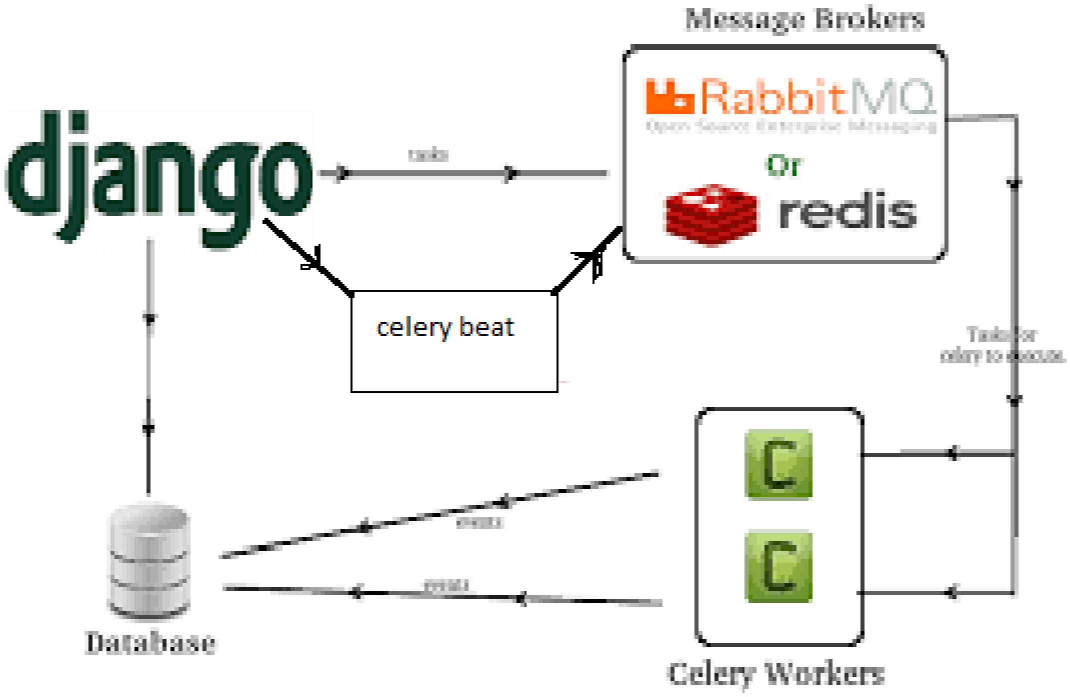
Celery

Using celery we can assign a task to some worker and worker can perform that task . Used to increase the efficiency of cpu.
Example
Sending emails,sending push notification etc.

Architecture



1. First we need to install a message broker like redis/rebitmq etc

Redis - which is used as a task queues . where celery take task and perform it .

To download and install redis:- https://github.com/tporadowski/redis/releases

To install celery

pip install celery

Celery is basically a worker which perform any asynchronous task . to run any task by celery we need to run celery server as well.

To install celery beat

pip install django-celery-beat

This is used to schedule any task to be done on particular hour/ minute /date /month/ year
And also used to define any task to be done after any interval.
We need to activate the celery beat

To install celery result

pip install django-celery-results

This is used to save the result of the task in database,if status of the performed task is failure or success.

2.We need to mention in setting.py file

```
INSTALLED_APPS += [
    'django_celery_beat',
    'django_celery_results',
]
```

```
#celery settings

CELERY_BROKER_URL = 'redis://192.168.1.1:6379'
CELERY_TASK_SERIALIZER = 'json'
CELERY_RESULT_SERIALIZER = 'json'
CELERY_ACCEPT_CONTENT=['json']
CELERY_TIMEZONE = 'Asia/Shanghai'
#CELERY_ENABLE_UTC = True


CELERY_RESULT_BACKEND = "django-db"   ## this is for save result in database

#celery beat setting  this by default we have to set it
CELERY_BEAT_SCHEDULER = 'django_celery_beat.schedulers:DatabaseScheduler'
```

3.Update **_init_.py**   in same directory as setting.py

```
from .celery import app as celery_app

__all__ = ('celery_app',)
```

4.Create `celery.py` to setup `Celery app` in main django project

In same directory as setting.py file

We need to import celery from celery library

```
import os

from celery import Celery
from django.conf import settings
```

Crontab/solar - is used by celery beat to schedule any task at particular time

Here every where written **project_name** we need to write **our project name**

```
os.environ.setdefault('DJANGO_SETTINGS_MODULE', 'project_name.settings')

app = Celery('project_name',broker='redis://127.0.0.1:6379')

app.config_from_object('django.conf:settings', namespace='CELERY')
```

App instance is created of our project which is used in our __init_.py file

```
# Celery Beat Settings
app.conf.beat_schedule = {
    'send-mail-every-day-at-7': {
        'task': 'send_mail_app.tasks.send_mail_func',
        'schedule': 2*60,
        'args':('ashish')
    }
}
```

Send-mail-every-day-at-7 = this is our mane we can provide it any name accordion to our use.

Task = here we define our task which is created in our **task.py file**

Schedule = here we define **interval** at which this task repeated it self every 2 minute , *by default it take time in second*

```
app.autodiscover_tasks()

@app.task(bind=True)
def debug_task(self):
    print(f'Request: {self.request!r}')
```

app.autodiscover_tasks() is used to automaticaly find the tasks created in each and every app which is installed in INSTALLED_APP in setting .py file

There are three type of schedule:

i). Time delta -this is used when we need to repeat task at an particular interval

Ex after an hour ,after,one day,after 2 minute etc

```
'schedule': 2*60,
```

ii). Crontab - this is used when we need to run particular task at specified time

Ex hour= ,minute= , etc   shown below

Note- we have to import crontab first if we need to use . shown below

```
from celery.schedules import crontab # this is used for celery beat

'schedule':crontab(hour=11, minute=53,day_of_month=19, month_of_year = 
6,)
```

iii). Solar- this is used when we use to do our task on the bases of our sun direction

Ex sunrise, sunset,dawn_civil,dusk_nautical, shown below

Note- we need to import solar . shown below

```
from celery.schedules import solar
'schedule':solar('sunset', -37.81753, 144.96715), # these two values
are longitude,latitude position.
```

5.Create `tasks.py` in any app

Where we can define any task which we need to perform

```
    from celery import shared_task

    @shared_task(bind=True)
    def send_mail_func(self):
        ---
        ---
        Return "done"
```

@shared_task is a decorator is used to identify that this task can be handal by cellery. By this cellery can identify it can be done my celery worker.

`(bind=True)` is used for task at particular instance

.

6. Now we need to run commands in different terminal

For django server

Command   python manage.py runserver

For *celery worker*

Command   celery -A poject_name worker –pool=solo -l info

Note- here ve use **–pool=solo** this is compulsory to use to run in windows operating system. This means work can be done by worker only.

By default it use **–pool = prefork.**

Their are extra like we use **prefork , thread** etc.

For *django_celery_ beat*

Command   celery -A poject_name beat -l info

To schedule task to be implement we need to activate celery beat by using above command in different terminal

Note-: we can perform or set all scheduling from database by login admin also .

Their are different table like

.Task results - here u will chek all task status

.interval- here u set interval time

.contrab-

.preodic tasks

.Solar event

Note we can set scheduling only from interval or contrab etc