

# Mist Python Library



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# Mist Python3 Library explanations



## What is it?

- A collection of Python3 files made to simplify the creation of python scripts using Mist APIs

## What does it do?

- Automate some processes (authentication, org/site selection, ...)
- Organize the API calls so there is no need to read the whole API documentation everytime (e.g. `mllib.requests.sites.devices.get()` to retrieve the devices from a specific site)
- Accelerate the development process of Python scripts by providing reusable code and examples

## Who can use it?

- Anyone who wants
- If someone wants to create new scripts based on this library, Python knowledge is required

## Where can I get it?

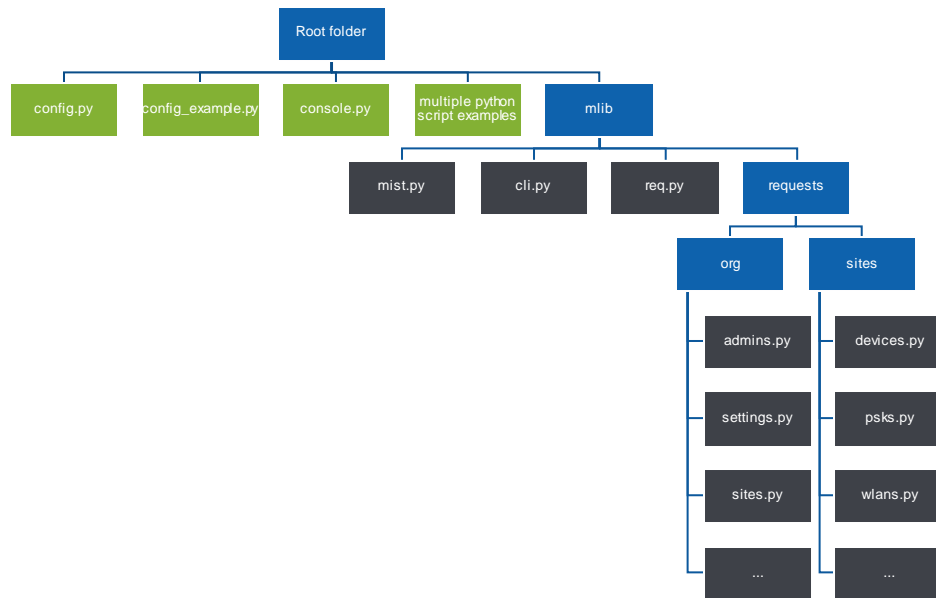
- The whole library is available on github, and "may" be updated in the future with bug fixes and new example scripts  
Github: [https://github.com/tmunzer/Mist\\_library](https://github.com/tmunzer/Mist_library)

## Limitations?

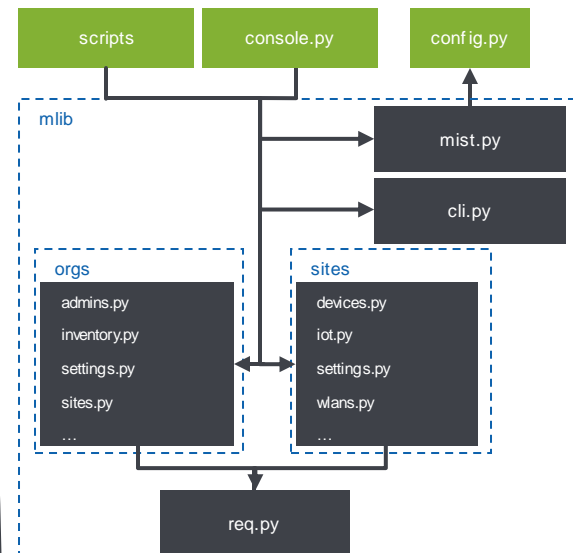
- All the API calls are not created yet, I'm creating them when needed. But new API calls can be easily added.

# Script organization

## Folders and files organization



## Scripts dependencies



### User files

These files are the entry points for **end users**. They are configuration files or executable python scripts.

### Library files

These files are the library files, and will be used by **developer** to create new Python scripts.

# Mist Python3 Library explanations



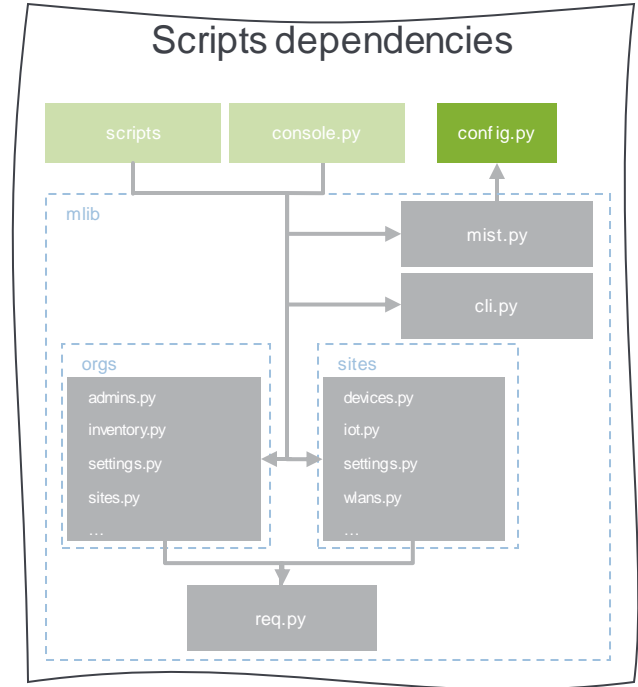
## Configuration file

Configuration file located inside the root folder.

Allows to store:

- the credentials
- the host to reach depending on the Cloud used (US, EU)
- the log level.

The format and explanation of the config.py file can be found in the config\_example.py file.



**Note:**

This is optional. If there is no “config.py” file, the script will contact the US cloud (api.mist.com) and ask for login/password every time.

The script configuration file allows you to store:

- Credentials:

- AND
- Host: Optional. May be used to ask the script to use other Cloud than US Cloud. For example, use “api.eu.mist.com” for EU Cloud
- OR
- Login only: the password and OTP (if 2FA is enabled) will be asked by the script
- OR
- Login/Password: the OTP (if 2FA is enabled) will be asked by the script
- OR
- API Token: nothing will be asked by the script
- 
- Log Level: this is optional. It allows you to chose the level of verbosity of the scripts

All the explanations are present in the “config\_example.py” file.

**Example:**

```
credentials = {  
    "apitoken": "xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx",  
    "host": "api.mist.com"  
}  
log_level = 6
```

```
credentials = {  
    "email": "user@mycorp.net",  
    "host": "api.mist.com"  
}  
log_level = 6
```

# Mist Python3 Library explanations



## Python Console tool

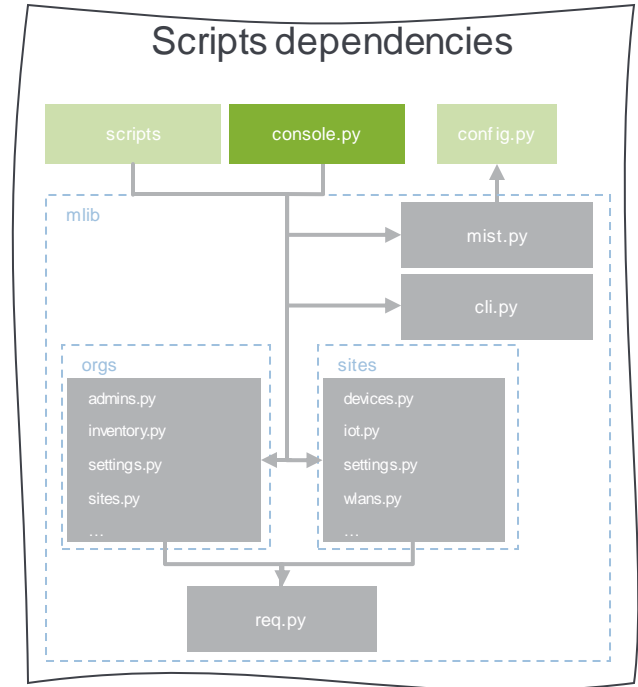


*console.py* is a module to easily use/test the Mist library from python CLI.

This module will:

- automatically start a session (i.e. authenticate the user based on the configuration stored in *config.py* or by asking credentials).
- Provide autocompletion to easily find the right syntax to use the Python3 Mist Library

(Work in Progress... there is plan to improve this part in the future)



|  |  |
|--|--|
| <p><u>Start Python3 from the Mist Library folder</u></p>   | <pre>tmunzer@tmunzer-mbp:~/data/4_dev/Mist/Mist_library\$ python3 Python 3.7.4 (default, Sep 7 2019, 18:27:02) [Clang 10.0.1 (clang-1001.0.46.4)] on darwin Type "help", "copyright", "credits" or "license" for more information.</pre>   |
| <p><u>Load the module.</u></p> <p>When the module is loaded, it will automatically start a session.</p>  | <pre>&gt;&gt;&gt; import console NOTICE: Login file found. NOTICE: API Token authentication used INFO: Request &gt; GET https://api.mist.com/api/v1/self DEBUG: Response Status Code: 200</pre>  |
| <p><u>console.get_org_id() and console.get_site_id()</u></p> <p>Available function to easily find an org_id or a site_id to be used in future requests</p> | <pre>&gt;&gt;&gt; org_id = console.get_org_id()  Available organizations: 0) API test (id: ebad74f0-xxxx-xxxx-xxxx-850a0f98248a) 1) API test (id: ebad74f0-xxxx-xxxx-xxxx-850a0f98248a)  Select an Org (0 to 1, or q to exit): 0  Selected org id: ebad74f0-xxxx-xxxx-xxxx-850a0f98248a</pre>  |
| <p><u>Autocompletion example.</u></p> <p>Use TAB to autocomplete and double TAB to see possible completions</p>  | <pre>&gt;&gt;&gt; console.mlib.org. console.mlib.orgs.admins    console.mlib.orgs.licenses  console.mlib.orgs.sites console.mlib.orgs.channels  console.mlib.orgs.settings  console.mlib.orgs.stats console.mlib.orgs.inventory console.mlib.orgs.site_groups</pre>  |
| <p><u>See parameters to pass to the function</u></p> <p>Just send the function without parameters to see which parameters are required.</p>                | <pre>&gt;&gt;&gt; console.mlib.orgs.admins.get() Traceback (most recent call last):   File "&lt;stdin&gt;", line 1, in &lt;module&gt; TypeError: get() missing 2 required positional arguments: 'mist_session' and 'org_id'</pre>  |
| <p><u>Send a request and see the response</u></p> <p>Example of request. In this case, to get all the administrators from an org.</p>                      | <pre>&gt;&gt;&gt; console.mlib.orgs.admins.get(console.session, org_id) INFO: Request &gt; GET https://api.mist.com/api/v1/orgs/ebad74f0-xxxx-xxxx-xxxx-850a0f98248a/admins DEBUG: Response Status Code: 200 {'result': [{'admin_id': '2c39a11b-xxxx-xxxx-xxxx-0b061c931809', 'privileges': [{'scope': 'org', 'role': 'admin', 'org_id': 'ebad74f0-xxxx-xxxx-xxxx-850a0f98248a'}], 'last_name': 'Skywalker', 'first_name': 'Anakin', 'email': 'askywalker@gmail.com'}, {'admin_id': '02a9d599-xxxx-xxxx-xxxx-59a11bf2333', 'privileges': [{'scope': 'org', 'role': 'admin', 'org_id': 'ebad74f0-xxxx-xxxx-xxxx-850a0f98248a'}], 'last_name': 'Skywalker', 'first_name': 'Luck', 'email': 'lskywalker@gmail.com'}], 'status_code': 200, 'error': '', 'uri': '/api/v1/orgs/ebad74f0-xxxx-xxxx-xxxx-850a0f98248a/admins'}</pre> |

# Mist Python3 Library explanations



## Script examples

Set of Python3 scripts using the Mist Library.

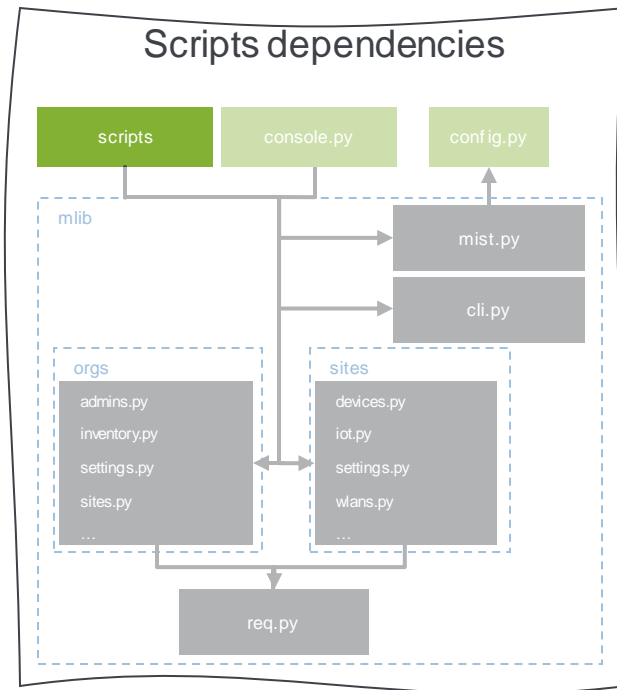
Example scripts are built to require a minimum input from users, but they can also be totally automated and/or run by an external software.

Each script has help and description at the beginning of the file.

If needed, new scripts can be added in the future to solve

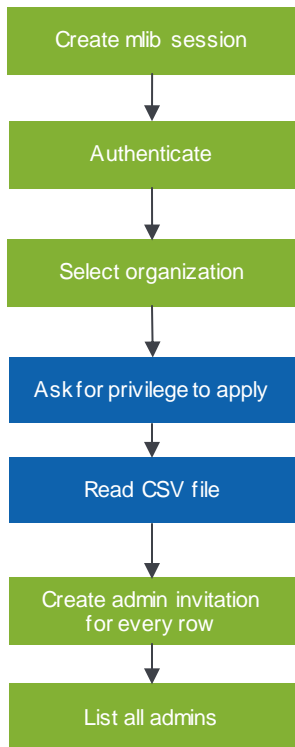
Here is a list of available scripts as of today (01/2020):

- [org\\_admin\\_import.py](#)  
read a CSV file to automatically generate admin invitations
- [org\\_auto\\_site\\_assignment.py](#)  
use APIs to enable autoprovisioning feature
- [org\\_report\\_rogue.py](#)  
generate a report (and save it as a CSV file) of all the rogue APs and clients from an organization or a site.
- [site\\_conf\\_psk\\_import\\_csv.py](#)  
read a CSV file to automatically create PSK
- [site\\_conf\\_psk.py](#)  
use APIs to create a new PSK
- [site\\_conf\\_rogue.py](#)  
use APIs to configure Rogue detection
- [site\\_conf\\_webhook.py](#)  
use APIs to configure webhooks (org or site level). Useful to create a webhook configuration for Splunk.
- [site\\_conf\\_wlan.py](#)  
use APIs to create/delete a WLAN



# Example: org\_admin\_import.py

The entire org\_admin\_import.py script is less than 50 lines of code. Most of the code used is from the Mist Libraries.



Automated with the mist.py module (reusable library)

1 line of code:

```
mist = mist_lib.Mist_Session()
```

Automated with the cli.py module (reusable library)

1 line of code:

```
org_id = cli.select_org(mist)
```

Code specific to this script

Use pre-defined methods from the Mist Library (reusable library)

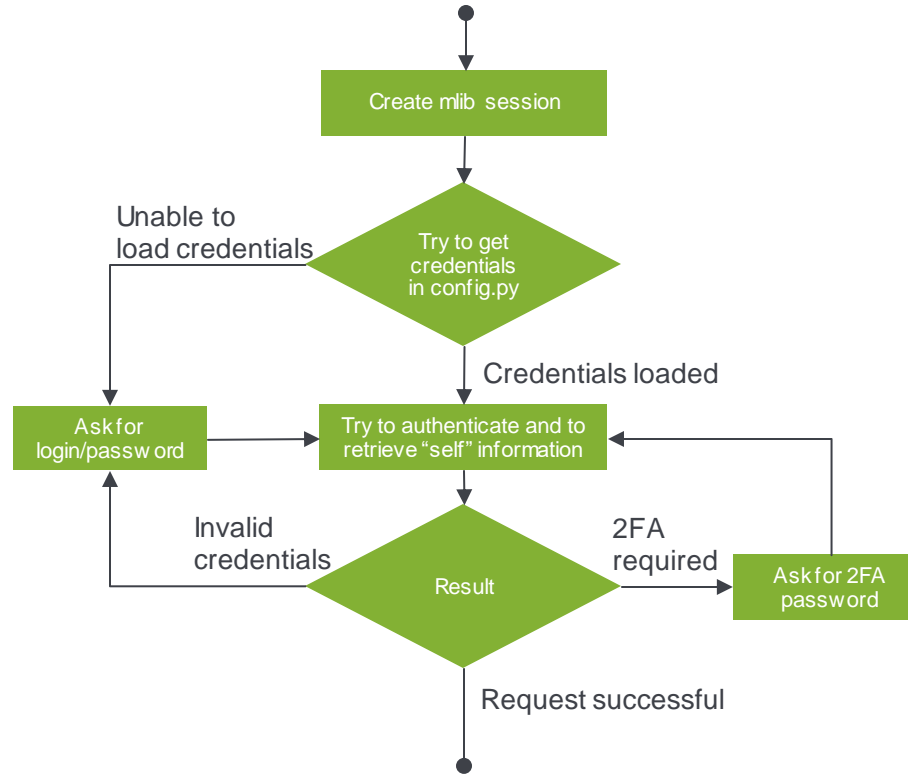
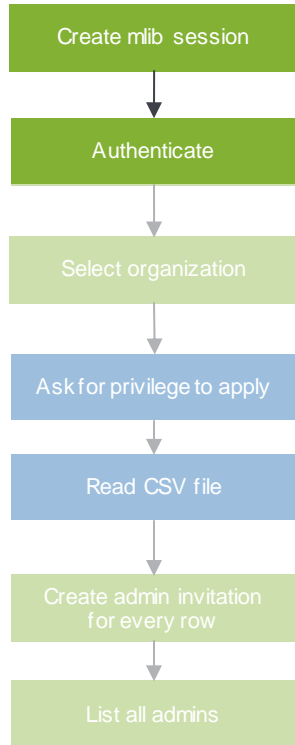
1 line of code to create an admin:

```
mist_lib.requests.org.admins.create_invite(mist, org_id, email, privileges, first_name, last_name)
```

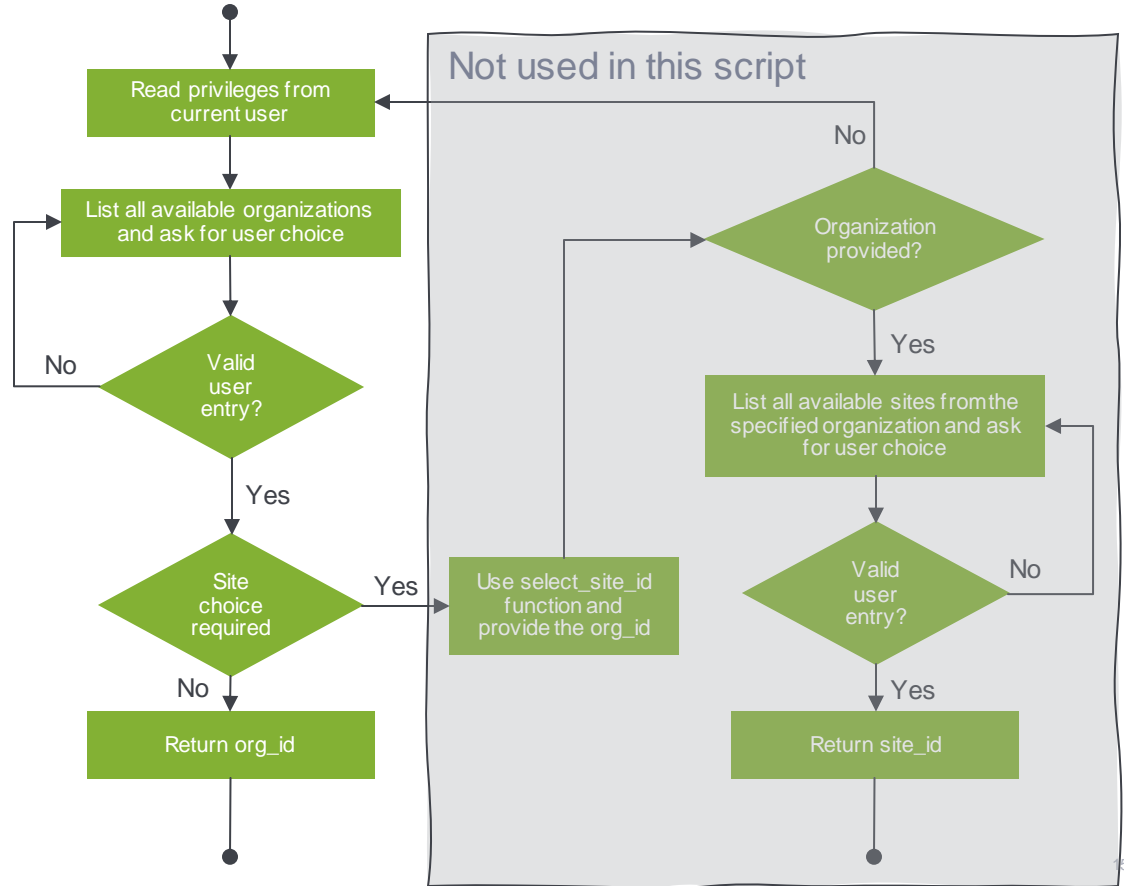
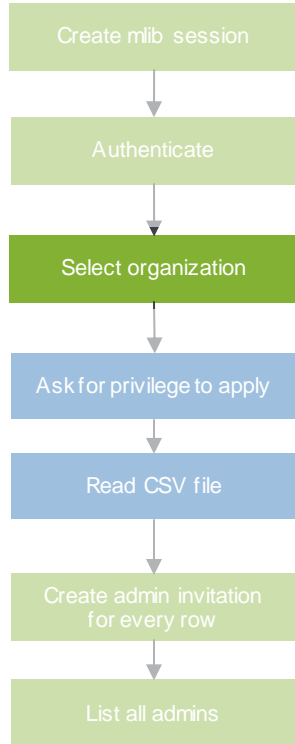
2 lines of code to get all the admins and display them nicely:

```
admins = mist_lib.requests.org.admins.get(mist, org_id)['result']  
print(tabulate(admins))
```

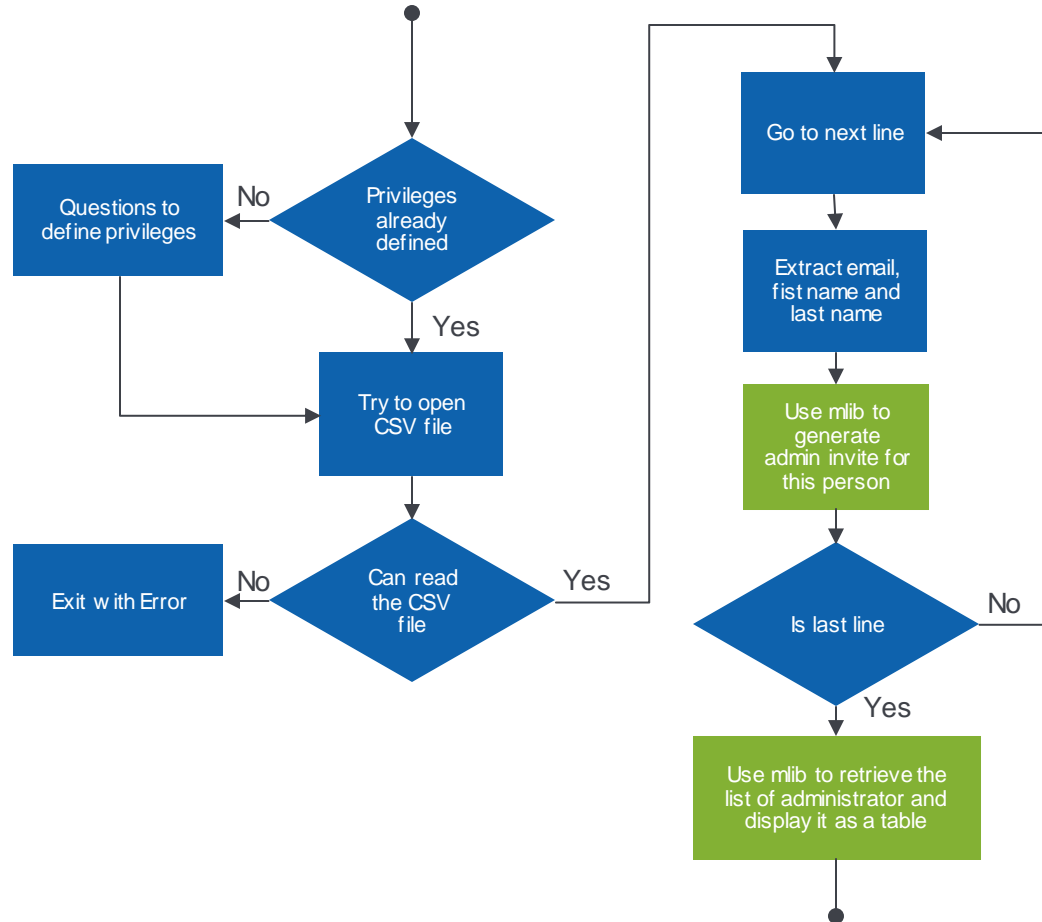
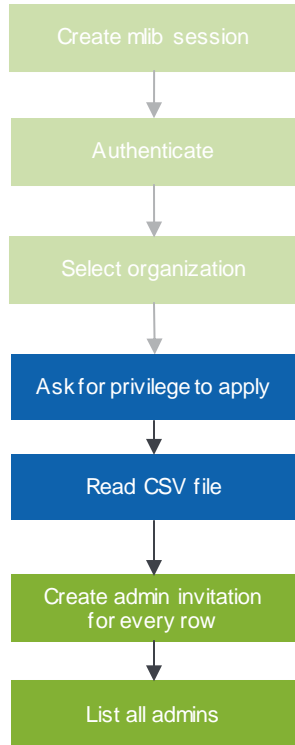
# Example: org\_admin\_import.py



# Example: org\_admin\_import.py



# Example: org\_admin\_import.py





# How to use it



Install Python

Download Mist  
Library

Create config.py

Test console.py

Test a script



Download and Install Python3 from <https://www.python.org/downloads/>



For Windows users, be sure to select **Customize Installation** and to enable **add Python to environment variables** during the installation wizard



Install library dependencies with pip:

```
pip install geopy tzwhere requests tabulate  
OR (depending on your system)  
pip3 install geopy tzwhere requests tabulate
```

Install Python

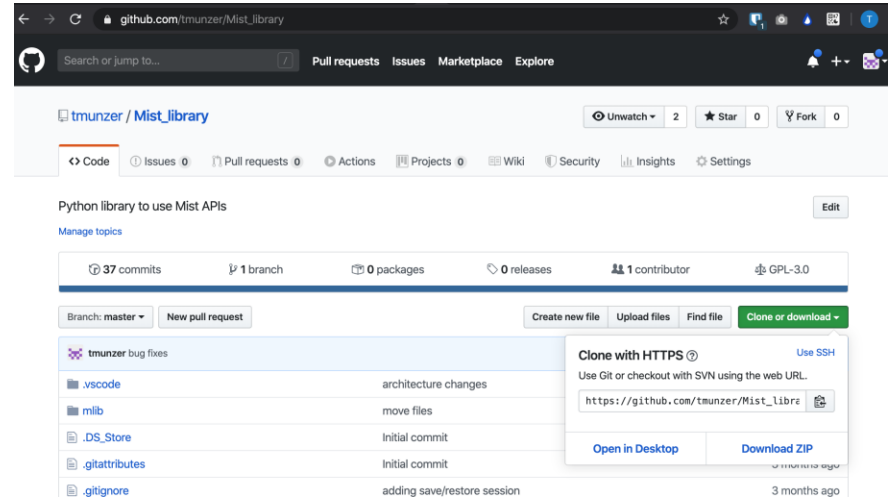
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- Get the library from Github
  - Go to [https://github.com/tmunzer/Mist\\_library](https://github.com/tmunzer/Mist_library)
  - Click on **Clone or Download**
  - then click on **Download ZIP**
- Unzip the downloaded archive.



Install Python

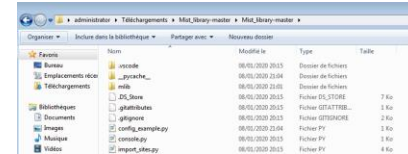
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Test a script

Go to the library folder. You should see files like **config\_example.py**.



Create a file **config.py** and edit it.

I recommend to use text editors like atom (available on <https://atom.io>) or Visual Studio Code (available at <https://code.visualstudio.com/>)

Add the configuration to your **config.py** file.

Be sure to replace the login and password or the Access Token with your own credentials.

```
credentials = {
    "email": "user@domain",
    "password": "xxxxx",
    "host": 'api.mist.com'
}
```

OR

```
credentials = {
    "apitoken": "xxxxxxxxxxxxxx",
    "host": "api.mist.com"
}
```

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Test a script

**console.py** is not build like as python script, but more like a python module. This means you must **start python**, and then **import the console module**:

Tips: You must run Python from the Mist Library folder

Tips: You don't have to add the ".py" extension when you want to load it.

Once the **console** module is loaded, it will automatically

- Display the help information
- Start a Mist session and store it in the **console.session** variable

### Warning

The current version is not totally functional when 2FA is enabled. Only GET requests may work.

```
tmunzer@tmunzer-mbp:~/4_dev/Mist/Mist_library$ python3
Python 3.7.4 (default, Sep  7 2019, 18:27:02)
[Clang 10.0.1 (clang-1001.0.46.4)] on darwin
Type "help", "copyright", "credits" or "license" for more information.
>>> import console
```

```
>>> import console

Info:
This Python3 module is built to help you to use and test Mist Library

Help:
When this module is imported, it will automatically authenticate you, create a Mist session, and
store is into the variable
    console.session

You can use it afterward with Mist Library request. For example, you can do:
The you will be able to use the script to generate and send request to the Mist Cloud. For example,
you can do:
    console.mlib.org.channels.country_codes_get(console.session)

Some API request will ask for an "org_id" or a "site_id". The following commands are here to help
you to retrieve (and store) this information:
    console.get_org_id()
    console.get_site_id()

Usage:
console.help()          Show this message
console.get_org_id()    Help you to retrieve an Org ID
console.get_site_id()   Help you to retrieve a Site ID
console.show(data)      Nicely display API call response. Where "data" is is the API response

NOTICE: Login file found.
NOTICE: API Token authentication used
INFO: Request > GET https://api.mist.com/api/v1/self
DEBUG: Response Status Code: 200
```

Install Python

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Create config.py

Test console.py

Test a script

- You can use **console.get\_org\_id()** and **console.get\_site\_id()** to easily retrieve and store your org and site IDs:

```
>>> mysite = console.get_site_id()

Available organizations:
0) API test (id: ebad74f0-850a0f98248a)
1) API test (id: ebad74f0-850a0f98248a)

Select an Org (0 to 1, or q to exit): 0

Available sites:
0) Secondary Site (id: 91e219cd-b-a7dcfdfebbd5)
1) Primary Site (id: 89d1af18-40e13bd6d3c0)

Select a Site (0 to 1, or q to exit): 1

Selected site id: 89d1af18-40e13bd6d3c0
>>>
```

- You can use the autocompletion feature to know which command is available.

```
>>> console.mlib.sites.devices.
console.mlib.sites.devices.create(  console.mlib.sites.devices.delete(  console.mlib.sites.devices.get(  console.mlib.sites
```

- You can send a command without parameters to know which parameters are required

```
>>> console.mlib.sites.devices.get()
Traceback (most recent call last):
  File "<stdin>", line 1, in <module>
TypeError: get() missing 2 required positional arguments: 'mist_session' and 'site_id'
```

- You can display the raw data received from the server by just typing the command

```
>>> console.mlib.sites.devices.get(console.session, mysite)
INFO: Request > GET https://api.mist.com/api/v1/sites/fo018c13-1eeb894a96c4/devices
DEBUG: Response Status Code: 200
{'result': [{'switch_config': {'wds': {}, 'eth1': {}, 'module': {}, 'eth0': {}}, 'orientation': 265, 'x_m': 7.380324693115277, 'site_id': 'fo018c13-1eeb894a96c4', 'dystone_uid_enabled': False, 'beacon_enabled': False, 'beacon_rate_mode': 'default', 'beacon_rate': 'default', 'eddystone_url': 'default', 'eddystone_url_enabled': False, 'beam_disabled': {}, 'hw_rev': '800', 'y_m': 9.63761908584998, 'disable_eth1': False, 'type': 'ap', 'map_id': '2b298', 'radio_config': {'ant_gain_5': None, 'ant_gain_24': None}, 'orientation_overwrite': True, 'name': 'lab-ms-ap-02', 'org_id': '203d3d02-76896a338f4', 'AI': {'enabled': True, 'name': 'my input 1', 'DO': {'enabled': True, 'value': 0}}, 'y': 675.11328125, 'x': 516.990234375, 'model': 'AP43', 'map_id': None, 'height': 0, 'mac': '1577789874', 'tag_id': '240278', 'tag_uuid': '203d3d02-76896a338f4', 'device_profile_id': None, 'created_time': '1578420314', 's': 'lab', 'org_id': '203d3d02-76896a338f4', 'y': 0, 'x': 0, 'model': 'AP21', 'type': 'ap', 'locating': False}}, {'status_code': 200, 'error': ''}]}
```

- Or you can use the command **console.show(data)** to display it nicely

```
>>> console.show(console.mlib.sites.devices.get(console.session, mysite))
INFO: Request > GET https://api.mist.com/api/v1/sites/fo018c13-1eeb894a96c4/devices
DEBUG: Response Status Code: 200

switch_config      orientation  x_m  site_id      tag_uuid
config             modified_time  mac      tag_id  radio_config  y      x  model      height  notes  locating  orientation_overwrite  name      org_id
-----
{'wds': {}, 'eth1': {}, 'module': {}, 'eth0': {}}, 265 7.38032 fo018c13-1eeb894a96c4 203d3d02-76896a338f4
dystone_uid_enabled: False, 'beacon_enabled': False, 'beacon_rate_mode': 'default', 'beacon_rate': 'default', 'eddystone_url':
d9275f 1577789874 240278 {'ant_gain_5': None, 'ant_gain_24': None} True lab-ms-ap-02 203d3d02-76896a338f4
{'my input 1', 'DO': {'enabled': True, 'value': 0}} 675.113 516.99 AP43 0 fo018c13-1eeb894a96c4 203d3d02-76896a338f4
```

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Test a script

- Open the script file to see how to use it, and, in some case, to configure the script with your specifications

```
org_admins_import.py > (e) admins
1  '''
2  Python script to invite/add administrators from a CSV file.
3  The CSV file must have 3 columns: email, first name, last name
4
5  You can run the script with the command "python3 org_admins_import.py <path_to_the_csv_file>"
6
7  The script has 3 different steps:
8  1) admin login
9  2) select the organisation where you want to add/invite the admins
10 3) choose if you want to give access to the whole organisation, or only to specific sites
11 '''
12 ### PARAMETERS ###
13 csv_separator = ","
14 privileges = []
15
```

- If the script is used with an external file (e.g. a CSV file), prepare it.

```
org_admins_import_example.csv
1 owkenobi@gmail.com,Obi-Wan,Kenobi
2 pamidala@gmail.com,Padme,Amidala
```

- Open your terminal, go to the Mist Library folder, and start the script as explained in the help.

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Test a script

```
tmunzer@tmunzer-mbp:~/4_dev/Mist/Mist_library$ python3 ./org_admins_import.py ./org_admins_import_example.csv
```

```
INFO: Restoring session...
```

```
ERROR: Unable to load session...
```

```
NOTICE: Login file found.
```

```
NOTICE: API Token authentication used
```

```
INFO: Request > GET https://api.mist.com/api/v1/self
```

```
DEBUG: Response Status Code: 200
```

```
Available organizations:
```

```
0) API test (id: ebad74f0-xxxx-xxxx-xxxx-850a0f98248a)
```

```
1) API test (id: ebad74f0-xxxx-xxxx-xxxx-850a0f98248a)
```

```
Select an Org (0 to 1, or q to exit): 0
```

```
Which level of privilege at the org level ("s" for Super Admin, "n" for Network Admin, "o" for observer, "h" for helpdesk)? o
```

```
Do you want to select specific sites (y/N)? n
```

```
INFO: Request > GET https://api.mist.com/api/v1/orgs/ebad74f0-xxxx-xxxx-xxxx-850a0f98248a/sites
```

```
DEBUG: Response Status Code: 200
```

```
Opening CSV file ./org_admins_import_example.csv
```

```
owkenobi@gmail.com, Obi-Wan, Kenobi
```

```
INFO: Request > POST https://api.mist.com/api/v1/orgs/ebad74f0-xxxx-xxxx-xxxx-850a0f98248a/invites
```

```
pamidala@gmail.com, Padme, Amidala
```

```
INFO: Request > POST https://api.mist.com/api/v1/orgs/ebad74f0-xxxx-xxxx-xxxx-850a0f98248a/invites
```

```
DEBUG: Response Status Code: 200
```

```
INFO: Request > GET https://api.mist.com/api/v1/orgs/ebad74f0-xxxx-xxxx-xxxx-850a0f98248a/admins
```

```
DEBUG: Response Status Code: 200
```

| admin_id                             | privileges  | last_name | first_name | email                | invite_id                            | expire_time |
|--------------------------------------|---|-----------|------------|----------------------|--------------------------------------|-------------|
| 2c39e11b-xxxx-xxxx-xxxx-0b061c931809 | [{'scope': 'org', 'role': 'admin', 'org_id': 'ebad74f0-xxxx-xxxx-xxxx-850a0f98248a'}]               | Skywalker | Anakin     | askywalker@gmail.com |                                      |             |
| 02a9d599-xxxx-xxxx-xxxx-59a111bf2333 | [{'scope': 'org', 'role': 'admin', 'org_id': 'ebad74f0-xxxx-xxxx-xxxx-850a0f98248a'}]               | Munzer    | Thomas     | tmunzer@juniper.net  |                                      |             |
| 3e30dde4-xxxx-xxxx-xxxx-fa3d975303ab | [{'scope': 'site', 'role': 'write', 'site_id': '89d1af18-e326-4d5e-9760-40e13dd6d3c0'}]             | Skywalker | Luck       | lskywalker@gmail.com |                                      |             |
|                                      | [{'scope': 'org', 'role': 'read', 'site_id': '', 'org_id': 'ebad74f0-xxxx-xxxx-xxxx-850a0f98248a'}] | Kenobi    | Obi-Wan    | owkenobi@gmail.com   | e6c2ed08-xxxx-xxxx-xxxx-93ef13848c38 | 1.57867e+09 |
|                                      | [{'scope': 'org', 'role': 'read', 'site_id': '', 'org_id': 'ebad74f0-xxxx-xxxx-xxxx-850a0f98248a'}] | Amidala   | Padme      | pamidala@gmail.com   | ee39b8a6-xxxx-xxxx-xxxx-1589b7d3eb37 | 1.57806e+09 |



# Questions?



Thank you!



