



Contributing to Apache Airflow

Airflow Summit
8 July 2021

Kaxil Naik
Airflow Committer and PMC Member
OSS Airflow Team @ Astronomer

Who am I?



- Airflow Committer & PMC Member
- Manager of Airflow Engineering team @ Astronomer
 - Work full-time on Airflow
- Previously worked at DataReply
- Masters in Data Science & Analytics from Royal Holloway, University of London
- Twitter: <https://twitter.com/kaxil>
- Github: <https://github.com/kaxil/>
- LinkedIn: <https://www.linkedin.com/in/kaxil/>



Agenda



- My Journey with Airflow
- How to start contributing to Airflow
- Contribution Workflow
- Continue committing regularly & steadily to become Airflow Committer.
(including talking about current Guidelines of becoming a Committer)
- Different mediums of communication (Dev list, users list, Slack channel, Github Discussions etc)
- Reviewing PRs, Testing and voting on releases
- Dev Environment
- Number of commits does not matter as much as the experience and actual code



My Journey

Motivation to contribute !



The screenshot shows a Stack Overflow question page. The header includes the Stack Overflow logo, navigation links for 'About', 'Products', and 'For Teams', and a search bar. The left sidebar contains navigation options: 'Home', 'PUBLIC', 'Questions' (selected), 'Tags', 'Users', 'COLLECTIVES', 'Explore Collectives', 'FIND A JOB', and 'Jobs'. The main content area features the question title 'Copy files from one Google Cloud Storage Bucket to other using Apache Airflow', its metadata ('Asked 3 years, 7 months ago', 'Active 9 months ago', 'Viewed 3k times'), and the problem description: 'I want to copy files from a folder in Google Cloud Storage Bucket (e.g Folder1 in Bucket1) to another Bucket (e.g Bucket2). I can't find any Airflow Operator for Google Cloud Storage to copy files.' Below the question are tags for 'google-cloud-platform', 'google-cloud-storage', 'airflow', 'gcp', and 'apache-airflow'. A user profile for 'kaxil' is shown with a timestamp of 'Nov 23 '17 at 10:12' and statistics of '13k', '2', '40', and '59'. On the right, there is a 'Google Cloud Collective' banner and a 'The Overflow Blog' section with two entries.

<https://stackoverflow.com/q/47452879/5691525>

Motivation to contribute !



1



I just found a new operator in contrib uploaded 2 hours ago:

<https://github.com/apache/incubator->

[airflow/blob/master/airflow/contrib/operators/gcs_to_gcs.py](https://github.com/apache/incubator-airflow/blob/master/airflow/contrib/operators/gcs_to_gcs.py) called

`GoogleCloudStorageToGoogleCloudStorageOperator` that should copy an object from a bucket to another, with renaming if requested.

Share Edit Delete Flag

edited Aug 22 '19 at 11:21

answered Nov 23 '17 at 10:14



kaxil

13k ● 2 ● 40 ● 59

[Add a comment](#)

<https://stackoverflow.com/a/47452939/5691525>

But it didn't work ...



Fixed it - My First PR



[AIRFLOW-1842] Fixed the Super class name for the operator #2810

Closed kaxil wants to merge 1 commit into apache:master from kaxil:patch-1

Conversation 6 Commits 1 Checks 0 Files changed 1

kaxil commented on 23 Nov 2017 · edited Member

Dear Airflow maintainers,

Please accept this PR. I understand that it will not be reviewed until I have checked off all the steps below!

JIRA

- My PR addresses the following [Airflow JIRA](#) issues and references them in the PR title. For example, "[AIRFLOW-XXX] My Airflow PR"
 - <https://issues.apache.org/jira/browse/AIRFLOW-1842>

Description

- Here are some details about my PR, including screenshots of any UI changes:
 - Renamed the super class from `GoogleCloudStorageOperatorToGoogleCloudStorageOperator` to `GoogleCloudStorageToGoogleCloudStorageOperator`.

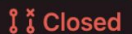

This fixes the error `NameError: global name 'GoogleCloudStorageOperatorToGoogleCloudStorageOperator' is not defined`





Tests

My First PR - Fixes Typo





[AIRFLOW-1842] Fixed the Super class name for the operator #2810

 Closed kaxil wants to merge 1 commit into `apache:master` from `kaxil:patch-1` 

 Conversation **6**  Commits **1**  Checks **0**  Files changed **1**

Changes from all commits ▾ File filter ▾ Conversations ▾ Jump to ▾  0/

▼  2  airflow/contrib/operators/gcs_to_gcs.py 

```
↑... @@ -51,7 +51,7 @@ def __init__(self,
51 51         delegate_to=None,
52 52         *args,
53 53         **kwargs):
54 -         super(GoogleCloudStorageOperatorToGoogleCloudStorageOperator, self).__init__(*args, **kwargs)
54 +         super(GoogleCloudStorageToGoogleCloudStorageOperator, self).__init__(*args, **kwargs)
55 55         self.source_bucket = source_bucket
56 56         self.source_object = source_object
57 57         self.destination_bucket = destination_bucket
```

My First PR - I didn't follow Guidelines !!



Closed [AIRFLOW-1842] Fixed the Super class name for the operator #2810
kaxil wants to merge 1 commit into apache:master from kaxil:patch-1

bolkedebruin commented on 23 Nov 2017
Please adhere to the commit guidelines. Thanks!

kaxil commented on 23 Nov 2017
@bolkedebruin I have updated the title and updated the JIRA issue and everything needed to confirm to the guidelines.

bolkedebruin commented on 24 Nov 2017
Please check your commit message. It does not refer the Jira issue and your commit message does not follow the guidelines. After that is fixed it can be merged.

kaxil changed the title ~~Fixed the Super class name for the operator~~ [AIRFLOW-1842] Fixed the Super class name for the operator on 24 Nov 2017

kaxil commented on 24 Nov 2017
Have edited it and created a new pull request at #2812

bolkedebruin commented on 26 Nov 2017
Please close this issue.

kaxil closed this on 26 Nov 2017



My First “Merged” PR/commit



✓ [AIRFLOW-1842] Fixed Super class name for the gcs to gcs copy operator Browse files

Fixed incorrect Super class name in gcs to gcs copy operator from `GoogleCloudStorageOperatorToGoogleCloudStorageOperator` to `GoogleCloudStorageToGoogleCloudStorageOperator`.

Closes #2812 from kaxil/patch-2

main
upgrade-check/1.4.0 ... 1.10.0rc1

kaxil authored and bolkedebruin committed on 26 Nov 2017 1 parent 87c6c83 commit 4247ff0228afd06b8210321dcf660e6e7aca7b62

Showing 1 changed file with 1 addition and 1 deletion. Unified Split

airflow/contrib/operators/gcs_to_gcs.py

```
@@ -51,7 +51,7 @@ def __init__(self,
51 51     delegate_to=None,
52 52     *args,
53 53     **kwargs):
54 -     super(GoogleCloudStorageOperatorToGoogleCloudStorageOperator, self).__init__(*args, **kwargs)
54 +     super(GoogleCloudStorageToGoogleCloudStorageOperator, self).__init__(*args, **kwargs)
55 55     self.source_bucket = source_bucket
56 56     self.source_object = source_object
57 57     self.destination_bucket = destination_bucket
```



Slowly & Steadily started adding more contributions



Commits on Feb 2, 2018

[AIRFLOW-2053] Fix quote character bug in BQ hook ...
kaxil authored and Fokko committed on 2 Feb 2018 ✓

Commits on Jan 31, 2018

[AIRFLOW-2037] Add methods to get Hash values of a GCS object ...
kaxil authored and Fokko committed on 31 Jan 2018 ✓

Commits on Jan 26, 2018

[AIRFLOW-1943] Add External BigQuery Table feature ...
kaxil authored and Fokko committed on 26 Jan 2018 ✗

[AIRFLOW-2033] Add Google Cloud Storage List Operator ...
kaxil authored and Fokko committed on 26 Jan 2018 ✗

Commits on Jan 25, 2018

[AIRFLOW-2031] Add missing gcp_conn_id in the example in DataFlow doc...
kaxil authored and Fokko committed on 25 Jan 2018 ✗

Commits on Jan 12, 2018

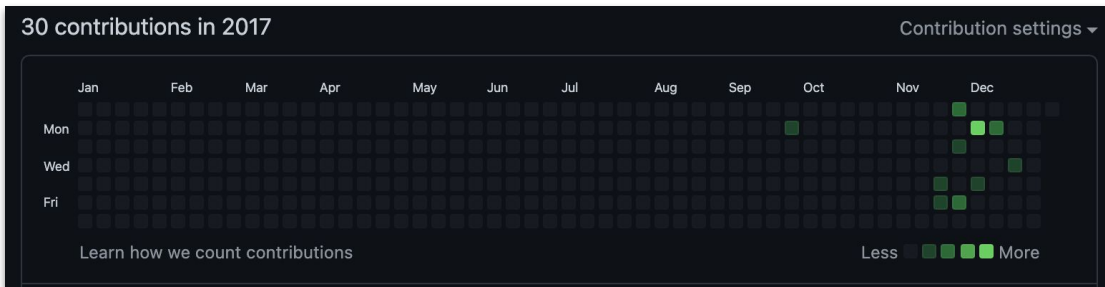
[AIRFLOW-1997] Fix GCP operator doc strings ...
kaxil authored and criccomini committed on 12 Jan 2018 ✓

Commits on Jan 3, 2018

[AIRFLOW-1946][AIRFLOW-1855] Create a BigQuery Get Data Operator ...
kaxil authored and criccomini committed on 3 Jan 2018 ✓

Commits on Dec 11, 2017

[AIRFLOW-1892] Modify BQ hook to extract data filtered by column ...
kaxil authored and criccomini committed on 11 Dec 2017 ✓



What did I learn while working on OSS



- Writing unit-tests
- Improved Coding skills
- Got to know many companies & devs across the globe
- Improved communication skills
 - Commit messages & PR descriptions
 - Email threads on dev list
 - Presentations

Became Airflow Committer & (P)PMC Member



Apache Airflow

@ApacheAirflow



The [@ApacheAirflow](#) is happy to announce new committer & PPMC member [@kaxil](#) ! Please welcome him aboard! bit.ly/2FXWdw2

9:27 PM · May 8, 2018 · Twitter Web Client

||| [View Tweet activity](#)

2 Retweets **1** Quote Tweet **5** Likes

<https://twitter.com/ApacheAirflow/status/993950478785490945>

Steered Release for Airflow 1.10.2



From: Kaxil Naik <k...@gmail.com>
To: de...@airflow.apache.org
Subject: [VOTE] Airflow 1.10.2rc1
Date: 2019/01/17 00:04:25
List: dev@airflow.apache.org

Hey all,

I have cut Airflow 1.10.2 RC1. This email is calling a vote on the release, which will last for 72 hours. Consider this my (binding) +1.

Airflow 1.10.2 RC1 is available at:
<https://dist.apache.org/repos/dist/dev/airflow/1.10.2rc1/>

apache-airflow-1.10.2rc1-source.tar.gz is a source release that comes with INSTALL instructions.
apache-airflow-1.10.2rc1-bin.tar.gz is the binary Python "sdist" release.

Public keys are available at:
<https://dist.apache.org/repos/dist/release/airflow/KEYS>

Only votes from PMC members are binding, but members of the community are encouraged to test the release and vote with "(non-binding)".

Please note that the version number excludes the `rcX` string, so it's now simply 1.10.2. This will allow us to rename the artifact without modifying the artifact checksums when we actually release.

Changes since 1.10.2b2:

- [AIRFLOW-3691] Update notice to 2019 (#4503)
- [AIRFLOW-3689] Update pop-up message when deleting DAG in RBAC UI (#4505)
- [AIRFLOW-3690] Fix bug to set state of a task for manually-triggered DAGs (#4504)
- [AIRFLOW-XXX] Update Contributing Guide - Git Hooks (#4120)
- [AIRFLOW-3426] Correct Python Version Documentation Reference (#4259)
- [AIRFLOW-3693] Replace psycpg2-binary by psycpg2 (#4508)
- [AIRFLOW-2663] Add instructions to install SSH dependencies
- [AIRFLOW-XXX] Clean up installation extra packages table (#3750)
- [AIRFLOW-XXX] Remove redundant space in Kerberos (#3866)
- [AIRFLOW-3086] Add extras group for google auth to setup.py. (#3917)
- [AIRFLOW-XXX] Add Kubernetes Dependency in Extra Packages Doc (#4281)

From: Kaxil Naik <k...@gmail.com>
To: de...@airflow.apache.org
Subject: Airflow 1.10.2 is released
Date: 2019/01/23 01:18:38
List: dev@airflow.apache.org

Dear Airflow community,

I'm happy to announce that* Airflow 1.10.2* was just released.

The source release, as well as the binary "sdist" release, are available here:

<https://dist.apache.org/repos/dist/release/airflow/1.10.2/>

We also made this version available on PyPi for convenience (`pip install apache-airflow`):

<https://pypi.python.org/pypi/apache-airflow>

The documentation is available on:

- <https://airflow.apache.org/>
- <https://airflow.apache.org/1.10.2/>
- <https://airflow.readthedocs.io/en/1.10.2/>
- <https://airflow.readthedocs.io/en/stable/>

Find the CHANGELOG here for more details:

<https://airflow.apache.org/changelog.html#airflow-1-10-2-2019-01-19>

Cheers,
Kaxil

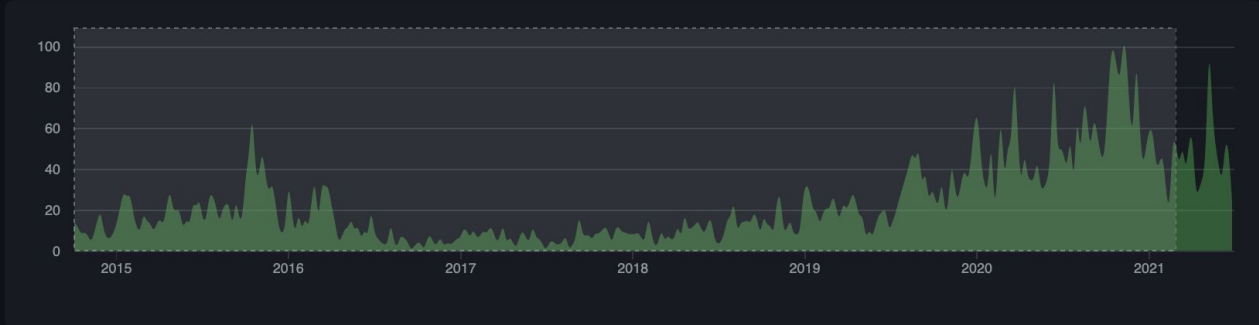
Became Leading Airflow Committer in Feb 2021





Oct 5, 2014 – Feb 28, 2021

Contributions: Commits ▾

Contributions to main, excluding merge commits and bot accounts



 **kaxil** #1
1,020 commits 85,582 ++ 69,732 --

 **mistercrunch** #2
1,019 commits 80,053 ++ 29,195 --

You are next !!





How to start contributing?

How to start contributing?



- Contributing Guidelines: [CONTRIBUTING.rst](#)
- Contributing Quick Start Guide: [CONTRIBUTORS_QUICK_START.rst](#)
- Good First Issues: <https://github.com/apache/airflow/contribute>



Contribution Workflow



1. Find the issue you want to work on
2. Setup a local dev environment
3. Understand the codebase
4. Write Code & add tests if it's a code change
5. Run tests locally
6. Create PR and wait for reviews
7. Address any suggestions by reviewers
8. Nudge politely if your PR is pending reviews for a while



Finding issues to work on

Finding issues to work on



- Start small: the aim should be to understand the process
- Bugs / features impacting you or your work
- Documentation Issues (including Contribution Guides)
 - Missing or outdated info, typos, formatting issues, broken links etc
- Good First Issues: <https://github.com/apache/airflow/contribute>
- Other open GitHub Issues: <https://github.com/apache/airflow/issues>

Finding issues to work on - Open Unassigned Issues



If the issue is open and un-assigned,
comment you want to work on it.

A committer will assign that issue to
you. Then it is all yours.

The screenshot shows a GitHub issue page for "Add how-to Guide for Databricks Operators #11916". The issue is marked as "Open" and was opened by user "kaxil" on 28 Oct 2020. The description includes links to GitHub repositories and documentation. A comment from "sharad-vm" on 29 Oct 2020 asks to be assigned the issue. A subsequent comment from "kaxil" on 29 Oct 2020 states "Awesome, assigned".

Add how-to Guide for Databricks Operators #11916
Open kaxil opened this issue on 28 Oct 2020 · 2 comments

kaxil commented on 28 Oct 2020 Member

Description

A guide that describes how to use all the operators for Azure (<https://github.com/apache/airflow/tree/master/airflow/providers/databricks/operators>) would be useful.

Other guides are available:
<https://airflow.readthedocs.io/en/latest/howto/operator/index.html>

Source code for those guides are at:
<https://github.com/apache/airflow/tree/master/docs/howto/operator>

Are you wondering how to start contributing to this project? Start by reading our contributor guide

Best regards,
Kaxil

kaxil added `good first issue` `kind:documentation` labels on 28 Oct 2020

sharad-vm commented on 29 Oct 2020 · edited Contributor

@kaxil I'm a newbie here and would like to start contributing to Airflow with this. Can you please assign this to me?

kaxil assigned sharad-vm on 29 Oct 2020

kaxil commented on 29 Oct 2020 Member Author

Awesome, assigned

Finding issues to work on - Improving Documentation



- If you faced an issue with docs, better fix it for future readers
- Documentation PRs are the best first contributions
- Missing or outdated info, typos, formatting issues, broken links etc
- No need of writing unit tests
- Examples:
 - <https://github.com/apache/airflow/pull/16275>
 - <https://github.com/apache/airflow/pull/13462>
 - <https://github.com/apache/airflow/pull/15265>



Setup a local dev environment

SetUp Local Development Environment



- Fork [Apache Airflow](#) repo & clone it locally
- Install pre-commit hooks ([link](#)) to detect minor issues before creating a PR
 - Some of them even automatically fix issues e.g 'black' formats python code
 - Install pre-commit framework: `pip install pre-commit`
 - Install pre-commit hooks: `pre-commit install`
- Use `breeze` - a wrapper around docker-compose for Airflow development.
 - Mac Users: Increase resources available to **Docker for Mac**
 - Check Prerequisites: <https://github.com/apache/airflow/blob/main/BREEZE.rst#prerequisites>
 - Setup autocomplete: `./breeze setup-autocomplete`

SetUp Local Development Environment - Breeze



- Airflow CI uses **breeze** too so it allows reproduction locally
- Allows running Airflow with different environments (different Python versions, different Metadata db, etc):

- `./breeze --python 3.6 --backend postgres --postgres-version 12`

- You can also run a local instance of Airflow using:

- `./breeze start-airflow --python 3.6 --backend postgres`

- You can then access the Webserver on <http://localhost:28080>

SetUp Local Development Environment - Breeze



```
Welcome to your tmux based running Airflow environment (courtesy of Breeze).

  To stop Airflow and exit tmux just type 'stop_airflow'.

root@1b1ea79151e0:/opt/airflow#

Info fsevents@2.3.2: The platform "linux" is incompatible with this module.
Info "fsevents@2.3.2" is an optional dependency and failed compatibility check. Excluding it from installation.
Info fsevents@1.2.13: The platform "linux" is incompatible with this module.
Info "fsevents@1.2.13" is an optional dependency and failed compatibility check. Excluding it from installation.
[3/4] Linking dependencies...
warning " > eonasdan-bootstrap-datetimepicker@4.17.40" has unmet peer dependency "bootstrap@^3.3".
warning " > eonasdan-bootstrap-datetimepicker@4.17.40" has unmet peer dependency "moment@^2.10".
warning " > redoc@2.0.0-rc.54" has unmet peer dependency "core-js@^3.1.4".
warning " > redoc@2.0.0-rc.54" has unmet peer dependency "mobx@^6.0.4".
warning " > redoc@2.0.0-rc.54" has unmet peer dependency "react@^16.8.4 || ^17.0.0".
warning " > redoc@2.0.0-rc.54" has unmet peer dependency "react-dom@^16.8.4 || ^17.0.0".
warning " > redoc@2.0.0-rc.54" has unmet peer dependency "react@^16.8.4 || ^17.0.0".
warning " > redoc@2.0.0-rc.54" has unmet peer dependency "styled-components@^4.1.1 || ^5.1.1".
warning "redoc > @redocly/react-dropdown-aria@2.0.12" has unmet peer dependency "react@^16.8.4 || ^17.0.0".
warning "redoc > @redocly/react-dropdown-aria@2.0.12" has unmet peer dependency "react-dom@^16.8.4 || ^17.0.0".
warning "redoc > @redocly/react-dropdown-aria@2.0.12" has unmet peer dependency "styled-components@^5.1.1".
warning "redoc > mobx-react@7.2.0" has unmet peer dependency "mobx@^6.1.0".
warning "redoc > mobx-react@7.2.0" has unmet peer dependency "react@^16.8.0 || ^17".
warning "redoc > react-tabs@3.2.2" has unmet peer dependency "react@^16.3.0 || ^17.0.0-0".
warning "redoc > mobx-react > mobx-react-lite@3.2.0" has unmet peer dependency "mobx@^6.1.0".
warning "redoc > mobx-react > mobx-react-lite@3.2.0" has unmet peer dependency "react@^16.8.0 || ^17".
warning " > babel-loader@8.2.2" has unmet peer dependency "@babel/core@^7.0.0".
warning "babel-plugin-css-modules-transform > css-modules-require-hook > postcss-modules-resolve-imports@1.3.0" has incorrect peer dependency "postcss@^6.0.0".
warning " > moment-locales-webpack-plugin@1.2.0" has unmet peer dependency "moment@^2.8.0".

root@1b1ea79151e0:/opt/airflow# airflow scheduler

[2021-07-07 01:07:28,032] {scheduler_job.py:621} INFO - Starting the scheduler
[2021-07-07 01:07:28,033] {scheduler_job.py:626} INFO - Processing each file at most -1 times
* Serving Flask app "airflow.utils.serve_logs" (lazy loading)
* Environment: production
  WARNING: This is a development server. Do not use it in a production deployment.
  Use a production WSGI server instead.
* Debug mode: off
[2021-07-07 01:07:28,041] {_internal.py:113} INFO - * Running on http://0.0.0.0:8793/ (Press CTRL+C to quit)
[2021-07-07 01:07:28,280] {manager.py:174} INFO - Launched DagFileProcessorManager with pid: 1567
[2021-07-07 01:07:28,283] {scheduler_job.py:1151} INFO - Resetting orphaned tasks for active dag runs
[2021-07-07 01:07:28,470] {settings.py:51} INFO - Configured default timezone Timezone('UTC')

airflow webserver
root@1b1ea79151e0:/opt/airflow# airflow webserver

[2021-07-07 01:06:39,524] {dagbag.py:495} INFO - Filling up the DagBag from /dev/null
Running the Gunicorn Server with:
Workers: 4 sync
Host: 0.0.0.0:8080
Timeout: 120
Logfiles: --
Access Logformat:
=====
[2021-07-07 01:06:44 +0000] [736] [INFO] Starting gunicorn 20.1.0
[2021-07-07 01:06:44 +0000] [736] [INFO] Listening at: http://0.0.0.0:8080 (736)
[2021-07-07 01:06:44 +0000] [736] [INFO] Using worker: sync
[2021-07-07 01:06:44 +0000] [765] [INFO] Booting worker with pid: 765
[2021-07-07 01:06:44 +0000] [770] [INFO] Booting worker with pid: 770
[2021-07-07 01:06:45 +0000] [797] [INFO] Booting worker with pid: 797
[2021-07-07 01:06:45 +0000] [806] [INFO] Booting worker with pid: 806

[Airflow] 0:Main*
"1b1ea79151e0" 01:07 07-Jul-21
```



Understand the Codebase

Understand the Codebase



- [apache/airflow](#) is mono-repo containing:
 - [Apache Airflow Python package](#)
 - [More than 60 Providers](#) ([Google](#), [Amazon](#), [Postgres](#), etc)
 - [Container image](#)
 - [Helm Chart](#)
- Each of these items are released and versioned separately

Understand the Codebase



- Do not try to understand the entire codebase at once
- Get familiar with the directory structure first
- Dive into the source code related to your issue
- Similar to: If you are moving to a new house, you would try to first get familiar with your immediate neighbours and then others. (unless you have memory like Sheldon Cooper !!!)



Understand the Codebase - Directory Structure



Area	Paths (relative to the repository root)
Core Airflow Docs	docs/apache-airflow
Stable API	airflow/api_connexion
CLI	airflow/cli
Webserver / UI	airflow/www
Scheduler (incl. Dag Parsing)	airflow/jobs/scheduler_job.py
Executors	airflow/executors
DAG Serialization	airflow/serialization
Helm Chart (& it's tests)	chart
Container Image	Dockerfile
Tests	tests

Understand the Codebase - Directory Structure



Area	Paths (relative to the repository root)
Providers	airflow/providers
Core Operators	airflow/operators
Core Hooks	airflow/hooks
Core Sensors	airflow/sensors
DB Migrations	airflow/migrations
ORM Models (Python Class -> DB Tables)	airflow/models
Secrets Backend	airflow/secrets
Configuration	airflow/configuration.py
Permission Model	airflow/www/security.py
All Docs (incl. docs for Chart & Container image)	docs

Understand the Codebase - Areas



- Get expertise in a certain area before diving into a different one.

Easy	Medium	Complex (core)
Docs	Webserver	Scheduler & Dag Parsing
CLI	Helm Chart	Executors
Operators / Hooks / Sensors (Providers)	Dockerfile	Configuration
Stable API	Secrets Backend	Permission Model
	DB Migrations	



Write Code & add docs & tests

Write code, add tests and docs



- You can re-use lot of logic of the code in the “same area”
- If adding a feature, find previously merged PRs in same area to get an idea
- Check out [Coding style and best practices](#) in `CONTRIBUTING.rst`
- Add Tests and Docs
 - The `tests` directory has same structure as `airflow`.
 - E.g If code file is `airflow/providers/google/cloud/operators/bigquery.py` tests for it should be added at `tests/providers/google/cloud/operators/test_bigquery.py`
 - Docs for it would be at `docs/apache-airflow-providers-google/operators/cloud/bigquery.rst`

Write code, add tests and docs



- You can re-use lot of logic of the code in the “same area”
 - e.g. if you are adding a new Operator for GCP, you can check how current GCS operators are implemented or find a PR that added a operator in Google Provider & see what all they added.
- Check out [Coding style and best practices](#) in `CONTRIBUTING.rst`
- Add Tests and Docs
 - The `tests` directory has same structure as `airflow`.
 - E.g If code file is `airflow/providers/google/cloud/operators/bigquery.py` tests for it should be added at `tests/providers/google/cloud/operators/test_bigquery.py`



Run tests locally



Create PR and wait for reviews



Address Reviews



Nudge for reviews



Communication Channels



Becoming a Committer



Links / References



- Airflow

- Repo: <https://github.com/apache/airflow>
- Website: <https://airflow.apache.org/>
- Blog: <https://airflow.apache.org/blog/>
- Documentation: <https://airflow.apache.org/docs/stable/>
- Slack: <https://s.apache.org/airflow-slack>
- Twitter: <https://twitter.com/apacheairflow>

- Contact Me:

- Twitter: <https://twitter.com/kaxil>
- Github: <https://github.com/kaxil/>
- LinkedIn: <https://www.linkedin.com/in/kaxil/>





ASTRONOMER

Thank You!

