
settei Documentation

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Spoqa, Inc

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1	Loading a configuration is easy	3
1.1	settei — App object holding configuration	3
1.1.1	settei.base — Basic app object	4
1.1.2	settei.presets — Richer presets for several frameworks	6
1.1.3	settei.version — Version data	10
1.2	Changelog	10
1.2.1	Version 0.5.2	10
1.2.2	Version 0.5.1	10
1.2.3	Version 0.5.0	10
1.2.4	Version 0.4.0	10
1.2.5	Version 0.3.0	10
1.2.6	Version 0.2.2	11
1.2.7	Version 0.2.0	11
1.2.8	Version 0.1.1	11
1.2.9	Version 0.1.0	11
2	Indices and tables	13
	Python Module Index	15
	Index	17

Configuration utility for common Python applications and services. FYI, “settei” () means settings in Japanese. :)

Loading a configuration is easy

Suppose you use Flask with Settei.

```
from flask import Flask
from settei import Configuration, config_property

class WebConfiguration(Configuration):
    """Load Configuration::

        [web]
        debug = true

    """

    #: debug option
    debug = config_property('web.debug', bool, default=False)

conf = WebConfiguration.from_path(pathlib.Path('.') / 'dev.toml')
app = Flask(__name__)

if __name__ == '__main__':
    app.run(debug=conf.debug)
```

1.1 settei — App object holding configuration

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1.1.1 settei.base — Basic app object

New in version 0.2.0.

exception `settei.base.ConfigError`

The base exception class for errors related to `Configuration` and `config_property()`.

New in version 0.4.0.

exception `settei.base.ConfigKeyError`

An exception class rises when there's no a configuration key. A subtype of `ConfigError` and `KeyError`.

New in version 0.4.0.

exception `settei.base.ConfigTypeError`

An exception class rises when the configured value is not of a type the field expects.

New in version 0.4.0.

class `settei.base.Configuration` (*config: Mapping[str, object] = {}, **kwargs*)

Application instance with its settings e.g. database. It implements read-only `Mapping` protocol as well, so you can treat it as a dictionary of string keys.

Changed in version 0.4.0: Prior to 0.4.0, it had raised Python's built-in `KeyError` on missing keys, but since 0.4.0 it became to raise `ConfigKeyError`, a subtype of `KeyError`, instead.

classmethod `from_file` (*file*) → `settei.base.Configuration`

Load settings from the given *file* and instantiate an `Configuration` instance from that.

Parameters *file* – the file object that contains TOML settings

Returns an instantiated configuration

Return type `Configuration`

classmethod `from_path` (*path: pathlib.Path*) → `Configuration`

Load settings from the given *path* and instantiate an `Configuration` instance from that.

Parameters *path* (`pathlib.Path`) – the file path that contains TOML settings

Returns an instantiated configuration

Return type `Configuration`

exception `settei.base.ConfigValueError`

An exception class rises when the configured value is somewhat invalid.

New in version 0.4.0.

exception `settei.base.ConfigWarning`

Warning category which raised when a default configuration is used instead due to missing required configuration.

class `settei.base.config_object_property` (*key: str, cls, docstring: str = None, recurse: bool = False, **kwargs*)

Similar to `config_property` except it purposes to represent more complex objects than simple values. It can be utilized as dependency injector.

Suppose a field declared as:

```
from werkzeug.contrib.cache import BaseCache

class App(Configuration):
    cache = config_object_property('cache', BaseCache)
```


Also a configuration:

```
[cache]
class = "werkzeug.contrib.cache:RedisCache"
host = "a.nodes.redis-cluster.local"
port = 6379
db = 0
```

The above instantiates the following object:

```
from werkzeug.contrib.cache import RedisCache
RedisCache(host='a.nodes.redis-cluster.local', port=6380, db=0)
```

There's a special field named `*` which is for positional arguments as well:

```
[cache]
class = "werkzeug.contrib.cache:RedisCache"
"*" = [
    "a.nodes.redis-cluster.local",
    6379,
]
db = 0
```

The above configuration is equivalent to the following Python code:

```
from werkzeug.contrib.cache import RedisCache
RedisCache('a.nodes.redis-cluster.local', 6380, db=0)
```

By default it doesn't recursively evaluate. For example, the following configuration:

```
[field]
class = "a:ClassA"
[field.value]
class = "b:ClassB"
[field.value.value]
class = "c:ClassC"
```

is evaluated to:

```
from a import ClassA
ClassA(value={'class': 'b:ClassB', 'value': {'class': 'c:ClassC'}})
```

If `recurse=True` option is provided, it evaluates nested tables too:

```
from a import ClassA
from b import ClassB
from c import ClassC

ClassA(value=ClassB(value=ClassC()))
```

Parameters

- **key** (*str*) – the dotted string of key path. for example `abc.def` looks up `config['abc']['def']`
- **cls** (*type*) – the allowed type of the configuration
- **docstring** (*str*) – optional documentation about the configuration. it will be set to `__doc__` attribute

- **recurse** (*bool*) – whether to evaluate nested tables as well. `False` by default
- **default** – keyword only argument. optional default value used for missing case. cannot be used with `default_func` at a time
- **default_func** (*collections.abc.Callable*) – keyword only argument. optional callable which returns a default value for missing case. it has to take an `App` mapping, and return a default value. cannot be used with `default` at a time
- **default_warning** (*bool*) – keyword only argument. whether to warn when default value is used. does not warn by default. this option is only available when `default` value is provided

New in version 0.4.0.

New in version 0.5.0: The `recurse` option.

class `settei.base.config_property` (*key: str, cls, docstring: str = None, **kwargs*)

Declare configuration key with type hints, default value, and docstring.

Parameters

- **key** (*str*) – the dotted string of key path. for example `abc.def` looks up `config['abc']['def']`
- **cls** (*type*) – the allowed type of the configuration
- **docstring** (*str*) – optional documentation about the configuration. it will be set to `__doc__` attribute
- **default** – keyword only argument. optional default value used for missing case. cannot be used with `default_func` at a time
- **default_func** (*collections.abc.Callable*) – keyword only argument. optional callable which returns a default value for missing case. it has to take an `App` mapping, and return a default value. cannot be used with `default` at a time
- **default_warning** (*bool*) – keyword only argument. whether to warn when default value is used. does not warn by default. this option is only available when `default` value is provided

Changed in version 0.4.0: Prior to 0.4.0, it had raised Python’s built-in `KeyError` on missing keys, but since 0.4.0 it became to raise `ConfigKeyError`, a subtype of `KeyError`, instead.

In the same manner, while prior to 0.4.0, it had raised Python’s built-in `TypeError` when a configured value is not of a type it expects, but since 0.4.0 it became to raise `ConfigTypeError` instead. `ConfigTypeError` is also a subtype of `TypeError`.

docstring

(*str*) The properly indented `__doc__` string.

1.1.2 `settei.presets` — Richer presets for several frameworks

New in version 0.2.0.

`settei.presets.celery` — Preset for Celery

class `settei.presets.celery.WorkerConfiguration` (*config: Mapping[str, object] = {}, **kwargs*)

The application object mixin which holds configuration for Celery.

on_worker_loaded (*app: celery.app.base.Celery*)

Trigger the `worker.on_loaded` hooks. You should invoke this function when the Celery app is ready with the Celery app as argument. You may want to use `celery.loaders.base.BaseLoader.on_worker_init`

`worker.on_loaded` hook can be a Python code or list of module path.

When `worker.on_loaded` is a single string, it will be interpreted as Python code. The configuration and the Celery app is injected as `self` and `app` each:

```
[worker]
on_loaded = """
print('Hello, world!')
print('self is configuration!: {}'.format(self))
print('app is celery app!: {}'.format(app))
"""
```

When `worker.on_loaded` is a list of string, it will be interpreted as module paths:

```
[worker]
on_loaded = [
    "utils.hooks:sample_hook",
    "src.main:print_hello_world",
]
```

The hook must receive two arguments, Configuration and `celery.Celery`:

```
def sample_hook(conf: Configuration, app: Celery):
    print('Hello, world!')
    print('conf is configuration!: {}'.format(conf))
    print('app is celery app!: {}'.format(app))
```

Parameters `app` (`celery.Celery`) – a ready celery app

Changed in version 0.5.2: Hooks list added

worker_broker_url

The url of the broker used by Celery. See also Celery's and Kombu's docs about broker urls:

<http://docs.celeryproject.org/en/latest/configuration.html#broker-url> <http://kombu.readthedocs.org/en/latest/userguide/connections.html#connection-urls>

worker_config

(`typing.Mapping[str, object]`) The configuration mapping for worker that will go to Celery. `conf`.

worker_result_backend

The backend used by Celery to store task results. See also Celery's docs about result backends:

<http://docs.celeryproject.org/en/latest/configuration.html#celery-result-backend>

worker_schedule

(`typing.Mapping[str, typing.Mapping[str, object]]`) The schedule table for Celery Beat, scheduler for periodic tasks.

There's some preprocessing before reading configuration. Since TOML doesn't have custom types, you can't represent `timedelta` or `crontab` values from the configuration file. To workaround the problem, it evaluates strings like `'f ()'` pattern if they are appeared in a `schedule` field.

For example, if the following configuration is present:

```
[worker.celerybeat_schedule.add-every-30-seconds]
task = "tasks.add"
schedule = "timedelta(seconds=30)" # string to be evaluated
args = [16, 16]
```

it becomes translated to:

```
CELERYBEAT_SCHEDULE = {
    'add-every-30-seconds': {
        'task': 'tasks.add',
        'schedule': datetime.timedelta(seconds=30), # evaluated!
        'args': (16, 16),
    },
}
```

Note that although `timedelta` and `crontab` is already present in the context, you need to import things if other types. It can also parse and evaluate the patterns like `'module.path:func()'`.

Also `args` fields are translated from array to tuple.

See also Celery's docs about periodic tasks:

<http://docs.celeryproject.org/en/latest/userguide/periodic-tasks.html>

New in version 0.2.2.

settei.presets.flask — Preset for Flask apps

New in version 0.2.0.

class `settei.presets.flask.WebConfiguration` (*config: Mapping[str, object] = {}, **kwargs*)

Settei configuration for the `Flask`. For more information, See the example below:

```
config = WebConfiguration.from_path('config.toml')
app = Flask(__name__)
app.config.update(config.web_config)

@app.before_first_request
def before_first_request():
    config.on_web_loaded(app)

app.run()
```

on_web_loaded (*app: flask.app.Flask*)

Trigger the `web.on_loaded` hooks. You should invoke this function when the WSGI app is ready with the WSGI app as argument. You may want to use `flask.Flask.before_first_request`.

`web.on_loaded` hook can be a Python code or list of module path.

When `web.on_loaded` is a single string, it will be interpreted as Python code. The configuration and the WSGI app is injected as `self` and `app` each:

```
[web]
on_loaded = """
print('Hello, world!')
print('self is configuration!: {}'.format(self))
print('app is flask app!: {}'.format(app))
"""
```

When `web.on_loaded` is a list of string, it will be interpreted as module paths:

```
[web]
on_loaded = [
    "utils.hooks:sample_hook",
    "src.main:print_hello_world",
]
```

The hooks must receive two arguments, `Configuration` and `flask.Flask`:

```
def sample_hook(conf: Configuration, app: Flask):
    print('Hello, world!')
    print('conf is configuration!: {}'.format(conf))
    print('app is flask app!: {}'.format(app))
```

Parameters `app` (`flask.Flask`) – a ready wsgi/flask app

Changed in version 0.5.2: Hooks list added

web_config

(`typing.Mapping`) The configuration mapping for web that will go to `flask.Flask.config`.

web_debug

Whether to enable debug mode. On debug mode the server will reload itself on code changes, and provide a helpful debugger when things go wrong.

settei.presets.logging — Preset for logging configuration

New in version 0.2.0.

Preset for apps holding `logging` configuration. Logging can be configured through TOML file e.g.:

```
[logging]
version = 1

[logging.loggers.flask]
handlers = ["stderr"]

[logging.loggers."urllib.request"]
handlers = ["stderr"]

[logging.loggers.werkzeug]
handlers = ["stderr"]

[logging.handlers.stderr]
class = "logging.StreamHandler"
level = "INFO"
stream = "ext://sys.stderr"
```

class `settei.presets.logging.LoggingConfiguration` (`config: Mapping[str, object] = {}`, `**kwargs`)

Hold configuration for `logging`.

configure_logging () → None
Configure `logging`.

1.1.3 `settei.version` — Version data

New in version 0.2.0.

```
settei.version.VERSION = '0.5.2'  
(str) The version string e.g. '1.2.3'.
```

```
settei.version.VERSION_INFO = (0, 5, 2)  
(typing.Tuple[int, int, int]) The triple of version numbers e.g. (1, 2, 3).
```

1.2 Changlog

1.2.1 Version 0.5.2

Released on June 10, 2019.

- Enabled declaring `enum.Enum` types in `config_property`. [#29]
- Add hooks list feature for `on_web_loaded` and `on_worker_loaded`. [#30]

1.2.2 Version 0.5.1

Released on Sep 11, 2018.

- Became to support Python 3.7. [#25, #28]

1.2.3 Version 0.5.0

Released on July 24, 2017.

- Added `recurse` option to `config_object_property`. If it's `True` nested tables are also evaluated. `False` by default for backward compatibility.

1.2.4 Verison 0.4.0

Released on May 14, 2017.

- `config_object_property` was added. It's a kind of dependency injection, but very limited version.
- `ConfigError`, `ConfigKeyError`, `ConfigTypeError`, and `ConfigValueError`.

Prior to 0.4.0, `Configuration` had raised Python's built-in `KeyError` on missing keys, but since 0.4.0 it became to raise `ConfigKeyError`, a subtype of `KeyError`, instead.

In the same manner, while prior to 0.4.0, it had raised Python's built-in `TypeError` when a configured value is not of a type it expects, but since 0.4.0 it became to raise `ConfigTypeError` instead. `ConfigTypeError` is also a subtype of `TypeError`.

1.2.5 Version 0.3.0

Released on January 22, 2017.

- As `tsukkomi` is now abandoned, it's replaced by `typeguard`.

1.2.6 Version 0.2.2

Released on November 18, 2016. Note that the version 0.2.1 has never been released due to our mistake on versioning.

- `WorkerConfiguration` became to have `worker_schedule` config property to configure Celery beat — Celery's periodic tasks.

1.2.7 Version 0.2.0

Released on July 13, 2016.

- `settei` became a package (had been a module), which contains `settei.base` module.
- `settei.Configuration`, `settei.ConfigWarning`, and `settei.config_property` were moved to `settei.base` module. Although aliases for these previous import paths will be there for a while, we recommend to import them from `settei.base` module since they are deprecated.
- Presets were introduced: `settei.presets`.
 - `settei.presets.celery` is for configuring Celery apps.
 - `settei.presets.flask` is for configuring Flask web apps.
 - `settei.presets.logging` is for configuring Python standard logging system.
- `settei.version` module was added.
- `typeannotations` was replaced by `tsukkomi`.
- Settei now requires `pytoml` 0.1.10 or higher. (It had required 0.1.7 or higher.)

1.2.8 Version 0.1.1

Released on April 15, 2016.

- `settei.base.config_property` became to support `typing.Union` type.

1.2.9 Version 0.1.0

Released on April 1, 2016. Initial release.

CHAPTER 2

Indices and tables

- `genindex`
- `modindex`
- `search`

S

settei, 3
settei.base, 3
settei.presets, 6
settei.presets.celery, 6
settei.presets.flask, 8
settei.presets.logging, 9
settei.version, 9

C

`config_object_property` (class in *settei.base*), 4
`config_property` (class in *settei.base*), 6
`ConfigError`, 4
`ConfigKeyError`, 4
`ConfigTypeError`, 4
`Configuration` (class in *settei.base*), 4
`configure_logging()` (*settei.presets.logging.LoggingConfiguration* method), 9
`ConfigValueError`, 4
`ConfigWarning`, 4

D

`docstring` (*settei.base.config_property* attribute), 6

F

`from_file()` (*settei.base.Configuration* class method), 4
`from_path()` (*settei.base.Configuration* class method), 4

L

`LoggingConfiguration` (class in *settei.presets.logging*), 9

O

`on_web_loaded()` (*settei.presets.flask.WebConfiguration* method), 8
`on_worker_loaded()` (*settei.presets.celery.WorkerConfiguration* method), 6

S

settei (module), 3
settei.base (module), 3
settei.presets (module), 6
settei.presets.celery (module), 6

settei.presets.flask (module), 8
settei.presets.logging (module), 9
settei.version (module), 9

V

`VERSION` (in module *settei.version*), 10
`VERSION_INFO` (in module *settei.version*), 10

W

`web_config` (*settei.presets.flask.WebConfiguration* attribute), 9
`web_debug` (*settei.presets.flask.WebConfiguration* attribute), 9
`WebConfiguration` (class in *settei.presets.flask*), 8
`worker_broker_url` (*settei.presets.celery.WorkerConfiguration* attribute), 7
`worker_config` (*settei.presets.celery.WorkerConfiguration* attribute), 7
`worker_result_backend` (*settei.presets.celery.WorkerConfiguration* attribute), 7
`worker_schedule` (*settei.presets.celery.WorkerConfiguration* attribute), 7
`WorkerConfiguration` (class in *settei.presets.celery*), 6