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# **AnyBlok / Dramatiq Documentation**

***Release 1.0.3***

**Jean-Sébastien Suzanne**

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Information about the AnyBlok / Dramatiq project.

## 1.1 Project Homepage

AnyBlok is hosted on [github](https://github.com/AnyBlok/anyblok_dramatiq) - the main project page is at [https://github.com/AnyBlok/anyblok\\_dramatiq](https://github.com/AnyBlok/anyblok_dramatiq). Source code is tracked here using [GIT](#).

Releases and project status are available on Pypi at [http://pypi.python.org/pypi/anyblok\\_dramatiq](http://pypi.python.org/pypi/anyblok_dramatiq).

The most recent published version of this documentation should be at <http://doc.anyblok-dramatiq.anyblok.org>.

## 1.2 Project Status

AnyBlok with Dramatiq is currently in beta status and is expected to be fairly stable. Users should take care to report bugs and missing features on an as-needed basis. It should be expected that the development version may be required for proper implementation of recently repaired issues in between releases;

## 1.3 Installation

Install released versions of AnyBlok from the Python package index with [pip](#) or a similar tool:

```
pip install anyblok_dramatiq
```

Installation via source distribution is via the `setup.py` script:

```
python setup.py install
```

Installation will add the `anyblok` commands to the environment.

## 1.4 Unit Test

Run the test with `nose`:

```
pip install nose
nosetests anyblok_dramatiq/tests
```

## 1.5 Dependencies

AnyBlok / Dramatiq works with **Python 3.6** and later. The install process will ensure that [AnyBlok](#), [dramatiq](#) are installed, in addition to other dependencies. The latest version of them is strongly recommended.

## 1.6 Contributing (hackers needed!)

Anyblok / Dramatiq is at a very early stage, feel free to fork, talk with core dev, and spread the word!

## 1.7 Author

Jean-Sébastien Suzanne

## 1.8 Contributors

[Anybox](#) team:

- Jean-Sébastien Suzanne

[Sensee](#) team:

- Franck Bret

## 1.9 Bugs

Bugs and feature enhancements to AnyBlok should be reported on the [Issue tracker](#).

### Contents

- *MEMENTO*
  - *How to use dramatiq and which context*
  - *Add middleware on dramatiq*



### 2.1 How to use dramatiq and which context

The goal of dramatiq is to process some task on another system process. If your tasks will be done on the same process, you read the wrong solution. But if your tasks can be executed in another process, and it takes time to process them, you are welcome.

The first thing to know is you will need to run the application:

- `anyblok_dramatiq`: to process the task.
- Another anyblok script to execute the main process, `anyblok_pyramid` if you have a web service.

Make attention that they both use the same broker, else they should not be communicate each other.

**Warning:** the `anyblok_dramatiq` must be installed

To execute your task by dramatiq, you have to define **actor** or **actor\_send** on your AnyBlok Model. Read the doc of the doc of `dramatiq` blok to know how declare it.

### 2.2 Add middleware on dramatiq

**dramatiq** allow to add middleware to improve the process, **anyblok\_dramatiq** add one middleware for historize the messages and their status.

You can add in your project an existing **dramatiq** middleware or your own. [read more](#) to know existing middleware or how create your own.

**anyblok\_dramatiq** add this own console script to run the workers, you need add the middleware in the entrypoint `anyblok_dramatiq.middleware`:

```
setup(  
    ...  
    entry_points={  
        'anyblok_dramatiq.middleware': [  
            'mymiddleware=module.path:ClassName',  
        ],  
    },  
    ...  
)
```

## Contents

- *Code*
  - *Actor*
  - *Broker*
  - *Dramatiq middleware*
  - *Scripts*

### 3.1 Actor

**exception** anyblok\_dramatiq.actor.**AnyBlokActorException**

Bases: `ValueError`

A `ValueError` exception for anyblok\_dramatiq

**with\_traceback()**

Exception.with\_traceback(tb) – set self.\_\_traceback\_\_ to tb and return self.

**class** anyblok\_dramatiq.actor.**AnyBlokActor** (*fn, \*, broker, actor\_name, queue\_name, priority, options*)

Bases: `dramatiq.actor.Actor`

Overload the `dramatiq.actor.Actor` class

the goal is to allow the decorator `actor_send`, this decorator use directly the method `send`

**send** (*\*args, \*\*kwargs*)

Send to the broker

anyblok\_dramatiq.actor.**declare\_actor\_for** (*method, \*\*kwargs*)

Method to add anyblok\_dramatiq.actor.actor decorator on the class method

#### Parameters

- **method** – classmethod pointer
- **\*\*kwargs** – decorator kwargs

anyblok\_dramatiq.actor.**declare\_actor\_send\_for** (*method, \*\*kwargs*)

Method to add anyblok\_dramatiq.actor.actor\_send decorator on the class method

#### Parameters

- **method** – classmethod pointer
- **\*\*kwargs** – decorator kwargs

`anyblok_dramatiq.actor.actor(queue_name='default', priority=0, **options)`

Decorator to get an Actor

**Parameters**

- **queue\_name** – name of the queue
- **priority** – priority of the actor
- **\*\*options** – options for actor

`anyblok_dramatiq.actor.actor_send(queue_name='default', priority=0, **options)`

Decorator to get an AnyBlokActor

**Parameters**

- **queue\_name** – name of the queue
- **priority** – priority of the actor
- **\*\*options** – options for actor

`anyblok_dramatiq.actor.call_directly_the_actor_send()`

Context manager to call directly without use dramatiq

**class** `anyblok_dramatiq.actor.ActorPlugin(registry)`

Bases: `anyblok.model.plugins.ModelPluginBase`

`anyblok.model.plugin` to allow the build of the `anyblok_dramatiq.actor`

**after\_model\_construction** (*base, namespace, transformation\_properties*)

Do some action with the constructed Model

**Parameters**

- **base** – the Model class
- **namespace** – the namespace of the model
- **transformation\_properties** – the properties of the model

**initialisation\_transformation\_properties** (*properties, transformation\_properties*)

Initialise the transform properties

**Parameters**

- **properties** – the properties declared in the model
- **new\_type\_properties** – param to add in a new base if need

**insert\_in\_bases** (*new\_base, namespace, properties, transformation\_properties*)

Insert in a base the overload

**Parameters**

- **new\_base** – the base to be put on front of all bases
- **namespace** – the namespace of the model
- **properties** – the properties declared in the model
- **transformation\_properties** – the properties of the model

**transform\_base\_attribute** (*attr, method, namespace, base, transformation\_properties, new\_type\_properties*)

transform the attribute for the final Model

**Parameters**

- **attr** – attribute name
- **method** – method pointer of the attribute
- **namespace** – the namespace of the model
- **base** – One of the base of the model
- **transformation\_properties** – the properties of the model
- **new\_type\_properties** – param to add in a new base if need

**class** anyblok\_dramatiq.actor.**ActorSendPlugin** (*registry*)

Bases: anyblok.model.plugins.ModelPluginBase

anyblok.model.plugin to allow the build of the anyblok\_dramatiq.actor\_send

**after\_model\_construction** (*base, namespace, transformation\_properties*)

Do some action with the constructed Model

#### Parameters

- **base** – the Model class
- **namespace** – the namespace of the model
- **transformation\_properties** – the properties of the model

**initialisation\_transformation\_properties** (*properties, transformation\_properties*)

Initialise the transform properties

#### Parameters

- **properties** – the properties declared in the model
- **new\_type\_properties** – param to add in a new base if need

**insert\_in\_bases** (*new\_base, namespace, properties, transformation\_properties*)

Insert in a base the overload

#### Parameters

- **new\_base** – the base to be put on front of all bases
- **namespace** – the namespace of the model
- **properties** – the properties declared in the model
- **transformation\_properties** – the properties of the model

**transform\_base\_attribute** (*attr, method, namespace, base, transformation\_properties, new\_type\_properties*)

transform the attribute for the final Model

#### Parameters

- **attr** – attribute name
- **method** – method pointer of the attribute
- **namespace** – the namespace of the model
- **base** – One of the base of the model
- **transformation\_properties** – the properties of the model
- **new\_type\_properties** – param to add in a new base if need

## 3.2 Broker

`anyblok_dramatiq.broker.prepare_broker (withmiddleware=True)`

Configure the broker for send and workers

## 3.3 Dramatiq middleware

**class** `anyblok_dramatiq.middleware.DramatiqMessageMiddleware`

Bases: `dramatiq.middleware.middleware.Middleware`

Middleware for dramatiq, the goal is to detect if the the call was done by anyblok tools with the `Model.Dramatiq.Message`. This model stock the status of the message and the history of the status's change

**after\_process\_message** (*broker, message, \*, result=None, exception=None*)

Called after process message

If the message is in the `Model.Dramatiq.Message` then the status will be change to **done** or **failed**.

---

**Note:** the status is failed if an exception is passed or a rollback is need

---

Before the end, the session is expired to release the Session pool thread

### Parameters

- **broker** – the broker used
- **message** – the message send in the broker
- **result** – return by the process
- **exception** – any `Exception` raised by the process

**after\_skip\_message** (*broker, message*)

Called after skip message

If the message is in the `Model.Dramatiq.Message` then the status will be change to **skip**

Before the end, the session is expired to release the Session pool thread

### Parameters

- **broker** – the broker used
- **message** – the message send in the broker

**after\_worker\_shutdown** (*\*args, \*\*kwargs*)

Called before worker shutdown

Close the AnyBlok registry

**before\_consumer\_thread\_shutdown** (*\*args, \*\*kwargs*)

Called before consumer thread shutdown

remove the session instance to clean the Session pool

**before\_enqueue** (*broker, message, delay*)

Called when a message is delayed or enqueued

If the message is in the `Model.Dramatiq.Message` then the status will be change to **delayed** or **enqueued**

**Parameters**

- **broker** – the broker used
- **message** – the message send in the broker
- **delay** – delay in milliseconds

**before\_process\_message** (*broker, message*)

Called before process message

Invalid the cache, this is mean that if a cache have to be invalidated then it will be invalidated else nothing is done

If the message is in the `Model.Dramatiq.Message` then the status will be change to **running**

**Parameters**

- **broker** – the broker used
- **message** – the message send in the broker

**before\_worker\_thread\_shutdown** (*\*args, \*\*kwargs*)

Called before worker thread shutdown

remove the session instance to clean the Session pool

## 3.4 Scripts

`anyblok_dramatiq.scripts.worker_process` (*worker\_id, logging\_fd*)

consume worker to process messages and execute the actor

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  - *Blok dramatiq*
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      - *actor\_send*
    - \* *API doc*
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  - *Blok dramatiq task*
    - \* *Memento*
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      - *Model.Dramatiq.Job*
    - \* *API doc*
      - *Task*
      - *Job*





## 4.1 Blok dramatiq

**class** anyblok\_dramatiq.bloks.dramatiq.DramatiqBlok(*registry*)

Bases: anyblok.blok.Blok

Dramatiq's Blok class definition

**author** = 'jssuzanne'

**conditional\_by** = []

**conflicting\_by** = []

**classmethod** declare\_actors(*registry*)

Actor declaration

```
from anyblok_dramatiq import (
    declare_actor_for,
    declare_actor_send_for,
)
declare_actor_for(Model.methode_name)
# or
declare_actor_send_for(Model.methode_name)
```

**classmethod** import\_declaration\_module()

Python module to import in the given order at start-up

**load**()

Load all the actor defined in all the installed bloks

**name** = 'dramatiq'

**optional\_by** = []

**classmethod** reload\_declaration\_module(*reload*)

Python module to import while reloading server (ie when adding Blok at runtime)

```
required = ['anyblok-core']
required_by = ['dramatiq-task']
version = '1.0.3'
```

### 4.1.1 Memento

An **actor** method is a classmethod who are executed by the dramatiq worker. AnyBlok define two different actor decorator:

- `actor`: Works exactly as the `dramatiq.actor` decorator
- `actor_send`: This actor call the `send` broker method by default

The actor decorator from anyblok must decorate only an AnyBlok Model, Mixin or Core

#### `actor`

The more basic actor:

```
from anyblok_dramatiq import actor

@register(Model)
class MyModel:

    ...

    @actor()
    def actor_method(cls, *args, **kwargs)
        # do something
        ...
```

This use case is simple, you may:

- Call directly the `actor_method` and execute it:

```
registry.MyModel.actor_method(, *a, **kw)
```

- Use the dramatiq fonctionnality without `Model.Dramatiq.Message`:

```
message = registry.MyModel.actor_method.send(*a, **kw)
registry.Dramatiq.send2broker(message)
```

- Use the dramatiq fonctionnality with `Model.Dramatiq.Message` to get status and history:

```
registry.Dramatiq.create_message(registry.MyModel.actor_method, *a, **kw)
```

---

**Note:** In this case the message will be send to dramatiq worker by the `postcommit_hook` of AnyBlok

---

#### `actor_send`

The more basic actor:

```

from anyblok_dramatiq import actor_send

@register(Model)
class MyModel:

    ...

    @actor_send()
    def actor_method(cls, *args, **kwargs)
        # do something
        ...

```

By default this decorator allow one case, use the dramatiq fonctionnality with `Model.Dramatiq.Message`:

```
registry.MyModel.actor_method(*a, **kw)
```

The inheritance of AnyBlok allow to overwrite all classmethod to transform them by an actor easily.

In the case where you want execute directly the actor you have to use the context manager `call_directly_the_actor_send`:

```

from anyblok_dramatiq import call_directly_the_actor_send

with call_directly_the_actor_send():
    registry.MyModel.actor_method(*a, **kw)

```

## 4.1.2 API doc

### Message

**class** `anyblok_dramatiq.bloks.dramatiq.message.Dramatiq`  
 Bases: `object`

No SQL Model, use to get tools for dramatiq messaging

**AnyBlok registration:**

- Type: Model
- Registry name: `Model.Dramatiq`
- Tablename: `dramatiq`

**classmethod** `create_message(actor, *args, **kwargs)`

Prepare a message and add an entry in the Message Model :param actor: an Actor instance :param delay: use for postcommit hook `send2broker` :param `*args`: args of the actor :param `**kwargs`: kwargs of the actor :rtype: dramatiq message instance

**classmethod** `send2broker(*messages, delay=None, run_at=None)`

Send all the messages with the delay

#### Parameters

- `*messages` – message instance list
- `delay` – delay before send
- `run_at` – datetime when the process must be executed

```
class anyblok_dramatiq.bloks.dramatiq.message.Message
```

```
    Bases: anyblok.mixin.DramatiqMessageStatus
```

Message model for dramatiq

**AnyBlok registration:**

- Type: Model
- Registry name: Model.Dramatiq.Message
- Tablename: dramatiq\_message
- Inherited Models or Mixins:
  - anyblok.mixin.DramatiqMessageStatus

| Fields     |  |
|------------|--|
| updated_at | <ul style="list-style-type: none"><li>• is auto updated - False</li><li>• default timezone - &lt;UTC&gt;</li><li>• Type - anyblok.column.DateTime</li></ul>  |
| message    | <ul style="list-style-type: none"><li>• nullable - False</li><li>• default - anyblok.column.NoDefaultValue</li><li>• Type - anyblok.column.Json</li></ul>  |
| id         | <ul style="list-style-type: none"><li>• binary - None</li><li>• native - None</li><li>• nullable - False</li><li>• default - anyblok.column.NoDefaultValue</li><li>• primary_key - True</li><li>• Type - anyblok.column.UUID</li></ul> |

```
classmethod get_instance_of (message)
```

Called by the middleware to get the model instance of the message

```
classmethod insert (*args, **kwargs)
```

Over write the insert to add the first history line

```
update_status (status, error=None)
```

Called by the middleware to change the status and history

## 4.2 Blok dramatiq task

```
class anyblok_dramatiq.bloks.task.DramatiqTaskBlok (registry)
```

```
    Bases: anyblok.blok.Blok
```

Dramatiq's task definition

```
    author = 'jssuzanne'
```

```
    conditional_by = []
```

```
conflicting_by = []

classmethod import_declaration_module()
    Python module to import in the given order at start-up

name = 'dramatiq-task'

optional_by = []

classmethod reload_declaration_module(reload)
    Python module to import while reloading server (ie when adding Blok at runtime)

required = ['anyblok-core', 'dramatiq']

required_by = []

version = '1.0.3'
```

### 4.2.1 Memento

The tasks is based on dramatiq, The instance of the model:

- Task: define what the task have to do
- Job: historize the execution of an instance of Task with specific data

#### Model.Dramatiq.Task

This model is not directly useable, you have to use polymosphic model:

- Model.Dramatiq.Task.CallMethod: call a classmethod on a model, defined by the task
- Model.Dramatiq.Task.StepByStep: call each sub task one by one on function of the order
- Model.Dramatiq.Task.Parallel: call all sub tasks on one shot

#### Model.Dramatiq.Job

The job is the execution of the task with dramatiq, The job historize also action done and action to do. To create a job, you must get a task create the job with the method `do_the_job`:

```
task = registry.Dramatiq.Task.query().first()
task.do_the_job(with_args=tuple(), with_kwargs=dict(), run_at=a_datetime)
# this job will not be traited now and by the process but by another process
```

---

**Note:** In the case where the task will be an `StepByStep` or `Parallel` task, then the task create one or more job, one for the job and one for sub jobs

---

### 4.2.2 API doc

#### Task

```
class anyblok_dramatiq.bloks.task.task.Task
    Bases: object

    Main Task, define the main table
```

**AnyBlok registration:**

- Type: Model
- Registry name: Model.Dramatiq.Task
- Tablename: dramatiq\_task

| Fields    |   |
|-----------|---|
| label     | <ul style="list-style-type: none"><li>• nullable - False</li><li>• default - anyblok.column.NoDefaultValue</li><li>• Type - anyblok.column.String</li><li>• size - 64</li></ul>   |
| task_type | <ul style="list-style-type: none"><li>• selections - 'get_task_type'</li><li>• nullable - False</li><li>• default - anyblok.column.NoDefaultValue</li><li>• Type - anyblok.column.Selection</li><li>• size - 64</li></ul> |
| main_task | <ul style="list-style-type: none"><li>• model - Model.Dramatiq.Task</li><li>• Type - anyblok.relationship.Many2One</li><li>• index - False</li><li>• backref - 'sub_tasks'</li></ul>                                      |
| create_at | <ul style="list-style-type: none"><li>• is auto updated - False</li><li>• nullable - False</li><li>• default timezone - &lt;UTC&gt;</li><li>• Type - anyblok.column.DateTime</li></ul>                                    |
| order     | <ul style="list-style-type: none"><li>• nullable - False</li><li>• default - 100</li><li>• Type - anyblok.column.Integer</li></ul>  |
| update_at | <ul style="list-style-type: none"><li>• is auto updated - True</li><li>• nullable - False</li><li>• default timezone - &lt;UTC&gt;</li><li>• Type - anyblok.column.DateTime</li></ul>                                     |
| id        | <ul style="list-style-type: none"><li>• default - anyblok.column.NoDefaultValue</li><li>• primary_key - True</li><li>• Type - anyblok.column.Integer</li><li>• autoincrement - True</li></ul>                             |

**classmethod** `define_mapper_args()`

Polymorphism configuration

**do\_the\_job** (*main\_job=None, run\_at=None, with\_args=None, with\_kwargs=None*)

Create a job for this tash and add send it to dramatiq

**Parameters**

- **main\_job** – parent job if exist
- **run\_at** – datetime to execute the job
- **with\_args** – tuple of the argument to pass at the job
- **with\_kwargs** – dict of the argument to pass at the job

**classmethod** `get_task_type()`

List the task type possible

**run** (*job*)

Execute the task for one job

**Parameters** **job** – job executed

**run\_next** (*job*)

next action to execute when a sub job finish this task for one job

**Parameters** **job** – job executed

## Job

**class** `anyblok_dramatiq.bloks.task.job.Job`

Bases: `object`

The job is an execution of an instance of task

**AnyBlok registration:**

- Type: Model
- Registry name: Model.Dramatiq.Job
- Tablename: dramatiq\_job

| Fields    |   |
|-----------|---|
| main_job  | <ul style="list-style-type: none"> <li>• model - <code>Model.Dramatiq.Job</code></li> <li>• Type - <code>anyblok.relationship.Many2One</code></li> <li>• index - <code>False</code></li> <li>• backref - <code>'sub_jobs'</code></li> </ul>     |
| status    | <ul style="list-style-type: none"> <li>• nullable - <code>False</code></li> <li>• default - <code>'new'</code></li> <li>• Type - <code>anyblok.column.Selection</code></li> <li>• size - <code>64</code></li> </ul>                             |
| run_at    | <ul style="list-style-type: none"> <li>• is auto updated - <code>False</code></li> <li>• default timezone - <code>&lt;UTC&gt;</code></li> <li>• Type - <code>anyblok.column.DateTime</code></li> </ul>  |
| data      | <ul style="list-style-type: none"> <li>• nullable - <code>False</code></li> <li>• default - <code>anyblok.column.NoDefaultValue</code></li> <li>• Type - <code>anyblok.column.Json</code></li> </ul>  |
| task      | <ul style="list-style-type: none"> <li>• model - <code>Model.Dramatiq.Task</code></li> <li>• Type - <code>anyblok.relationship.Many2One</code></li> <li>• index - <code>False</code></li> </ul>   |
| error     | <ul style="list-style-type: none"> <li>• default - <code>anyblok.column.NoDefaultValue</code></li> <li>• Type - <code>anyblok.column.Text</code></li> </ul>   |
| create_at | <ul style="list-style-type: none"> <li>• is auto updated - <code>False</code></li> <li>• nullable - <code>False</code></li> <li>• default timezone - <code>&lt;UTC&gt;</code></li> <li>• Type - <code>anyblok.column.DateTime</code></li> </ul> |
| update_at | <ul style="list-style-type: none"> <li>• is auto updated - <code>True</code></li> <li>• nullable - <code>False</code></li> <li>• default timezone - <code>&lt;UTC&gt;</code></li> <li>• Type - <code>anyblok.column.DateTime</code></li> </ul>  |
| uuid      | <ul style="list-style-type: none"> <li>• binary - <code>False</code></li> <li>• native - <code>None</code></li> <li>• nullable - <code>False</code></li> <li>• default - <code>&lt;function uuid1 at 0x7fe91eb400&gt;</code></li> </ul>         |
|           | <ul style="list-style-type: none"> <li>• primary_key - <code>True</code></li> <li>• Type - <code>anyblok.column.UUID</code></li> </ul>  |



**call\_main\_job()**

Call the main job if exist to do the next action of the main job

**lock()**

lock the job to be sure that only one thread execute the run\_next

**classmethod run** (*job\_uuid=None*)

dramatiq actor to execute a specific task

**actor\_send** event call with positionnal argument { 'priority': 0, 'queue\_name': 'default' }

## Contents

- *CHANGELOG*

- *1.0.3 (2018-02-24)*

- *1.0.2 (2018-02-12)*

- *1.0.1 (2018-01-10)*

- *1.0.0 (2017-12-23)*



### 5.1 1.0.3 (2018-02-24)

- [REF] Anyblok 0.17.0 changed setter to add application and application groups, So I had to adapt the existing to use new setter

### 5.2 1.0.2 (2018-02-12)

- [FIX] multi process lock AnyBlok seem lock the data base during the migration, the dramatiq process don't migrate the data base, the migration is now forbidden

### 5.3 1.0.1 (2018-01-10)

- [FIX] put the configuration `dramatiq-broker` on the default application

### 5.4 1.0.0 (2017-12-23)

- [IMP] dramatiq console script to execute workers process
- [IMP] actor and actor\_send decorator to define dramatiq actor
- [IMP] dramatiq middleware to modify `Model.Dramatiq.Message` status
- [IMP] dramatiq blok to historize the message and status
- [IMP] dramatiq-task to add a back task with dramatiq



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## CHAPTER 7

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