How to build a system test dashboard

... and why you should do it

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About me

- Software developer engineer for AWS
- Apache Airflow committer
# Apache Airflow - Amazon Provider Package Health

View the health of AWS service integrations for Apache Airflow

This live dashboard displays the current health of AWS service integrations available in the Amazon Provider package of Apache Airflow. The following table shows data for all runs from the past 7 days of the AWS System Tests using the latest Apache Airflow codebase.

<table>
<thead>
<tr>
<th>System test</th>
<th>Invocations</th>
<th>Successes</th>
<th>Failures</th>
<th>Duration</th>
<th>Last 10 runs (latest on the right)</th>
</tr>
</thead>
<tbody>
<tr>
<td>example_appflow_run</td>
<td>68</td>
<td>68</td>
<td>0</td>
<td>00h00m48s</td>
<td>[green dots]</td>
</tr>
<tr>
<td>example_athena</td>
<td>68</td>
<td>68</td>
<td>0</td>
<td>00h00m47s</td>
<td>[green dots]</td>
</tr>
<tr>
<td>example_batch</td>
<td>68</td>
<td>68</td>
<td>0</td>
<td>00h02m49s</td>
<td>[green dots]</td>
</tr>
<tr>
<td>example_cloudformation</td>
<td>68</td>
<td>68</td>
<td>0</td>
<td>00h03m02s</td>
<td>[green dots]</td>
</tr>
<tr>
<td>exampleDatasync</td>
<td>68</td>
<td>68</td>
<td>0</td>
<td>00h00m44s</td>
<td>[green dots]</td>
</tr>
<tr>
<td>example_dynamodb</td>
<td>68</td>
<td>68</td>
<td>0</td>
<td>00h01m17s</td>
<td>[green dots]</td>
</tr>
<tr>
<td>example_dynamodb_to_s3</td>
<td>68</td>
<td>66</td>
<td>2</td>
<td>00h15m28s</td>
<td>[green dots]</td>
</tr>
<tr>
<td>example_ec2</td>
<td>68</td>
<td>68</td>
<td>0</td>
<td>00h02m41s</td>
<td>[green dots]</td>
</tr>
<tr>
<td>example_ecs</td>
<td>67</td>
<td>67</td>
<td>0</td>
<td>00h01m14s</td>
<td>[green dots]</td>
</tr>
<tr>
<td>example_ecs_fargate</td>
<td>68</td>
<td>68</td>
<td>0</td>
<td>00h01m39s</td>
<td>[green dots]</td>
</tr>
<tr>
<td>example_eks_with_fargate_in_one_step</td>
<td>68</td>
<td>68</td>
<td>0</td>
<td>00h17m40s</td>
<td>[green dots]</td>
</tr>
<tr>
<td>example_eks_with_fargate_profile</td>
<td>68</td>
<td>68</td>
<td>0</td>
<td>00h17m35s</td>
<td>[green dots]</td>
</tr>
<tr>
<td>example_eks_with_nodegroup_in_one_step</td>
<td>68</td>
<td>68</td>
<td>0</td>
<td>00h16m42s</td>
<td>[green dots]</td>
</tr>
</tbody>
</table>
What is a system test?
What is a system test?

- Executable DAGs
- Runnable with a `pytest` command
- Integration tests for operators and sensors
How to build a system test dashboard?
How to build a system test dashboard?

1. How to execute system tests frequently?
2. How to generate a dashboard from system test results?
3. How to notify on system test results?
How to execute system tests frequently?
How to execute system tests frequently?

- Git pull
- Git push
- Airflow repository
- Airflow fork
- AWS CodeBuild
- Event (time based)
- AWS Cloud
How to execute system tests frequently?

1. Git pull from the Airflow repository.
2. Airflow fork.
3. Git push.
4. AWS CodeBuild triggered by an event (time based).
5. AWS CodePipeline.
How to execute system tests frequently?

1. **GitHub** pull
2. **Airflow** repository
3. **AWS CodeBuild**
4. Event (time based)
5. **AWS CodePipeline**
6. **AWS CodeBuild**
   - example_athena
   - example_batch
   - example_ec2
   - ...

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**Diagram Details**

- **AWS Cloud**
- **Git pull**
- **Git push**
- **Airflow fork**
- **Event** (time based)
How to execute system tests frequently?

- Git pull
- Airflow repository
- Git push
- Airflow fork

AWS Cloud

- AWS CodeBuild
- Event (time based)

AWS CodePipeine

- example_athena
- example_batch
- example_ec2
- ...

AWS CodeBuild

- Invocation metric
- Success metric
- Failure metric
- Duration metric
How to generate a system test dashboard?

AWS Cloud

- Invocation metric
- Success metric
- Failure metric
- Duration metric
How to generate a system test dashboard?

**AWS Lambda**
- Amazon S3 bucket
- Event (time based)
  - Invocation metric
  - Success metric
  - Failure metric
  - Duration metric

**Generate dashboard**
How to generate a system test dashboard?

GitHub pages repository

AWS CodeBuild

Amazon S3 bucket

AWS Lambda

Event (time based)

Generate dashboard

Changes detected

Invocation metric
Success metric
Failure metric
Duration metric

Upload files
How to generate a system test dashboard?

AWS Cloud

GitHub pages repository

Upload files

AWS CodeBuild

Changes detected

Generate dashboard

Amazon S3 bucket

AWS Lambda

Event (time based)

Invocation metric

Success metric

Failure metric

Duration metric

User

http://abc.github.io/…
How to notify on system test results?

AWS Cloud

 Invocation metric  Success metric  Failure metric  Duration metric
How to notify on system test results?

AWS Cloud

- Invocation alarm
- Success metric
- Failure metric
- Duration metric
How to notify on system test results?

AWS Cloud

AWS Lambda

Amazon SNS Topic

Invocation alarm

Success metric

Failure alarm

Failure metric

Duration metric

Invocation metric
How to notify on system test results?

AWS Cloud

- Send Slack message
- AWS Lambda
- Trigger
- Amazon SNS Topic
- Invocation alarm
- Failure alarm
- Invocation metric
- Success metric
- Failure metric
- Duration metric

AWS Airflow team

- Slack
- Ticket

Start investigating

Cut ticket
Why you should do it?
Why you should do it?

- Visibility
  - Live (or almost) visibility on health of operators, sensors and system tests
  - Guarantee that system tests are real working DAGs
Why you should do it?

- Quality
  - Detect fast bugs/regression made in Airflow
    - In the last 2 months, 3 bug fixes in core Airflow
  - Ability to run all system tests against release candidate
Why you should do it?

- Community
  - Valuable data for the community
  - Encourage people to fix their own bugs
Questions?