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# jetfactory Documentation

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Jetfactory is a Python framework for creating structured, portable and high-performance Web APIs. It's built on top of Sanic and uses the blazing fast uvloop implementation of the asyncio event loop.



# CHAPTER 1

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## Compatibility

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Python 3.6+





## CHAPTER 2

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### Installing

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```
$ pip install jetfactory
```



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## CHAPTER 4

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Environment

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## CHAPTER 5

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Instance

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## CHAPTER 6

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File

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At a minimum, the `jetfactory.Application` needs to be created with at least one *Jetpack*. Additional parameters can be provided to further customize the instance; see the docs below for more info.

### API

**class** `jetfactory.Application` (*packages=None, path='/api', settings=None, \*\*kwargs*)

Creates a Jetfactory application

#### Parameters

- **packages** – List of (<path>, <package>)
- **path** – Application root path
- **settings** – Settings overrides
- **kwargs** – kwargs to pass along to Sanic

**run** (*host=None, port=None, workers=None, debug=False, sql\_log=False, access\_log=False, \*\*kwargs*)

Starts the HTTP server

#### Parameters

- **host** – Listen host, defaults to 127.0.0.1
- **port** – Listen port, defaults to 8080
- **workers** – Number of workers, defaults to 1 per core.
- **debug** – Debugging
- **sql\_log** – Log SQL-statements
- **access\_log** – Log requests
- **kwargs** – Parameters to pass along to Sanic.run

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**Note:** The `jetfactory.Application` and `jetfactory.Application.run()` can be configured using the environment and files as well.

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*Read more about this in the Configuration section.*

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### Example

```
import jetfactory
import jet_apispec
import jet_guestbook

# Create application
app = jetfactory.Application(
    path='/api',
    packages=[
        ('/guestbook', jet_guestbook),
        ('/packages', jet_apispec)
    ]
)

# Start server
app.run(host='192.168.0.1')
```

## CHAPTER 8

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Manager

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Jetpacks are used for grouping, labeling and making components ready for registration with an Application.

### API

**class** `jetfactory.Jetpack` (*name, description, controller=None, services=None, models=None*)  
Associates components and meta with a package, for registration with a Jetfactory Application.

#### Parameters

- **name** – Package name
- **description** – Package description
- **controller** – Controller class
- **services** – List of Service objects
- **models** – List of Model classes

#### **path**

Package path accessor

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**Important:** The Jetpack's `__init__.py` file must have a `__version__` variable set to be successfully registered with an Application.

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### Example

```
from jetfactory import Jetpack
from jet_guestbook import service
from .service import VisitService, VisitorService
from .model import VisitModel, VisitorModel
from .controller import Controller

__version__ = '0.1.0'

export = Jetpack(
```

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```
controller=Controller,  
services=[VisitService, VisitorService],  
models=[VisitModel, VisitorModel],  
name='guestbook',  
description='Example guestbook package'  
)
```



The Jetpack *Controller* class inherits from `ControllerBase` and is registered with the *Application* upon server start.

### API

#### Example

```
from jetfactory.controller import ControllerBase

class Controller(ControllerBase):
    async def on_ready(self):
        self.log.debug(f'Controller ready at path: {self.pkg.path}')

    async def on_request(self, request):
        self.log.debug(f'Request received: {request}')
```

---

**Note:** Continue reading about *Routing* to see how *handlers* can be added.

---

## 10.1 Routing

Routing is implemented using one or more *handlers* decorated with a `@route`. Used without the `@input_load` decorator, the entire request object is passed to the handler.

### API

`jetfactory.controller.decorators.route` (*path*, *method*, *description=None*, *inject=None*)  
Prepares route registration, and performs handler injection.

#### Parameters

- **path** – Handler path, relative to application and package paths
- **method** – HTTP Method

- **inject** – List of *Injector* injections
- **description** – Endpoint description

**Returns** Route handler

### Example

```
from sanic.response import HTTPResponse
from jetfactory.controller import ControllerBase, route

class Controller(ControllerBase):
    async def on_request(self, request):
        self.log.debug(f'Request received: {request}')

    @route('/<name>', 'GET'):
        async def greet(self, request, name):
            return HTTPResponse({'msg': f'hello {name} from {request.ip}'})
```

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**Note:** Continue reading about *Transformation* to see how request/response data can be manipulated.

---

## 10.2 Transformation

Request and response transformation is performed when a request reaches `@input_load`, and upon handler return in `@output_dump`. These two decorators provides a declarative way of defining what comes in and what goes out of a route handler.

### API

`jetfactory.controller.decorators.input_load(**schemas)`

Takes a list of schemas used to validate and transform parts of a request object. The selected parts are injected into the route handler as arguments.

**Parameters** `schemas` – list of schemas (kwargs)

**Returns** Route handler

`jetfactory.controller.decorators.output_dump(schema_cls, status=200, many=False)`

Returns a transformed and serialized HTTPResponse

**Parameters**

- **schema\_cls** – Marshmallow.Schema class
- **status** – Return status (on success)
- **many** – Whether to return a list or single object

**Returns** HTTPResponse

### Example of request/response transformation

```
from jetfactory.controller import ControllerBase, route
from jetfactory.schema import ParamsSchema
from .visit import svc_visit
from .visit.schemas import Visit

class Controller(ControllerBase):
```

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```
async def on_request(self, request):
    self.log.debug(f'Request received: {request}')

@route('/', 'GET')
@input_load(query=ParamsSchema) # Transform and validate the query string
@output_dump(Visit, many=True) # Dump many `Visit`s
async def visits_get(self, query):
    # Call the service layer and dump the result as a JSON string
    return await svc_visit.get_many(**query)

@route('/<visit_id>', 'PUT') # Perform an update operation
@input_load(body=Visit) # Transform and validate the JSON payload
@output_dump(Visit) # Dump one `Visit`
async def visit_update(self, remote_addr, body, visit_id):
    # Call the service layer and dump the result as a JSON string
    return await svc_visit.visit_update(remote_addr, visit_id, body)
```

## 10.3 Schemas

Schemas are used in transformation decorators to perform object serialization and generating HTTP API documentation.

### Example

```
from jetfactory.schema import fields, Schema

class Visit(Schema):
    id = fields.Integer()
    visited_on = fields.String(attribute='created_on')
    message = fields.String()
    name = fields.String()

    class Meta:
        dump_only = ['id', 'visited_on']
        load_only = ['visit_id', 'visitor_id']

class VisitNew(Schema):
    message = fields.String(required=True)
    name = fields.String(required=True)
```

### See also:

Check out the [Marshmallow API docs](#) for more info on how to work with schemas.



Jetfactory provides a set of built-in service classes, or Mixins if you will - used to extend a Package's service layer with extra features such as database and HTTP access.

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**Note:** Create a PR or Issue if you want a Service Layer component added or updated.

---

## 11.1 BaseService

This Service implements the singleton pattern and is directly or indirectly used by all types of Jetfactory services.

### API

**class** `jetfactory.service.BaseService`

The Service base class used for creating Package Services, it implements the singleton pattern as Services are commonly used in many parts of a Package.

#### Variables

- **app** – Jetfactory application instance
- **loop** – Asyncio event loop (uvloop)

**on\_ready** ()

Called upon initialization

**classmethod register** (*pkg, mgr*)

Class method used internally by the Jetfactory manager to register a Service

#### Parameters

- **pkg** – instance of `jetfactory.Jetpack`
- **mgr** – instance of `Jetfactory.JetManager`

## 11.2 DatabaseService

The built-in `DatabaseService` inherits from `BaseService` and provides an interface for interacting with MySQL and PostgreSQL databases using the `peewee-async` manager.

### 11.2.1 Example

```
from jetfactory.service import DatabaseService
from jetfactory.exceptions import JetfactoryException

from jet_guestbook.model import VisitModel

class VisitService(DatabaseService):
    __model__ = VisitModel

    async def get_authored(self, visit_id, remote_addr):
        visit = await self.get_by_pk(visit_id)
        if visit.visitor.ip_addr != remote_addr:
            raise JetfactoryException('Not allowed from your IP', 403)

        return visit

    async def visit_count(self, ip_addr):
        return await self.count(VisitModel.visitor.ip_addr == ip_addr)
```

### 11.2.2 API

**class** `jetfactory.service.DatabaseService`

Service class providing an interface with common database operations

#### Variables

- `__model__` – Peewee.Model
- `db_manager` – Jetfactory database manager (peewee-async)

**count** (*expression=None, \*\*kwargs*)

Return the number of records the given query would yield

#### Parameters

- **expression** – peewee.Expression (optional)
- **kwargs** – kwargs to pass along to `_get_query_filtered`

**Returns** count (int)

**create** (*item: dict*)

Creates new record, returning the record upon success

**Parameters** **item** – item to be inserted

**Returns** peewee.Model

**delete** (*record\_id: int*)

Deletes a record by id

**Parameters** **record\_id** – record id

**Returns** {'deleted': True|False}

**get\_by\_pk** (*record\_id: int*)

Returns the matching record or raises an exception

**Parameters** **record\_id** – the record to query for

**Returns** peewee.Model

**get\_many** (*expression=None, \*\*kwargs*)

Returns a list of zero or more records

**Parameters**

- **expression** – peewee.Expression (optional)
- **kwargs** – kwargs to pass along to *\_get\_query\_filtered*

**Returns** [peewee.Model]

**get\_one** (*\*args, \*\*kwargs*)

Get exactly one record or raise an exception

**Parameters**

- **args** – peewee.Expression (optional)
- **kwargs** – kwargs to pass along to *\_get\_query\_filtered*

**Returns** peewee.Model

**get\_or\_create** (*item: dict*)

Get an object or create it with the provided defaults

**Parameters** **item** – item to be fetched or inserted

**Returns** peewee.Model

**model**

Return service model or raise an exception

**Returns** peewee.Model

**classmethod register** (*pkg, mgr*)

Class method used internally by the Jetfactory manager to register a Service

**Parameters**

- **pkg** – instance of *jetfactory.Jetpack*
- **mgr** – instance of *Jetfactory.JetManager*

**update** (*record, payload*)

Updates a record in the database

**Parameters**

- **record** – peewee.Model or PK
- **payload** – update payload

**Returns** updated record

---

**Important:** The `__model__` class attribute must be set for Services implementing the *DatabaseService*.

---

## 11.2.3 Models

Models are implemented using `Peewee.Model`.

### Example

```
from datetime import datetime
from peewee import Model, ForeignKeyField, CharField, DateTimeField
from .visitor import VisitorModel

class VisitModel(Model):
    class Meta:
        table_name = 'visit'

    created_on = DateTimeField(default=datetime.now)
    message = CharField(null=False)
    visitor = ForeignKeyField(VisitorModel)

    @classmethod
    def extended(cls, *fields):
        return cls.select(VisitModel, VisitorModel, *fields).join(VisitorModel)
```

## 11.3 HttpClientService

The built-in `HttpClientService` provides an interface for interacting with HTTP servers.

### 11.3.1 Example

```
from jetfactory.service import HttpClientService, DatabaseService
from .model import EntryModel

class EntryService(HttpClientService, DatabaseService):
    __model__ = EntryModel

    def __init__(self):
        self.backup_url = 'https://192.168.1.10'

    async def entry_add(self, entry_new):
        entry = await self.create(entry_new)

        self.log.info(f'sending a copy to {self.backup_url}')
        await self.http_post(self.backup_url, entry_new)

        return entry
```

### 11.3.2 API

```
class jetfactory.service.HttpClientService
    Service class providing functions for interacting with HTTP servers
```



**Variables** `http_client` – aiohttp.ClientSession instance

**http\_get** (*url: str*)

Creates a new HTTP GET request

**Parameters** `url` – URL to send the request to

**Returns** aiohttp.ClientResponse

**http\_post** (*url: str, payload: dict*)

Creates a new HTTP POST request

**Parameters**

- `url` – URL to send the request to
- `payload` – Payload to send

**Returns** aiohttp.ClientResponse

**http\_request** (*\*args, \*\*kwargs*)

Creates a custom HTTP request

**Parameters**

- `args` – args to pass along to `aiohttp.ClientSession.request`
- `kwargs` – kwargs to pass along to `aiohttp.ClientSession.request`

**Returns** aiohttp.ClientResponse

**classmethod register** (*pkg, mgr*)

Class method used internally by the Jetfactory manager to register a Service

**Parameters**

- `pkg` – instance of `jetfactory.Jetpack`
- `mgr` – instance of `Jetfactory.JetManager`



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