django-uwsgi Documentation

Release 0.2.0

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November 10, 2016

Contents

You can view the code of this project or fork it (please, send pull requests), at Github.

CHAPTER 1

Features

- Admin page with uWSGI stats (options to reload/stop uWSGI, clear uWSGI cache)
- uWSGI Cache Backend for Django
- uWSGI Email Backend for Django(send emails via uWSGI's spooler)
- Debug Panel for django-debug-toolbar (offers same functions as admin page)
- Django template loader for embedded into uWSGI files
- Django Management Command `runuwsgi` (with live autoreload when DEBUG is True)
- uWSGI config generator
- Django CBV Mixins based on uWSGI decorators
- Forms to send log messages and signals to uWSGI via admin interface

Some features are not added into repo or not yet implemented(See Todo)

CHAPTER 2

Installation

django-uwsgi is easy installable via pip:

```
pip install django-uwsgi
```

or clone it from github:

```
git clone https://github.com/unbit/django-uwsgi.git
cd django-uwsgi
pip install .

# or for development
pip install -e .
```

By default `django-uwsgi` doesn't installed with uWSGI as requirement. And here are a few known reasons why:

- Django project installed into virtualenv and running in Emperor mode. In this case uWSGI is installed system-wide or into some other virtualenv.
- Some devs love to use system package managers like apt and prefer to install uwsgi other way.
- you need to build uWSGI with custom profile ex: `UWSGI_PROFILE=gevent pip install uwsgi`

You can install django-uwsgi with uWSGI by appending [uwsgi] to the install command:

```
pip install django-uwsgi[uwsgi]
```

CHAPTER 3

Configuration

3.1 Adding django-uwsgi to your project

Add `'django_uwsgi',` to your `INSTALLED_APPS` in `settings.py`:

```
INSTALLED_APPS += ['django_uwsgi',]
```

Add django_uwsgi into `urls.py`:

```
urlpatterns += [url(r'^admin/uwsgi/', include('django_uwsgi.urls')),]
```

CHAPTER 4

Decorators

The uWSGI API is very low-level, as it must be language-independent.

That said, being too low-level is not a Good Thing for many languages, such as Python.

Decorators are, in our humble opinion, one of the more kick-ass features of Python, so in the uWSGI source tree you will find a module exporting a bunch of decorators that cover a good part of the uWSGI API.

4.1 Notes

Signal-based decorators execute the signal handler in the first available worker. If you have enabled the spooler you can execute the signal handlers in it, leaving workers free to manage normal requests. Simply pass `target='spooler'` to the decorator.

```
@timer(3, target='spooler')
def hello(signum):
    print("hello")
```

4.2 Example: a Django session cleaner and video encoder

Let's define a `tasks.py` module and put it in the Django project directory.

```
import os
from django.contrib.sessions.models import Session
from django_uwsgi.decorators import cron, spool

@cron(40, 2, -1, -1, -1)
def clear_django_session(num):
    print("it's 2:40 in the morning: clearing django sessions")
    Session.objects.all().delete()

@spool
def encode_video(arguments):
    os.system("ffmpeg -i \"%s\" image%%d.jpg" % arguments['filename'])
```

The session cleaner will be executed every day at 2:40, to enqueue a video encoding we simply need to spool it from somewhere else.

```
from tasks import encode_video

def index(request):
    # launching video encoding
    encode_video.spool(filename=request.POST['video_filename'])
    return render_to_response('enqueued.html')
```

Now run uWSGI with the spooler enabled:

```
[uwsgi]
; a couple of placeholder
django_projects_dir = /var/www/apps
my_project = foobar
; chdir to app project dir and set pythonpath
chdir = %(django_projects_dir)/%(my_project)
pythonpath = %(django_projects_dir)
; load django
module = django.core.handlers:WSGIHandler()
env = DJANGO_SETTINGS_MODULE=%(my_project).settings
; enable master
master = true
; 4 processes should be enough
processes = 4
; enable the spooler (the mytasks dir must exist!)
spooler = %(chdir)/mytasks
; load the task.py module
import = task
; bind on a tcp socket
socket = 127.0.0.1:3031
```

The only especially relevant option is the `import` one. It works in the same way as `module` but skips the WSGI callable search. You can use it to preload modules before the loading of WSGI apps. You can specify an unlimited number of ‘‘import’’ directives.

4.3 django_uwsgi.decorators API reference

`django_uwsgi.decorators.`**`postfork`**(*func*)

uWSGI is a preforking (or “fork-abusing”) server, so you might need to execute a fixup task after each `fork()`. The `postfork` decorator is just the ticket. You can declare multiple `postfork` tasks. Each decorated function will be executed in sequence after each `fork()`.

```
    @postfork
    def reconnect_to_db():
        myfoodb.connect()

    @postfork
    def hello_world():
        print("Hello World")
```

`django_uwsgi.decorators.`**`spool`**(*func*)

The uWSGI spooler can be very useful. Compared to Celery or other queues it is very “raw”. The `spool` decorator will help!

```
    @spool
    def a_long_long_task(arguments):
        print(arguments)
```

```
        for i in xrange(0, 10000000):
            time.sleep(0.1)

    @spool
    def a_longer_task(args):
        print(args)
        for i in xrange(0, 10000000):
            time.sleep(0.5)

    # enqueue the tasks
    a_long_long_task.spool(foo='bar',hello='world')
    a_longer_task.spool({'pippo':'pluto'})
```

The functions will automatically return `uwsgi.SPOOL_OK` so they will be executed one time independently by their return status.

`django_uwsgi.decorators.`**`spoolforever`**(*func*)

Use `spoolforever` when you want to continuously execute a spool task. A `@spoolforever` task will always return `uwsgi.SPOOL_RETRY`.

```
    @spoolforever
    def a_longer_task(args):
        print(args)
        for i in xrange(0, 10000000):
            time.sleep(0.5)

    # enqueue the task
    a_longer_task.spool({'pippo':'pluto'})
```

`django_uwsgi.decorators.`**`spoolraw`**(*func*)

Advanced users may want to control the return value of a task.

```
        @spoolraw
        def a_controlled_task(args):
            if args['foo'] == 'bar':
                return uwsgi.SPOOL_OK
            return uwsgi.SPOOL_RETRY

        a_controlled_task.spool(foo='bar')
```

`django_uwsgi.decorators.`**`rpc`**(*"name"*, *func*)

uWSGI RPC is the fastest way to remotely call functions in applications hosted in uWSGI instances. You can easily define exported functions with the @rpc decorator.

```
    @rpc('helloworld')
    def ciao_mondo_function():
        return "Hello World"
```

`django_uwsgi.decorators.`**`signal`**(*num)(func*)

You can register signals for the signal framework in one shot.

```
    @signal(17)
    def my_signal(num):
        print("i am signal %d" % num)
```

`django_uwsgi.decorators.`**`timer`**(*interval*, *func*)

Execute a function at regular intervals.

```
@timer(3)
def three_seconds(num):
    print("3 seconds elapsed")
```

django_uwsgi.decorators.**rbtimer**(*interval*, *func*)
Works like @timer but using red black timers.

django_uwsgi.decorators.**cron**(*min*, *hour*, *day*, *mon*, *wday*, *func*)
Easily register functions for the CronInterface.

```
@cron(59, 3, -1, -1, -1)
def execute_me_at_three_and_fiftynine(num):
    print("it's 3:59 in the morning")
```

Since 1.2, a new syntax is supported to simulate `crontab`-like intervals (every Nth minute, etc.). `*/5 * * * *` can be specified in uWSGI like thus:

```
@cron(-5, -1, -1, -1, -1)
def execute_me_every_five_min(num):
    print("5 minutes, what a long time!")
```

django_uwsgi.decorators.**filemon**(*path*, *func*)
Execute a function every time a file/directory is modified.

```
@filemon("/tmp")
def tmp_has_been_modified(num):
    print("/tmp directory has been modified. Great magic is afoot")
```

django_uwsgi.decorators.**erlang**(*process_name*, *func*)
Map a function as an *Erlang <http://uwsgi-docs.readthedocs.org/en/latest/Erlang.html>* process.

```
@erlang('foobar')
def hello():
    return "Hello"
```

django_uwsgi.decorators.**thread**(*func*)
Mark function to be executed in a separate thread.

Important: Threading must be enabled in uWSGI with the `enable-threads` or `threads <n>` option.

```
@thread
def a_running_thread():
    while True:
        time.sleep(2)
        print("i am a no-args thread")

@thread
def a_running_thread_with_args(who):
    while True:
        time.sleep(2)
        print("Hello %s (from arged-thread)" % who)

a_running_thread()
a_running_thread_with_args("uWSGI")
```

You may also combine `@thread` with `@postfork` to spawn the postfork handler in a new thread in the freshly spawned worker.

```
@postfork
@thread
def a_post_fork_thread():
    while True:
        time.sleep(3)
        print("Hello from a thread in worker %d" % uwsgi.worker_id())
```

django_uwsgi.decorators.**lock**(*func*)

This decorator will execute a function in fully locked environment, making it impossible for other workers or threads (or the master, if you're foolish or brave enough) to run it simultaneously. Obviously this may be combined with @postfork.

```
@lock
def dangerous_op():
    print("Concurrency is for fools!")
```

django_uwsgi.decorators.**mulefunc**([*mulespec*], *func*)

Offload the execution of the function to a *mule <http://uwsgi-docs.readthedocs.org/en/latest/Mules.html>*. When the offloaded function is called, it will return immediately and execution is delegated to a mule.

```
@mulefunc
def i_am_an_offloaded_function(argument1, argument2):
    print argument1,argument2
```

You may also specify a mule ID or mule farm to run the function on. Please remember to register your function with a uwsgi import configuration option.

```
@mulefunc(3)
def on_three():
    print "I'm running on mule 3."

@mulefunc('old_mcdonalds_farm')
def on_mcd():
    print "I'm running on a mule on Old McDonalds' farm."
```

django_uwsgi.decorators.**harakiri**(*time*, *func*)

Starting from uWSGI 1.3-dev, a customizable secondary harakiri subsystem has been added. You can use this decorator to kill a worker if the given call is taking too long.

```
@harakiri(10)
def slow_function(foo, bar):
    for i in range(0, 10000):
        for y in range(0, 10000):
            pass

# or the alternative lower level api

uwsgi.set_user_harakiri(30) # you have 30 seconds. fight!
slow_func()
uwsgi.set_user_harakiri(0) # clear the timer, all is well
```

CHAPTER 5

Email Backend

A Django backend for e-mail delivery using uWSGI Spool to queue deliveries.

5.1 Usage

First, add uWSGI backend in your settings file.

```
EMAIL_BACKEND = 'django_uwsgi.mail.EmailBackend'
```

And send your e-mails normally.

```
from django.core.mail import send_mail

send_mail('Subject here', 'Here is the message.', 'from@example.com',
    ['to@example.com'], fail_silently=False)
```

5.2 Note

You must setup uwsgi spooler. Example ini:

```
plugin = spooler
spooler = /tmp
spooler-import = django_uwsgi.tasks
```

or use built in management command *runuwsgi*

5.3 Changing the backend

By default the 'django.core.mail.backends.smtp.EmailBackend' is used for the real e-mail delivery. You can change that using:

```
UWSGI_EMAIL_BACKEND = 'your.backend.EmailBackend'
```

5.4 django-configurations

If you're using django-configurations in your project, you must setup importer as mentioned in django-configurations docs for celery

CHAPTER 6

Cache Backend

6.1 Installation

change settings to:

```
CACHES = {
    'default': {
        'BACKEND': 'django_uwsgi.cache.UwsgiCache',

        # and optionally, if you used a different cache name
        'LOCATION': 'foobar'
    }
}
```

6.2 django-confy

if you're using django-confy:, you can use url like:

```
CACHE_URL=uwsgi://foobar
```

6.3 Settings

`UWSGI_CACHE_FALLBACK`

- `False` - raises Exception if `uwsgi` cannot be imported.
- `True` (default) - if uwsgi is not importable this cache backend will alias to LocMemCache. Note that south or other management commands might try to load the cache backend so this is why it's the default.

CHAPTER 7

Management Command

7.1 runuwsgi

```
python manage.py runuwsgi
```

7.2 runuwsgi options:

7.3 http

```
python manage.py runuwsgi http=8000
```

7.4 socket

```
python manage.py runuwsgi socket=/tmp/projectname-uwsgi.sock
```

7.5 Other options

Any other options can be passed via environment variables, prefixed with *UWSGI_*

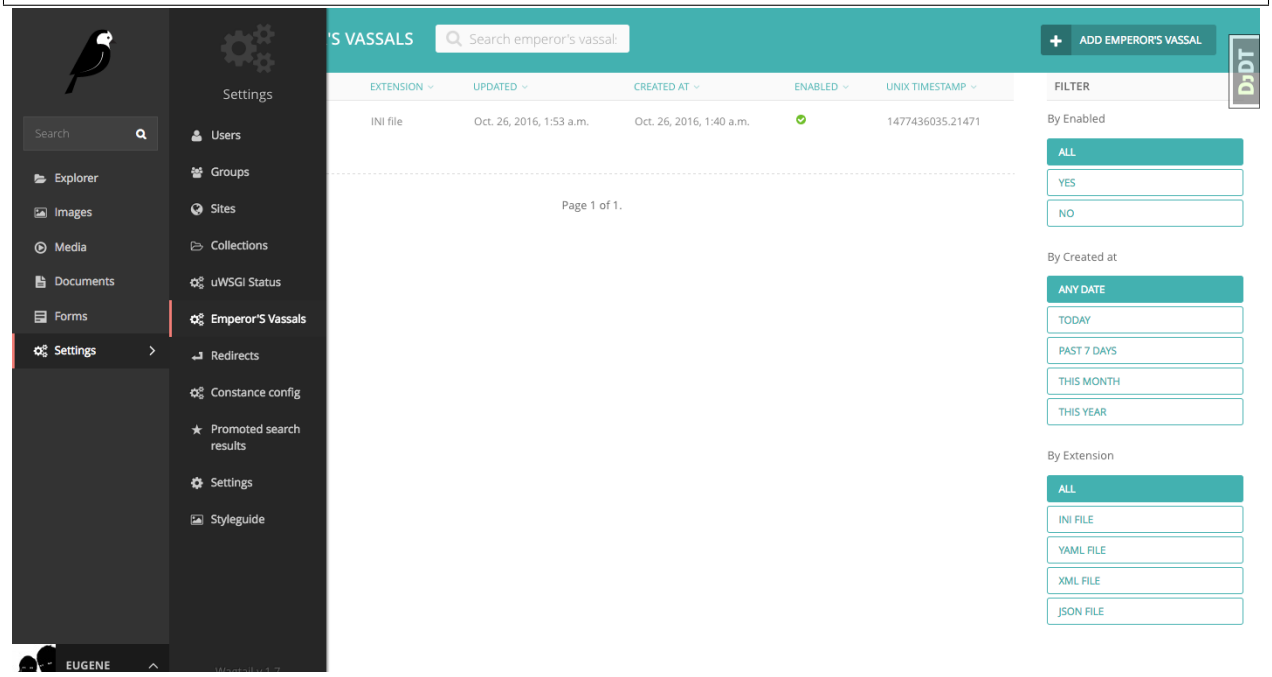
CHAPTER 8

Emperor

you can use *django_uwsgi.emperor* module if you want to store vassals configs in PostgreSQL database.

Simply add *'django_uwsgi.emperor'*, into *INSTALLED_APPS*

```
INSTALLED_APPS += ['django_uwsgi.emperor',]
```



Populate vassals via django admin interface and start uwsgi with command like:

```
uwsgi --plugin emperor_pg --emperor "pg://host=127.0.0.1 user=foobar dbname=emperor;SELECT name,confi
```

Each time vassal added, removed, updated, enabled or disabled - uwsgi will start/stop it or reload.

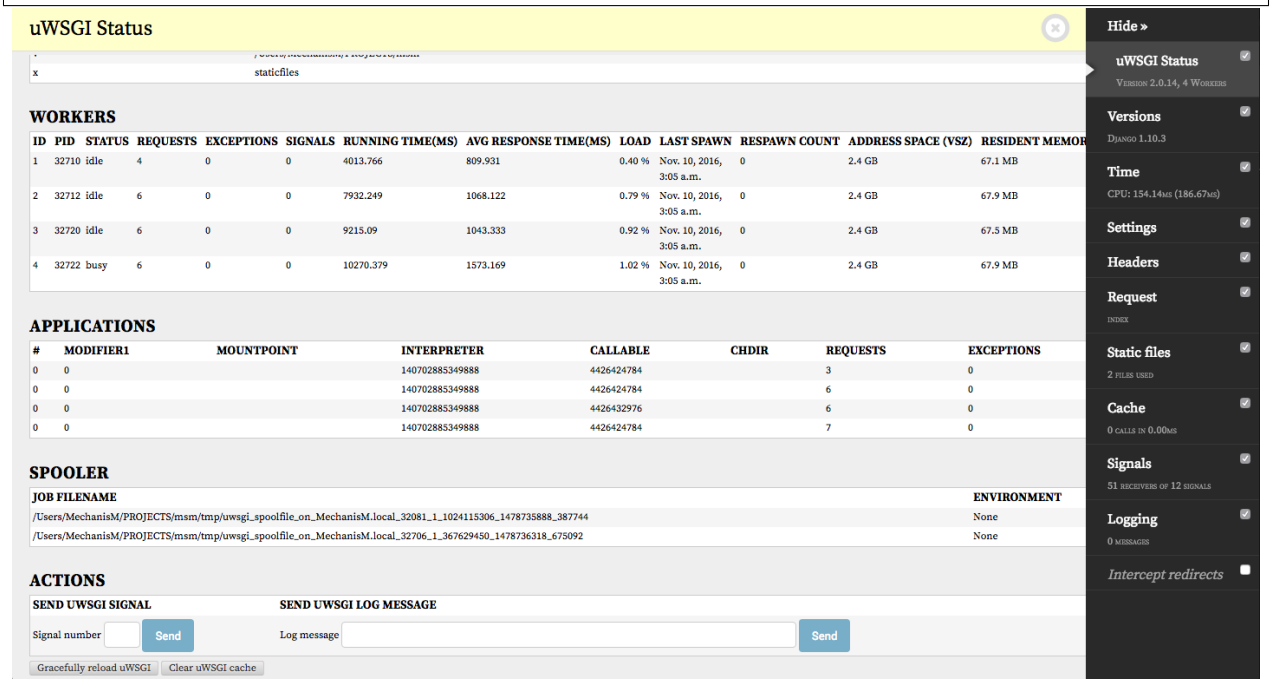
CHAPTER 9

Integrations

9.1 Django-Debug-Toolbar

If you're using django-debug-toolbar, you can add:

```
DEBUG_TOOLBAR_PANELS += ['django_uwsgi.panels.UwsgiPanel',]
```



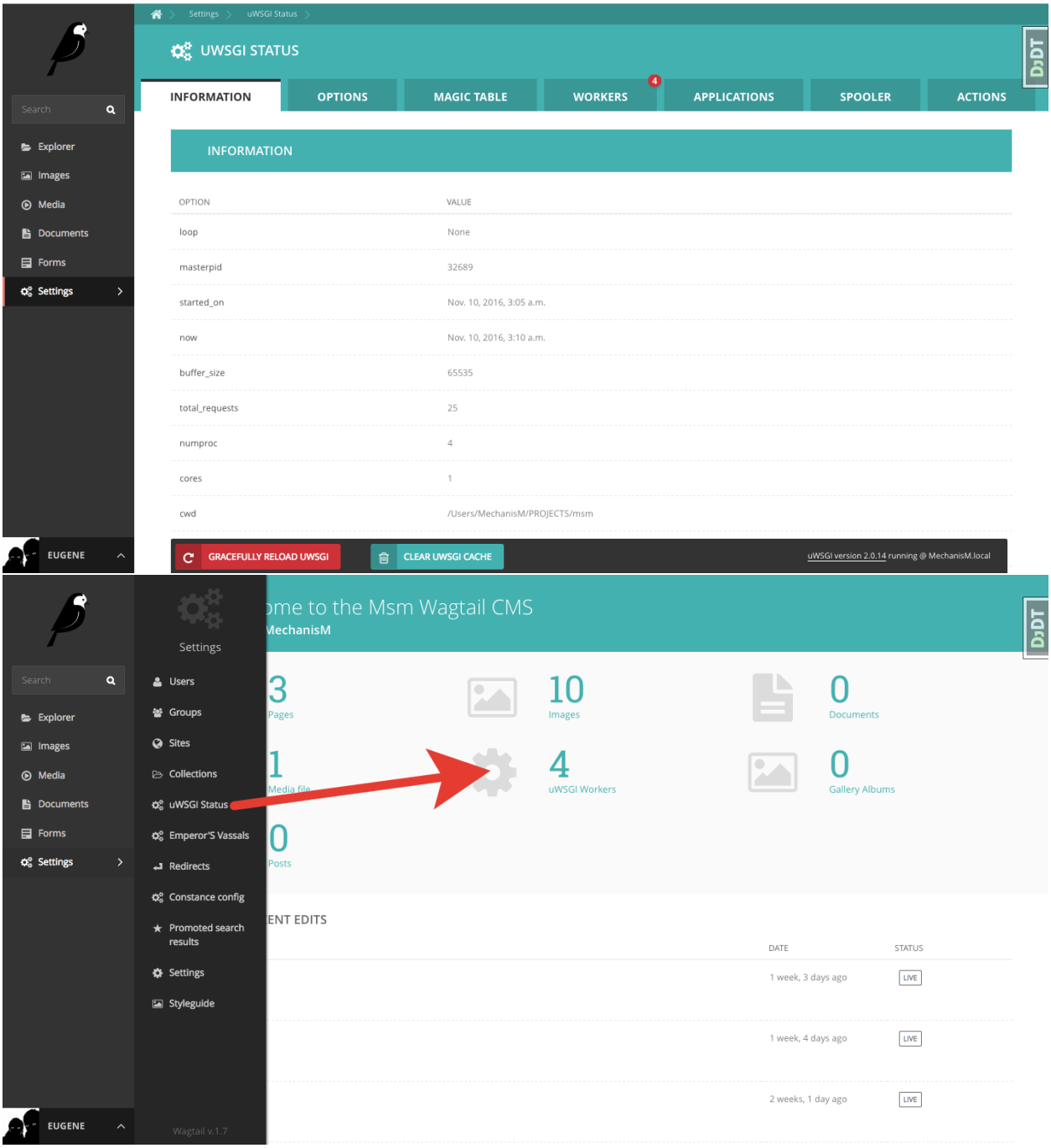
9.2 Wagtail

If you're using Wagtail:

There is *wagtail_hooks.py* file available and Wagtail will read it automatically

And you don't have to add *django_uwsgi* into urls.py

Wagtail admin interface:


Settings
uWSGI Status
UWSGI STATUS
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OPTIONS
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APPLICATIONS
SPOOLER
ACTIONS
Search
Explorer
Images
Media
Documents
Forms
Settings
EUGENE
OPTION
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loop
None
masterpid
32689
started_on
Nov. 10, 2016, 3:05 a.m.
now
Nov. 10, 2016, 3:10 a.m.
buffer_size
65535
total_requests
25
numproc
4
cores
1
cwd
/Users/MechanisM/PROJECTS/msm
GRACEFULLY RELOAD UWSGI
CLEAR UWSGI CACHE
uWSGI version 2.0.14 running @ MechanisM.local
Settings
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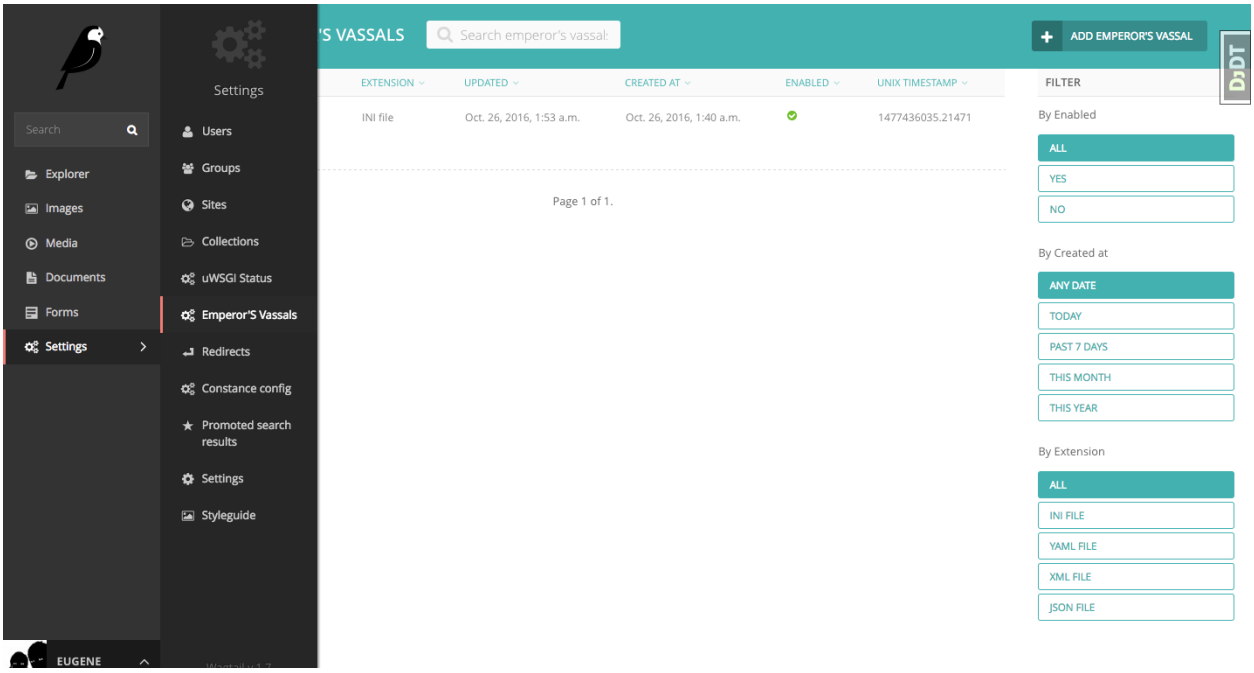
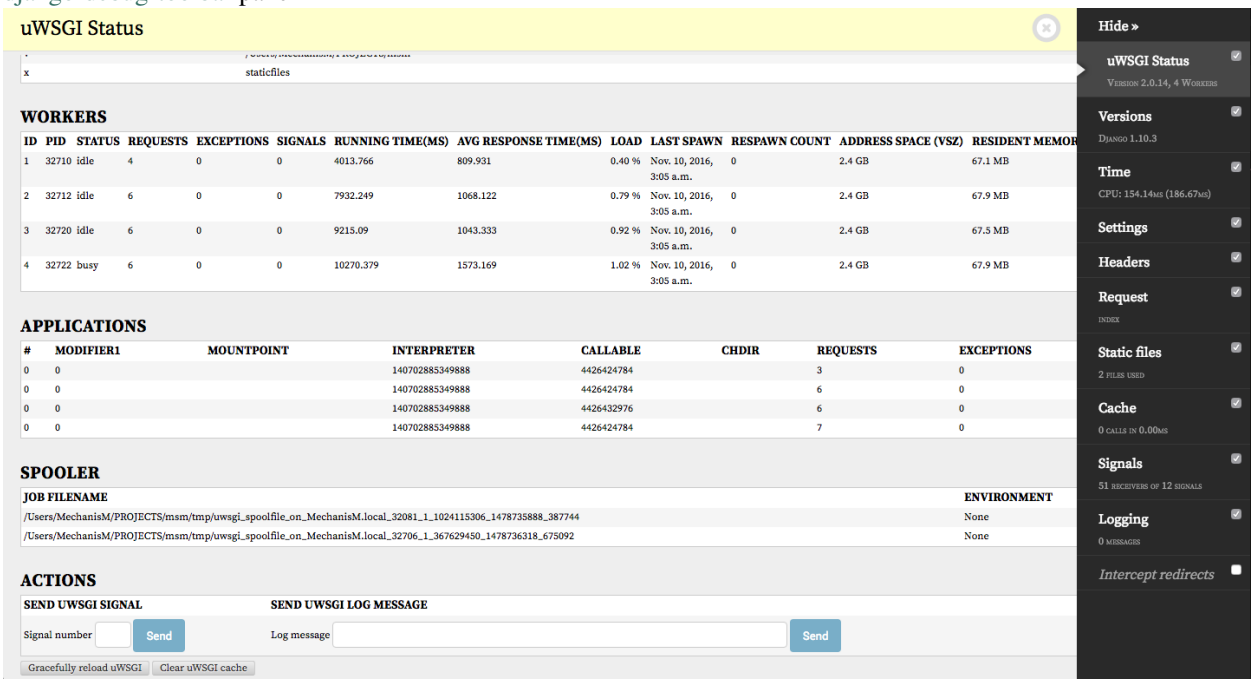
Groups
Sites
Collections
uWSGI Status
Emperor'S Vassals
Redirects
Constance config
Promoted search results
Settings
Styleguide
Wagtail v.1.7
Pages
Images
Documents
Media file
uWSGI Workers
Gallery Albums
Posts
DATE
STATUS
1 week, 3 days ago
LIVE
1 week, 4 days ago
LIVE
2 weeks, 1 day ago
LIVE


Settings
Search
Explorer
Images
Media
Documents
Forms
Settings
Users
Groups
Sites
Collections
uWSGI Status
Emperor'S Vassals
Redirects
Constance config
Promoted search results
Settings
Styleguide
EUGENE
'S VASSALS
Search emperor's vassal
ADD EMPEROR'S VASSAL
EXTENSION
UPDATED
CREATED AT
ENABLED
UNIX TIMESTAMP
INI file
Oct. 26, 2016, 1:53 a.m.
Oct. 26, 2016, 1:40 a.m.
1477436035.21471
Page 1 of 1.
FILTER
By Enabled
ALL
YES
NO
By Created at
ANY DATE
TODAY
PAST 7 DAYS
THIS MONTH
THIS YEAR
By Extension
ALL
INI FILE
YAML FILE
XML FILE
JSON FILE

Screenshots

django-debug-toolbar panel



Wagtail admin interface:

Emperor's Vassal Admin Panel

django.contrib.admin interface

CHAPTER 11

Todo

- Tests
- uWSGI config generator
- Improve Docs
- Translations?
- Good cache panel
- Ability to add cronjobs/filemonitors via admin interface
- Options for sendfile if uwsgi serving files

Some code is borrowed from projects I did earlier and some code is still not added yet, but does exists in my projects.

CHAPTER 12

Changelog

CHAPTER 13

Contributing

13.1 Code Style

13.2 Docs

13.3 Tests

CHAPTER 14

Indices and tables

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