



Skills
Network

Data Pipelines Using Apache AirFlow

Estimated time needed: **30** minutes.

About This SN Labs Cloud IDE

This Skills Network Labs Cloud IDE provides a hands-on environment for course and project related labs. It utilizes Theia, an open-source IDE (Integrated Development Environment) platform, that can be run on desktop or on the cloud. To complete this lab, we will be using the Cloud IDE based on Theia and Apache Airflow running in a Docker container.

Important Notice about this lab environment

Please be aware that sessions for this lab environment are not persistent. A new environment is created for you every time you connect to this lab. Any data you may have saved in an earlier session will get lost. To avoid losing your data, please plan to complete these labs in a single session.

Scenario

Write a pipeline that analyzes the web server log file, extracts the required lines(ending with html) and fields(time stamp, size) and transforms (bytes to mb) and load (append to an existing file.)

Objectives

In this assignment you will author an Apache Airflow DAG that will:

- Extract data from a web server log file
- Transform the data
- Load the transformed data into a tar file

Tools / Software

- Apache AirFlow

Note - Screenshots

Throughout this lab you will be prompted to take screenshots and save them on your own device. You will need these screenshots to either answer graded quiz questions or to upload as your submission for peer review at the end of this course. You can use various free screengrabbing tools to do this or use your operating system's shortcut keys to do this (for example Alt+PrintScreen in Windows).

Exercise 1 - Prepare the lab environment

Before you start the assignment:

- Start Apache Airflow.

- Download the dataset from the source to the destination mentioned below.

Source : <https://cf-courses-data.s3.us.cloud-object-storage.appdomain.cloud/IBM-DB0321EN-SkillsNetwork/ETL/accesslog.txt>

Destination : /home/project/airflow/dags/capstone

Exercise 2 - Create a DAG

Task 1 - Define the DAG arguments

Create a DAG with these arguments.

- owner
- start_date
- email

You may define any suitable additional arguments.

Take a screenshot of the code you used clearly showing the above arguments.

Name the screenshot dag_args.jpg. (Images can be saved with either the .jpg or .png extension.)

Task 2 - Define the DAG

Create a DAG named process_web_log that runs daily.

Use suitable description.

Take a screenshot of the code you used to define the DAG.

Name the screenshot dag_definition.jpg. (Images can be saved with either the .jpg or .png extension.)

Task 3 - Create a task to extract data

Create a task named `extract_data`.

This task should extract the `ipaddress` field from the web server log file and save it into a file named `extracted_data.txt`

Take a screenshot of the task code.

Name the screenshot `extract_data.jpg`. (Images can be saved with either the `.jpg` or `.png` extension.)

Task 4 - Create a task to transform the data in the txt file

Create a task named `transform_data`.

This task should filter out all the occurrences of `ipaddress` “198.46.149.143” from `extracted_data.txt` and save the output to a file named `transformed_data.txt`.

Take a screenshot of the task code.

Name the screenshot `transform_data.jpg`. (Images can be saved with either the `.jpg` or `.png` extension.)

Task 5 - Create a task to load the data

Create a task named `load_data`.

This task should archive the file `transformed_data.txt` into a tar file named `weblog.tar`.

Take a screenshot of the task code.

Name the screenshot `load_data.jpg`. (Images can be saved with either the `.jpg` or `.png` extension.)

Task 6 - Define the task pipeline

Define the task pipeline as per the details given below:

| Task | Functionality |
|-------------|-----------------------------|
| First task | <code>extract_data</code> |
| Second task | <code>transform_data</code> |
| Third task | <code>load_data</code> |

Take a screenshot of the task pipeline section of the DAG.

Name the screenshot `pipeline.jpg`. (Images can be saved with either the `.jpg` or `.png` extension.)

Exercise 3 - Getting the DAG operational.

Save the DAG you defined into a file named `process_web_log.py`.

Task 7 - Submit the DAG

Take a screenshot of the command you used and the output.

Name the screenshot `submit_dag.jpg`. (Images can be saved with either the `.jpg` or `.png` extension.)

Task 8 - Unpause the DAG

Take a screenshot of the command you used and the output.

Name the screenshot `unpause_dag.jpg`. (Images can be saved with either the `.jpg` or `.png` extension.)

Task 9 - Monitor the DAG

Take a screenshot of the DAG runs for the Airflow console.

Name the screenshot dag_runs.jpg. (Images can be saved with either the .jpg or .png extension.)

End of the assignment.

Authors

Ramesh Sannareddy

Other Contributors

Rav Ahuja

Change Log

| Date (YYYY-MM-DD) | Version | Changed By | Change Description |
|-------------------|---------|-------------------|-------------------------|
| 2021-13-12 | 0.1 | Ramesh Sannareddy | Created initial version |
| 2022-30-01 | 0.2 | Alison Woolford | Updated version |
| 2022-04-14 | 0.2 | Alison Woolford | Updated version |

Copyright (c) 2022 IBM Corporation. All rights reserved.