Plynx Documentation

Release 1.2.3

Plynx

Jun 04, 2023

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PLynx is a domain agnostic platform for managing reproducible experiments and data-oriented workflows.

CHAPTER 1

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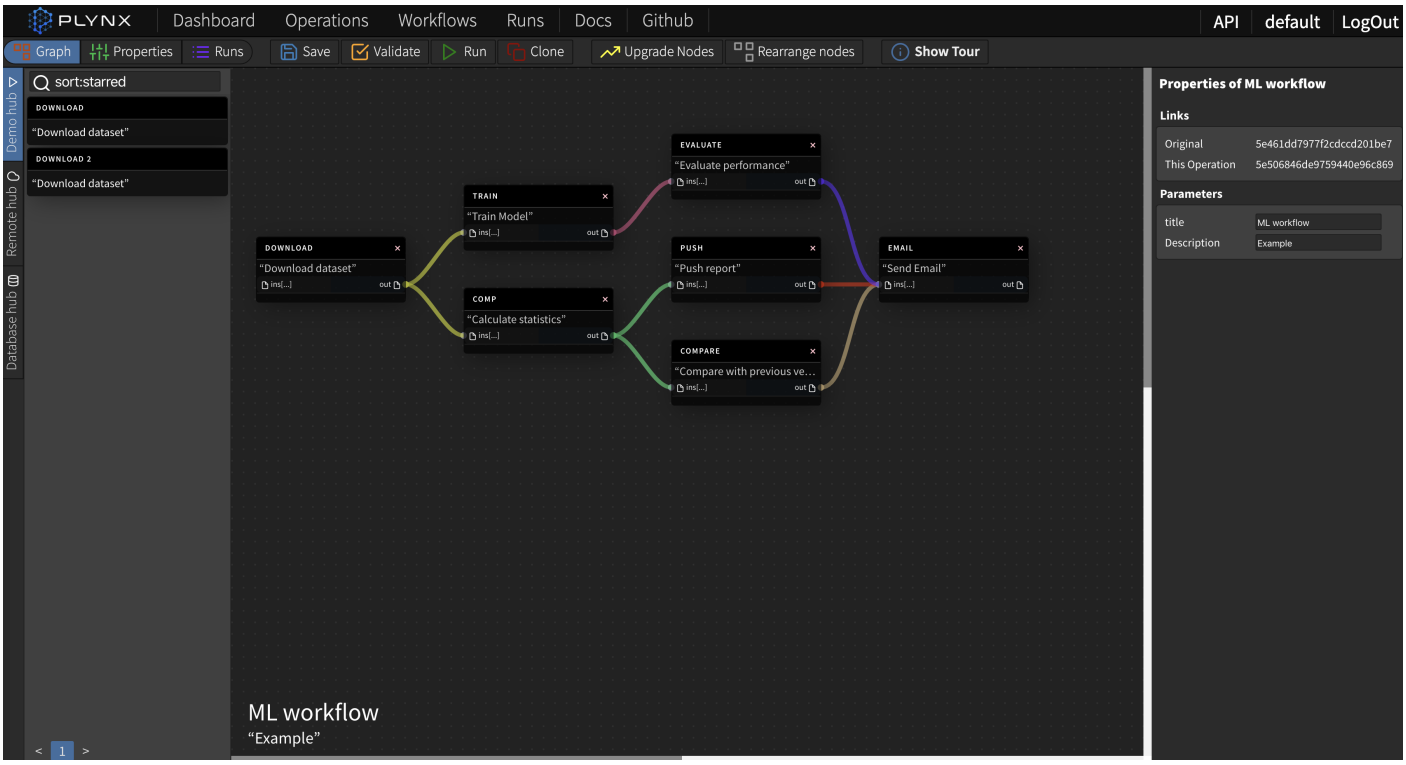
1.1 Overview



PLynx is a high level domain agnostic orchestration and computation platform. It is not constrained by a particular application and can be extended to custom data oriented workflows and experiments.

The platform abstracts users from the engineering and organizational complexities, such as data access, containerization, remote computation, automatic failover, progress monitoring, and other advanced computer science concepts.

The core principles of PLynx include:

- *Domain agnostic*. PLynx orchestrates multiple services with higher level APIs, such as various cloud services, version control repositories, databases and clusters.
- *Flexible experimentation*. Users are not limited by pre-defined experiment structure or approved operations. They are encouraged to reuse existing solutions, but if necessary they can introduce their solutions.
- *Reproducible experiments*. Results of each of the experiments are accessible and reusable. Past experiments and ideas can be reused anytime by anyone without technical challenges.
- *Parallel execution*. It is possible to conduct multiple experiments simultaneously.
- *Caching*. Results of previously executed Operations and subgraphs will be reused.
- *Monitoring*. PLynx abstracts orchestration, visualization, workflow version control, sharing the results and others.

1.1.1 Demo

Demo is available at https://plynx.com.

1.1.2 Open source

PLynx is licensed under Apache 2.0. Source code is available at Github.

1.1.3 Other links

Please refer to an article in Medium about the goals of the project.

1.2 Get started

1.2.1 Run local cluster

Make sure you install docker first. Get started with Docker

tl;dr

```
git clone https://github.com/khaxis/plynx.git   # Clone the repo

cd plynx

cp template_config.yaml config.yaml                # Make a copy of a config
make up                                          # to start production services
```

Then go to http://localhost:3001

It will start the following services:

- MongoDB instance
- PLynx User Interface
- API service
- DAG worker

- Several Python and Bash workers (5 by default)

Run `make down` to stop the services.

1.2.2 Other *make* commands

- `make build` - build all docker images.
- `make run_tests` - build docker images and run the tests.
- `make up` - run the services locally.
- `make down` - shut down services.
- `make dev` - run developer version of PLynx.

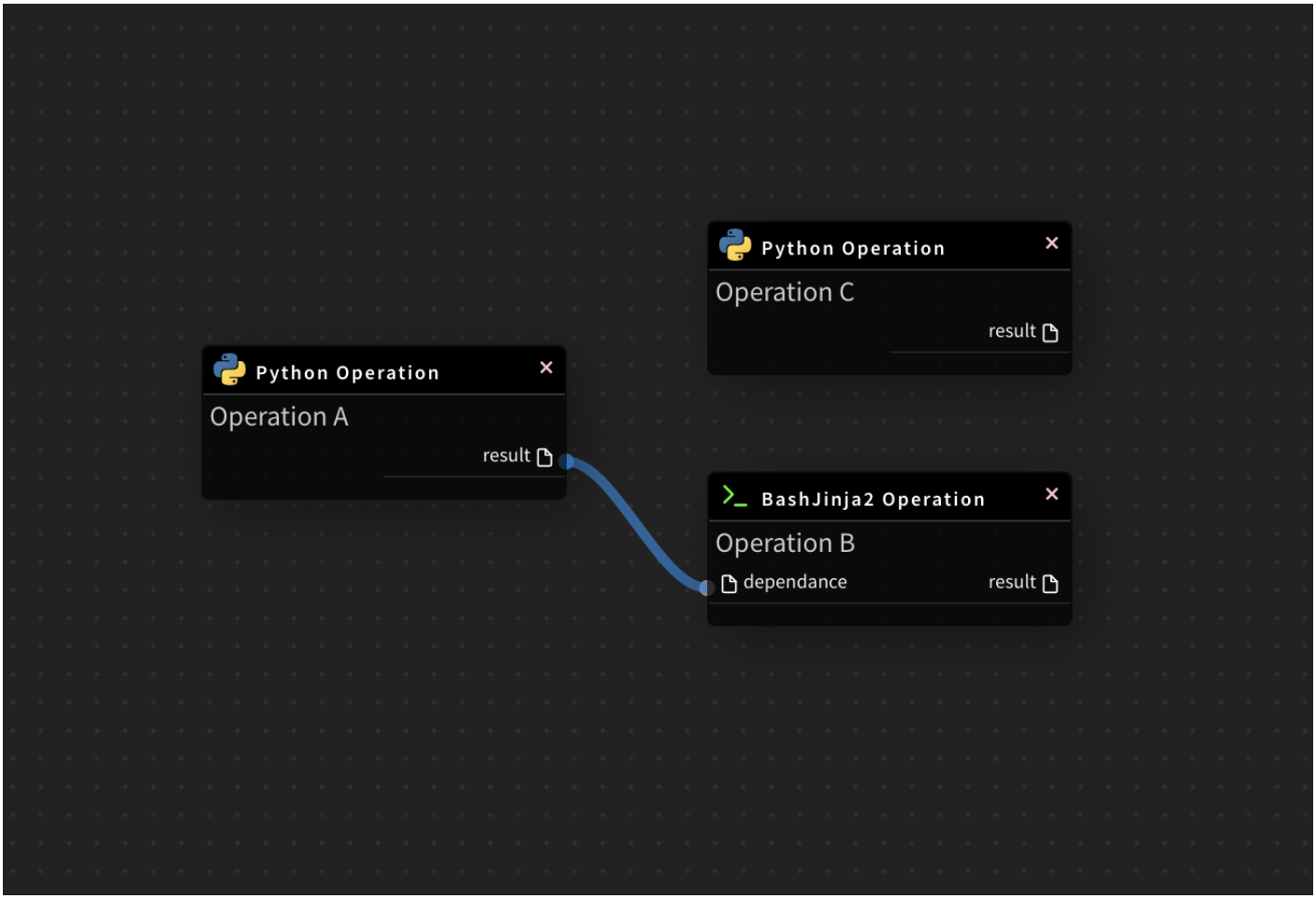
1.3 Concepts

PLynx is a domain agnostic platform for managing reproducible experiments and data-oriented workflows.

1.3.1 Graph

In Plynx, each experiment is represented as Directed Acyclic Graph or simply Graph – a collection of all the nodes you want to run, organized in a way that reflects their relationships and dependencies.

For example, a simple graph could consist of three operations: A, B, and C. It could say that A has to run successfully and produce a resource before B can run, because B depends on it. But C can run anytime. In other words graph describes how you want to carry out your workflow.



Notice that we haven't said anything about what we actually want to do! A, B, and C could be anything:

- A prepares data for B to analyze while C sends an email.
- A monitors your location so B can open your garage door while C turns on your house lights.

The important thing is that the graph isn't concerned with what its constituent nodes do; its job is to make sure that whatever they do happens in the right order.

Unlike existing solutions (such as Apache Airflow), PLynx makes no assumption about the structure of its graphs. Each graph can be created dynamically using UI or APIs. In data science it is common to try new features or ideas with custom layout. Multiple ideas might fail before you find the promising one. PLynx makes it easy to create new experiments based on existing graphs and try them simultaneously and reproduce results if needed.

1.3.2 Operation

While graphs describe how to run an experiment, operations determine what actually gets done.

Operation is a building block of the graphs. They describe a single executable task in a workflow. Operations are usually (recommended) atomic, meaning they share only input and output resources with any other operations.

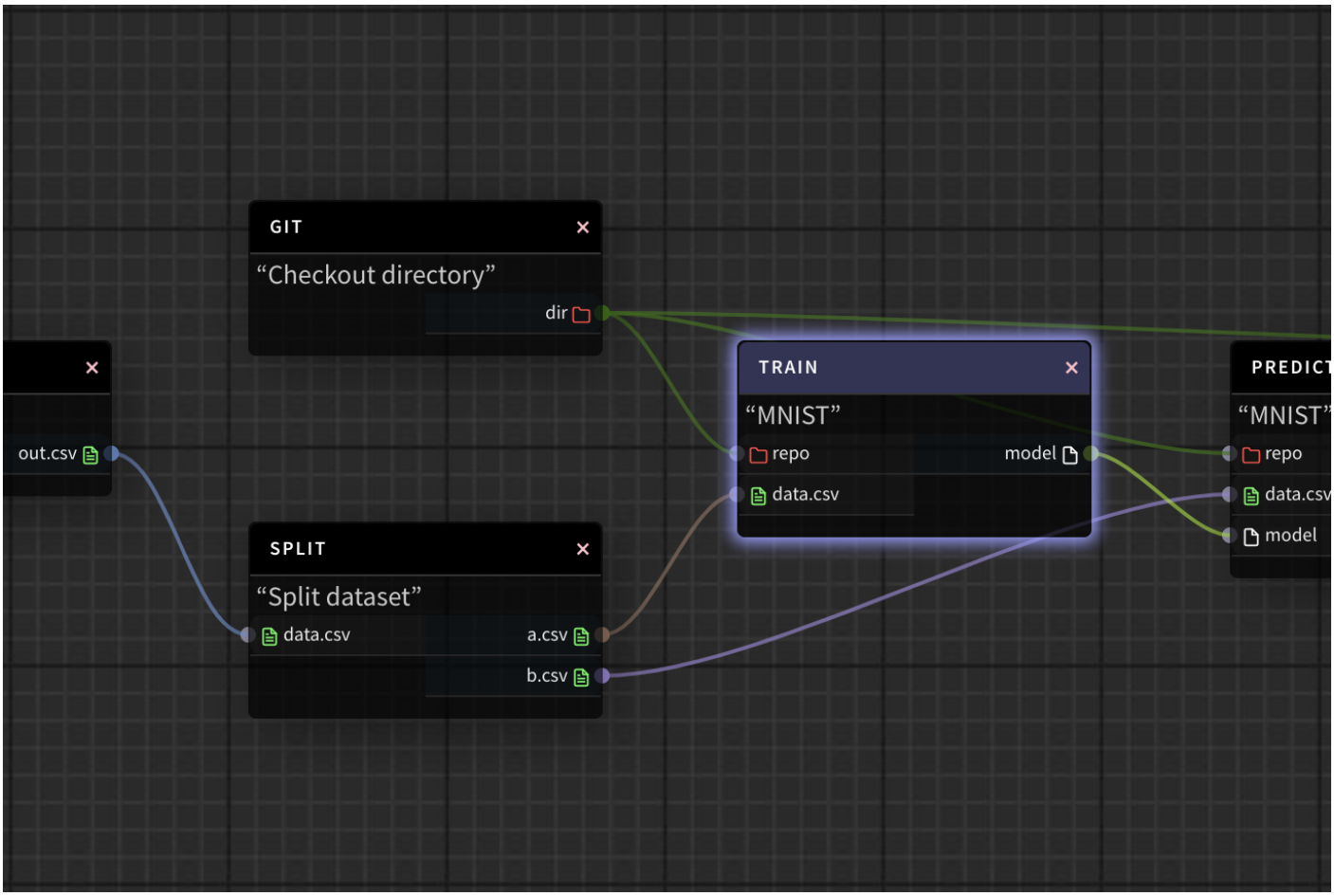
PLynx is using multiple types of Operations that can be customized by plugins. Here are some of them.

- *Python Operation* executes code in python.
- *BashJinja2 Operation* uses jinja2 templates to execute bash script.

- *Composite Operation* consists of multiple other operations. It can be considered as a sub-graph.

The graph will make sure that operations run in the correct certain order; other than those dependencies, operations generally run independently. In fact, they may run on two completely different machines.

This is a subtle but very important point: in general, operation should be atomic. If there is an intermediate resource an Operator can produce which can be used by other consumer, such as transformed data or subset, you should consider splitting the operation. It encourages users to create their workflows in a more modular and parameterized way reusing existing solutions. This way they don't reinvent existing solutions multiple times and can use advantages of cached results and distributed computation.



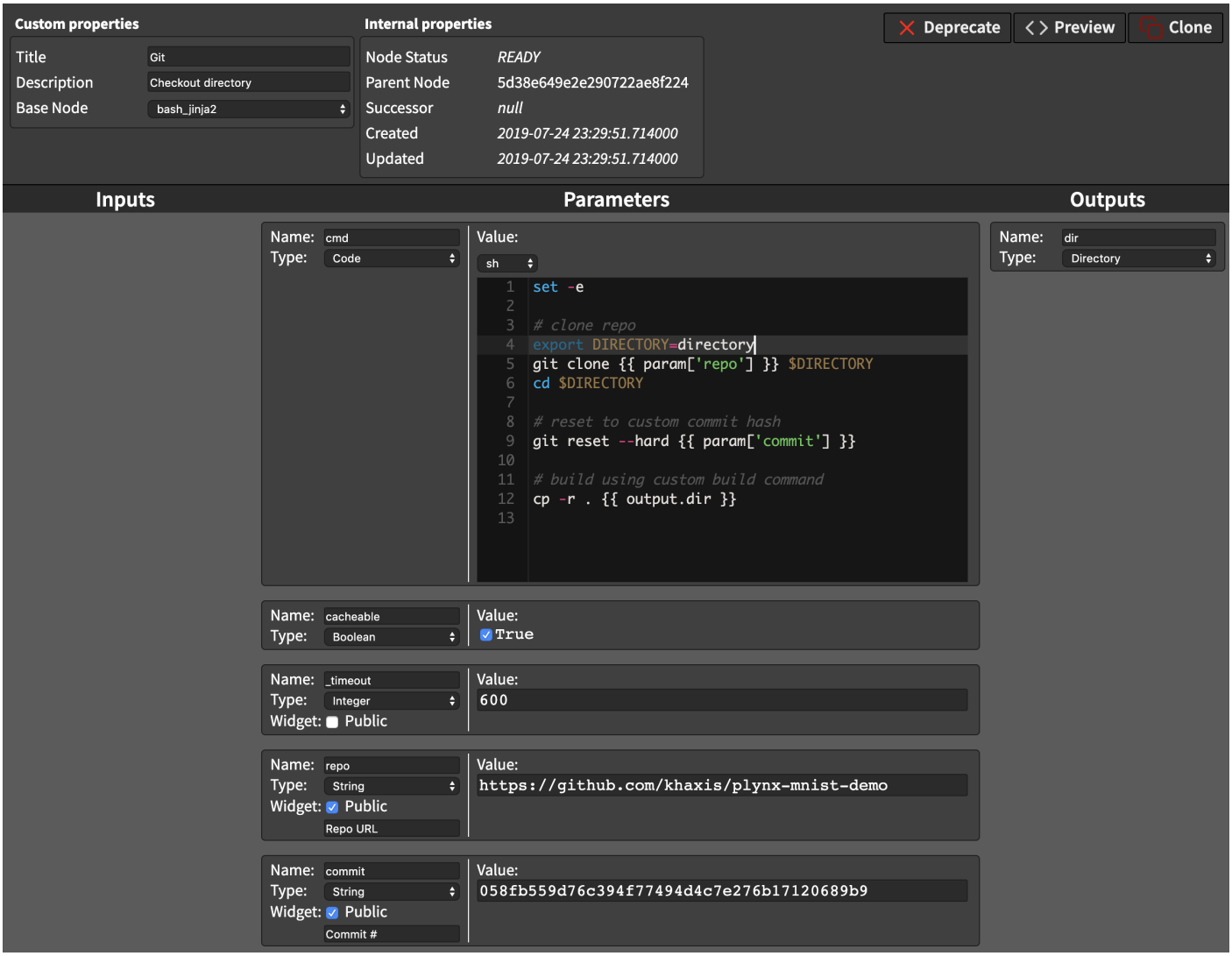
The graph above is a part of a machine learning pipeline. PLynx will execute operations in the order defined by the graph. In the example above, *Train* operation requires two *Resources*: *repo* and *data.csv*. As soon as these resources are available, PLynx worker will pick this job up and execute it. In this sense PLynx is very similar to *Makefiles*.

Resource preparation and execution is defined by internal PLynx class called `BaseNode`. Currently it includes the following ones:

base_node_name	Description
`file`	It is a dummy BaseNode. The File gets never executed. Instead of that it has a single output called *out* which is known before execution.
`bash_jinja2`	It executes a custom bash command. Users specify external resources and parameters with Jinja2 templating language. See examples *Creating operations*.
`python`	Custom python script will be specified by this `BaseNode`. See examples *Creating operations*.

1.3.3 Creating operations

Users are responsible for defining operations. Say we have a git repository where we keep scripts for each step for machine learning pipeline. *Git - checkout directory* is an operation defined by a user. Given a link to a repository and commit hash the operation clones the repository and creates a new resource in PLynx. The resource is called `dir` and has a type *Directory*. The directory might contain multiple scripts and can be reused by other operations.



The script that defines *Git - checkout directory* operation can be found in a system parameter `cmd`:

```
set -e

# clone repo
export DIRECTORY=directory
git clone {{ params['repo'] }} $DIRECTORY
cd $DIRECTORY

# reset to custom commit hash
git reset --hard {{ params['commit'] }}

# build using custom build command
```

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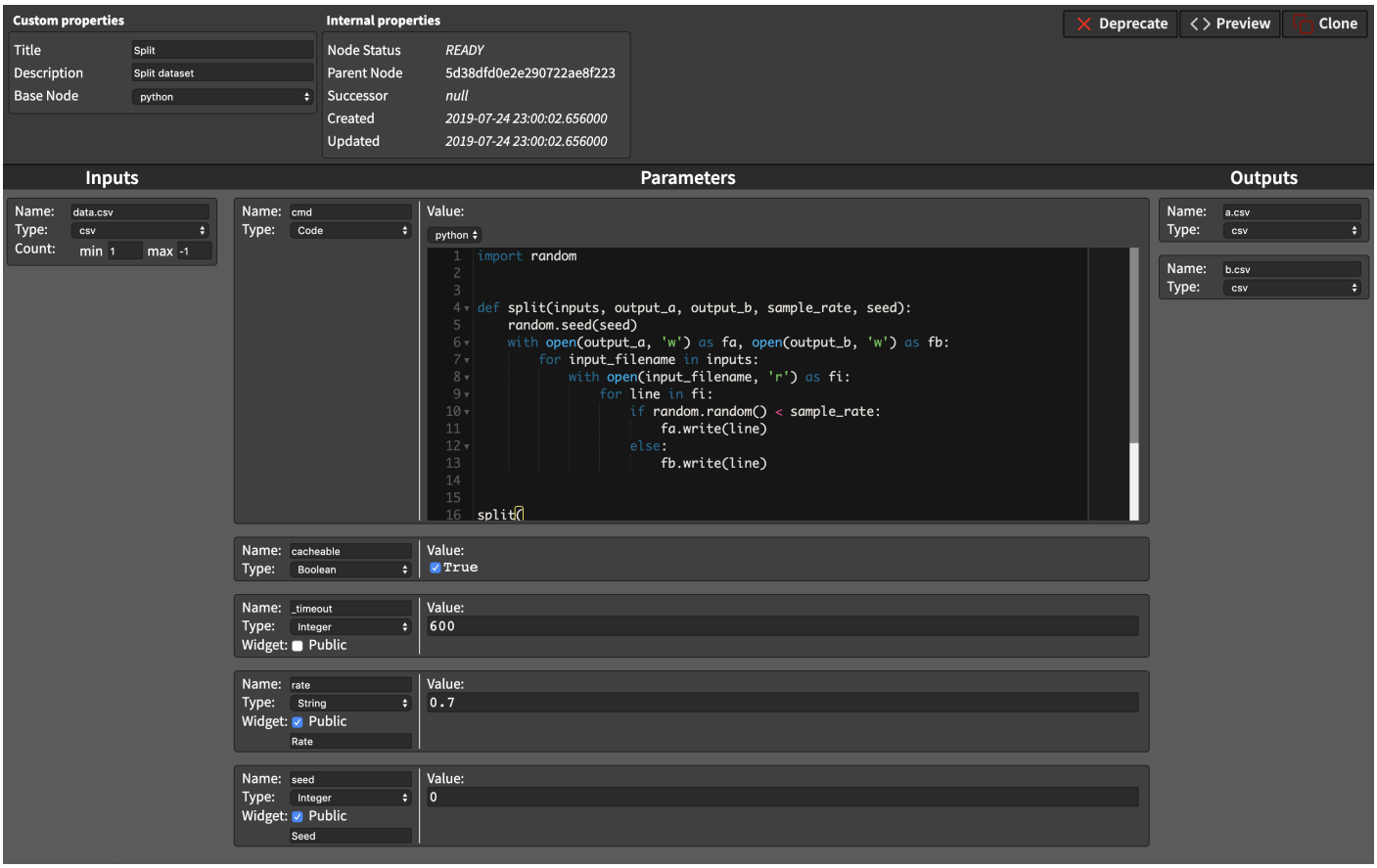
```
cp -r . {{ outputs.dir }}
```

Before executing the script, PLynx worker will prepare inputs: it will download and preprocess inputs and create empty outputs. The worker will create an empty directory. The path to this directory is not known in advance: in order to avoid race condition on the filesystem each process will be working with temporary path. You can find the exact path using `{{ inputs.* }}` or `{{ outputs.* }}` placeholders. In *git* example you it would be `{{ outputs.dir }}`.



Similarly operation can be defined in python. Instead of *jinja2* templates use python variables `inputs`, `outputs`, and `params`.

```
import random


def split(inputs, output_a, output_b, sample_rate, seed):
    random.seed(seed)
    with open(output_a, 'w') as fa, open(output_b, 'w') as fb:
        for input_filename in inputs:
            with open(input_filename, 'r') as fi:
                for line in fi:
                    if random.random() < sample_rate:
                        fa.write(line)
                    else:
                        fb.write(line)
```

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```
split(
    inputs=inputs['data.csv'],
    output_a=outputs['a.csv'],
    output_b=outputs['b.csv'],
    seed=int(params['seed']),
    sample_rate=float(params['rate']),
)
```

1.4 Configuration

Configuration file is a way to customize and extend PLynx for your needs. It defines structure of the platform, declares plugins and their interaction.

An example of a config file can be found here: config.yaml

1.4.1 Executors

PLynx is using MongoDB to store Workflows, Operations, Runs and other metadata. API and Workers need to have access to the database to work properly.

```
mongodb:
  user: <username>
  password: <password>
  host: <server ip>
  port: <server port>
```

1.4.2 Storage

All of the artifacts will be stored as files. Your Resource plugins *Resources* define the way how to handle them.

```
storage:
  scheme: <scheme_label>
  prefix: <prefix>
```

Here are possible schemas that works as a driver to a file storage.

Scheme	Prefix example	Description
`file`	`/data/resources/`	Using a local directory as a file storage. Note the the file system should be accessible by API and all of the workers. This can be done by running everything on a single machine or mounting a persistent storage.
`gs`	`gs:///plynx-resources/`	Google Cloud Storage driver.
`s3`	`s3:///plynx-resources/`	AWS s3 driver.

1.4.3 Auth

PLynx can run in multiuser mode if you provide it with a secret key. It is used to generate authentication tokens.

Note you may also use `--secret-key` argument running API server in order to avoid keeping the key in a file for security concerns.

```
auth:
  secret_key: <secret key>
```

1.4.4 Web

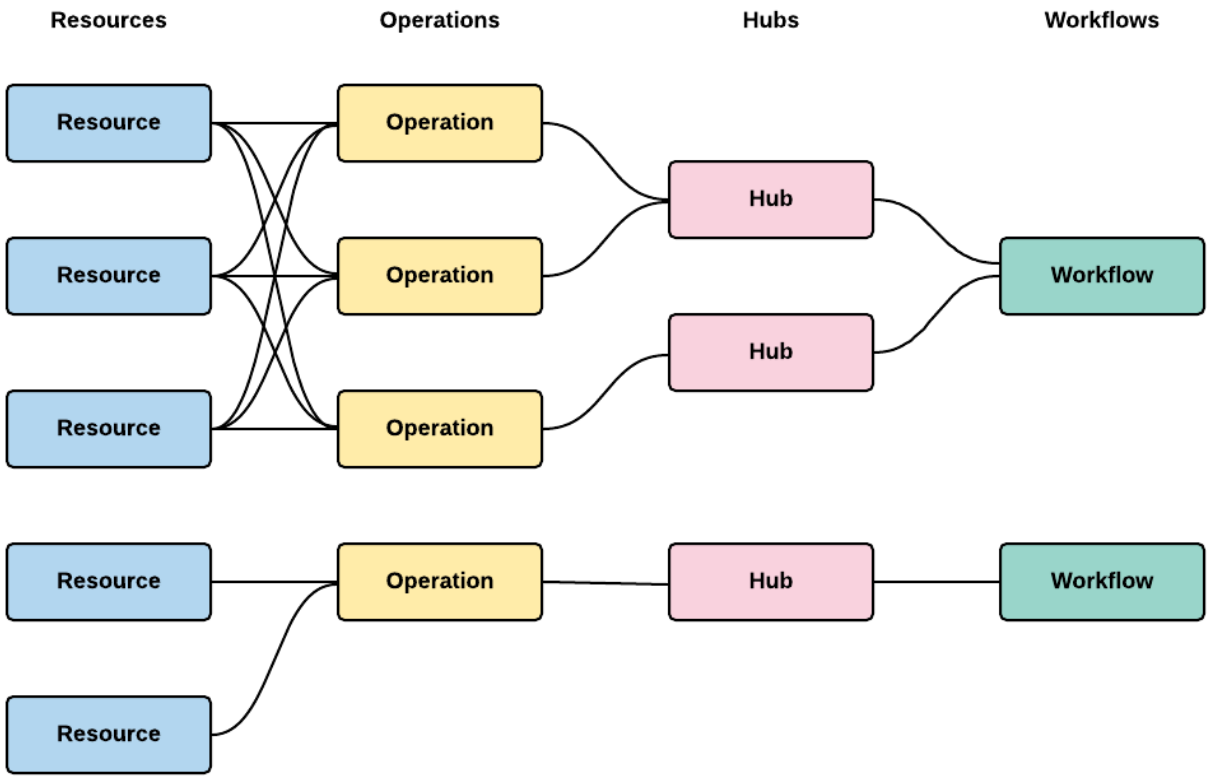
This part of a configuration file is used by the API server. It customizes flask web service.

```
web:
  host: <host>
  port: <port>
  endpoint: <endpoint>
  debug: <debug mode>
```

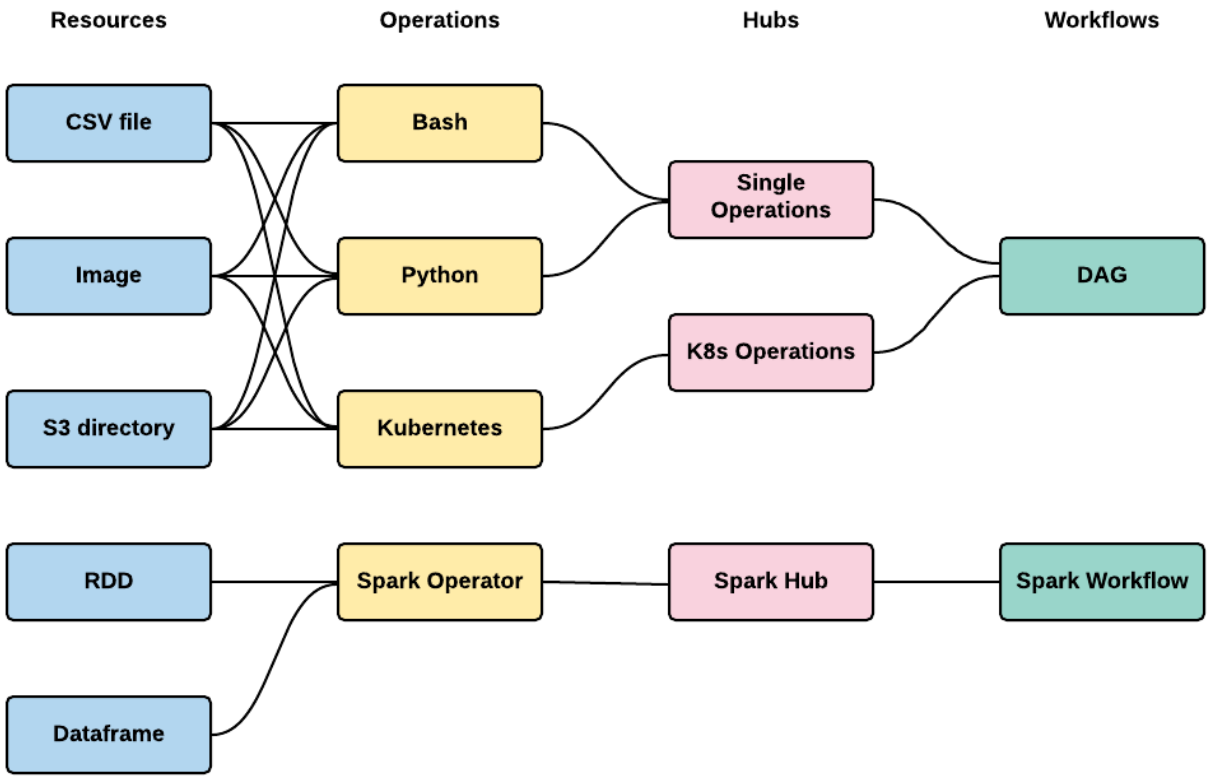
1.4.5 Plugins

The architecture of PLynx supports various use cases. It does not rely on a single backend or workflow. PLynx is basically a graph editor with plugins that provide with backend computation.

Simple structure of plugins is show below.



Please look at an example below. This architecture supports two kinds of Workflows with their own backend and Operations. It can be all configured in `config.yaml` without any change to PLynx. Using `config.yaml` allows to set up PLynx for your use case without making changes to the platform to avoid forking and using outdated version of PLynx.



1.4.5.1 Workflows

There can be can be multiple types of Workflows that share some Hubs or no Hubs at all. Workflow backend is provided by *Executors*.

Examples: - DAG executor that runs operations one by one or in parallel based on the order given by graph structure. - Spark executor that materializes graph into spark code. - Image processing pipeline that applies filters and transformations in given order.

```
workflows:
  - kind: <unique identifier>
    title: <readable title>
    executor: <executor class>
    hubs:
      - <list of hub identifiers>
```

1.4.5.2 Hubs

Main reason of using Hubs is to organize Operations in a useful and convenient way. Hubs are using backend from *Hubs*.

Examples: - Database hub searches all of the Operations from the database. - Static hub serves a static list of Operations. - PLynx supports hierarchical structure of a catalog of Operations using Groups. - Using external sources that open new Operations libraries or serve additional features such as version control.

```
hubs:
  - kind: <unique identifier>
    title: <readable title>
    icon: <icon>
    cls: <hub class>
    args:
      <additional arguments>
```

1.4.5.3 Operations

Operations form building blocks for Workflows. They can be either atomic, i.e. represent a single script, or they can consist of other Operations. Operation backend is provided by *Executors*.

Examples: - Python script. - Bash script. - Same as Python or Bash, but using its own environment, such as additional API or SDK or custom hardware.

```
operations:
  - kind: <unique identifier>
    title: <readable title>
    executor: <executor class>
    icon: <icon>
    color: <color>
    resources:
      <list of resource identifiers>
```

1.4.5.4 Resources

Resources are an abstraction for working with artifacts. Each artifact in PLynd is a file. Resources define some standardized interface to work them. Resources backend is provided by *Resources*.

Examples: - Simple file. - Directory. It will be stored as an archive in *Storage*. Directory resource will take care of unzipping it before starting an Operation and will take of it when it successfully finishes. - Executable. This is a file with unix flag `+x` set.

```
resources:
  - kind: <unique identifier>
    title: <readable title>
    cls: <resource class>
    icon: <icon>
    color: <color>
```

1.5 Plugins

PLynx offers a generic interface for working with custom infrastructure and services. Different organizations have different stacks and different needs. Using PLynx plugins can be a way for companies to customize their PLynx installation to reflect their ecosystem.

Plugins can be used as an easy way to write, share and activate new sets of features.

There's also a need for a set of more complex applications to interact with different flavors of data and backend infrastructure. Essentially PLynx is a graph editor with computational backend provided by plugins and configuration.

Examples:

- Inputs and Outputs might have explicitly different types. They can be simple files or references to S3 / Big Query table / HDFS path etc.
- Users have an option to customize pre or post-processing as well as preview options.
- Operations can be execute commands in multiple languages or in custom environments.
- Some applications require executing Operations one by one, others transform DAGs into AWS Step functions or Argo utilizing 3rd party backend.
- Catalog and categorization of Operations can be supported bu Hubs.
- ...

1.5.1 Executors

Executors are the mechanism by which job instances get run.

PLynx has support for various executors. Some of them execute a single job such as python or bash script. Others are working with DAG structure.

PLynx can be customized by additional executors.

```
import plynx.base.executor


class CustomExecutor(plynx.base.executor.BaseExecutor):
    """ Custom Executor.

    Args:
        node_dict (dict)

    """

    def __init__(self, node_dict):
        super(DAG, self).__init__(node_dict)

        # Initialization

    @classmethod
    def get_default_node(cls, is_workflow):
        """
        You may modify a node by additional parameters.
        """
        node = super().get_default_node(is_workflow)

        # customize your default node here

        return node

    def run(self):
        """
        Worker will execute this function.
        """

    def kill(self):
        """
        Worker will call this function if parent executor or a user canceled the␣
↪process.
```

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```
        """

    def validate(self):
        """
        Validate Node.
        """
```

1.5.2 Resources

PLynx explicitly define artifacts: Inputs, Outputs, and Logs. The mechanism to handle custom artifacts is supported by Resource plugins.

```
import plynx.base.resource


class CustomResource(plynx.base.resource.BaseResource):
    @staticmethod
    def prepare_input(filename, preview):
        """
        Prepare resource before execution.
        """
        if preview:
            return {NodeResources.INPUT: filename}
        # Customize preprocessing here
        return {NodeResources.INPUT: filename}

    @staticmethod
    def prepare_output(filename, preview):
        """
        Prepare output resource before execution.

        For example create a directory or an empty file.
        """
        if preview:
            return {NodeResources.OUTPUT: filename}
        # Customize preprocessing here
        return {NodeResources.OUTPUT: filename}

    @staticmethod
    def postprocess_output(filename):
        """
        Process output after execution.

        For example compress a file or compute extra statistics.
        """
        return filename

    @classmethod
    def preview(cls, preview_object):
        """
        Redefine preview function.

        For example display text content or <img>
        """
```

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```
        return '<pre>{}</pre>'.format(content)
```

1.5.3 Hubs

Hubs let users to organize Operations in the editor and use additional sources.

```
import plynx.base.hub


class CustomHub(plynx.base.hub.BaseHub):
    def __init__(self, **argv):
        super(CollectionHub, self).__init__()

        # use arguments to customize the hub

    def search(self, query):
        """
        Customize search.
        """
```

Warning: API docs are outdated. Please contact us for details.

1.6 REST API

The PLynx REST API allows you to perform most of the actions with Graphs, Operations and Files. The API is hosted under the `/plynx/api/v0` route on the PLynx server. For example, to list latest Graphs on backend server hosted at `http://localhost:5005`, make GET request: `http://localhost:5005/plynx/api/v0/graphs`.

Table of Contents

1.6.1 Authentication

User session should start with this endpoint. If a user if is verified, response will contain access and refresh tokens.

Endpoint	HTTP Method
`plynx/api/v0/token`	`GET`

1.6.1.1 Response Structure

Field Name	Type	Description
status	`STRING`	Status of the query. One of the following: `success` or `failed`
message	`STRING`	Extended status.
access_token	`STRING`	Short-term token.
refresh_token	`STRING`	Long-term token.

1.6.2 List multiple Graphs

Endpoint	HTTP Method
`plynx/api/v0/search_graphs`	`POST`

Blank line required after table.

Get a list of Graphs. You can specify search parameters as a request body, for example:

```
{
   "per_page": 20,
   "offset": 0,
   "search":"author:default "
}
```

1.6.2.1 Request Structure

Parameter name	Type	Default value	Description
search	`STRING`	`""`	Search string. See plynx-internal-search-string for more details.
per_page	`INTEGER`	`20`	Number of instances returned by the query.
offset	`INTEGER`	`0`	Number of instances to skip.
status	`STRING` or `LIST`	`[]`	List of statuses. See *Graph Running Status* for more details.

1.6.2.2 Response Structure

Field Name	Type	Description
items	An array of *Graph*	All experiments.
total_count	`INTEGER`	Total number of graphs that meet the query.
status	`STRING`	Status of the query. One of the following: `success` or `failed`

1.6.2.3 Example

```
curl -X POST \
    'http://localhost:5005/plynx/api/v0/search_graphs' \
    -u default: -H "Content-Type: application/json" \
    -d '{"per_page":1, "search":"author:default"}'
```

1.6.3 Get single Graph

Endpoint	HTTP Method
`plynx/api/v0/graphs/{graph_id}`	`GET`

Get a single Graph in *Graph* format.

Parameter `graph_id` is required.

When `graph_id == "new"` (i.e. `curl 'http://localhost:5005/plynx/api/v0/graphs/new' -u default:`) PLynx backend will generate a default empty Graph. Please note this new Graph will not be saved in the database. Use POST request instead plynx-rest-post_graph:

1.6.3.1 Response Structure

Field Name	Type	Description
data	*Graph*	Graph object.
resources_dict	plynx-internal-resources_dict	Dictionary of available resources types that come as plugins.
status	`STRING`	Status of the query. One of the following: `success` or `failed`

1.6.3.2 Example

```
curl 'http://localhost:5005/plynx/api/v0/graphs/5d1b8469705c1865e288a664' -u default:
```

1.6.4 Post Graph

Endpoint	HTTP Method
`plynx/api/v0/graphs`	`POST`

This endpoint covers multiple actions with a Graph, such as saving, approving, generating code, etc. A single request can contain a sequence of actions that will be applied in the same order.

Note that some of the actions that require a change in the database, are not always permitted. For example when the user is not the original author of the Graph. In this case the Graph is considered as `read only`.

1.6.4.1 Data

Parameter name	Type	Description
graph	*Graph*	Graph object.
action	`LIST` of `STRING`	List of actions. See *Actions* for more details.

1.6.4.2 Actions

Action Name	Description	Permission limitations	Extra fields in response
SAVE	Save the graph. If the Graph with the same Id does not exist, it will be created.	Author must match the current user	
APPROVE	Save the graph and execute it if it passes validation.	Author must match the current user	`validation_error`
VALIDATE	Check if the Graph passes validation, i.e. cycles detected, invalid inputs, etc.	Any User	`validation_error`
REARRANGE	Rearrange Nodes based on topology of the Graph.	Any User	
UPGRADE_NODES	Replace outdated nodes with new versions	Any User	`upgraded_nodes_count`
CANCEL	Cancel currently running Graph.	Author must match the current user	
GENERATE_CODE	Generate python API code that can recreate the same graph.	Any User	`code`
CLONE	Clone the graph and save it.	Any User	`new_graph_id`

1.6.4.3 Response Structure

Field Name	Type	Description
graph	*Graph*	Graph object.
url	`STRING`	URL.
message	`STRING`	Dictionary of available resources types that come as plugins.
status	`STRING`	Status of the query. One of the following: `success` or `failed` or `validation_failed`
validation_error (extra)	An array of plynx-internal-validation_error	If errors found on validation step.
upgraded_nodes_count (extra)	`INTEGER`	Dictionary of available resources types that come as plugins.
code (extra)	`STRING`	Resulting code

1.6.5 Single action endpoints

Similarly to *Actions*, you can perform actions with existing Graphs. These POST-requests do not require json data. Backend will use existing Graph instead.

Endpoint	HTTP Method	Data
plynx/api/v0/graphs/{graph_id}/approve	POST	None
plynx/api/v0/graphs/{graph_id}/validate	POST	None
plynx/api/v0/graphs/{graph_id}/rearrange	POST	None
plynx/api/v0/graphs/{graph_id}/upgrade_nodes	POST	None
plynx/api/v0/graphs/{graph_id}/cancel	POST	None
plynx/api/v0/graphs/{graph_id}/generate_code	POST	None
plynx/api/v0/graphs/{graph_id}/clone	POST	None

Additional PATCH endpoint is available to update the Graph.

Endpoint	HTTP Method	Data
plynx/api/v0/graphs/{graph_id}/update	PATCH	JSON, required

1.6.5.1 Example

```
# Clone existing Graph
curl -X POST \
    'http://localhost:5005/plynx/api/v0/graphs/5d1b8469705c1865e288a664/clone' \
    -u default:
# {"status": "SUCCESS", "message": "Actions completed with Graph(_
↪id=`5d1b8469705c1865e288a664`)", "graph": {"_id": "5d291e57713b286094d4ad85", "title
↪": "hello world", "description": "Description", "graph_running_status": "CREATED",
↪"author": "5d0686aa52691468eaef391c", "nodes": [{"_id": "5d27e3bd0f432b5e3693314c",
↪"title": "Sum", "description": "Sum values", "base_node_name": "python", "parent_
↪node": "5d27b8dd50e56dbbce063449", "successor_node": null, "inputs": [{"name":
↪"input", "file_types": ["file"], "values": [], "min_count": 1, "max_count": -1}],
↪"outputs": [{"name": "output", "file_type": "file", "resource_id": null}],
↪"parameters": [{"name": "cmd", "parameter_type": "code", "value": {"value": "s =␣
↪0\nfor filename in input[\"input\"]:\n    with open(filename) as fi:\n        s +=␣
↪sum([int(line) for line in fi])\nwith open(output[\"output\"], \"w\") as fo:\n    ␣
↪fo.write(\"{}\\n\".format(s))\n", "mode": "python"}, "mutable_type": false,
↪"removable": false, "publicable": false, "widget": null}, {"name": "cacheable",
↪"parameter_type": "bool", "value": true, "mutable_type": false, "removable": false,
↪"publicable": false, "widget": null}], "logs": [{"name": "stderr", "file_type":
↪"file", "resource_id": null}, {"name": "stdout", "file_type": "file", "resource_id
↪": null}, {"name": "worker", "file_type": "file", "resource_id": null}], "node_
↪running_status": "CREATED", "node_status": "READY", "cache_url": "", "x": 190, "y":␣
↪143, "author": "5d0686aa52691468eaef391c", "starred": false}]}, "url": "http://
↪localhost:3001/graphs/5d291e57713b286094d4ad85", "new_graph_id":
↪"5d291e57713b286094d4ad85"}

# Change Title and Description
# Note "new_graph_id": "5d291e57713b286094d4ad85"
curl -X PATCH \
    'http://localhost:5005/plynx/api/v0/graphs/5d1b8469705c1865e288a664/update' \
    -u default: -H "Content-Type: application/json" \
    -d '{"title": "Custom title", "description":"Custom Description"}'

# Execute the Graph:
curl -X POST \
    'http://localhost:5005/plynx/api/v0/graphs/5d1b8469705c1865e288a664/approve' \
    -u default:
```

1.6.6 List multiple Nodes

Note Files and Operations internally are represented as Nodes.

Endpoint	HTTP Method
`plynx/api/v0/search_nodes`	`POST`

Get a list of Nodes. You can specify search parameters as a request body, for example:

```
{
   "per_page": 20,
   "offset": 0,
   "search":"author:default "
}
```

1.6.6.1 Request Structure

Parameter name	Type	Default value	Description
search	`STRING`	`""`	Search string. See plynx-internal-search-string for more details.
per_page	`INTEGER`	`20`	Number of instances returned by the query.
offset	`INTEGER`	`0`	Number of instances to skip.
status	`STRING` or `LIST`	`[]`	List of statuses. See *Node Status* for more details.
base_node_names	`LIST` of plynx-internal-base_node	`[]`	List of base nodes. See plynx-internal-base_node for more details.

1.6.6.2 Response Structure

Field Name	Type	Description
items	An array of *Node*	Nodes (Operations and Files)
resources_dict	An array of plynx-internal-resources_dict	List of resources available in the platform.
total_count	`INTEGER`	Total number of nodes that meet the query.
status	`STRING`	Status of the query. One of the following: `success` or `failed`

1.6.6.3 Example

```
curl -X POST \
    'http://localhost:5005/plynx/api/v0/search_nodes' \
    -u default: -H "Content-Type: application/json" \
    -d '{"per_page":1, "search":"author:default"}'
```

1.6.7 Get single Node

Endpoint	HTTP Method
`plynx/api/v0/nodes/{node_id}`	`GET`

Get a single Graph in *Node* format.

There are special cases when *node_id* is *base_node_name*, i.e. `curl 'http://localhost:5005/plynx/api/v0/nodes/python'` or `curl 'http://localhost:5005/plynx/api/v0/nodes/bash_jinja2'`. Backend will generate a default Operation.

1.6.7.1 Response Structure

Field Name	Type	Description
data	*Node*	Node object.
resources_dict	plynx-internal-resources_dict	Dictionary of available resources types that come as plugins.
status	`STRING`	Status of the query. One of the following: `success` or `failed`

1.6.7.2 Example

```
curl 'http://localhost:5005/plynx/api/v0/nodes/5d27b8dd50e56dbbce063449' -u default:
```

1.6.8 Post Node

Endpoint	HTTP Method
`plynx/api/v0/nodes`	`POST`

This endpoint covers multiple actions with a Node, such as saving, approving, deprecating, etc.

Note that some of the actions that require a change in the database, are not always permitted. For example when the user is not the original author of the Node. In this case the Node is considered as `read only`.

1.6.8.1 Data

Parameter name	Type	Description
node	*Node*	Node object.
action	`STRING`	List of actions. See *Actions* for more details.

1.6.8.2 Actions

Action Name	Description	Permission limitations	Extra fields in response
SAVE	Save the Node. If the Node with the same Id does not exist, it will be created.	Author must match the current user	
APPROVE	Save the Node and make accessible in Graphs if it passes validation.	Author must match the current user	`validation_error`
VALIDATE	Check if the Node passes validation, i.e. incorrect parameter values.	Any User	`validation_error`
DEPRECATE	Deprecate the Node. User will still be able to use it.	Author must match the current user	
MANDATORY_DEPRECATE	Deprecate the Node mandatory. Users will no longer be able to use it.	Author must match the current user	`validation_error`
PREVIEW_CMD	Preview exec script.	Any User	`validation_error`

1.6.8.3 Response Structure

Field Name	Type	Description
node	*Node*	Node object.
url	`STRING`	URL.
message	`STRING`	Extended status.
status	`STRING`	Status of the query. One of the following: `success` or `failed` or `validation_failed`
validation_error (extra)	An array of plynx-internal-validation_error	If errors found on validation step.
preview_text (extra)	`STRING`	Resulting code.

1.6.9 Upload File

This endpoint will create a new Node with type *File*. If you work with large files it is recommended to use an external file storage and Operation that downloads the file (i.e. S3).

Endpoint	HTTP Method	Data
`plynx/api/v0/upload_file`	`POST` or `PUT`	Forms, required

Form	Description
data	Binary data of the file.
title	Title of the file
description	Description of the file
file_type	Type, i.e. *file*, *csv*, *image*, etc.

1.6.9.1 Example

```
curl \
    -X POST \
    'http://localhost:5005/plynx/api/v0/upload_file' \
    -u default: \
    -H "Content-Type: multipart/form-data" \
    -F data=@/tmp/a.csv \
    -F title=report \
    -F description=2019 \
    -F file_type=csv
    -F node_kind=basic-file
```

1.6.10 Modify existing Graphs

Endpoint	HTTP Method	Data
plynx/api/v0/graphs/{graph_id}/nodes/list_nodes	GET	*None*
plynx/api/v0/graphs/{graph_id}/nodes/insert_node	POST	*node_id: required.* *x: optional.* Default: 0. *y: optional.* Default: 0.
plynx/api/v0/graphs/{graph_id}/nodes/remove_node	POST	*node_id: required.*
plynx/api/v0/graphs/{graph_id}/nodes/create_link	POST	*from: required. Type: Object.* Output node description. *from.node_id: required.* *from.resource: required.* Name of the Output *to: required. Type: Object.* Input node description. *to.node_id: required.* *to.resource: required.* Name of the Input
plynx/api/v0/graphs/{graph_id}/nodes/remove_link	POST	*from: required. Type: Object.* Output node description. *from.node_id: required.* *from.resource: required.* Name of the Output *to: required. Type: Object.* Input node description. *to.node_id: required.* *to.resource: required.* Name of the Input
plynx/api/v0/graphs/{graph_id}/nodes/change_parameter	POST	*node_id: required.* *parameter_name: required.* *parameter_value: required.*

1.6.10.1 Example

```
curl -X POST 'http://localhost:5005/plynx/api/v0/graphs/5d292406713b286094d4ad87/
↪nodes/insert_node' \
    -u default: -H "Content-Type: application/json" \
    -d '{"node_id": "5d2d4b1dc36682386f559eae", "x": 100, "y": 100}'

curl -X POST 'http://localhost:5005/plynx/api/v0/graphs/5d292406713b286094d4ad87/
↪nodes/remove_node' \
    -u default: -H "Content-Type: application/json" \
    -d '{"node_id": "5d27e3bd0f432b5e3693314c"}'

curl -X POST 'http://localhost:5005/plynx/api/v0/graphs/5d292406713b286094d4ad87/
↪nodes/create_link' \
    -u default: -H "Content-Type: application/json" \
    -d '{"from": {"node_id": "5d2fbdf3373d3b7ce6e69043", "resource": "out"}, "to": {
↪"node_id": "5d3081ea99d54c7b6b8ff56b", "resource": "input"}}'

curl -X POST 'http://localhost:5005/plynx/api/v0/graphs/5d292406713b286094d4ad87/
↪nodes/change_parameter' \
    -u default: -H "Content-Type: application/json" \
    -d '{"node_id": "5d30b7eb88fb6a42caf0c565", "parameter_name": "template",
↪"parameter_value": "abc"}'
```

1.6.11 Working with a single Resource

This endpoint is a proxy between the client and internal PLynx resources.

WARNING: try to avoid calling this endpoint without "preview" argument set to True. Currently PLynx supports multiple data storages and is not optimized for a particular one. It will be fixed in the future versions, exposing additional endpoints.

Endpoint	HTTP Method
`plynx/api/v0/resources/{resource_id}`	`GET`

Blank line required after table.

Additional arguments to the endpoint:

Argument	Type	Description
`preview`	`BOOLEAN`	Preview flag (default: *false*)
`file_type`	`STRING`	One of the plugins. See plynx-internal-file-types for more details.

1.6.12 Get state of the Master

When Master is running, it periodically syncs its state with PLynx database. Use this endpoint to access it. See See plynx-internal-master_state.

Endpoint	HTTP Method
`plynx/api/v0/master_state`	`GET`

1.6.12.1 Example

```
curl 'http://localhost:5005/plynx/api/v0/master_state' -u default:
```

Warning: Internal data structures are outdated. Please contact us for details.

1.7 Internal data structures

This section is meant for advanced users. PLynx exposes Rest API for creating Graphs and Nodes and monitoring their states. We will give you an overview of these objects below.

Table of Contents

1.7.1 Graph

Graph is a basic structure of experiments. The Graph defines layout of Operations and Files and their dependancies. See intro-graph.

Field Name	Type	Description
_id	STRING	Unique ID of the Graph.
title	STRING	Title string of the Graph.
description	STRING	Description string of the Graph.
author	STRING	ID of the author.
graph_running_status	STRING	Current status. *Graph Running Status*
insertion_date	STRING	Date time when the record was created in format *%Y-%m-%d %H:%M:%S.%LZ.*
update_date	STRING	Date time when the record was updated in format *%Y-%m-%d %H:%M:%S.%LZ.*
nodes	LIST	List for the nodes. See *Node*.
_readonly	BOOLEAN	Flag that shows if current user has write access to this object.

1.7.1.1 Graph Running Status

Value	Description
CREATED	Initial state of the Graph. Users can make changes in it.
READY	The Graph was approved. No changes accepted.
RUNNING	Master took control over the Graph and is working on execution.
SUCCESS	Execution of the Graph finished successfully.
FAILED_WAITING	One or more Operations failed during execution. Waiting for the rest of operations to be canceled.
FAILED	One or more Operations failed during execution.
CANCELED	User canceled execution.

1.7.2 Node

Operations and Files are derived from Nodes. See intro-node.

Field Name	Type	Description
_id	STRING	Unique ID of the Node.
title	STRING	Title string of the Node.
description	STRING	Description string of the Node.
author	STRING	ID of the author.
node_running_status	STRING	Status of the Node inside a Graph. *Node Running Status*
node_status	STRING	Status of the Node. *Node Status*
insertion_date	STRING	Date time when the record was created in format *%Y-%m-%d %H:%M:%S.%LZ*.
update_date	STRING	Date time when the record was updated in format *%Y-%m-%d %H:%M:%S.%LZ*.
_readonly	BOOLEAN	Flag that shows if current user has write access to this object.
base_node_name	STRING	Base Node name. plynx-concepts-base_node_name
cache_url	STRING	URL to the cached operation.
parent_node_id	STRING	Reference to the parent Node. It refers to *nodes* collection.
starred	BOOLEAN	Flag is set to *true* if the Node is prioritized.
successor_node_id	STRING	If the Node is deprecated this field will reference to a successor in *nodes* collection.
x	INTEGER	*X* position in the Graph.
y	INTEGER	*Y* position in the Graph.
inputs	LIST	List for the Inputs. See *Input*.
parameters	LIST	List for the Parameters. See *Parameter*.
logs	LIST	List for the Logs. See *Log*.
outputs	LIST	List for the Outputs. See *Output*.

1.7.2.1 Input

Field Name	Type	Description
name	STRING	Name of the Input.
file_types	LIST	List of file types. See plynx-plugins-file_types.
values	LIST	List of Values. See *Input Value*.
min_count	INTEGER	Minimum number of Inputs.
max_count	INTEGER	Maximum number of Inputs.

1.7.2.2 Input Value

Field Name	Type	Description
node_id	`STRING`	ID of the Node the Operation depends on in a Graph.
output_id	`STRING`	Name of the Output in the Operation it depends on.
resource_id	`STRING`	Reference to a resource.

1.7.2.3 Parameter

Field Name	Type	Description
name	`STRING`	Name of the Parameter.
parameter_type	`LIST`	List of parameter types. See intro-parameter_types.
value	–	Type is specific to parameter type.
mutable_type	`BOOLEAN`	Flag specifies if user can change *parameter_type*.
removable	`BOOLEAN`	Flag specifies if user can remove the Parameter.
publicable	`BOOLEAN`	Flag specifies if user can publish the Parameter.
widget	`OBJECT`	*Null* of *Object* with the field `alias`. It contains the name of the parameter in the UI.

1.7.2.4 Output

Field Name	Type	Description
name	`STRING`	Name of the Output.
file_type	`STRING`	File type. See plynx-plugins-file_types.
resource_id	`STRING`	Reference to the file.

1.7.2.5 Log

Similar to *Output*. Field `file_type` is always set to `file`.

1.7.2.6 Node Running Status

This enum describes the state of the Node in the Graph.

Value	Description
`STATIC`	Usually Files have this status. This status never change.
`CREATED`	Initial state of the Node in the Graph.
`IN_QUEUE`	Operation is ready to be executed.
`RUNNING`	A worker is working on execution.
`SUCCESS`	Operation has been completed
`RESTORED`	Result of the Operation has been restored from previous execution.
`FAILED`	Operation has failed during execution.
`CANCELED`	User canceled execution.

1.7.2.7 Node Status

This enum describes global the state of the Node.

Value	Description
CREATED	Initial state of the Node. Users can still Modify it.
READY	Operation is ready to be used in Graphs.
DEPRECATED	Usage of the Operation is not recommended but it can be used.
MANDATORY_DEPRECATED	Usage of the Operation is not allowed.

1.8 Kubernetes deployment

This section covers basic deployment to google cloud kubernetes service.

Table of Contents

1.8.1 Step 0: Create a cluster

Kubernetes on Google Cloud Quickstart

First we will need to set up *gcloud* utils.

```
gcloud config set project [YOUR_PROJECT_ID]
gcloud config set compute/zone [YOUR_ZONE]
```

Create cluster with a custom name.

```
export CLUSTER_NAME=[CLUSTER_NAME]
gcloud container clusters create ${CLUSTER_NAME}
gcloud container clusters get-credentials ${CLUSTER_NAME}
```

Resize cluster (optional).

```
# Optional
gcloud container clusters resize ${CLUSTER_NAME} --node-pool default-pool --num-nodes␣
↪3
```

1.8.2 Step 1: Create service account credentials

Reference to Google Cloud docs

1. Create service account: *IAM & admin -> Service accounts -> Create Service Account*
2. Select custom username.
3. Add roles: *Storage Object Creator* and *Storage Object Viewer*
4. Create *json* key. It will download a file *plynx-*.json*, i.e. */Users/username/Downloads/plynx-197007-2aeb7faedf34.json*
5. Create a new bucket

```
# example YOUR_BUCKET_PATH=gs://plynx-test
export BUCKET=[YOUR_BUCKET_PATH]
gsutil mb ${BUCKET}
```

6. **IMPORTANT!** Add legacy permissions in Console User Interface.
   a. Go to *Storage -> [YOUR_BUCKET_PATH] -> Permissions*.
   b. In your User Account modify *Role(s)*: add *Storage Legacy Bucket Reader* and *Storage Legacy Bucket Writer*
7. Store credentials in kubernetes.

```
kubectl create secret generic gs-key --from-file=key.json=[PATH_TO_KEY_JSON]
```

8. Configure env variable mapping

```
kubectl create configmap storage-config --from-literal=storage-scheme=gs --from-
↪literal=storage-prefix=${BUCKET}/resources/
```

1.8.3 Step 2: Create secret key

Generate new secret key and write it to the file. Reuse the file in kubernetes secrets.

```
openssl rand -base64 16 | tr -d '\n' > secret.txt
kubectl create secret generic secret-key --from-file=secret.txt=./secret.txt
```

1.8.4 Step 3: Create MongoDB pod

Clone configuration files.

```
git clone https://github.com/plynx-team/plynx.git
cd plynx/kubernetes
```

To create the MongoDB pod, run these two commands:

```
kubectl apply -f googlecloud_ssd.yaml

kubectl apply -f mongo-statefulset.yaml
```

1.8.5 Step 4: PLynx pods

Create PLynx pods and services.

```
kubectl apply -f backend-service.yaml
kubectl apply -f backend-deployment.yaml
kubectl expose deployment backend --type=NodePort --name=backend-server

kubectl apply -f frontend-deployment.yaml
kubectl apply -f frontend-service.yaml

kubectl apply -f router.yaml

kubectl apply -f master-service.yaml
kubectl apply -f master-deployment.yaml

kubectl apply -f workers-deployment.yaml
```

1.8.6 Step 5: Init users

List of pods:

```
kubectl get pods

# NAME                          READY   STATUS    RESTARTS   AGE
# backend-8665dc7967-7wlks      1/1     Running   0          9m49s
# frontend-57857fc888-6gj57     1/1     Running   0          124m
# master-7f686d64f6-6shbq       1/1     Running   0          122m
# mongo-0                       2/2     Running   0          144m
# worker-6d5fc66f55-5g7q2       1/1     Running   5          76m
# worker-6d5fc66f55-5tsdf       1/1     Running   0          11m
# worker-6d5fc66f55-9vjv8       1/1     Running   0          11m
```

ssh to master pod.

```
kubectl exec -t -i master-7f686d64f6-6shbq bash
```

When connected, create a user.

```
plynx users --mode create_user --db-host mongo --username foo --password woo
```

1.8.7 Step 6: Try PLynx

1. Go to *Kubernetes Engine -> Services and Ingress*
2. Select Ingress called *api-router*
3. Go to the page located at *Load balancer IP*.
4. Use username *foo* and password *woo*

1.9 Frequently Asked Questions

1.9.1 Who is it for?

PLynx has been developed mainly for Data Scientists and ML Engineers as a high level abstraction of data pipelines and infrastructure. It is not limited by them and can be used by other technical and non-technical professionals, etc.

Modular architecture makes PLynx rather a graph editor that transforms graphs into executable code.

1.9.2 Can I run it without docker?

Yes you can, but this way is not recommended.

Docker is an extremely powerful platform that has become a de-facto standard in the industry. Besides encapsulation, isolation and portability, it provides a more convenient way to control complex systems.

If you still want to run it without docker or have some other issues with deployment, please don't hesitate to contact us in discord

1.9.3 How is it different from Airflow, Kubeflow and other platforms?

Here are some main differences and principles.

- PLynx follows the principle of rapid development: Try Fast Fail Fast. Highly reliable execution is not as important as flexibility and ability to try different experiments. Using reliable data pipelines in Data Science can bring incremental improvements, however there is usually far more to gain from other activities like integrating new data sources or using additional workflows.
- Each Operation has named *inputs* and *outputs*. It removes hidden logic and allows you to *reuse* existing Operations in new Workflows.
- The interface abstracts data scientists from the engineering and organizational complexities, such as data access, containerization, distributed processing, automatic failover, and other advanced computer science concepts.
- Plugins are very flexible and support multiple platforms and use cases.
- It encourages people to create their workflows in a more modular and parameterized way reusing existing solutions. This way they don't reinvent existing solutions many times and can use advantages of cached results and distributed computation.
- No need to have a domain specialist run the entire pipeline. Non-specialist can rerun an existing one.
- Experiments in Graph format are very well interpretable. It can be used by non-experts, or by people from other teams.

1.9.4 Is it a no-code platform?

Not exactly. Users have ability to write their own Operations as well as use existing repositories.

1.9.5 How can I install additional packages?

Option 1. Build your new images (preferred)

- Create a new Dockerfile with your dependancies.
- Install PyPI PLynx package

- Deploy your new image.

Option 2. Run worker locally. (experimental)

- Run `make up_local_service` to start the database, UI and api services in docker-compose.
- Run `make up_local_worker` to start a single local worker. Note you will need to install packages necessary to run a worker itself.

Option 3. Local build copy.

- Add dependancies to your requirements.txt
- Run `make build` to build new images.
- Run `make up` to start your local PLynx.

Option 4. Kubernetes Operation (not available now)

Currently work in queue. Please upvote

1.9.6 How to contact us?

Please don't hesitate to join us in discord.

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   unless required by applicable law (such as deliberate and grossly
   negligent acts) or agreed to in writing, shall any Contributor be
   liable to You for damages, including any direct, indirect, special,
   incidental, or consequential damages of any character arising as a
   result of this License or out of the use or inability to use the
   Work (including but not limited to damages for loss of goodwill,
   work stoppage, computer failure or malfunction, or any and all
   other commercial damages or losses), even if such Contributor
   has been advised of the possibility of such damages.

9. Accepting Warranty or Additional Liability. While redistributing
   the Work or Derivative Works thereof, You may choose to offer,
   and charge a fee for, acceptance of support, warranty, indemnity,
   or other liability obligations and/or rights consistent with this
   License. However, in accepting such obligations, You may act only
   on Your own behalf and on Your sole responsibility, not on behalf
   of any other Contributor, and only if You agree to indemnify,
   defend, and hold each Contributor harmless for any liability
   incurred by, or claims asserted against, such Contributor by reason
   of your accepting any such warranty or additional liability.
```

1.11 API Reference

This page contains auto-generated API reference documentation[1].

1.11.1 plynx

Interactive, Scalable, Shareable and Reproducible Workflow Orchestration framework

1.11.1.1 Subpackages

plynx.base

[1] Created with sphinx-autoapi

Submodules

plynx.base.executor

Templates for PLynx Executors and utils.

Module Contents

class plynx.base.executor.**RunningStatus**
Async job running status

node_running_status :str

class plynx.base.executor.**BaseExecutor**(*node: Optional[Node] = None*)
Bases: abc.ABC

Base Executor class

IS_GRAPH :bool = False

_update_node(*self*, *node*)

run(*self*, *preview: bool = False*)
Main execution function.

- Workdir has been initialized.
- Inputs are not preprocessed.
- Outputs shoul be manually postprocessed.
- It is OK to raise an exception in this function.

Returns: enum: plynx.constants.NodeRunningStatus

launch(*self*)
Launch the Node on the backend.

The difference between *launch()* and *run()* is that: - *run()* assumes synchronous execution. - *launch()* does not necessary have this assumtion. Use *get_node_running_status* to get the status of the execution.

Returns: RunningStatus

get_running_status(*self*)
Returns the status of the execution.

Async executions should sync with the remote and return the result immediately.

kill(*self*)
Force to kill the process.

The reason can be the fact it was working too long or parent executor canceled it.

is_updated(*self*)
Function that is regularly called by a Worker.

The function is running in a separate thread and does not block execution of *run()*.

Returns: (bool): True if worker needs to update DB else False

classmethod get_default_node(*cls*, *is_workflow: bool*)
Generate a new default Node for this executor

init_executor(*self*)
Initialize environment for the executor

clean_up_executor(*self*)
Clean up the environment created by executor

validate(*self*, *ignore_inputs: bool = True*)
Validate Node.

Return: (ValidationError) Validation error if found; else None

class plynx.base.executor.**Dummy**
Bases: *plynx.base.executor.BaseExecutor*

Dummy Executor. Used for static Operations

run(*self*, *preview=False*)
Not Implemented

status(*self*)
Not Implemented

kill(*self*)
Not Implemented

classmethod get_default_node(*cls*, *is_workflow: bool*)
Not Implemented

plynx.base.hub

Templates for PLynx Hubs and utils.

Module Contents

class plynx.base.hub.**Query**
Hub search query entry

status :str =

search :str =

per_page :int = 30

offset :int = 0

user_id :Optional[str]

class plynx.base.hub.**BaseHub**
Base Hub class

search(*self*, *query: Query*)
Search for items given a query

plynx.base.resource

Templates for PLynx Resources and utils.

Module Contents

plynx.base.resource.**PreviewObject**

plynx.base.resource.**_force_decode**(*byte_array*)

class plynx.base.resource.**BaseResource**
Base Resource class

DISPLAY_RAW :bool = False

DISPLAY_THUMBNAIL :bool = False

static prepare_input(*filename: str*, *preview: bool = False*)
Resource preprocessor

static prepare_output(*filename: str*, *preview: bool = False*)
Prepare output

static preprocess_input(*value: Any*)
Resource preprocessor

static postprocess_output(*value: Any*)
Resource postprocessor

classmethod preview(*cls*, *preview_object: PreviewObject*)
Preview Resource

classmethod thumbnail(*cls*, *output: Any*)
Thumbnail preview Resource

plynx.bin

PLynx CLI.

Submodules

plynx.bin.cli

PLynx CLI parser

Module Contents

plynx.bin.cli.**_config**

class plynx.bin.cli.**Arg**
Common argument tuple

flags :Union[Tuple[str], Tuple[str, str]]

help :str

action :Optional[str]

default :Optional[Any]

type :Optional[Type]

levels :Optional[List[str]]

required :bool = False

nargs :Optional[str]

plynx.bin.cli.**api**(*args*)
Start web service.

plynx.bin.cli.**worker_server**(*args*)
Start worker service.

plynx.bin.cli.**cache**(*args*)
Show cache options.

plynx.bin.cli.**worker**(*args*)
Start worker service.

plynx.bin.cli.**users**(*args*)
Show users options.

plynx.bin.cli.**version**(*args*)
Print PLynx version

plynx.bin.cli.**execute**(*args*)
Execute Operation.

plynx.bin.cli.**make_operations_meta**(*args*)
Execute Operation.

class plynx.bin.cli.**CLIFactory**
The class that generates PLynx CLI parser

ARGS

SUBPARSERS

classmethod parse_global_config_parameters(*cls*, *args*)
Parse parameters applied to all of the services.

classmethod get_parser(*cls*)
Generate CLI parser

plynx.bin.cli.**get_parser**()
Generate CLI parser

Package Contents

class plynx.bin.**CLIFactory**
The class that generates PLynx CLI parser

ARGS

SUBPARSERS

classmethod parse_global_config_parameters(*cls*, *args*)
Parse parameters applied to all of the services.

classmethod get_parser(*cls*)
Generate CLI parser

plynx.bin.**main**()
Main PLynx CLI function.

plynx.constants

Main PLynx constants defined in this module

Submodules

plynx.constants.collections

Standard PLynx collections in DB

Module Contents

class plynx.constants.collections.**Collections**
All basic collections used in DB

NODE_CACHE :str = node_cache

RUN_CANCELLATIONS :str = run_cancellations

RUNS :str = runs

TEMPLATES :str = templates

USERS :str = users

WORKER_STATE :str = worker_state

HUB_NODE_REGISTRY :str = hub_node_registry

plynx.constants.node_enums

Node constants

Module Contents

class plynx.constants.node_enums.**NodeRunningStatus**
Running status enum

STATIC :str = STATIC

CREATED :str = CREATED

READY :str = READY

IN_QUEUE :str = IN_QUEUE

RUNNING :str = RUNNING

SUCCESS :str = SUCCESS

RESTORED :str = RESTORED

FAILED :str = FAILED

FAILED_WAITING :str = FAILED_WAITING

CANCELED :str = CANCELED

SPECIAL :str = SPECIAL

_FAILED_STATUSES :Set[str]

_SUCCEEDED_STATUSES :Set[str]

_AWAITING_STATUSES :Set[str]

_NON_CHANGEABLE_STATUSES :Set[str]

_FINISHED_STATUSES :Set[str]

static is_finished(*node_running_status: str*)
Check if the status is final

static is_succeeded(*node_running_status: str*)
Check if the status is final and successful

static is_failed(*node_running_status: str*)
Check if the status is final and failed

static is_non_changeable(*node_running_status: str*)
Check if the status is in static or special

class plynx.constants.node_enums.**NodeStatus**
Node permanent status

CREATED :str = CREATED

READY :str = READY

DEPRECATED :str = DEPRECATED

MANDATORY_DEPRECATED :str = MANDATORY_DEPRECATED

class plynx.constants.node_enums.**NodePostAction**
HTTP post action

SAVE :str = SAVE

APPROVE :str = APPROVE

CREATE_RUN :str = CREATE_RUN

CREATE_RUN_FROM_SCRATCH :str = CREATE_RUN_FROM_SCRATCH

CLONE :str = CLONE

VALIDATE :str = VALIDATE

DEPRECATE :str = DEPRECATE

MANDATORY_DEPRECATE :str = MANDATORY_DEPRECATE

PREVIEW_CMD :str = PREVIEW_CMD

REARRANGE_NODES :str = REARRANGE_NODES

UPGRADE_NODES :str = UPGRADE_NODES

CANCEL :str = CANCEL

GENERATE_CODE :str = GENERATE_CODE

class plynx.constants.node_enums.**NodePostStatus**
Standard HTTP response status

SUCCESS :str = SUCCESS

FAILED :str = FAILED

VALIDATION_FAILED :str = VALIDATION_FAILED

class plynx.constants.node_enums.**NodeClonePolicy**
Clone algorithm

NODE_TO_NODE :int = 0

NODE_TO_RUN :int = 1

RUN_TO_NODE :int = 2

class plynx.constants.node_enums.**NodeVirtualCollection**
Virtual collection

OPERATIONS :str = operations

WORKFLOWS :str = workflows

class plynx.constants.node_enums.**SpecialNodeId**
Special Node IDs in the workflows

INPUT :ObjectId

OUTPUT :ObjectId

class plynx.constants.node_enums.**NodeOrigin**
Enum that indicates where the Node came from

DB :str = DB

BUILT_IN_HUBS :str = BUILT_IN_HUBS

plynx.constants.node_enums.**IGNORED_CACHE_PARAMETERS**

plynx.constants.parameter_types

Parameter enums

Module Contents

class plynx.constants.parameter_types.**ParameterTypes**
Standard parameter types

STR :str = str

INT :str = int

FLOAT :str = float

BOOL :str = bool

TEXT :str = text

ENUM :str = enum

LIST_STR :str = list_str

LIST_INT :str = list_int

LIST_NODE :str = list_node

CODE :str = code

COLOR :str = color

plynx.constants.parameter_types.**PRIMITIVE_TYPES**

plynx.constants.resource_enums

Resource enums

Module Contents

class plynx.constants.resource_enums.**NodeResources**
Internal node elements

INPUT :str = inputs

OUTPUT :str = outputs

CLOUD_INPUT :str = cloud_inputs

CLOUD_OUTPUT :str = cloud_outputs

PARAM :str = params

LOG :str = logs

class plynx.constants.resource_enums.**HubSearchParams**
Describing serach based on resource

INPUT_FILE_TYPE :str = input_file_type

OUTPUT_FILE_TYPE :str = output_file_type

plynx.constants.users

User based enums

Module Contents

class plynx.constants.users.**IAMPolicies**
Standard role policies

CAN_VIEW_OTHERS_OPERATIONS :str = CAN_VIEW_OTHERS_OPERATIONS

CAN_VIEW_OTHERS_WORKFLOWS :str = CAN_VIEW_OTHERS_WORKFLOWS

CAN_VIEW_OPERATIONS :str = CAN_VIEW_OPERATIONS

CAN_VIEW_WORKFLOWS :str = CAN_VIEW_WORKFLOWS

CAN_CREATE_OPERATIONS :str = CAN_CREATE_OPERATIONS

CAN_CREATE_WORKFLOWS :str = CAN_CREATE_WORKFLOWS

CAN_MODIFY_OTHERS_WORKFLOWS :str = CAN_MODIFY_OTHERS_WORKFLOWS

CAN_RUN_WORKFLOWS :str = CAN_RUN_WORKFLOWS

IS_ADMIN :str = IS_ADMIN

class plynx.constants.users.**UserPostAction**
HTTP POST action options

MODIFY :str = MODIFY

class plynx.constants.users.**RegisterUserExceptionCode**
Validation error codes

EMPTY_USERNAME :str = EMPTY_USERNAME

EMPTY_PASSWORD :str = EMPTY_PASSWORD

USERNAME_ALREADY_EXISTS :str = USERNAME_ALREADY_EXISTS

EMAIL_ALREADY_EXISTS :str = EMAIL_ALREADY_EXISTS

INVALID_EMAIL :str = INVALID_EMAIL

INVALID_LENGTH_OF_USERNAME :str = INVALID_LENGTH_OF_USERNAME

class plynx.constants.users.**TokenType**
Auth token type

ACCESS_TOKEN = access

REFRESH_TOKEN = refresh

plynx.constants.validation_enums

Node validation enums

Module Contents

class plynx.constants.validation_enums.**ValidationTargetType**
Object Target

BLOCK :str = BLOCK

GRAPH :str = GRAPH

INPUT :str = INPUT

NODE :str = NODE

PARAMETER :str = PARAMETER

PROPERTY :str = PROPERTY

class plynx.constants.validation_enums.**ValidationCode**
Standard validation code

IN_DEPENDENTS :str = IN_DEPENDENTS

MISSING_INPUT :str = MISSING_INPUT

MISSING_PARAMETER :str = MISSING_PARAMETER

INVALID_VALUE :str = INVALID_VALUE

DEPRECATED_NODE :str = DEPRECATED_NODE

EMPTY_GRAPH :str = EMPTY_GRAPH

plynx.constants.web

Web constants

Module Contents

class plynx.constants.web.**ResponseStatus**
Returned response status

SUCCESS :str = SUCCESS

FAILED :str = FAILED

Package Contents

class plynx.constants.**Collections**
All basic collections used in DB

NODE_CACHE :str = node_cache

RUN_CANCELLATIONS :str = run_cancellations

RUNS :str = runs

TEMPLATES :str = templates

USERS :str = users

WORKER_STATE :str = worker_state

HUB_NODE_REGISTRY :str = hub_node_registry

plynx.constants.**IGNORED_CACHE_PARAMETERS**

class plynx.constants.**NodeClonePolicy**
Clone algorithm

NODE_TO_NODE :int = 0

NODE_TO_RUN :int = 1

RUN_TO_NODE :int = 2

class plynx.constants.**NodeOrigin**
Enum that indicates where the Node came from

DB :str = DB

BUILT_IN_HUBS :str = BUILT_IN_HUBS

class plynx.constants.**NodePostAction**
HTTP post action

SAVE :str = SAVE

APPROVE :str = APPROVE

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GENERATE_CODE :str = GENERATE_CODE

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Standard HTTP response status

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VALIDATION_FAILED :str = VALIDATION_FAILED

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Running status enum

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CANCELED :str = CANCELED

SPECIAL :str = SPECIAL

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static is_finished(*node_running_status: str*)
Check if the status is final

static is_succeeded(*node_running_status: str*)
Check if the status is final and successful

static is_failed(*node_running_status: str*)
Check if the status is final and failed

static is_non_changeable(*node_running_status: str*)
Check if the status is in static or special

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Node permanent status

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MANDATORY_DEPRECATED :str = MANDATORY_DEPRECATED

class plynx.constants.**NodeVirtualCollection**
Virtual collection

OPERATIONS :str = operations

WORKFLOWS :str = workflows

class plynx.constants.**SpecialNodeId**
Special Node IDs in the workflows

INPUT :ObjectId

OUTPUT :ObjectId

plynx.constants.**PRIMITIVE_TYPES**

class plynx.constants.**ParameterTypes**
Standard parameter types

STR :str = str

INT :str = int

FLOAT :str = float

BOOL :str = bool

TEXT :str = text

ENUM :str = enum

LIST_STR :str = list_str

LIST_INT :str = list_int

LIST_NODE :str = list_node

CODE :str = code

COLOR :str = color

class plynx.constants.**HubSearchParams**
Describing serach based on resource

INPUT_FILE_TYPE :str = input_file_type

OUTPUT_FILE_TYPE :str = output_file_type

class plynx.constants.**NodeResources**
Internal node elements

INPUT :str = inputs

OUTPUT :str = outputs

CLOUD_INPUT :str = cloud_inputs

CLOUD_OUTPUT :str = cloud_outputs

PARAM :str = params

LOG :str = logs

class plynx.constants.**IAMPolicies**
Standard role policies

CAN_VIEW_OTHERS_OPERATIONS :str = CAN_VIEW_OTHERS_OPERATIONS

CAN_VIEW_OTHERS_WORKFLOWS :str = CAN_VIEW_OTHERS_WORKFLOWS

CAN_VIEW_OPERATIONS :str = CAN_VIEW_OPERATIONS

CAN_VIEW_WORKFLOWS :str = CAN_VIEW_WORKFLOWS

CAN_CREATE_OPERATIONS :str = CAN_CREATE_OPERATIONS

CAN_CREATE_WORKFLOWS :str = CAN_CREATE_WORKFLOWS

CAN_MODIFY_OTHERS_WORKFLOWS :str = CAN_MODIFY_OTHERS_WORKFLOWS

CAN_RUN_WORKFLOWS :str = CAN_RUN_WORKFLOWS

IS_ADMIN :str = IS_ADMIN

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Validation error codes

EMPTY_USERNAME :str = EMPTY_USERNAME

EMPTY_PASSWORD :str = EMPTY_PASSWORD

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EMAIL_ALREADY_EXISTS :str = EMAIL_ALREADY_EXISTS

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Auth token type

ACCESS_TOKEN = access

REFRESH_TOKEN = refresh

class plynx.constants.**UserPostAction**
HTTP POST action options

MODIFY :str = MODIFY

class plynx.constants.**ValidationCode**
Standard validation code

IN_DEPENDENTS :str = IN_DEPENDENTS

MISSING_INPUT :str = MISSING_INPUT

MISSING_PARAMETER :str = MISSING_PARAMETER

INVALID_VALUE :str = INVALID_VALUE

DEPRECATED_NODE :str = DEPRECATED_NODE

EMPTY_GRAPH :str = EMPTY_GRAPH

class plynx.constants.**ValidationTargetType**
Object Target

BLOCK :str = BLOCK

GRAPH :str = GRAPH

INPUT :str = INPUT

NODE :str = NODE

PARAMETER :str = PARAMETER

PROPERTY :str = PROPERTY

class plynx.constants.**ResponseStatus**
Returned response status

SUCCESS :str = SUCCESS

FAILED :str = FAILED

plynx.db

Submodules

plynx.db.db_object

The class defines *DBObject*. This is an abstraction of all of the objects in database.

Module Contents

plynx.db.db_object.**DBObjectType**

plynx.db.db_object.**_registry**

plynx.db.db_object.**register_class**(*target_class*)
Register inherited from DB Object class

plynx.db.db_object.**get_class**(*name: str*) → DBObjectType
Get DB Object inherited class object by its name from the registry

exception plynx.db.db_object.**DBObjectNotFound**
Bases: Exception

Internal Exception.

exception plynx.db.db_object.**ClassNotSavable**
Bases: Exception

Internal Exception.

class plynx.db.db_object.**_DBObject**
DB Object. Abstraction of an object in the DB.

DB_COLLECTION =

classmethod load(*cls: Type[DBObjectType], _id: ObjectId, collection: Optional[str] = None*)
Load object from db.

Args: _id (ObjectId): ID of the object in DB

save(*self, force: bool = False, collection: Optional[str] = None*)
Save Object in the database

copy (*self: DBObjectType*)
Make a copy

Return: A copy of the Object

classmethod from_dict (*cls: Type[DBObjectType], dict_obj: Dict[str, Any]*)
Create a class based on dict_obj

to_dict (*self: DBObjectType*)
Create serialized object

__str__ (*self*)

__repr__ (*self*)

class plynx.db.db_object.**Meta**
Bases: type

Class Registry handle

classmethod __new__ (*meta*, *name*, *bases*, *class_dict*)

class plynx.db.db_object.**DBObject**
Bases: *plynx.db.db_object._DBObject*

DB Object. Abstraction of an object in the DB.

Args: obj_dict (dict, None): Representation of the object. If None, an object with default fields will be created.

__post_init__ (*self*)

plynx.db.demo_user_manager

User Manager for demo

Module Contents

plynx.db.demo_user_manager.**template_collection_manager**

class plynx.db.demo_user_manager.**DemoUserManager**
The class contains Demo user code.

demo_config :DemoConfig

static _id_generator (*size: int = 6*, *chars: str = string.ascii_uppercase + string.digits*)

static create_demo_user ()
Create a demo user

static create_demo_templates (*user*)
Clone the default templates and assign them to the user.

plynx.db.node

Node DB Object and utils

Module Contents

plynx.db.node.**_clone_update_in_place**(*node: 'Node'*, *node_clone_policy: int*, *override_finished_state: bool*, *override_node_id: bool = False*)

class plynx.db.node.**_BaseResource**
Bases: *plynx.db.db_object.DBObject*

name :str =

file_type :str

values :List[Any]

is_array :bool = False

min_count :int = 1

class plynx.db.node.**Output**
Bases: *plynx.db.node._BaseResource*

Basic Output structure.

thumbnail :Optional[str]

class plynx.db.node.**InputReference**
Bases: *plynx.db.db_object.DBObject*

Basic Value of the Input structure.

node_id :ObjectId

output_id :str =

class plynx.db.node.**Input**
Bases: *plynx.db.node._BaseResource*

Basic Input structure.

primitive_override :Any

input_references :List[InputReference]

__post_init__(*self*)
Set default primitive_override if it is not set and file_type is primitive

add_input_reference(*self*, *node_id: ObjectId*, *output_id: str*)
Add input reference to the input

class plynx.db.node.**CachedNode**
Bases: *plynx.db.db_object.DBObject*

Values to override Node on display

node_running_status :str

outputs :List[Output]

logs :List[Output]

class plynx.db.node.**Node**
Bases: *plynx.db.db_object.DBObject*

Basic Node with db interface.

DB_COLLECTION

_id :ObjectId

_type :str = Node

_cached_node :Optional[CachedNode]

title :str = Title

description :str =

kind :str = dummy

parent_node_id :Optional[ObjectId]

successor_node_id :Optional[ObjectId]

original_node_id :Optional[ObjectId]

template_node_id :Optional[ObjectId]

origin :str

code_hash :str =

code_function_location :Optional[str]

node_running_status :str

node_status :str

cache_url :Optional[str]

x :int = 0

y :int = 0

author :Optional[ObjectId]

starred :bool = False

auto_sync :bool = True

auto_run :bool = True

auto_run_enabled :bool = True

latest_run_id :Optional[ObjectId]

inputs :List[Input]

parameters :List['Parameter']

outputs :List[Output]

logs :List[Output]

static _default_log(*name: str*)

apply_properties(*self*, *other_node: 'Node'*)

Apply Properties and Inputs of another Node. This method is used for updating nodes.

Args: other_node (Node): A node to copy Properties and Inputs from

clone(*self*, *node_clone_policy: int*, *override_finished_state: bool = True*)

Return a cloned copy of a Node

_get_custom_element(*self, arr: Union[List[Input], List['Parameter'], List[Output]], name: str, throw: bool, default: Optional[Callable[[str], Union[Input, 'Parameter', Output]]] = None*)

get_input_by_name(*self*, *name: str*)
Find Input object

get_parameter_by_name(*self*, *name: str*)
Find Parameter object

get_parameter_by_name_safe(*self*, *name: str*)
Find Parameter object

get_output_by_name(*self*, *name: str*)
Find Output object

get_log_by_name(*self*, *name: str*)
Find Log object

get_sub_nodes(*self*)
Get a list of subnodes

class plynx.db.node.**ParameterEnum**
Bases: *plynx.db.db_object.DBObject*

Enum value.

values :List[str]

index :int = 0

class plynx.db.node.**ParameterCode**
Bases: *plynx.db.db_object.DBObject*

Code value.

value :str =

mode :str = python

class plynx.db.node.**ParameterListOfNodes**
Bases: *plynx.db.db_object.DBObject*

List Of Nodes value.

value :List[Node]

plynx.db.node.**_get_default_by_type**(*parameter_type: str*)

plynx.db.node.**_value_is_valid**(*value*, *parameter_type: str*)

class plynx.db.node.**Parameter**
Bases: *plynx.db.db_object.DBObject*

Basic Parameter structure.

name :str =

parameter_type :str

value :Any =

mutable_type :bool = True

removable :bool = True

publicable :bool = True

widget :Optional[str]

reference :Optional[str]

__post_init__(*self*)

plynx.db.node_cache

Node Cache and utils

Module Contents

plynx.db.node_cache.**demo_config :DemoConfig**

class plynx.db.node_cache.**NodeCache**

Bases: *plynx.db.db_object.DBObject*

Basic Node Cache with db interface.

DB_COLLECTION

_id :ObjectId

key :str =

node_id :Optional[ObjectId]

run_id :Optional[ObjectId]

outputs :List[Output]

logs :List[Output]

removed :bool = False

protected :bool = False

static instantiate(*node: Node*, *run_id: ObjectId*)

Instantiate a Node Cache from Node.

Args: node (Node): Node object run_id (ObjectId): Run ID

Return: (NodeCache)

static generate_key(*node: Node*)

Generate hash.

Args: node (Node): Node object

Return: (str) Hash value

plynx.db.node_cache_manager

Cache Manager and utils.

Module Contents

class plynx.db.node_cache_manager.**NodeCacheManager**

The Node cache interface.

The cache is defined by Node's

- original_node_id

- inputs
- parameters

static get(*node: Node*)
Pull NodeCache if exists.

Args: node (Node): Node object

Return: (NodeCache) NodeCache or None

static post(*node: Node*, *run_id: ObjectId*)
Create NodeCache instance in the database.

Args: node (Node): Node object run_id (ObjectId, str): Run ID

Return: True if cache saved else False

static _make_query(*start_datetime: Optional[datetime.datetime] = None*, *end_datetime: Optional[datetime.datetime] = None*, *non_protected_only: bool = False*)
Make sample query.

Args: start_datetime (datetime, None): Start datetime or None if selecting from beginning end_datetime (datetime, None): End datetime or None if selecting until now

Return: Iterator on the list of dict-like objects

static get_list(*start_datetime: Optional[datetime.datetime] = None*, *end_datetime: Optional[datetime.datetime] = None*, *non_protected_only: bool = False*)
List of NodeCache objects.

Args: start_datetime (datetime, None): Start datetime or None if selecting from beginning end_datetime (datetime, None): End datetime or None if selecting until now

Return: Iterator on the list of dict-like objects

static clean_up()
Remove NodeCache objects with flag *removed* set

plynx.db.node_collection_manager

Node collection manager and utils

Module Contents

plynx.db.node_collection_manager.**_PROPERTIES_TO_GET_FROM_SUBS = ['node_running_status', 'lo**

class plynx.db.node_collection_manager.**NodeCollectionManager**(*collection: str*)
NodeCollectionManager contains all the operations to work with Nodes in the database.

get_db_objects(*self, status: Union[List[str], str] = '', node_kinds: Union[None, str, List[str]] = None, search: str = '', per_page: int = 20, offset: int = 0, user_id: Optional[ObjectId] = None*)
Get subset of the Objects.

Args: status (str, None): Node Running Status search (str, None): Search pattern per_page (int): Number of Nodes per page offset (int): Offset

Return: (list of dict) List of Nodes in dict format

get_db_objects_by_ids(*self, ids: Union[List[ObjectId], List[str]], collection: Optional[str] = None*)
Find all the Objects with a given IDs.

Args: ids (list of ObjectID): Object Ids

_update_sub_nodes_fields(*self, sub_nodes_dicts: List[Dict], reference_node_id: str, target_props: List[str], reference_collection: Optional[str] = None*)

get_db_node(*self*, *node_id: ObjectId*, *user_id: Optional[ObjectId] = None*)
Get dict representation of a Node.

Args: node_id (ObjectId, str): Object ID user_id (str, ObjectId, None): User ID

Return: (dict) dict representation of the Object

get_db_object(*self*, *object_id: ObjectId*, *user_id: Optional[ObjectId] = None*)
Get dict representation of an Object.

Args: object_id (ObjectId): Object ID user_id (ObjectId, None): User ID

Return: (dict) dict representation of the Object

static _transplant_node(*node: Node*, *dest_node: Node*)

upgrade_sub_nodes(*self*, *main_node: Node*)
Upgrade deprecated Nodes.

The function does not change the original graph in the database.

Return: (int): Number of upgraded Nodes

pick_node(*self, kinds: List[str]*)
Get node and set status to RUNNING in atomic way

plynx.db.run_cancellation_manager

Cancelation DB Object and utils

Module Contents

class plynx.db.run_cancellation_manager.**RunCancellation**
Bases: *plynx.db.db_object.DBObject*

RunCancellation represents Run Cancellation event in the database.

DB_COLLECTION

_id :ObjectId

run_id :Optional[ObjectId]

class plynx.db.run_cancellation_manager.**RunCancellationManager**
RunCancellationManager contains basic operations related to *runs_cancellations* collection.

run_id :ObjectId

static cancel_run(*run_id: ObjectId*)
Cancel Run. Args:

Unexpected indentation.

run_id (ObjectId) RunID

static get_run_cancellations()
Get all Run Cancellation events

static remove(*runs_cancellation_ids: List[ObjectId]*)
Remove Run Cancellation events with given Ids Args:

Unexpected indentation.

runs_cancellation_ids (list of ObjectID) List of Run IDs to remove

plynx.db.user

User DB Object and utils

Module Contents

plynx.db.user.**DEFAULT_POLICIES**

plynx.db.user.**JWT_ENCODE_ALGORITHM = HS256**

class plynx.db.user.**UserSettings**
Bases: *plynx.db.db_object.DBObject*

User Settings structure.

display_name :str =

picture :str =

class plynx.db.user.**User**
Bases: *plynx.db.db_object.DBObject*

Basic User class with db interface.

DB_COLLECTION

_id :ObjectId

username :str =

email :Optional[str] =

password_hash :str =

active :bool = True

policies :List[str]

settings :UserSettings

hash_password(*self*, *password: str*)
Change password.

Args: password (str) Real password string

verify_password(*self*, *password: str*)
Verify password.

Args: password (str) Real password string

Return: (bool) True if password matches else False

check_role(*self*, *role: str*)
Check if the user has a given role

static find_users()
Get all the users

generate_token(*self*, *token_type: str*, *expiration: int = 600*)
Generate a token.

Args: token_type (str) Either TokenType.ACCESS_TOKEN, or TokenType.REFRESH_TOKEN expiration (int) Time to Live (TTL) in sec

Return: (str) Secured token

static verify_auth_token(*token: str*)
Verify token.

Args: token (str) Token

Return: (User) User object or None

class plynx.db.user.**UserCollectionManager**
User Manger

static find_user_by_name(*username: str*)
Find User.

Args: username (str) Username

Return: (User) User object or None

static find_user_by_email(*email: str*)
Find User.

Args: email (str) Email

Return: (User) User object or None

static get_users(*search: str = ''*, *per_page: int = 20*, *offset: int = 0*)
Get a list of users

plynx.db.validation_error

Validation Error DB Object and utils

Module Contents

class plynx.db.validation_error.**ValidationError**
Bases: *plynx.db.db_object.DBObject*

Basic Validation Error class.

target :str

object_id :str

validation_code :str

children :List['ValidationError']

plynx.db.worker_state

Worker State DB Object and utils

Module Contents

class plynx.db.worker_state.**WorkerState**
Bases: *plynx.db.db_object.DBObject*

Worker statistics snapshot.

DB_COLLECTION

_id :ObjectId

worker_id :str =

host :str =

runs :List[Node]

kinds :List[str]

plynx.db.worker_state.**get_worker_states**() → List[WorkerState]
Get all of the workers with latest states

plynx.demo

Basic Operations for the demo.

Submodules

plynx.demo.basic_functions

PLynx Operations defined as python code. Using slighty more advanced functions than printing variables.

Module Contents

plynx.demo.basic_functions.**make_int**(*value*)
Pass Integer value as output.

plynx.demo.basic_functions.**make_enum**(*value*)
Pass Integer value as output.

plynx.demo.basic_functions.**example_func**(*x*, *y*, *coef*)
Math expression

plynx.demo.basic_functions.**sleep**(*x*, *timeout*)
Sleep for timeout sec and add 1.

plynx.demo.basic_functions.**error**(*x*)
Always raise exception

class plynx.demo.basic_functions.**Statefull**
Add 1 and keep the previous value

__call__(*self*, *x*)

plynx.demo.basic_functions.**auto_run_disabled**(*x*)
Auto run disabled for this node.

plynx.demo.basic_functions.**GROUP**

plynx.demo.hello_world

PLynx Operations defined as python code.

Module Contents

plynx.demo.hello_world.**get_name**(*your_name*)
Pass *your_name* parameter as output.

plynx.demo.hello_world.**print_message**(*name*)
Print greeting message.

plynx.demo.hello_world.**GROUP**

plynx.demo.types

PLynx Operations defined as python code. Produce basic types.

Module Contents

plynx.demo.types.**print_any**(*value*)
Format string to be html-friendly and print it.

plynx.demo.types.**all_types**()
Make basic values for each type.

plynx.demo.types.**print_int**(*value*)
Print input value.

plynx.demo.types.**print_str**(*value*)
Print input value.

plynx.demo.types.**print_dict**(*value*)
Print input value.

plynx.demo.types.**print_float**(*value*)
Print input value.

plynx.demo.types.**print_bool**(*value*)
Print input value.

plynx.demo.types.**print_color**(*value*)
Print input value.

plynx.demo.types.**file_to_dict**(*value*)
Transform file object to dict

plynx.demo.types.**dict_to_file**(*value*)
transform dict to file object

plynx.demo.types.**GROUP**

Package Contents

plynx.demo.**basic_group**

plynx.demo.**hello_group**

plynx.demo.**types_group**

plynx.demo.**COLLECTION**

plynx.node

PLynx API for generation user Nodes.

Submodules

plynx.node.typing

Standard PLynx types

Module Contents

plynx.node.typing.**ANY = any**

plynx.node.typing.**STR_TO_CLASS :Dict[str, Union[Type, Callable]]**

plynx.node.typing.**CLASS_TO_STR :Dict[Union[Type, Callable], str]**

plynx.node.typing.**type_to_str**(*type_cls: Union[str, Type, Callable]*) → str
Standard type to PLynx type

plynx.node.utils

General PLynx utils for user-defined Operations.

Module Contents

class plynx.node.utils.**Group**
Collection of Operations

title :str

items :list

to_dict(*self*)
Dict representation

plynx.node.utils.**callable_to_function_location**(*callable_obj: Callable*) → str
Generate the location of the function

plynx.node.utils.**generate_key**(*node: Node*) → str
Generate hash of the node template.

plynx.node.utils.**func_or_group_to_dict**(*func_or_group: Union[Callable, Group]*)
Recursive serializer

Package Contents

class plynx.node.**InputItem**
Input item abstraction

name :str

file_type :str

is_array :bool

min_count :int

to_dict(*self*)
Dict representation

class plynx.node.**OutputItem**
Output item abstraction

name :str

file_type :str

is_array :bool

min_count :int

to_dict(*self*)
Dict representation

class plynx.node.**ParamItem**
Parameter item abstraction

name :str

parameter_type :str

value :Any

widget :Optional[str]

to_dict(*self*)
Dict representation

class plynx.node.**PlynxParams**
Internal PLynx Node params

title :str

description :str

kind :str

node_type :str

auto_run_enabled :bool = True

inputs :List[InputItem]

params :List[ParamItem]

outputs :List[OutputItem]

plynx.node.**input**(*name=None*, *var_type=None*, *is_array=False*, *min_count=1*)
PLynx Operation Input

plynx.node.**output**(*name=None*, *var_type=None*, *is_array=False*, *min_count=1*)
PLynx Operation Output

plynx.node.**param**(*name=None*, *var_type=None*, *default=None*, *widget=''*)
PLynx Operation Parameter

plynx.node.**operation**(*node_type=None*, *title=None*, *description=''*, *kind=None*, *auto_run_enabled: bool = True*)
PLynx user-defined Operation

plynx.node.**parameter**

plynx.plugins

Subpackages

plynx.plugins.executors

Subpackages

plynx.plugins.executors.python

Submodules

plynx.plugins.executors.python.dag

An executor for the DAGs based on python backend.

Module Contents

plynx.plugins.executors.python.dag.**POOL_SIZE = 3**

plynx.plugins.executors.python.dag.**worker_main**(*job_run_queue: queue.Queue*, *job_complete_queue: queue.Queue*)
Main threaded function that serves Operations.

class plynx.plugins.executors.python.dag.**DAGParallel**(*node: Node*)
Bases: *plynx.plugins.executors.dag.DAG*

Python DAG scheduler.

Args: node_dict (dict)

IS_GRAPH = True

GRAPH_ITERATION_SLEEP = 0

pop_jobs(*self*)
Get a set of nodes with satisfied dependencies

_execute_node(*self*, *node: Node*)

kill(*self*)
Force to kill the process.

The reason can be the fact it was working too long or parent exectuter canceled it.

finished(*self*)
Return True or False depending on the running status of the DAG.

class plynx.plugins.executors.python.dag.**DAG**(*node: Node*)
Bases: *plynx.plugins.executors.dag.DAG*

Base Executor class

IS_GRAPH :bool = True

kill(*self*)
Force to kill the process.

The reason can be the fact it was working too long or parent exectuter canceled it.

init_executor(*self*)
Initialize environment for the executor

clean_up_executor(*self*)
Clean up the environment created by executor

_apply_inputs(*self*, *node*)

run(*self*, *preview: bool = False*)
Main execution function.

class plynx.plugins.executors.python.dag.**ExecutorWithWebWorkerServer**
Bases: *plynx.plugins.executors.python.dag.DAG*

This executor is used for testing purposes only.

static request_task(*url*, *data*)
Send a request to the server

static fire_and_forget(*url*, *json*)
Fire and forget

launch(*self*)
Launch the executor

plynx.plugins.executors.python.local

Python Operation

Module Contents

plynx.plugins.executors.python.local.**DEFAULT_CMD = # Python Operation**

Explicit markup ends without a blank line; unexpected unindent.

The code of the operation have to be defined as a function # # A function must be named *operation*. # The arguments are named and must represent then inputs of the PLynx Operation. # The function must return a dictionary that map to the outputs of PLynx Operation def operation(int_a, int_b):

Unexpected indentation.

return {"sum": int_a + int_b}

plynx.plugins.executors.python.local.**stateful_init_mutex**

plynx.plugins.executors.python.local.**stateful_class_registry**

plynx.plugins.executors.python.local.**_resource_manager**

plynx.plugins.executors.python.local.**materialize_fn_or_cls**(*node: Node*) → Callable

Unpickle the function

plynx.plugins.executors.python.local.**assign_outputs**(*node: Node, output_dict: Dict[str, Any]*)

Apply output_dict to node's outputs.

class plynx.plugins.executors.python.local.**redirect_to_plynx_logs**(*node: Node, stdout: str, stderr: str*)

Redirect stdout and stderr to standard PLynx Outputs

__enter__(*self*)

__exit__(*self*, **args*)

plynx.plugins.executors.python.local.**prep_args**(*node: Node*) → Dict[str, Any]

Pythonize inputs and parameters

class plynx.plugins.executors.python.local.**PythonNode**

Bases: *plynx.plugins.executors.bases.PLynxSyncExecutor*

Class is used as a placeholder for local python executor

run(*self*, *preview: bool = False*)

kill(*self*)

classmethod get_default_node(*cls*, *is_workflow: bool*)

Generate a new default Node for this executor

Submodules

plynx.plugins.executors.bases

Executors supporting PLynx sync/async inference framework

Module Contents

plynx.plugins.executors.bases.**run_cancellation_manager**()

Lazy RunCancellationManager object

class plynx.plugins.executors.bases.**PLynxAsyncExecutor**

Bases: *plynx.base.executor.BaseExecutor*

Base Executor class that is using PLynx Async Inference backend

launch(*self*)

Put the Node on the queue

kill(*self*)

get_running_status(*self*)
Returns the status of the execution.

Async executions should sync with the remote and return the result immediately.

class plynx.plugins.executors.bases.**PLynxSyncExecutor**
Bases: *plynx.base.executor.BaseExecutor*

Base Executor class that is using PLynx Sync Inference backend

launch(*self*)
Run the node now and return the status

class plynx.plugins.executors.bases.**PLynxAsyncExecutorWithDirectory**(*node*)
Bases: *plynx.plugins.executors.bases.PLynxAsyncExecutor*

Base Executor class that is using PLynx Async Inference backend

init_executor(*self*)
Make tmp dir if it does not exist

clean_up_executor(*self*)
Remove tmp dir

plynx.plugins.executors.dag

A standard executor for DAGs.

Module Contents

plynx.plugins.executors.dag.**_WAIT_STATUS_BEFORE_FAILED**

plynx.plugins.executors.dag.**_ACTIVE_WAITING_TO_STOP**

plynx.plugins.executors.dag.**node_cache_manager**()
Lazy NodeCacheManager definition

class plynx.plugins.executors.dag.**DAG**(*node: Node*)
Bases: *plynx.plugins.executors.bases.PLynxAsyncExecutor*

Main graph scheduler.

Args: node (Node)

IS_GRAPH = True

GRAPH_ITERATION_SLEEP = 1

finished(*self*)
Return True or False depending on the running status of the DAG.

pop_jobs(*self*)
Get a set of nodes with satisfied dependencies

update_node(*self*, *node: Node*)
Update node_running_status and outputs if the state has changed.

_set_node_status(*self*, *node_id: ObjectId*, *node_running_status: str*)

static _cacheable(*node: Node*)

classmethod get_default_node(*cls*, *is_workflow: bool*)

_execute_node(*self*, *node: Node*)

run(*self*, *preview: bool = False*)

kill(*self*)
Force to kill the process.

The reason can be the fact it was working too long or parent exectuter canceled it.

validate(*self*, *ignore_inputs: bool = True*)

plynx.plugins.executors.local

Standard Executors that support running on local machine.

Module Contents

plynx.plugins.executors.local.**_resource_merger_func**()

plynx.plugins.executors.local.**prepare_parameters_for_python**(*parameters: List[Parameter]*) → Dict[str, Any]

Pythonize parameters

class plynx.plugins.executors.local.**_ResourceMerger**(*init_level_0: List[str], init_level_1: List[str]*)

append(*self, resource_dict: Dict[str, List[str]], resource_name: str, is_list: bool*)
Append values to the resource

get_dict(*self*)
Return original dict.

```
```

Out: Dict

class plynx.plugins.executors.local.**BaseBash**(*node: Optional[Node] = None*)
Bases: *plynx.plugins.executors.bases.PLynxAsyncExecutorWithDirectory*

Base Executor that will use unix bash as a backend.

exec_script(*self*, *script_location: str*)
Execute the script when inputs are initialized.

kill(*self*)

is_updated(*self*)

__getstate__(*self*)

static _make_debug_text(*text: str*)

classmethod get_default_node(*cls*, *is_workflow: bool*)

_prepare_inputs(*self*, *preview: bool = False*)

_prepare_outputs(*self*, *preview: bool = False*)

_prepare_logs(*self*)

_get_script_fname(*self*, *extension: str = '.sh'*)

_prepare_parameters(*self*)

_postprocess_outputs(*self, outputs: Dict[str, str]*)

_postprocess_logs(*self*)

_extract_cmd_text(*self*)

upload_logs(*self*, *final: bool = False*)
Upload logs to the storage. When Final is False, only upload on update

run(*self*, *preview=False*)

class plynx.plugins.executors.local.**BashJinja2**
Bases: *plynx.plugins.executors.local.BaseBash*

Local executor that uses jinja2 template to format a bash script.

HELP_TEMPLATE = # Use templates: {}

Explicit markup ends without a blank line; unexpected unindent.

For example *{{{{ '{{{{' }}}} params['_timeout'] {{{{ '}}}}' }}}}* or *{{{{ '{{{{' }}}} inputs['abc'] {{{{ '}}}}' }}}}*

run(*self*, *preview: bool = False*)

classmethod get_default_node(*cls*, *is_workflow: bool*)

class plynx.plugins.executors.local.**PythonNode**(*node: Optional[Node] = None*)
Bases: *plynx.plugins.executors.local.BaseBash*

Local executor that uses python template to format a bash script.

run(*self*, *preview: bool = False*)

classmethod _get_arguments_string(*cls, var_name: str, arguments: Dict[str, Any]*)

static _pythonize(*value: Any*)

classmethod get_default_node(*cls*, *is_workflow: bool*)

class plynx.plugins.executors.local.**File**
Bases: *plynx.plugins.executors.bases.PLynxAsyncExecutor*

Dummy executor that represents STATIC Operations.

run(*self*, *preview: bool = False*)

kill(*self*)

classmethod get_default_node(*cls*, *is_workflow: bool*)

plynx.plugins.hubs

Submodules

plynx.plugins.hubs.collection

Plynx standard Hub based on the database of Operations

Module Contents

class plynx.plugins.hubs.collection.**CollectionHub**(*collection*, *operations*)
Bases: *plynx.base.hub.BaseHub*

Plynx standard Hub based on the database of Operations

search(*self*, *query: hub.Query*)

plynx.plugins.hubs.static_list

Plynx standard Hub based on the fixed list of Operations

Module Contents

plynx.plugins.hubs.static_list.**register_list_item**(*raw_item: Dict*) → Dict
Register a hub node (node or group) recursevely in the memory.

plynx.plugins.hubs.static_list.**_recursive_filter**(*search_parameters: Dict[str, str], search_string: str, list_of_nodes: List[Dict]*)

class plynx.plugins.hubs.static_list.**StaticListHub**(*list_nodes_path: str*)
Bases: *plynx.base.hub.BaseHub*

Plynx standard Hub based on the fixed list of Operations

search(*self*, *query: hub.Query*)

plynx.plugins.resources

Subpackages

plynx.plugins.resources.python

Submodules

plynx.plugins.resources.python.common

Commonly used Resource types and templates in python.

Module Contents

class plynx.plugins.resources.python.common.**Json**
Bases: *plynx.base.resource.BaseResource*

JSON file

DISPLAY_THUMBNAIL :bool = True

static preprocess_input(*value: Any*)
Resource_id to an object

static postprocess_output (*value: Any*)
Object to resource id

classmethod preview (*cls*, *preview_object: resource.PreviewObject*)
Generate preview html body

classmethod thumbnail (*cls*, *output: Any*)

Submodules

plynx.plugins.resources.cloud_resources

Resources that implement cloud abstractions

Module Contents

plynx.plugins.resources.cloud_resources.**CLOUD_SERVICE_CONFIG**

class plynx.plugins.resources.cloud_resources.**CloudStorage**
Bases: *plynx.base.resource.BaseResource*

Storage Resource, i.e. S3 bucket

static prepare_input (*filename: str*, *preview: bool = False*)
Preprocess input

static prepare_output (*filename: str*, *preview: bool = False*)
Postprocess output

classmethod preview (*cls*, *preview_object: resource.PreviewObject*)
Preview resource

plynx.plugins.resources.common

Commonly used Resource types.

Module Contents

plynx.plugins.resources.common.**WEB_CONFIG :WebConfig**

class plynx.plugins.resources.common.**Raw**
Bases: *plynx.base.resource.BaseResource*

Raw Resource that will be stored in jsonable format in the Node.

DISPLAY_RAW :bool = True

class plynx.plugins.resources.common.**RawInt**
Bases: *plynx.plugins.resources.common.Raw*

Raw Resource that will store an integer in the Node.

static preprocess_input (*value: Any*)
Resource_id to an object

class plynx.plugins.resources.common.**RawFloat**
Bases: *plynx.plugins.resources.common.Raw*

Raw Resource that will store an integer in the Node.

static preprocess_input(*value: Any*)
Resource_id to an object

class plynx.plugins.resources.common.**RawColor**
Bases: *plynx.plugins.resources.common.Raw*

Raw Resource that will store an integer in the Node.

static preprocess_input(*value: Any*)
Resource_id to an object

class plynx.plugins.resources.common.**File**
Bases: *plynx.base.resource.BaseResource*

Raw Resource that will be stored in the file format in the Node.

class plynx.plugins.resources.common.**PDF**
Bases: *plynx.base.resource.BaseResource*

PDF file

classmethod preview(*cls*, *preview_object: resource.PreviewObject*)
Generate preview html body

class plynx.plugins.resources.common.**Image**
Bases: *plynx.base.resource.BaseResource*

Image file

DISPLAY_THUMBNAIL :bool = True

classmethod preview(*cls*, *preview_object: resource.PreviewObject*)
Generate preview html body

classmethod thumbnail(*cls*, *output: Any*)

class plynx.plugins.resources.common.**_BaseSeparated**
Bases: *plynx.base.resource.BaseResource*

Base Separated file, i.e. csv, tsv

SEPARATOR :Optional[str]

_ROW_CLASSES :List[str] = ['even', 'odd']

_NUM_ROW_CLASSES :int

classmethod preview(*cls*, *preview_object: resource.PreviewObject*)
Generate preview html body

class plynx.plugins.resources.common.**CSV**
Bases: *plynx.plugins.resources.common._BaseSeparated*

CSV file

SEPARATOR :str = ,

class plynx.plugins.resources.common.**TSV**
Bases: *plynx.plugins.resources.common._BaseSeparated*

TSV file

SEPARATOR :str =

class plynx.plugins.resources.common.**Json**
Bases: *plynx.base.resource.BaseResource*

JSON file

classmethod preview(*cls*, *preview_object: resource.PreviewObject*)
Generate preview html body

class plynx.plugins.resources.common.**Executable**
Bases: *plynx.base.resource.BaseResource*

Executable file, i.e. bash or python

static prepare_input(*filename*, *preview: bool = False*)
Generate preview html body

class plynx.plugins.resources.common.**Directory**
Bases: *plynx.base.resource.BaseResource*

Directory file, i.e. zipfile

static prepare_input(*filename*, *preview: bool = False*)
Extract zip file

static prepare_output(*filename*, *preview: bool = False*)
Create output folder

static postprocess_output(*value: str*)
Compress folder to a zip file

classmethod preview(*cls*, *preview_object: resource.PreviewObject*)
Generate preview html body

plynx.plugins.resources.common.**FILE_KIND = file**

plynx.service

Submodules

plynx.service.cache

Main PLynx cache service and utils

Module Contents

plynx.service.cache.**OutputListTuple**

plynx.service.cache.**LIST_CACHE = list**

plynx.service.cache.**CLEAN_CACHE = clean**

plynx.service.cache.**MODES**

plynx.service.cache.**node_cache_manager :NodeCacheManager**

plynx.service.cache.**run_list_cache**(*start_datetime: Optional[datetime], end_datetime: datetime*)
Print all of the cache objects in a given time frame

plynx.service.cache.**run_clean_cache**(*start_datetime: Optional[datetime], end_datetime: datetime, yes: bool*)
Clean cache

plynx.service.cache.**run_cache**(*mode*, *start_datetime: str*, *end_datetime: str*, *yes: bool*)
Cache CLI entrypoint

plynx.service.execute

Main PLynx executor service and utils

Module Contents

plynx.service.execute.**run_execute**(*filename: str*)
Execute entrypoint. It materialize the Node based on file content and runs it.

plynx.service.make_operations_meta

Create metadata of operations

Module Contents

plynx.service.make_operations_meta.**_enhance_list_item**(*raw_item: Dict*) → Dict

plynx.service.make_operations_meta.**run_make_operations_meta**(*collection_module*, *out*)
Make metadata

plynx.service.users

Main PLynx users service and utils

Module Contents

plynx.service.users.**LIST_USERS = list_users**

plynx.service.users.**CREATE_USER = create_user**

plynx.service.users.**ACTIVATE_USER = activate_user**

plynx.service.users.**DEACTIVATE_USER = deactivate_user**

plynx.service.users.**MODES**

plynx.service.users.**run_list_users**() → None
List all users

plynx.service.users.**run_create_user**(*email: Optional[str], username: Optional[str], password: Optional[str]*) → User
Create a user

plynx.service.users.**run_set_activation**(*username: Optional[str], value: bool*) → None
Set user active status

plynx.service.users.**run_users**(*mode: str*, *email: Optional[str] = None*, *username: Optional[str] = None*, *password: Optional[str] = ''*)

Users CLI entrypoint

plynx.service.worker

Main PLynx worker service and utils

Module Contents

class plynx.service.worker.**Worker**(*worker_config: WorkerConfig*, *worker_id: Optional[str]*)

Worker main class.

On the high level Worker distributes Jobs over all available Workers and updates statuses of the Graphs in the database.

Worker performs several roles:

- Pull graphs in status READY from the database.
- Create Schedulers for each Graph.
- Populate the queue of the Jobs.
- Distribute Jobs accross Workers.
- Keep track of Job's statuses.
- Process CANCEL requests.
- Update Graph's statuses.
- Track worker status and last response.

SDB_STATUS_UPDATE_TIMEOUT :int = 1

WORKER_STATE_UPDATE_TIMEOUT :int = 1

serve_forever(*self*)

Run the worker.

execute_job(*self*, *executor: BaseExecutor*)

Run a single job in the executor

_run_db_status_update(*self*)

Syncing with the database.

_run_worker_state_update(*self*)

Syncing with the database.

stop(*self*)

Stop worker.

plynx.service.worker.**run_worker**(*worker_id: Optional[str] = None*)

Run worker daemon. It will run in the same thread.

plynx.service.worker_server

The serving logic of the worker

Module Contents

plynx.service.worker_server.**app**

plynx.service.worker_server.**logger**

class plynx.service.worker_server.**RunEnv**
Run environment or where the endpoint is running

HTTP = HTTP

PUBSUB = PUBSUB

plynx.service.worker_server.**execute_run**()
Execute a run with a given id

plynx.service.worker_server.**run_worker_server**(*verbose*, *endpoint_port: int*)
Run worker service

plynx.utils

Submodules

plynx.utils.common

Common utils

Module Contents

plynx.utils.common.**SearchParameter**

plynx.utils.common.**SEARCH_RGX**

plynx.utils.common.**TRUES = ['true', 't']**

plynx.utils.common.**FALSES = ['false', 'f']**

plynx.utils.common.**to_object_id**(*_id: Union[ObjectId, str, None]*) → ObjectId
Create ObjectId based on str, or return original value.

class plynx.utils.common.**JSONEncoder**
Bases: json.JSONEncoder

Handles some of the built in types

default(*self*, *o*)

plynx.utils.common.**zipdir**(*path: str*, *zf: zipfile.ZipFile*)
Walk in zip file

plynx.utils.common.**parse_search_string**(*search_string: str*) → Tuple[Dict, str]
Separate keywords fro mserach string

plynx.utils.common.**query_yes_no**(*question: str*, *default: str = 'yes'*) → bool
Ask a yes/no question via input() and return their answer.

Args: question (str): String that is presented to the user. default (str): 'yes' or 'no' default value

The 'answer' return value is True for 'yes' or False for 'no'.

plynx.utils.common.**str_to_bool**(*val: Union[str, bool]*) → bool
Convert string value to boolean

plynx.utils.common.**update_dict_recursively**(*dest: Dict[Any, Any], donor: Dict[Any, Any]*) → Dict[Any, Any]
Update dictionary in place

plynx.utils.config

Global PLynx config

Module Contents

plynx.utils.config.**PLYNX_CONFIG_PATH :str**

plynx.utils.config.**DEFAULT_ICON :str = feathericons.x-square**

plynx.utils.config.**DEFAULT_COLOR :str = #ffffff**

plynx.utils.config.**_CONFIG**

plynx.utils.config.**WorkerConfig**

plynx.utils.config.**MongoConfig**

plynx.utils.config.**StorageConfig**

plynx.utils.config.**AuthConfig**

plynx.utils.config.**WebConfig**

plynx.utils.config.**DemoConfig**

plynx.utils.config.**CloudServiceConfig**

plynx.utils.config.**ResourceConfig**

plynx.utils.config.**DummyOperationConfig**

plynx.utils.config.**OperationConfig**

plynx.utils.config.**HubConfig**

plynx.utils.config.**WorkflowConfig**

plynx.utils.config.**PluginsConfig**

plynx.utils.config.**IAMPoliciesConfig**

plynx.utils.config.**Config**

plynx.utils.config.**_get_config**() → Dict[str, Dict[str, Any]]
Get global config

plynx.utils.config.**get_worker_config**() → WorkerConfig
Generate worker config

plynx.utils.config.**get_db_config**() → MongoConfig
Generate DB config

plynx.utils.config.**get_storage_config**() → StorageConfig
Generate Storage config

plynx.utils.config.**get_auth_config**() → AuthConfig
Generate auth config

plynx.utils.config.**get_web_config**() → WebConfig
Generate web config

plynx.utils.config.**get_demo_config**() → DemoConfig
Generate web config

plynx.utils.config.**get_cloud_service_config**() → CloudServiceConfig
Generate cloud config

plynx.utils.config.**get_iam_policies_config**() → IAMPoliciesConfig
Generate IAM policies config

plynx.utils.config.**get_plugins**() → PluginsConfig
Generate kind config

plynx.utils.config.**get_config**() → Config
Generate full config

plynx.utils.config.**set_parameter**(*levels: List[str], value: Any*)
Set global config parameter

Args: levels (list): List of levels, i.e. ['mongodb', 'user'] value (value): Value of the parameter

plynx.utils.config.**_init_config**()

plynx.utils.content

Create default empty Operations

Module Contents

plynx.utils.content.**workflow_manager**

plynx.utils.content.**executor_manager**

plynx.utils.content.**create_template**(*user*, *kind*, *cmd*, *title*, *description*, *inputs=None*, *parameters=None*, *outputs=None*)

plynx.utils.content.**create_default_templates**(*user*)

plynx.utils.db_connector

DB connector

Module Contents

plynx.utils.db_connector.**PLYNX_DB = plynx**

plynx.utils.db_connector.**_DB**

plynx.utils.db_connector.**init_indexes**()
Create DB indexes

plynx.utils.db_connector.**get_db_connector**()
Create a connector lazily

plynx.utils.db_connector.**check_connection**()
Check DB connection

plynx.utils.exceptions

Standard PLynx Exceptions

Module Contents

exception plynx.utils.exceptions.**ExecutorNotFound**
Bases: ImportError

Executor not imported

exception plynx.utils.exceptions.**RegisterUserException**(*message: str*, *error_code: str*)
Bases: Exception

Failed to register the user

plynx.utils.executor

Utils to work with executors

Module Contents

plynx.utils.executor.**CONNECT_POST_TIMEOUT = 1.0**

plynx.utils.executor.**REQUESTS_TIMEOUT = 10**

plynx.utils.executor.**urljoin**(*base: str*, *postfix: str*) → str
Join urls in a reasonable way

plynx.utils.executor.**post_request**(*uri*, *data*, *num_retries=3*)
Make post request to the url

plynx.utils.executor.**_update_node**(*node: plynx.db.node.Node*)
Update node in the database

plynx.utils.executor.**materialize_executor**(*node: Union[Dict[str, Any], plynx.db.node.Node]*) → BaseExecutor
Create a Node object from a dictionary

Parameters: node: dictionary representation of a Node or the node itself

Returns: Executor: Executor based on the kind of the Node and the config

class plynx.utils.executor.**TickThread**(*executor: BaseExecutor*)
This class is a Context Manager wrapper. It calls method *tick()* of the executor with a given interval

TICK_TIMEOUT :int = 1

__enter__(*self*)
Currently no meaning of returned class

__exit__(*self*, *type_cls*, *value*, *traceback_val*)

call_executor_tick(*self*)
Run timed ticks

class plynx.utils.executor.**DBJobExecutor**(*executor: BaseExecutor*)
Executes a single job in an executor and updates its status.

run(*self*)
Run the job in the executor

kill(*self*)
Kill the running job

plynx.utils.file_handler

Smart file handeling

Module Contents

plynx.utils.file_handler.**_GLOBAL_STORAGE_CONFIG :Optional[StorageConfig]**

plynx.utils.file_handler.**_get_global_storage_config**() → StorageConfig

plynx.utils.file_handler.**open**(*filename: str*, *mode: str = 'rt'*)
Open file using internal configuration

plynx.utils.file_handler.**get_file_stream**(*file_path: str*, *preview: bool = False*, *file_type=None*) → BinaryIO
Get file stream object (deprecated)

plynx.utils.file_handler.**upload_file_stream**(*fp: BinaryIO*, *file_path: Optional[str] = None*, *seek: bool = True*) → str
Upload file stream to a given path (deprecated)

plynx.utils.hub_node_registry

Global Node Registry class

Module Contents

class plynx.utils.hub_node_registry.**Registry**
The class keeps record of built-in Operations

register_node(*self*, *node: Node*)
Register Node globally

find_nodes(*self, function_locations: List[str]*)
Find the Nodes

plynx.utils.hub_node_registry.**registry**

plynx.utils.logs

Logging utils

Module Contents

plynx.utils.logs.**set_logging_level**(*verbose: int*, *logger=None*)
Set logging level based on integer

plynx.utils.node_utils

This module contais utils related to plynx.db.Node, but not necessary involved into DB structure

Module Contents

plynx.utils.node_utils.**node_collection_managers**

class plynx.utils.node_utils.**_GraphVertex**
Used for internal purposes.

exception plynx.utils.node_utils.**GraphError**
Bases: Exception

Generic Graph topology exception

plynx.utils.node_utils.**_generate_parameters_key**(*node: Node*) → str
Generate hash key based on parameters only.

Args: node (Node): Node object

Return: (str) Hash value

plynx.utils.node_utils.**node_inputs_and_params_are_identical**(*subnode: Node*, *other_subnode: Node*) → bool
Check if two nodes are identical in terms of inputs and parameters

plynx.utils.node_utils.**augment_node_with_cache**(*node: Node*, *other_node: Node*) → None
Augment the Node in templates with a Node in Run. Results will be stored in *_cached_node* fields of the subnodes and not applied directly.

plynx.utils.node_utils.**traverse_reversed**(*node: Node*)
Traverse the subnodes in a reversed from the topoligical order.

plynx.utils.node_utils.**traverse_in_order**(*node: Node*)
Traverse the subnodes in a topoligical order.

plynx.utils.node_utils.**arrange_auto_layout**(*node: Node*, *readonly: bool = False*)
Use heuristic to rearange nodes.

plynx.utils.node_utils.**apply_cache**(*node: Node*)
Apply cache values to outputs and logs

plynx.utils.node_utils.**construct_new_run**(*node: Node*, *user_id*) → Tuple[Optional[Node], Node]
Create a new run based on a Node itself and the latest run as well.

plynx.utils.node_utils.**remove_auto_run_disabled**(*node: Node*)
Trim the subnodes the way that if there is no need to run a subnode and it is not auto runnable, ignore it.

plynx.utils.node_utils.**calc_status_to_node_ids**(*node: Optional[Node]*) → Dict[str, Set[ObjectId]]
Make a map node_running_status to list of ids.

plynx.utils.node_utils.**reset_nodes**(*node: Node*)
Reset statuses of the sub-nodes as well as logs and outputs

plynx.utils.node_utils.**traverse_left_join**(*node: Node*, *other_node: Node*)
Traverse two nodes in order and yield pairs of subnodes with the same *_id*.

plynx.utils.plugin_manager

Utils that materialize plugins

Module Contents

plynx.utils.plugin_manager.**_isinstance_namedtuple**(*x: Any*) → bool

plynx.utils.plugin_manager.**_as_dict**(*obj: Any*)

class plynx.utils.plugin_manager.**_ResourceManager**(*plugins: PluginsConfig*)

class plynx.utils.plugin_manager.**_ExecutorManager**(*plugins: PluginsConfig*)

class plynx.utils.plugin_manager.**_OperationManager**(*plugins: PluginsConfig*)

class plynx.utils.plugin_manager.**_HubManager**(*plugins: PluginsConfig*)

class plynx.utils.plugin_manager.**_WorkflowManager**(*plugins: PluginsConfig*)

plynx.utils.plugin_manager.**_plugins :PluginsConfig**

plynx.utils.plugin_manager.**_RESOURCE_MANAGER**

plynx.utils.plugin_manager.**_OPERATION_MANAGER**

plynx.utils.plugin_manager.**_HUB_MANAGER**

plynx.utils.plugin_manager.**_WORKFLOW_MANAGER**

plynx.utils.plugin_manager.**_EXECUTOR_MANAGER**

plynx.utils.plugin_manager.**_PLUGINS_DICT**

plynx.utils.plugin_manager.**get_resource_manager**()
Generate Resource plugin structure

plynx.utils.plugin_manager.**get_operation_manager**()
Generate Operation plugin structure

plynx.utils.plugin_manager.**get_hub_manager**()
Generate Hub plugin structure

plynx.utils.plugin_manager.**get_workflow_manager**()
Generate Workflow plugin structure

plynx.utils.plugin_manager.**get_executor_manager**()
Generate Exectutor plugin structure

plynx.utils.plugin_manager.**get_plugins_dict**()
Generate all of the plugins structure

plynx.utils.thumbnails

Thumbnail utils

Module Contents

plynx.utils.thumbnails.**get_thumbnail**(*output: plynx.db.node.Output*) → Optional[str]
Apply a single thumbnail

plynx.utils.thumbnails.**apply_thumbnails**(*node: plynx.db.node.Node*)
Fill thumbnail field of every subnode

plynx.web

Service endpoints.

Submodules

plynx.web.common

Common utils of the web service.

Module Contents

plynx.web.common.**app**

plynx.web.common.**logger**

plynx.web.common.**DEFAULT_EMAIL =**

plynx.web.common.**DEFAULT_USERNAME = default**

plynx.web.common.**DEFAULT_PASSWORD =**

plynx.web.common.**_CONFIG**

plynx.web.common.**register_user**(*username: str*, *password: str*, *email: str*, *picture: str = ''*, *is_oauth: bool = False*, *display_name: Optional[str] = None*) → User
Register a new user.

plynx.web.common.**_init_default_user**()

plynx.web.common.**verify_password**(*username_or_token: str*, *password: str*)
Veryfy password based on user

plynx.web.common.**authenticate**()
Return 401 message

plynx.web.common.**requires_auth**(*f*)
Auth wrapper

plynx.web.common.**make_fail_response**(*message*, ***kwargs*)
Return basic fail response

plynx.web.common.**make_permission_denied**(*message: str = 'Permission denied'*)
Return permission error

plynx.web.common.**make_success_response**(*extra_response: Optional[Dict[str, Any]] = None*)
Return successful response

plynx.web.common.**handle_errors**(*f*)
Handle errors wrapper

plynx.web.common.**run_api**(*verbose*)
Run web service

plynx.web.health

Health check

Module Contents

plynx.web.health.**get_health_base**()
Health check

plynx.web.health.**get_health**()
Health check

plynx.web.node

All of the endpoints related to the Nodes or simial DB structures

Module Contents

plynx.web.node.**PAGINATION_QUERY_KEYS**

plynx.web.node.**node_collection_managers**

plynx.web.node.**run_cancellation_manager**

plynx.web.node.**operation_manager**

plynx.web.node.**hub_manager**

plynx.web.node.**workflow_manager**

plynx.web.node.**executor_manager**

plynx.web.node.**PLUGINS_DICT**

plynx.web.node.**post_search_nodes**(*collection: str*)
Create a search request in templates or runs

plynx.web.node.**get_nodes**(*collection: str*, *node_link: Optional[str] = None*)
Get the Node based on its ID or kind

plynx.web.node.**post_node**(*collection: str*)
Post a Node with an action

plynx.web.resource

All of the endpoints related to Resources

Module Contents

plynx.web.resource.**RESOURCE_TYPES**

plynx.web.resource.**get_resource**(*resource_id: str*)
Get the data of the resource

plynx.web.resource.**post_resource**()
Upload a new resource

plynx.web.resource.**upload_file**()
Upload file

plynx.web.run

All of the endpoints related to the the runs

Module Contents

plynx.web.run.**node_collection_manager**

plynx.web.run.**run_cancellation_manager**

plynx.web.run.**get_a_run**()
Find a certain run and return it

plynx.web.run.**pick_a_run**()
Find a single run and return it

plynx.web.run.**update_run**()
Update an entry in /runs collections

plynx.web.run.**get_run_cancelations**()
Ask the server if there is a cancelation

plynx.web.state

Endpoints responsible for the dashboard

Module Contents

plynx.web.state.**PLUGINS_DICT**

plynx.web.state.**worker_states**()
Get worker's states

plynx.web.state.**push_worker_state**()
Update the worker state

plynx.web.user

All of the endpoints related to Users

Module Contents

plynx.web.user.**demo_user_manager**

plynx.web.user.**template_collection_manager**

plynx.web.user.**GOOGLE_CLIENT_ID**

plynx.web.user.**get_auth_token**()
Generate access and refresh tokens

plynx.web.user.**get_user**(*username: str*)
Get user info by username

plynx.web.user.**post_user**()
Update user info

plynx.web.user.**post_register**()
Register a new user

plynx.web.user.**post_register_with_oauth2**()
Register a new user

Package Contents

plynx.web.**DEFAULT_EMAIL =**

plynx.web.**DEFAULT_PASSWORD =**

plynx.web.**DEFAULT_USERNAME = default**

plynx.web.**app**

plynx.web.**authenticate**()
Return 401 message

plynx.web.**make_fail_response**(*message*, ***kwargs*)
Return basic fail response

plynx.web.**requires_auth**(*f*)
Auth wrapper

plynx.web.**run_api**(*verbose*)
Run web service

plynx.web.**verify_password**(*username_or_token: str*, *password: str*)
Veryfy password based on user

1.11.1.2 Package Contents

plynx.**__version__ = 1.11.1**

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