Working environment: VMware workstation 12.1.1
Operating System: Ubuntu 18.04.1 LTS
Python version: Python 2.7

Airflow

Introduction

Use Airflow to author workflows as directed acyclic graphs (DAGs) of tasks. The Airflow scheduler executes your tasks on an array of workers while following the specified dependencies. Rich command lines utilities makes performing complex surgeries on DAGs a snap. The rich user interface makes it easy to visualize pipelines running in production, monitor progress and troubleshoot issues when needed.

Version

1.10.0

Installation

```
# Airflow needs a home, ~/airflow is the default, but you can lay foundation
somewhere else if you prefer
# (optional)
export AIRFLOW_HOME=~/airflow

# install from pypi using pip
pip install apache-airflow

# start the web server, default port is 8080
airflow webserver -p 8080

# start the scheduler. This can make the server run as deamon.
airflow scheduler

# visit localhost:8080 in the browser and enable the example dag in the home page

# run task instance
airflow run example_bash_operator runme_0 2015-01-01
```

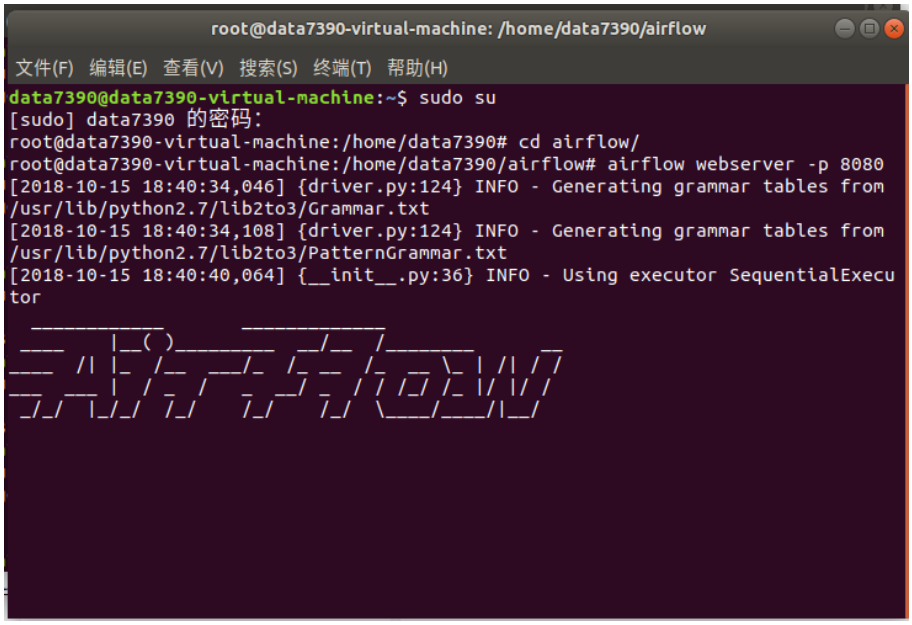
Tutorial application

```
"""
Code that goes along with the Airflow located at:
http://airflow.readthedocs.org/en/latest/tutorial.html
"""
from airflow import DAG
from airflow.operators.bash_operator import BashOperator
from datetime import datetime, timedelta
```

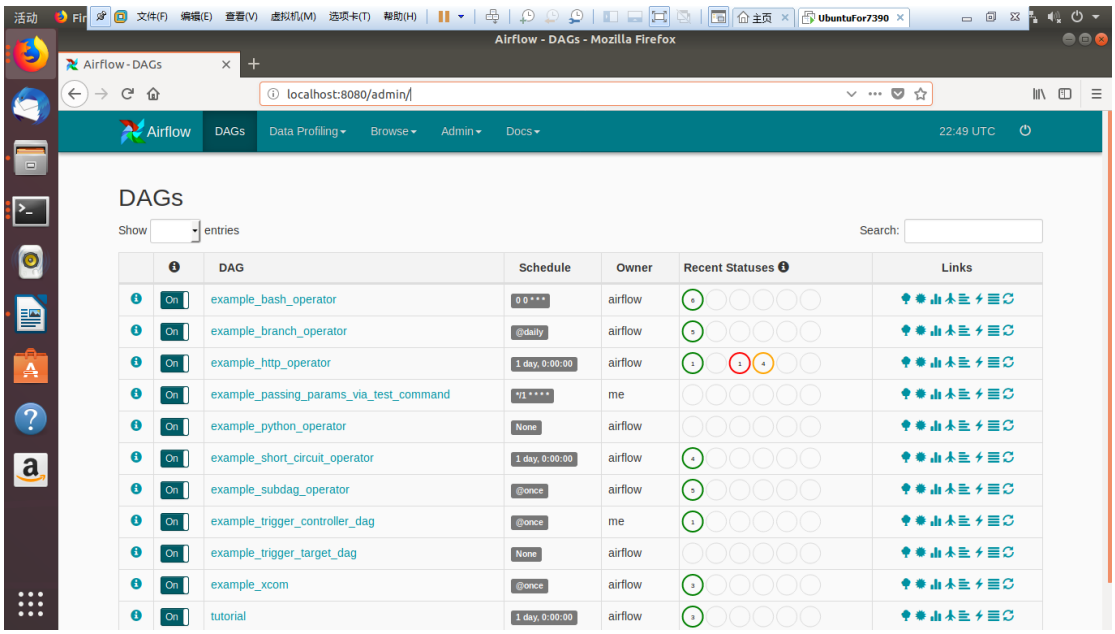
```
default_args = {
    'owner': 'airflow',
    'depends_on_past': False,
    'start_date': datetime(2015, 6, 1),
    'email': ['airflow@example.com'],
    'email_on_failure': False,
    'email_on_retry': False,
    'retries': 1,
    'retry_delay': timedelta(minutes=5),
    # 'queue': 'bash_queue',
    # 'pool': 'backfill',
    # 'priority_weight': 10,
    # 'end_date': datetime(2016, 1, 1),
}

dag = DAG(
    'tutorial', default_args=default_args, schedule_interval=timedelta(1))
# t1, t2 and t3 are examples of tasks created by instantiating operators
t1 = BashOperator(
    task_id='print_date',
    bash_command='date',
    dag=dag)
t2 = BashOperator(
    task_id='sleep',
    bash_command='sleep 5',
    retries=3,
    dag=dag)
templated_command = """
    {% for i in range(5) %}
        echo "{{ ds }}"
        echo "{{ macros.ds_add(ds, 7)}}"
        echo "{{ params.my_param }}"
    {% endfor %}
"""
t3 = BashOperator(
    task_id='templated',
    bash_command=templated_command,
    params={'my_param': 'Parameter I passed in'},
    dag=dag)
t2.set_upstream(t1)
t3.set_upstream(t1)
```

When I run start serve syntax, I need to get into root model, input sudo su

Then input
airflow# airflow webserver -p 8080



Then open your browser and input
http://localhost:8080
Airflow page will appear. Our tasks will show in different columns.

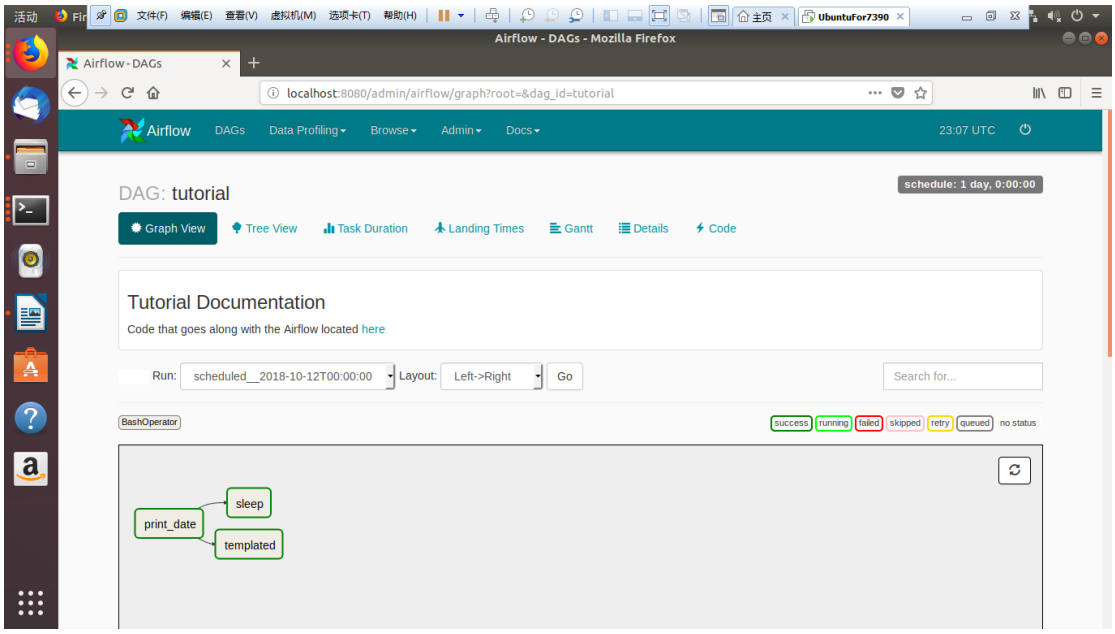


To run the tutorial script, we need to open a new terminal, find our task's path. Here I need to start root model. Input
sudo su
And then input
python tutorial.py
After that, we can test that task. Input

```
airflow test tutorial print_date 2018-10-12
```

Then refresh airflow page. Click tutorial DAG and we can get see tutorial task's running

record..



Celery

Introduction
Celery is an asynchronous task queue/job queue based on distributed message passing. It is focused on real-time operation, but supports scheduling as well.
Version
Celery 4.2
Choosing a Broker
Celery requires a solution to send and receive messages; usually this comes in the form of a separate service called a *message broker*. In my presentation, I chose RabbitMQ.
Installing RabbitMQ:

```
sudo apt-get install rabbitmq-server
```

Installing Celery:

```
pip install celery
```

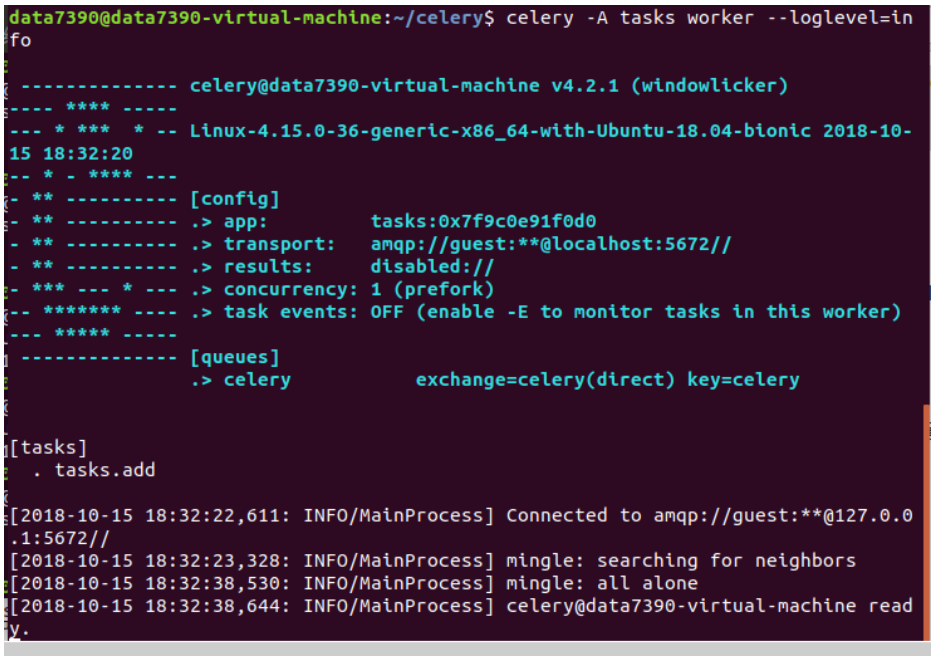
Application:
Create the file tasks.py:

```
from celery import Celery

app = Celery('tasks', broker='pyamqp://guest@localhost//')
```

```
@app.task

def add(x, y):

    return x + y
```

Running the Celery worker server

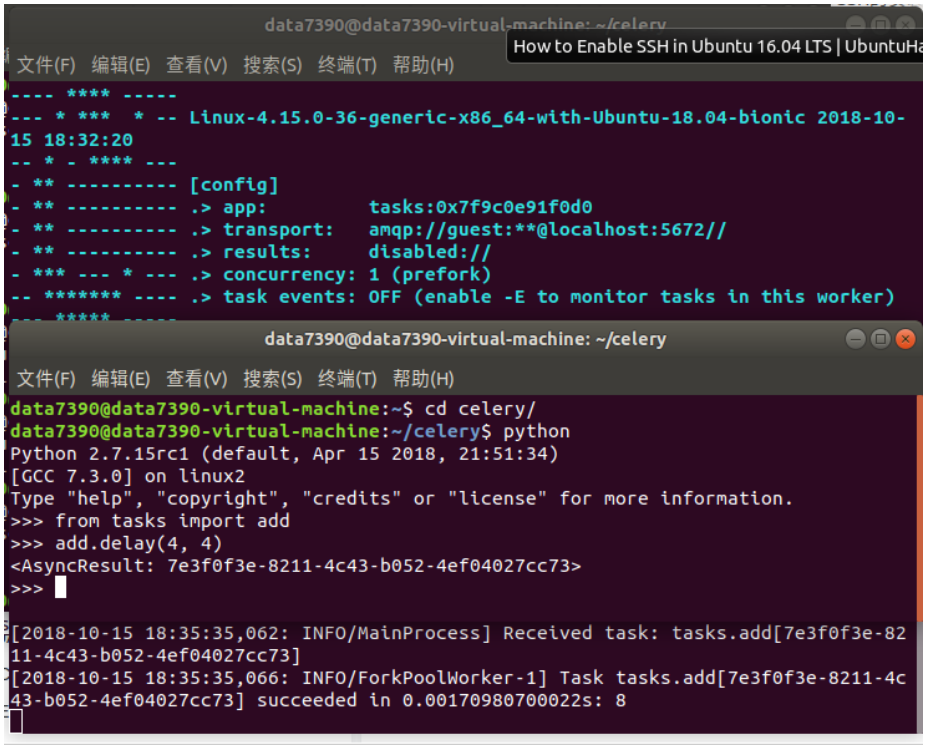
```
celery -A tasks worker --loglevel=info
```



Calling the task:
After running celery server, you can open a new terminal and call that task:

```
>>> from tasks import add

>>> add.delay(4, 4)
```

Then, the result will be printed at the previous terminal.



I zipped and uploaded my operation system in Google Drive. It contains all tools and configurations. The link is in rar.txt.

Reference

https://airflow.apache.org/start.html
http://docs.celeryproject.org/en/latest/getting-started/first-steps-with-celery.html