io/en/latest/advanced-usage.html#ssl-warnings
  warnings.warn(
/usr/lib/python3/dist-packages/urllib3/connectionpool.py:999: InsecureRequestWarn
 https://urllib3.readthedocs.io/en/latest/advanced-usage.html#ssl-warnings
 warnings.warn(
```

Create MISP Event

MISP events are encapsulation for contextually linked information. Linked information will include things such as domains, file hashes, IP addresses, Malicious binaries,. We are going to call an object named "Event from notebook 2" to do this run the following command.

```
from pymisp import ExpandedPyMISP, PyMISP, MISPEvent
event_obj = MISPEvent()
event_obj.distribution = 1
event_obj.threat_level_id = 1
event_obj.analysis = 1
event_obj.info = "Event from notebook 2"
# Add event to MISP
event = misp.add_event(event_obj)
event_id, event_uuid = event['Event']['id'], event['Event']['uuid']
print (event_id, event_uuid)
```

```
In [6]: from pymisp import ExpandedPyMISP, PyMISP, MISPEvent
In [7]: event_obj = MISPEvent()
In [8]: event_obj.distribution = 1
In [9]: event_obj.threat_level_id = 1
In [10]: event_obj.analysis = 1
In [11]: event_obj.info = "Event from notebook 2"
In [12]: event = misp.add_event(event_obj)
/usr/lib/python3/dist-packages/urllib3/connectionpool.py:999: InsecureRequestWarninhttps://urllib3.readthedocs.io/en/latest/advanced-usage.html#ssl-warnings warnings.warn(
In [13]: event_id, event_uuid = event['Event']['id'], event['Event']['uuid']
In [14]: print (event_id, event_uuid)
```

Addition of object to MISP event

The creation of a new MISP object generator should be done using a pre-defined template and inheritance. Our new MISP generator needs to generate attributes, and add them as class properties using additional attributes. When the object is sent to MISP, all the class properties will be exported to JSON Export. Attributes in MISP can be network indicators such as IP address, System indicators (e.g a string in memory), or bank account details.

To do this run the following command.

```
from pymisp import MISPAttribute
# Define attributes
attr_type = "ip-src"
value = "8.8.8.8"
category = "Network activity"
to ids = False
# Create attribute object
attribute = MISPAttribute()
attribute.type = attr_type
attribute.value = value
attribute.category = category
attribute.to_ids = to_ids
# Add attributes to event
attribute_to_change = misp.add_attribute(event_id, attribute)
# Print event
print(attribute_to_change['Attribute']['id'], attribute_to_change)
```

```
in [15]: from pymisp import MISPAttribute -
[n [16]: attr_type = "ip-src" =
[n [17]: value = "8.8.8.8"
In [18]: category = "Network activity"
[n [19]: to_ids = False 🚤
[n [20]: attribute = MISPAttribute()_____
[n [21]: attribute.type = attr_type 🚤 ___
[n [22]: attribute.value = value 🚤 📖
[n [23]: attribute.category = category 🛶...
In [24]: attribute.to_ids = to_ids 🔫—
[n [25]: attribute_to_change = misp.add_attribute(event_id, attribute)
/usr/lib/python3/dist-packages/urllib3/connectionpool.py:999: InsecureRequestWarn
https://urllib3.readthedocs.io/en/latest/advanced-usage.html#ssl-warnings
  warnings.warn(
In [26]: print(attribute_to_change['Attribute']['id'], attribute_to_change)
217893 {'Attribute': {'id': '217893', 'event_id': '741', 'object_id': '0', 'object
uuid': '91330e71-a213-4d9a-8bbf-a0abd6fe2fe8', 'timestamp': '1597701885', 'distribute'
last_seen': None, 'value': '8.8.8.8'}, 'AttributeTag': []}
```

Search MISP for IOC

Let's search for an IOC in MISP ipython interpreter. Run the following command to perform the search.

misp.search(controller='attributes', type attribute="ip-src", value="8.8.8.8")

```
https://urllib3.readthedocs.io/en/latest/advanced-usage.html#ssl-warnings
 warnings.warn(
['Attribute': [{'id': '217893',
'event_id': '741',
'object_id': '0',
'object_relation': None,
   'category': 'Network activity',
'type': 'ip-src',
   'to_ids': False,
   'uuid': '91330e71-a213-4d9a-8bbf-a0abd6fe2fe8',
   'timestamp': '1597701885',
'distribution': '5',
   'sharing_group_id': '0',
'comment': '',
   'deleted': False,
   'disable_correlation': False,
   'first_seen': None,
   'last_seen': None,
   'value': '8.8.8.8',
'Event': {'org_id': '2',
    'distribution': '1',
    'id': '741',
    'info': 'Event from notebook 2',
    'orgc_id': '2',
'uuid': 'b3d5fcb1-46c6-47c1-8130-19319077382b'}}]}
```

Awesome now you have completely setup MISP on your Ubuntu Platform.

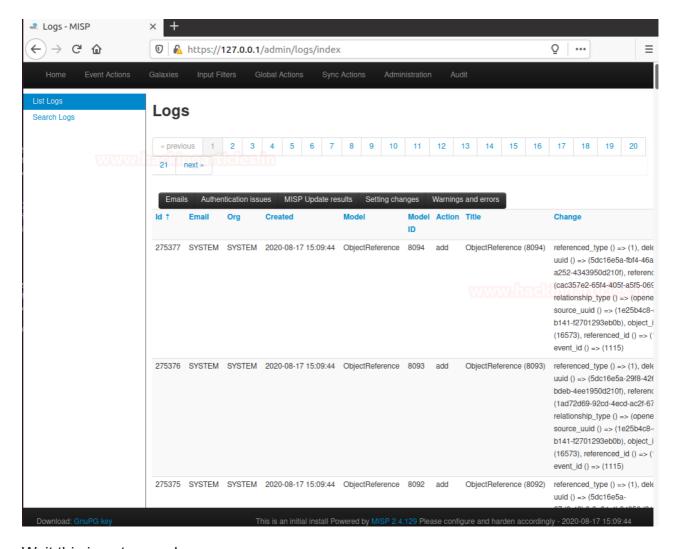
Great!

Threat Monitoring

Let's check what happens on the MISP dashboard.

This one is gonna very special as we can go into the "Audit" tab to build our panel.

When entering the Audit tab select "List Logs" tab



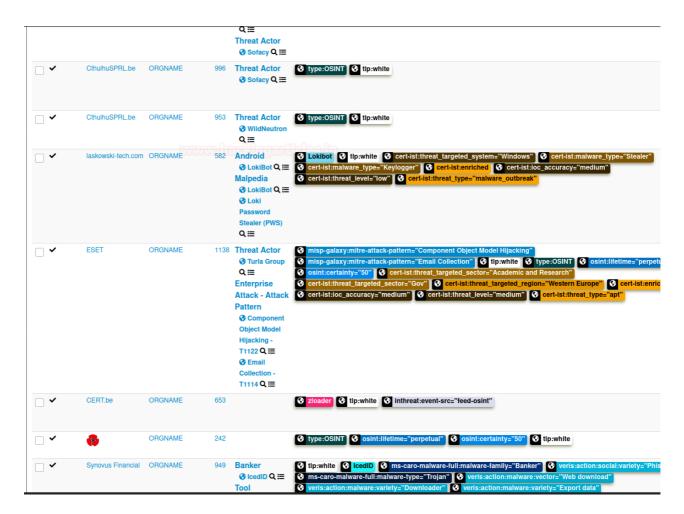
Wait this is not enough

Hold tight!

As we can see, Now we have direct access to every log related to Threat Intelligence.

We can for Example track illegal attacks.

Similarly, we can do Malware analysis from various servers also we can see logs of (NIDS) Network intrusion detection system, (LIDS), Log analysis Tools, SIEMs.



Nice! Now your Panel is included in your dashboard.

Updation of MISP in Future for Latest Versions

It is strongly recommended to upgrade MISP via the Web interface. This Blog may not always be up-to-date and will require you to fix permissions.

In general, updating MISP between point releases for example 2.4.50 -> 2.4.53 happens with the following command are to be executed to be as root.

To update the latest commit from 2.4 branches simply pull the latest commit.

Enter the following command

```
cd /var/www/MISP
sudo -u www-data git pull origin 2.4
sudo -u www-data git submodule update -init -recursive
```

Author – Vijay is a Certified Ethical Hacker, Technical writer and Penetration Tester at Hacking Articles. Technology and Gadget freak. Contact <u>Here</u>