django-trench Documentation

Release 0.1.0 beta

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Jan 15, 2019

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1.1 About

django-trench provides a set of REST API endpoints to supplement django-rest-framework with multi-factor authentication (MFA, 2FA). It supports both standard built-in authentication methods, as well as JWT (JSON Web Token). **django-trench** follows the url pattern developed in djoser library and may act as its supplement.

We deliver a couple of sample secondary authentication methods including sending OTP based code by email, SMS/text as well as through 3rd party mobile apps. Developers can easily add own auth backend supporting any communication channel.

1.1.1 Features

- Easily plugable and compatible with django-rest-framework and djoser

- Allows user to pick an additional authentication method from range of backends defined by a developer. Read more: *Authentication backends*

- Comes out of a box with email, SMS add mobile apps support

1.1.2 Requirements

Supported versions

- Python 3.4, 3.5, 3.6, 3.7

- Django 1.11, 2.0, 2.1

- Django REST Framework 3.8

If you implement `djoser` for authentication:

- [djoser](#) 1.15.0

If you are going to use JWT authentication:

- [django-rest-framework-jwt](#) 1.11.0

1.1.3 Quick Start

1. Install the package using pip:

```
pip install django-trench
```

or add it to your requirements file.

2. Add `django-trench` library to INSTALLED_APPS in your app settings file:

```
INSTALLED_APPS = (
    ...,
    'rest_framework',
    'rest_framework.authtoken',  # In case of implementing Token Based Authentication
    ...,
    'django-trench',
)
```

3. Run migrations

Read further in: *Installation*

1.1.4 Demo project

You can also check our demo.

1.2 Installation

1.2.1 First steps

1. Install the package using pip:

```
pip install django-trench
```

or add it to your requirements file.

2. Add `trench` library to INSTALLED_APPS in your app settings file:

```
INSTALLED_APPS = (
    ...,
    'rest_framework',
    'rest_framework.authtoken',  # In case of implementing Token Based Authentication
    ...,
```

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```
    'trench',
)
```

Note: If you're going to use `djoser` to handle user authentication make sure you have it installed and included in INSTALLED_APPS. You'll also need `djangorestframework-jwt` to support JSON Web Tokens.

1.2.2 Config

urls.py

```
urlpatterns = [
    ...,
    url(r'^auth/', include('trench.urls')),
]
```

If you utilise `djoser` and JWT authentication:

```
urlpatterns = [
    ...,
    url(r'^auth/', include('trench.urls')), # Base endpoints
    url(r'^auth/', include('djoser.urls')),
    url(r'^auth/', include('trench.urls.djoser')),  # for Token Based Authorization
    url(r'^auth/', include('trench.urls.jwt')), # for JWT
]
```

settings.py

`django-trench` supports `djangorestframework` built-in Token Based Authentication, as well as JSON Web Tokens. You'll need setup it accordingly:

```
REST_FRAMEWORK = {
    'DEFAULT_AUTHENTICATION_CLASSES': (
        'rest_framework.authentication.TokenAuthentication',
        # or / and
        'rest_framework_jwt.authentication.JSONWebTokenAuthentication',
    ),
}
```

1.2.3 Migrations

Last but not least, run migrations:

```
$ ./manage.py migrate
```

1.3 Additional settings

You can customize settings by adding `trench` dict in your `settings.py`:

```python
TRENCH_AUTH = {
    'FROM_EMAIL': 'your@email.com',
    'USER_ACTIVE_FIELD': 'is_active',
    'BACKUP_CODES_QUANTITY': 5,
    'BACKUP_CODES_LENGTH': 10,  # keep (quantity * length) under 200
    'BACKUP_CODES_CHARACTERS': (
        'abcdefghijklmnopqrstuvwxyzABCDEFGHIJKLMNOPQRSTUVWXYZ0123456789'
    ),
    'DEFAULT_VALIDITY_PERIOD': 30,
    'CONFIRM_DISABLE_WITH_CODE': False,
    'CONFIRM_BACKUP_CODES_REGENERATION_WITH_CODE': True,
    'ALLOW_BACKUP_CODES_REGENERATION': True,
    'APPLICATION_ISSUER_NAME': 'MyApplication',
    'MFA_METHODS': {
        'email': {
            'VERBOSE_NAME': _('email'),
            'VALIDITY_PERIOD': 60 * 10,
            'FIELD': 'email',
            'HANDLER': 'trench.backends.templated_mail.TemplatedMailBackend',
            'SERIALIZER': 'trench.serializers.RequestMFACreateEmailSerializer',
            'SOURCE_FIELD': 'email',
        },
        ...,
    },
}
```

1.3.1 FROM_EMAIL

Email address to be used as sender's while using email backend for sending codes.

1.3.2 USER_ACTIVE_FIELD

Field on `User` model which stores information whether user's account is active or not. Default: `is_active`

1.3.3 BACKUP_CODES_QUANTITY

Number of backup codes to be generated.

1.3.4 BACKUP_CODES_LENGTH

Length of backup code.

1.3.5 BACKUP_CODES_CHARACTERS

Range of characters to be used in backup code.

1.3.6 DEFAULT_VALIDITY_PERIOD

Period when OTP code validates positively (in seconds). Becomes a default if no validity period has been declared on a specific authentication method.

1.3.7 CONFIRM_DISABLE_WITH_CODE

If `True` requires a code verification to disable a current authentication method. Default: `False`

1.3.8 CONFIRM_BACKUP_CODES_REGENERATION_WITH_CODE

If `True` requires a code verification to regenerate backup code.

1.3.9 ALLOW_BACKUP_CODES_REGENERATION

If `True` allows regenerate backup codes. Default: `True`

1.3.10 APPLICATION_ISSUER_NAME

Issuer name for QR generation.

1.3.11 MFA_METHODS

A dictionary which holds all authentication methods and its settings. New method can be added as a next item.

Method item properties

- `'VERBOSE_NAME'` method name
- `'VALIDITY_PERIOD'` OTP code validity
- `'HANDLER'` location of the method's handler
- `'SERIALIZER'` location of a serializer
- `'SOURCE_FIELD'` field on a User model utilised in the method (i.e. field storing phone number for SMS)

1.4 API Endpoints

1.4.1 MFA method activation

- **/[method name]/activate/ [POST]**

    Request a new method activation and get an authentication code by specified channel.

Payload:

- `method` MFA method name

- **/[method name]/activate/confirm/` [POST]**

  Accepts the auth code, activates the method and returns backup codes

  Payload:

  - `code` auth code received by specified channel

- **/[method name]/deactivate/` [POST]**

  Deactivates the specified method. Depeding on *Additional settings* sends out a auth code and requires confirmation.

  Payload:

  - `code` auth code received by specified channel

`[method_name]` one of MFA methods specified in your project `settings.py`. Check out *Additional settings*.

- **/code/request/ [POST]**

  Triggers sending out a code.

1.4.2 Backup codes

- **/mfa/codes/regenerate/ [POST]**

  Requests new batch of backup codes.

  Payload:

  - `method` MFA method name

1.4.3 Settings

- **/mfa/config/ [GET]**

  Display app's configuration

- **/mfa/user-active-methods/ [GET]**

  Display methods activated by user

1.5 Authentication backends

`django-trench` comes with three predefined authentication methods.

Custom backends can be easily added by inheriting `AbstractMessageDispatcher` class.

1.5.1 Built-in backends

Email

This basic method utilise django-templated-mail. You'll need to have Email Backend setup. Check out Django documentation.

Text/SMS

SMS backends sends out text messages with Twilio. Credentials can be set in method's specific settings.

```
TRENCH_AUTH = {
    (...)
    'MFA_METHODS': {
        'sms': {
            'VERBOSE_NAME': 'sms',
            'VALIDITY_PERIOD': 60 * 10,
            'HANDLER': 'trench.backends.twilio.TwilioBackend',
            'SOURCE_FIELD': 'phone_number',
            'TWILIO_ACCOUNT_SID': TWILIO SID,
            'TWILIO_AUTH_TOKEN': TWILIO TOKEN,
            'TWILIO_VERIFIED_FROM_NUMBER': TWILIO REGISTERED NUMBER,
        },
        ...,
    },
}
```

Read more in *Additional settings*.

Authentication apps

This backend returns OTP based QR link to be scanned by apps like Gooogle Authenticator and Authy.

```
TRENCH_AUTH = {
    (...)
    'MFA_METHODS': {
        'app': {
            'VERBOSE_NAME': 'app',
            'VALIDITY_PERIOD': 60 * 10,
            'USES_THIRD_PARTY_CLIENT': True,
            'HANDLER': 'trench.backends.application.ApplicationBackend',
        },
        ...,
    },
}
```

1.5.2 Adding own authentication method

Base on provided examples you can create own handler class, which heritates from
`AbstractMessageDispatcher`.

```
from trench.backends import AbstractMessageDispatcher


class CustomAuthBackend(AbstractMessageDispatcher):

    def dispatch_message(self, *args, **kwargs):
```

```
        (....)
        return {'data': 'ok'}
```

It may be also required to provide a custom serializer depending on what information need to be passed on from user.
In order to run your own method update settings as follows:

```
TRENCH_AUTH = {
    (...)
    'MFA_METHODS': {
        'yourmethod': {
            'VERBOSE_NAME': 'yourmethod',
            'VALIDITY_PERIOD': 60 * 10,
            'SOURCE_FIELD': 'phone_number', # if your backend requires custom field
↪on User model
            'HANDLER': 'yourapp.backends.CustomAuthBackend',
            'SERIALIZER': 'yourapp.serializers.CustomAuthSerializer',
        },
        ...,
    },
}
```

1.6 Examples

In order to let you familiarise with the library, a fully working test project is provided in the repository.
It allows you to run `django-trench` with basic settings as well as play with it thanks to a sample frontend app.

1.6.1 Launching a sample app

1. Clone the repository:

```
$ git clone https://github.com/merixstudio/django-trench.git
```

2. Check `testproject` directory and adjust `settings.py` inside `testapp` according to *Installation* and *Additional settings* if necessary.

3. Make sure you have `docker` and `docker-compose` installed. Use `Makefile` to run backend:

```
$ make build
$ make migrate
```

3. Run the app using command:

```
$ make client
```

Frontend app is availabe on http://localhost:3000/ and expects backend running on http://localhost:8000/

1.6.2 Basic usage

You can create an admin user to be able to access admin panel `http://localhost:8000/admin`:

```
$ make create_admin
```

From built-in admin panel you can add users and setup credentials.
Alternatively `djoser` endpoints can be used to manage users in through REST requests. Read further in djoser docs.

Let's login:

```
$ curl -X POST http://localhost:8000/auth/login/ -d 'username=admin&
↪password=yourpassword'
```

In the following request you'll need a provided `token` for authorization.

To activate an email authentication:

```
$ curl -X POST http://localhost:8000/auth/email/activate/ -d 'method=email'
-H 'Authorization: JWT [token provided]'
```

Check the code and confirm:

```
$ curl -X POST http://localhost:8000/auth/email/activate/confirm/ -d 'code=[code␣
↪provided]'
-H 'Authorization: JWT [token provided]'
```

In response you'll receive a batch of backup codes.

Let's login again and check if an extra authentication works.

```
$ curl -X POST http://localhost:8000/auth/login/ -d 'username=admin&
↪password=yourpassword'

{
    "ephemeral_token": "token",
    "method": "email",
    "other_methods": []
}
```

Right, we need an extra step to get logged in. Let's get a code:

```
$ curl -X POST http://localhost:8000/auth/code/request/ -d 'method=email'
-H 'Authorization: JWT [token provided]'
```

Now we only need pass on the code and token:

```
$ curl -X POST http://localhost:8000/auth/login/code/
-d 'code=[code from previous step]&token=[ephemeral_token from step before]'

{
    "token": "JWT token",
}
```

All right, we're in!

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