🤖 💖 🧑‍💻

Google

Robots are your friends

Keeping your operators up to date with automation

Leah Cole
Google Cloud

Airflow
Summit 2021

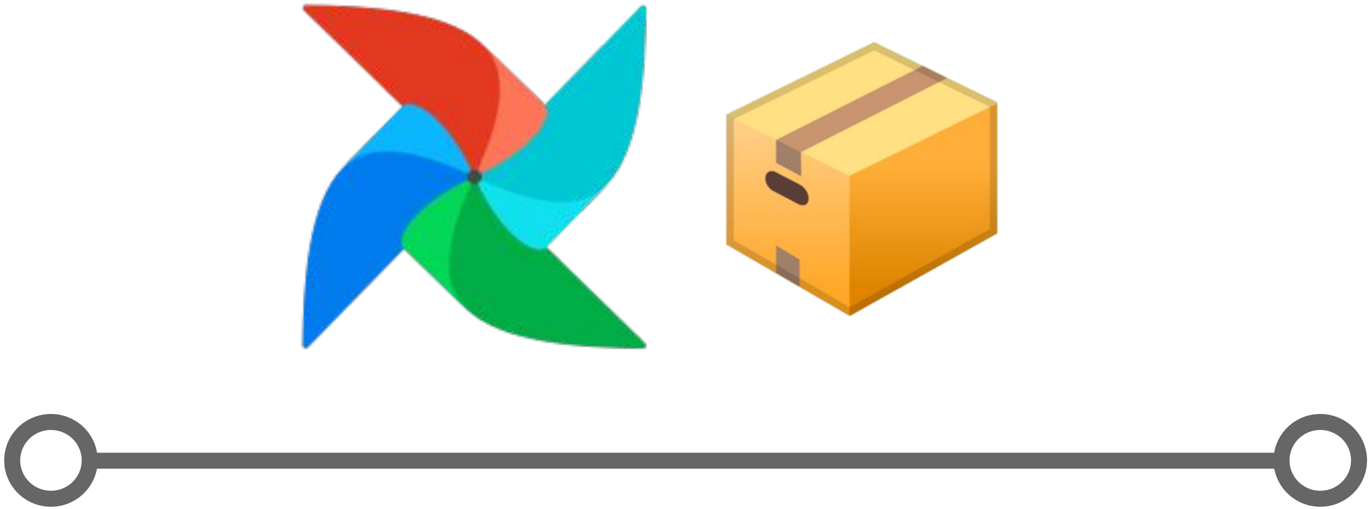
Agenda

- Intro to Leah + provider packages/backport packages
- Before robot friends
- With robot friends

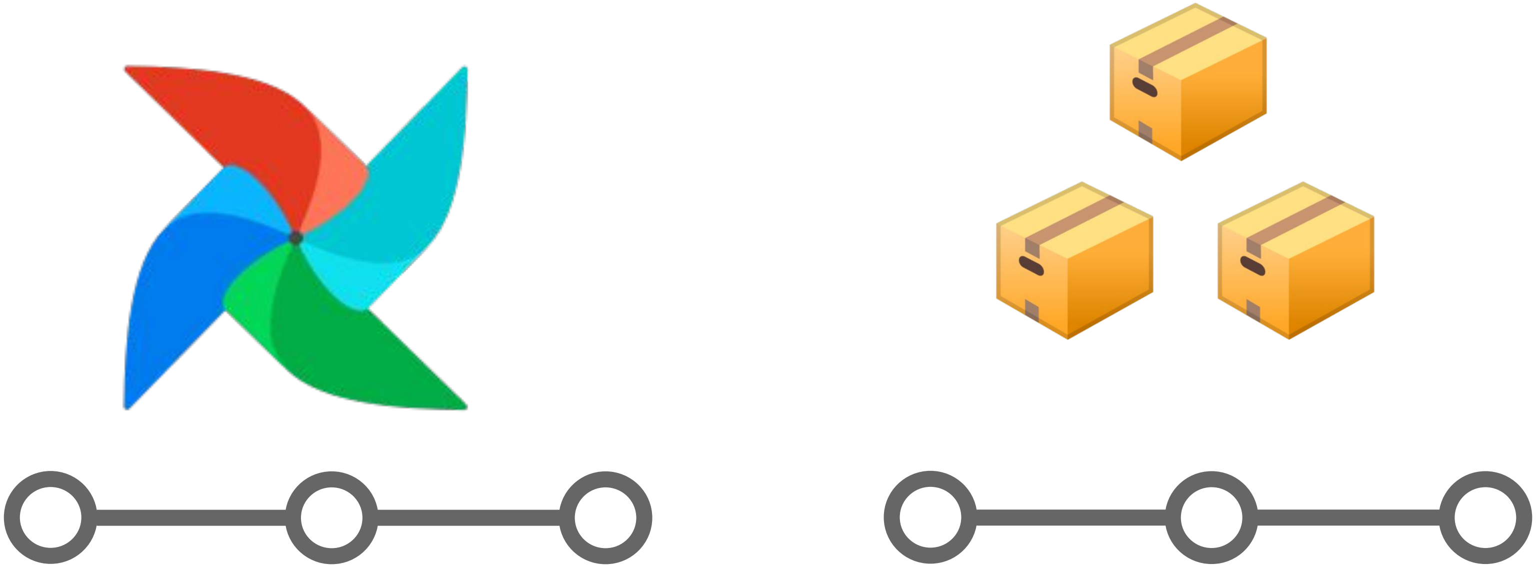
Hi, I'm Leah!

@leahecole

What are the provider packages?



What are the provider packages?



Before robot friends

Process without automation

New release of
providers package

Human notices
update, tests locally

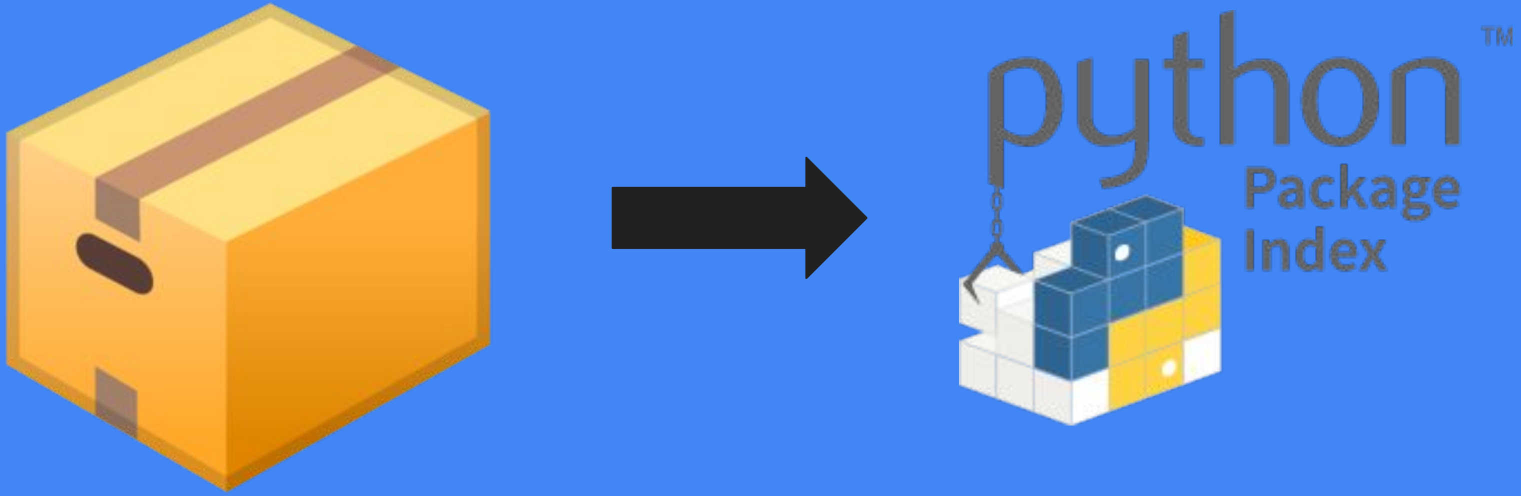
Tests DAGs in dev,
promotes to prod

Repo Structure

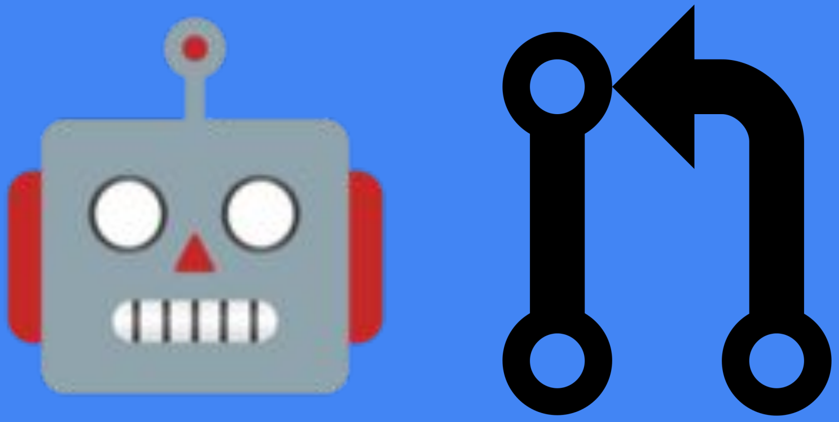
```
dags/
|   |__ example_dag.py
|   |__ example_dag_test.py
|
|__ requirements.txt
```

With robot friends

Step 0 - The provider packages are updated!



Step 1 - Renovate bot robot friend opens a PR



Create a requirements-composer.txt file

```
dags/
|   |__ example_dag.py
|   |__ example_dag_test.py
|
|__ requirements-composer.txt
|__ requirements.txt
```

Create a requirements-composer.txt file

```
apache-airflow-backport-providers-google==2020.11.13
```

Configure a robot friend

```
dags/
|    |__ example_dag.py
|    |__ example_dag_test.py
|
|__ requirements-composer.txt
|__ renovate.json
|__ requirements.txt
```

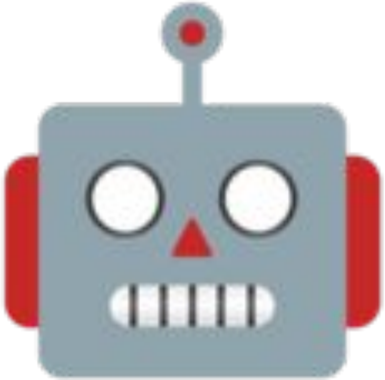
WhiteSource

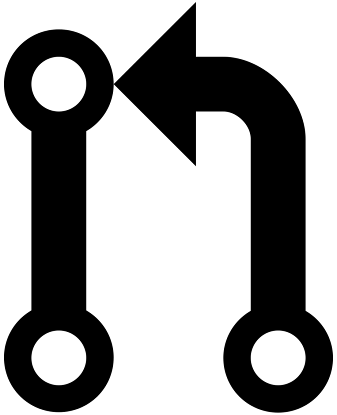
Configure a robot friend

```
 {
  "extends": [
    "config:base"
  ],
  "baseBranches": ["main"],
  "masterIssue": true,
  "pip_requirements": {
    "fileMatch": ["requirements-composer.txt"]
  }
}
```

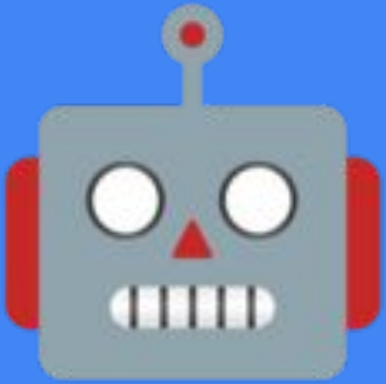
WhiteSource

Renovate bot robot friend opens a PR





Step 2: Cloud Build robot friend runs presubmit tests



Create a `Dockerfile`

```
dags/
|   |__ example_dag.py
|   |__ example_dag_test.py
|
|__ requirements-composer.txt
|__ Dockerfile
|__ renovate.json
|__ requirements.txt
```

Create a Dockerfile

```
FROM python:3.8

# Allow statements and log messages to immediately appear in the Cloud Run logs
ENV PYTHONUNBUFFERED True

COPY requirements.txt ./
COPY requirements-composer.txt ./

RUN pip install --no-cache-dir -r requirements.txt
RUN pip install --no-cache-dir -r requirements-composer.txt

#copy dag code to container image
ENV DAGS /dags
WORKDIR $DAGS
COPY . ./
CMD ["pytest", "-s", "dags/example_dag_test.py"]
```

Create a cloudbuild.yaml file

```
dags/
|   |__ example_dag.py
|   |__ example_dag_test.py
|
|__ requirements-composer.txt
|__ Dockerfile
|__ test-dags.cloudbuild.yaml
|__ renovate.json
|__ requirements.txt
```

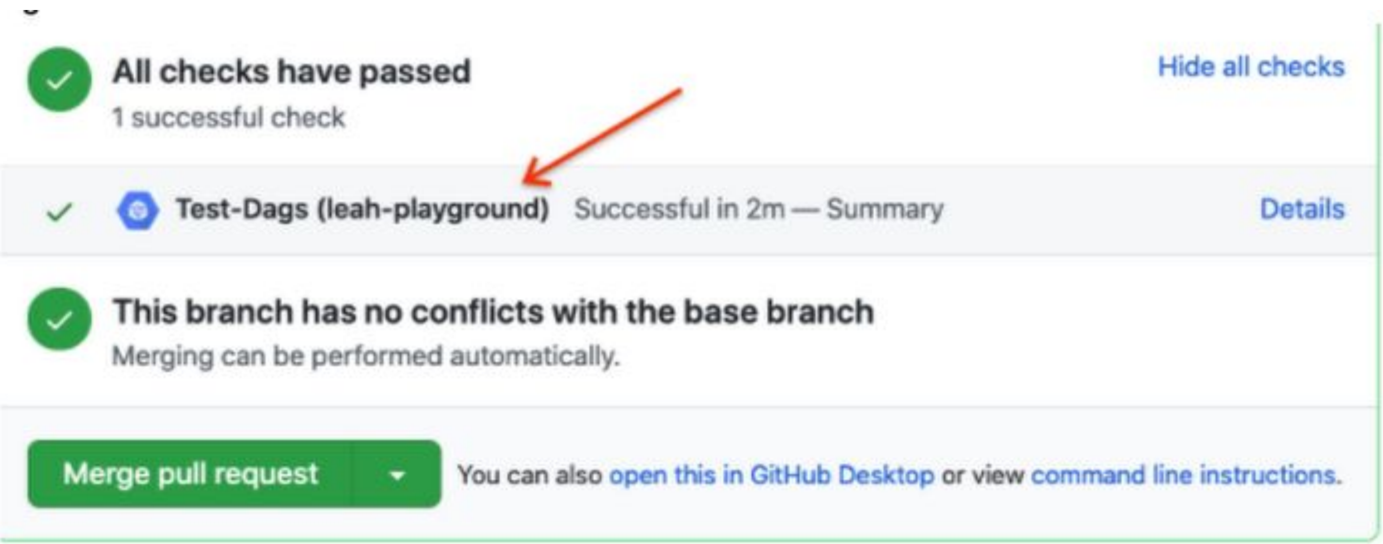
Create a cloudbuild.yaml file

```
steps:
  # build the docker image
  - name: 'gcr.io/cloud-builders/docker'
    args: ['build', '-t', 'gcr.io/${PROJECT_ID}/cicd:${SHORT_SHA}',
'.'] # tag docker image with commit sha
    id: 'docker build'
  # run the dag tests
  - name: 'gcr.io/cloud-builders/docker'
    args: ['run', 'gcr.io/${PROJECT_ID}/cicd:${SHORT_SHA}']
    id: 'test-dags'
```

Create a Cloud Build Trigger

Name: test-dags
Event: Pull Request
Source - Repository: choose your repository
Source - Base branch: ^main$
Source - Comment Control: not required
Build Configuration - Cloud build configuration file: /test-dags.cloudbuild.yaml

Cloud Build robot friend runs presubmit tests



All checks have passed

1 successful check

Hide all checks

✓ Test-Dags (leah-playground) Successful in 2m — Summary Details

This branch has no conflicts with the base branch

Merging can be performed automatically.

You can also open this in GitHub Desktop or view command line instructions.

@leahecole

Step 3 - PR Approved (by a human) and merged to main

Step 4 - Another Cloud Build robot friend updates your dev environment

Create a cloudbuild.yaml file

```
dags/
|   |__ example_dag.py
|   |__ example_dag_test.py
|
|__ requirements-composer.txt
|__ Dockerfile
|__ test-dags.cloudbuild.yaml
|__ update-composer.cloudbuild.yaml
|__ renovate.json
|__ requirements.txt
```

Create a cloudbuild.yaml file

```
steps:
  #update the composer environment
  - name: 'gcr.io/cloud-builders/gcloud'
    args: ['composer', 'environments', 'update',
'${_COMPOSER_NAME}', '--update-pypi-packages-from-file',
'requirements-composer.txt', '--location', '${_COMPOSER_REGION}']
    id: 'update-composer-env'
timeout: 3600s #1 hour timeout accommodates the long running
Composer upgrade operation
```

Create a Cloud Build Trigger

Name: update-composer-env

Event: Push to a branch

Source - Repository: choose your repository

Source - Base branch: ^main$

Source - Included files filter (glob): requirements-composer.txt

Build Configuration - Cloud build configuration file: /update-composer.cloudbuild.yaml

Advanced Configuration - Substitution variables

_COMPOSER_NAME - the name of your composer environment

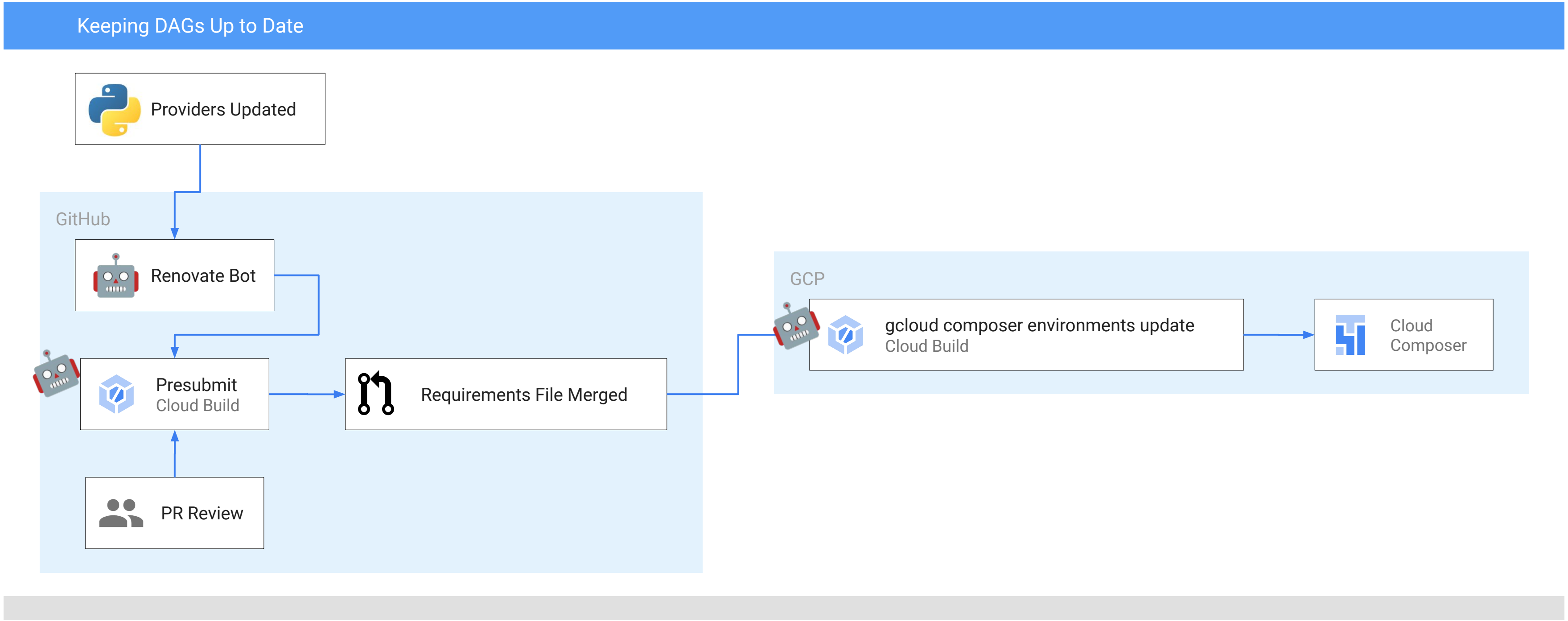
_COMPOSER_REGION - the Compute engine region where your environment is located

Step 5 - Look at DAGs in dev environment

Step 6 - Promote your updates to your prod environment

Putting it together

Architecture


Keeping DAGs Up to Date

@leahecole

What's next?

- Rollback strategy
- More system test automation
- Alternate components
    - GitHub Actions
    - Dependabot

Additional Resources

Testing Airflow workflows - Bas Harenslak - Airflow Summit 2020

Blog post summarizing the Cloud Build approach