Airflow That Remembers: The Dag Versioning Era is here!

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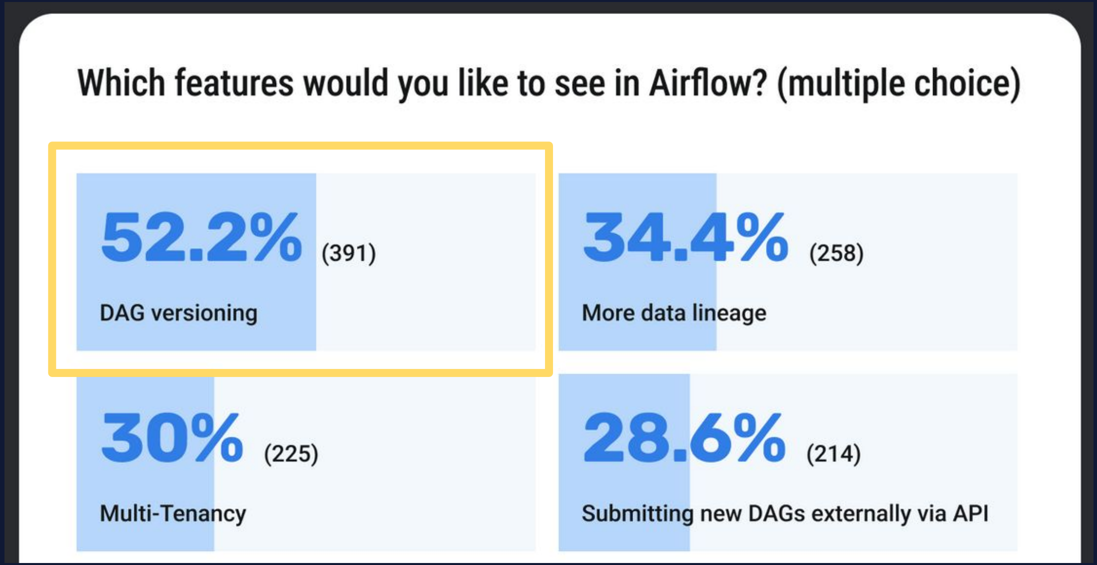
Slido for questions

OR

Join link:
https://app.sli.do/event/tFD2BRhuH4jT3rD2nBwntg



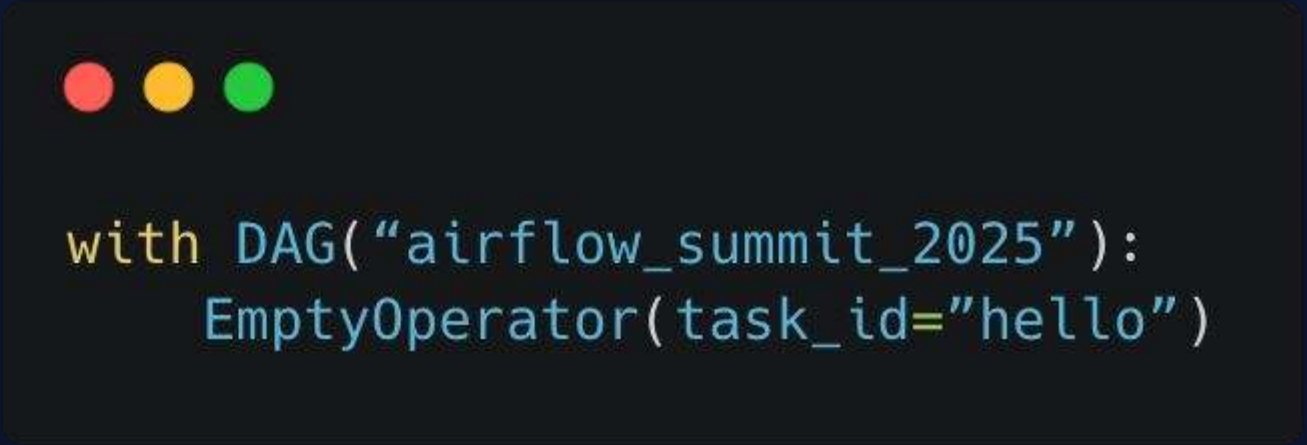
Which features would you like to see in Airflow? (multiple choice)

52.2% (391)
DAG versioning

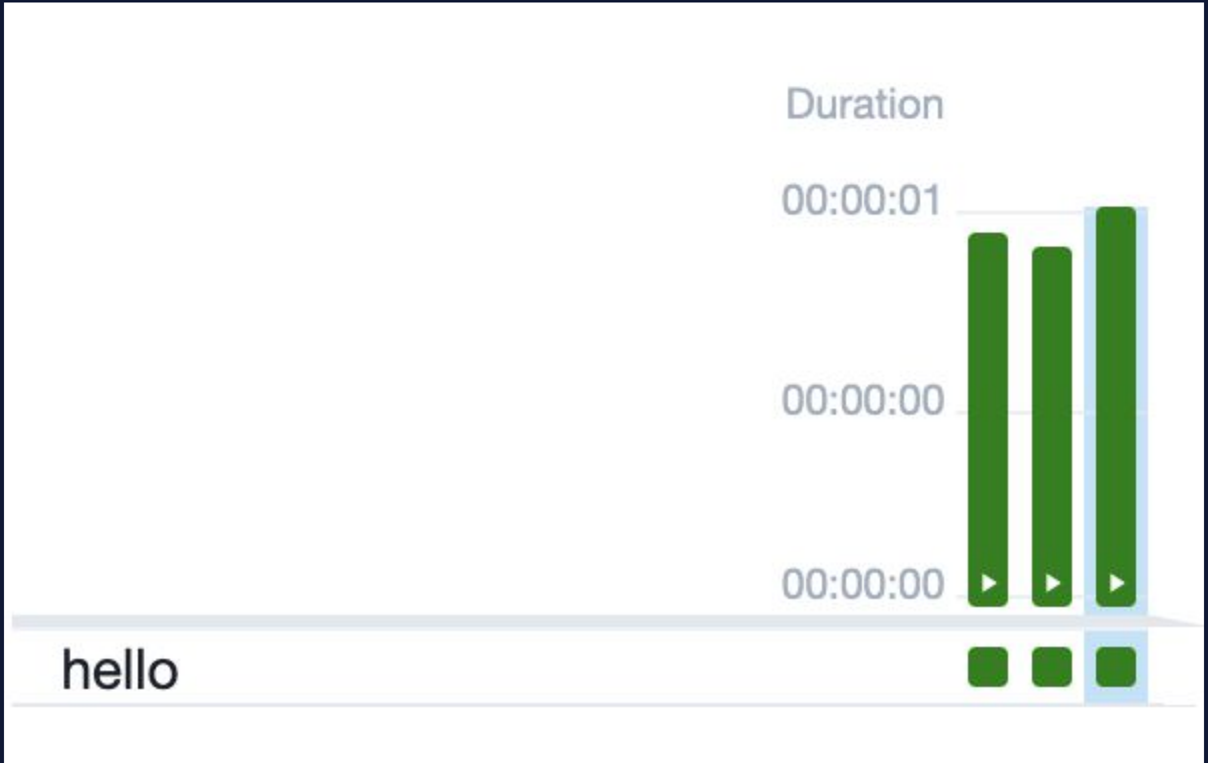
34.4% (258)
More data lineage

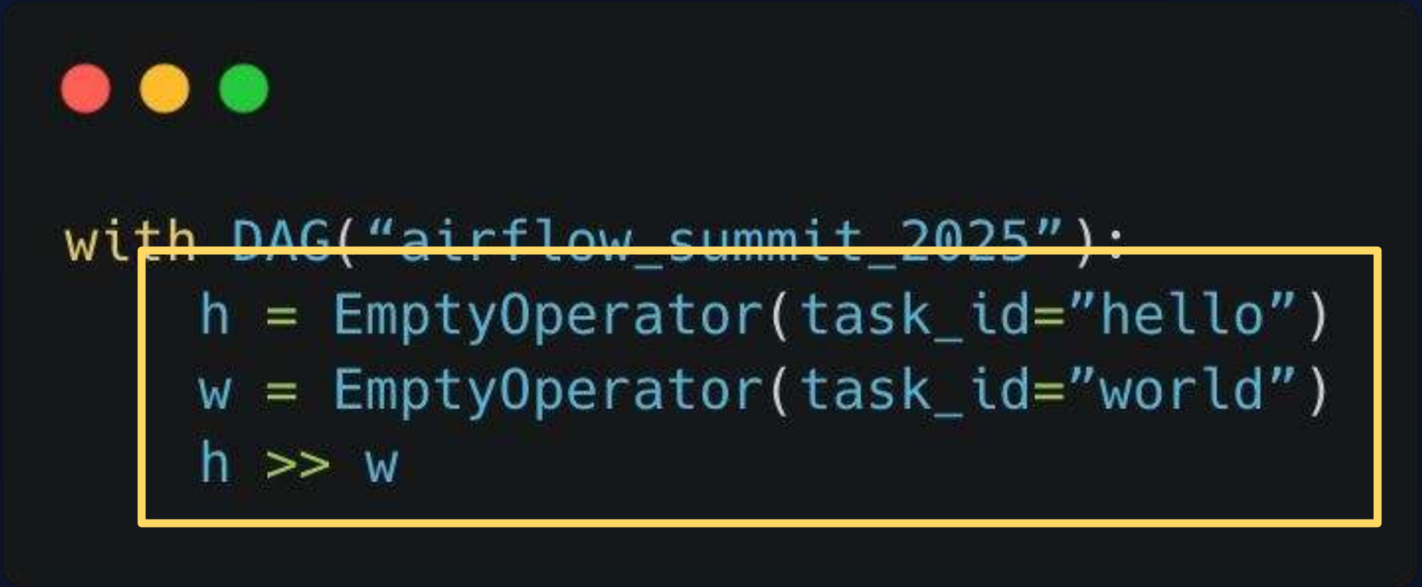
30% (225)
Multi-Tenancy

28.6% (214)
Submitting new DAGs externally via API

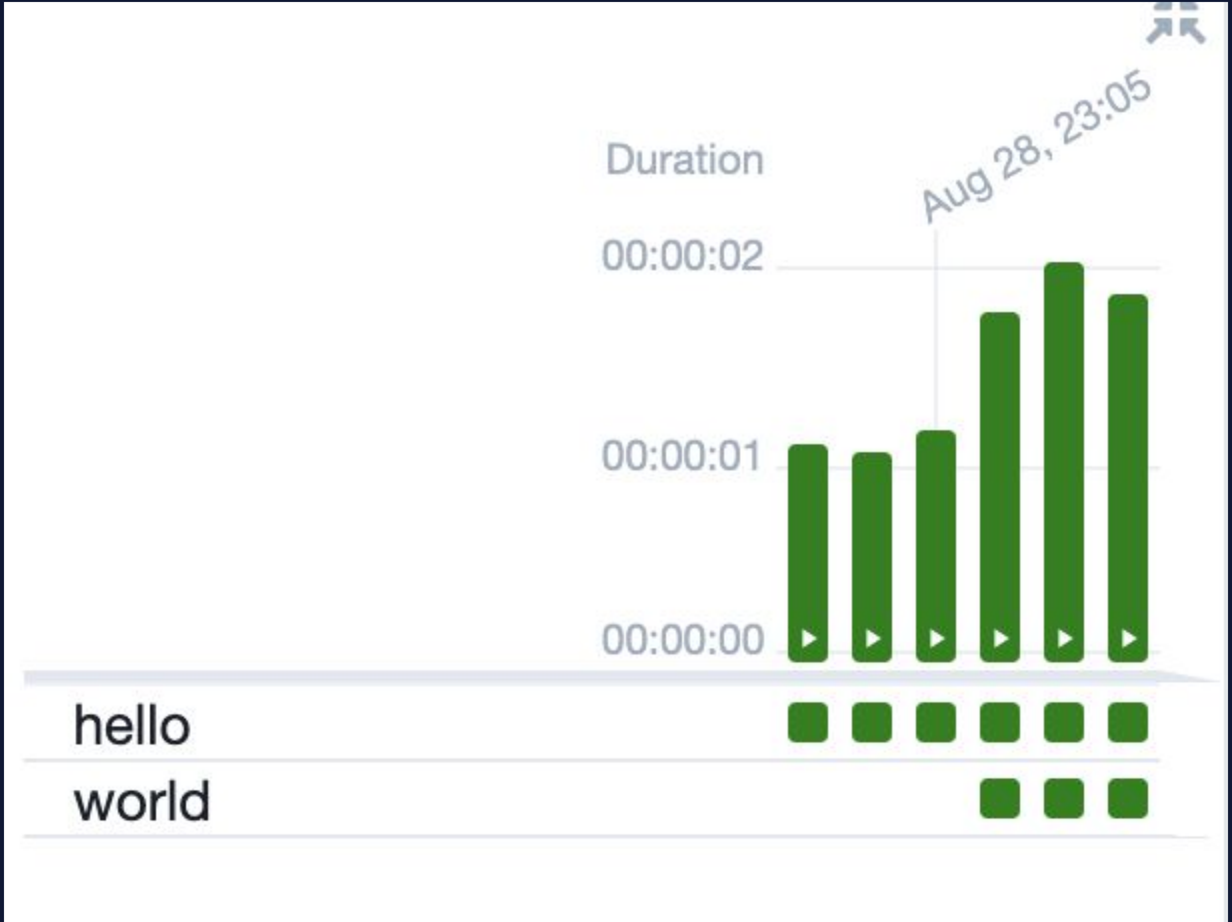


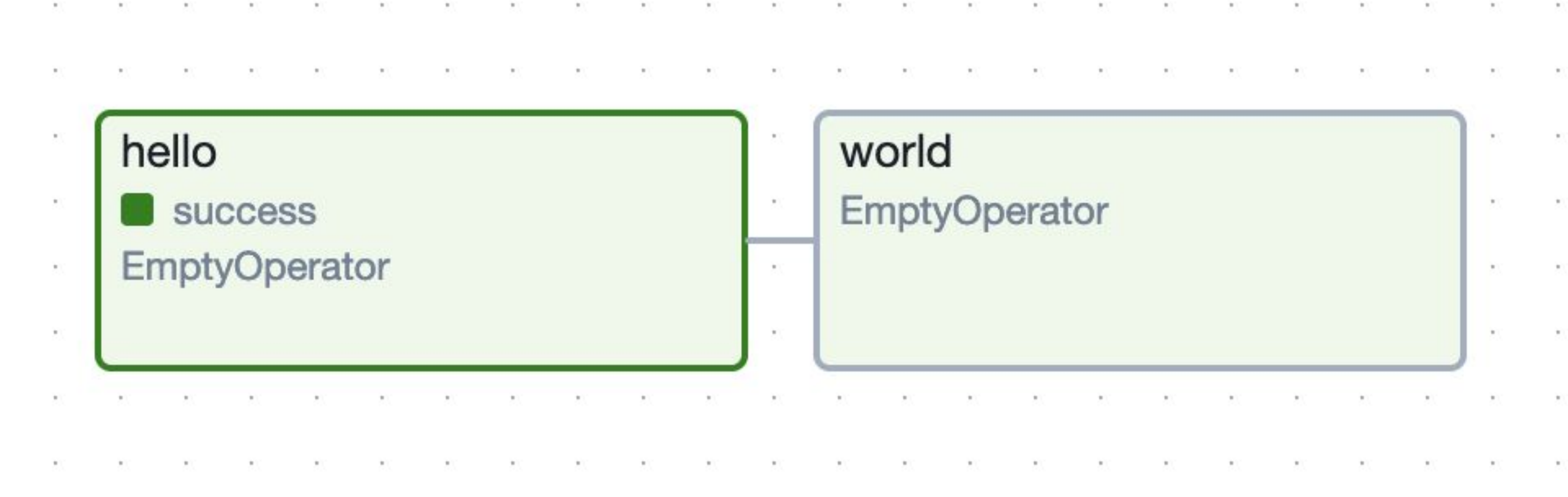
```
with DAG(“airflow_summit_2025”):
    EmptyOperator(task_id=”hello”)
```

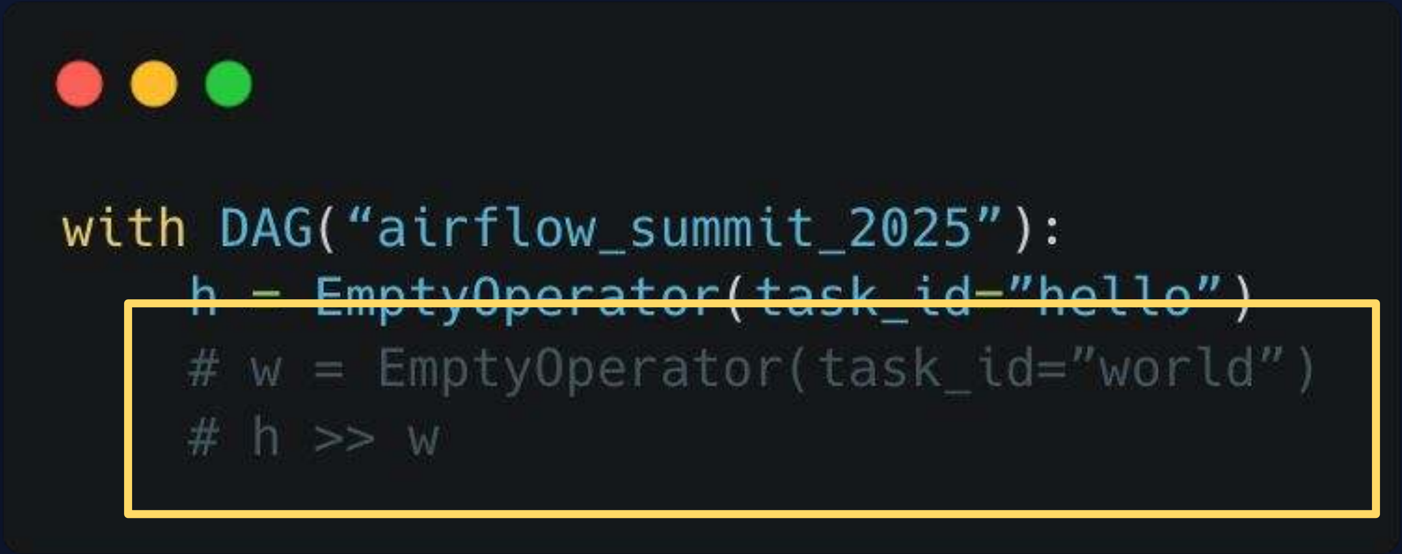

Duration
00:00:01
00:00:00
00:00:00
hello



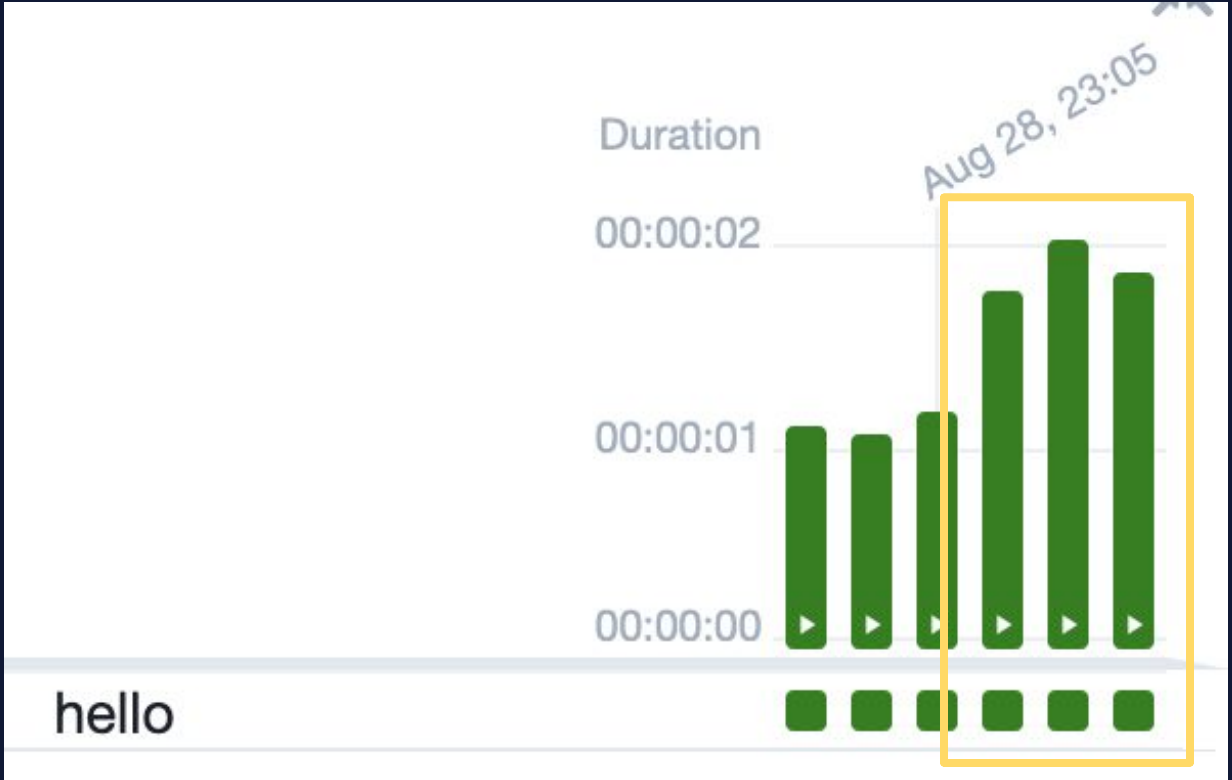
```
with DAG(“airflow_summit_2025”):
    h = EmptyOperator(task_id=”hello”)
    w = EmptyOperator(task_id=”world”)
    h >> w
```

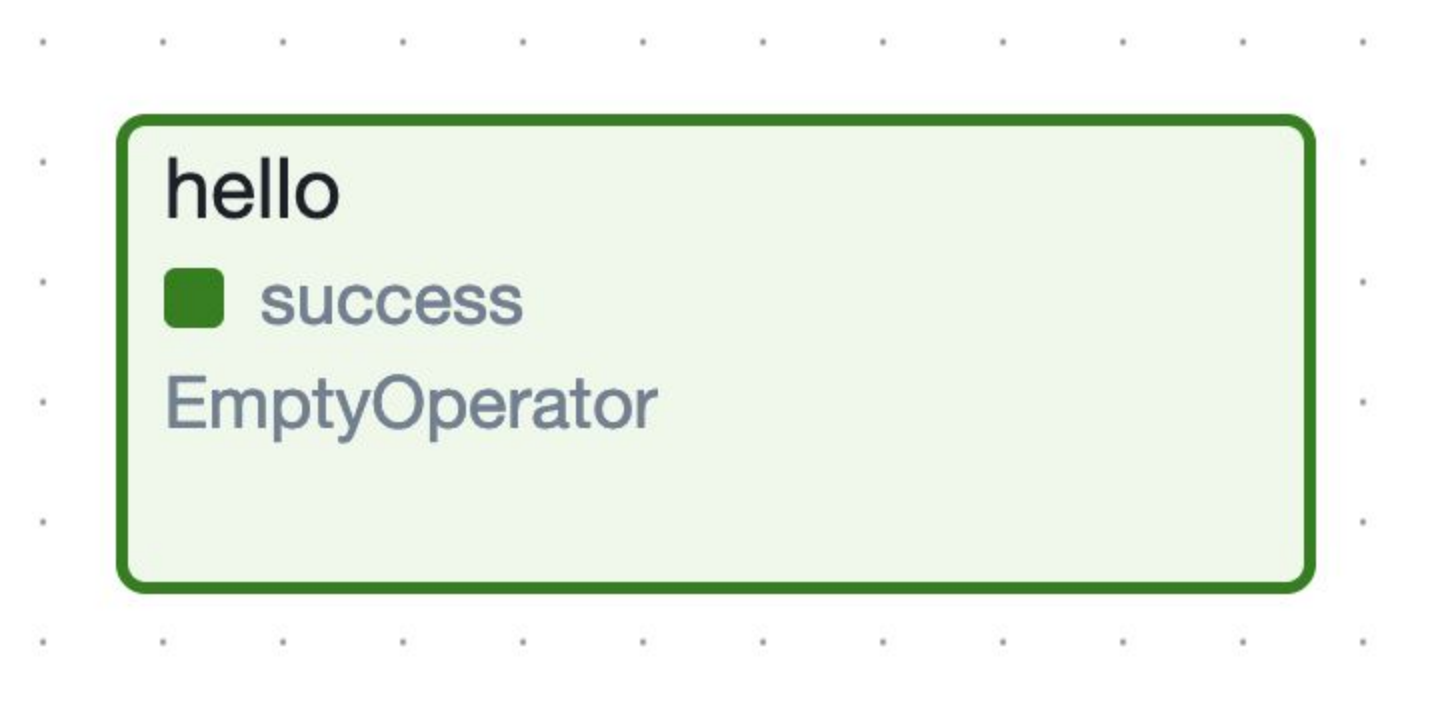

Duration
Aug 28, 23:05
00:00:02
00:00:01
00:00:00
hello
world


hello
🟩 success
EmptyOperator
world
EmptyOperator



```
with DAG(“airflow_summit_2025”):
    h = EmptyOperator(task_id=”hello”)
    # w = EmptyOperator(task_id=”world”)
    # h >> w
```

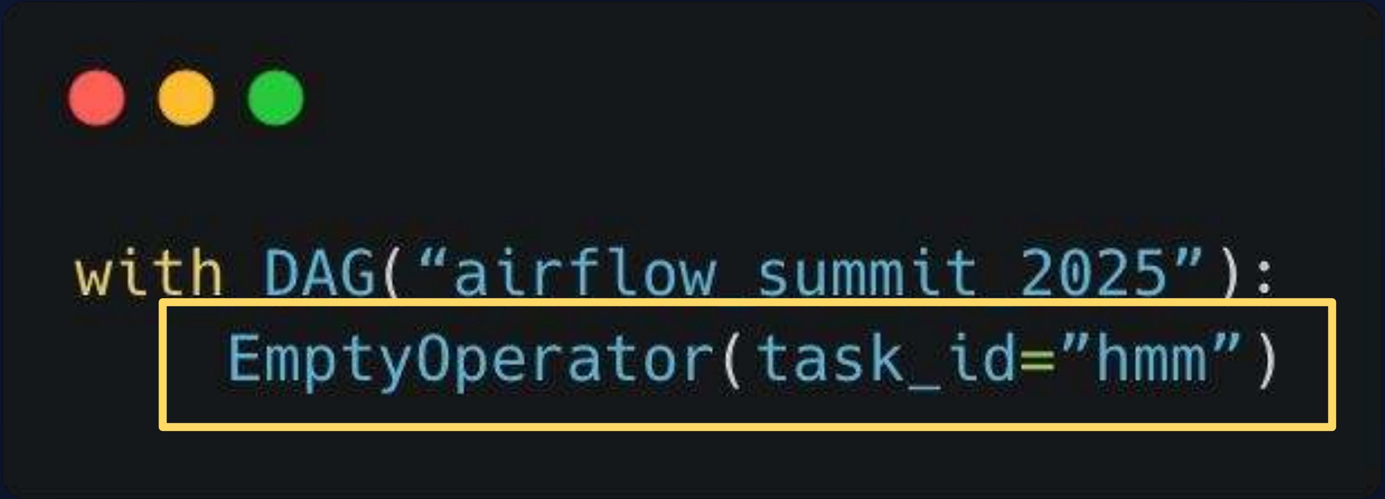

Duration
Aug 28, 23:05
00:00:02
00:00:01
00:00:00
hello



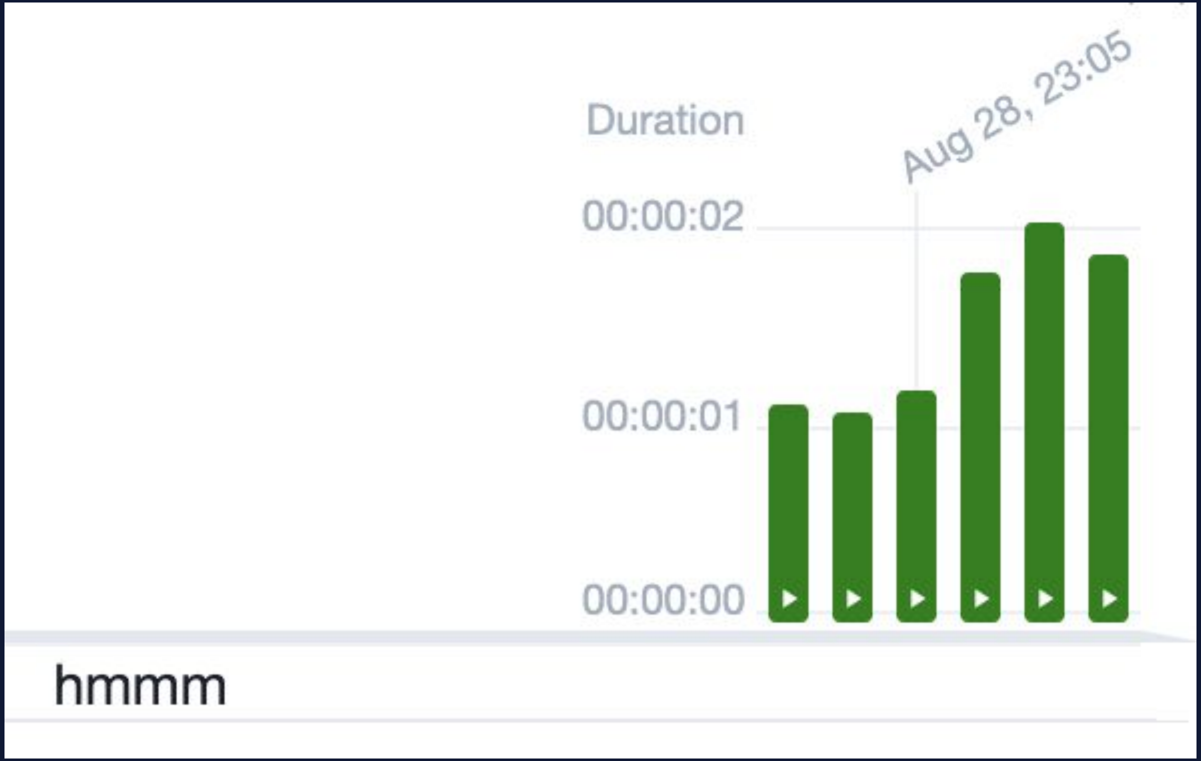
hello

🟩 success

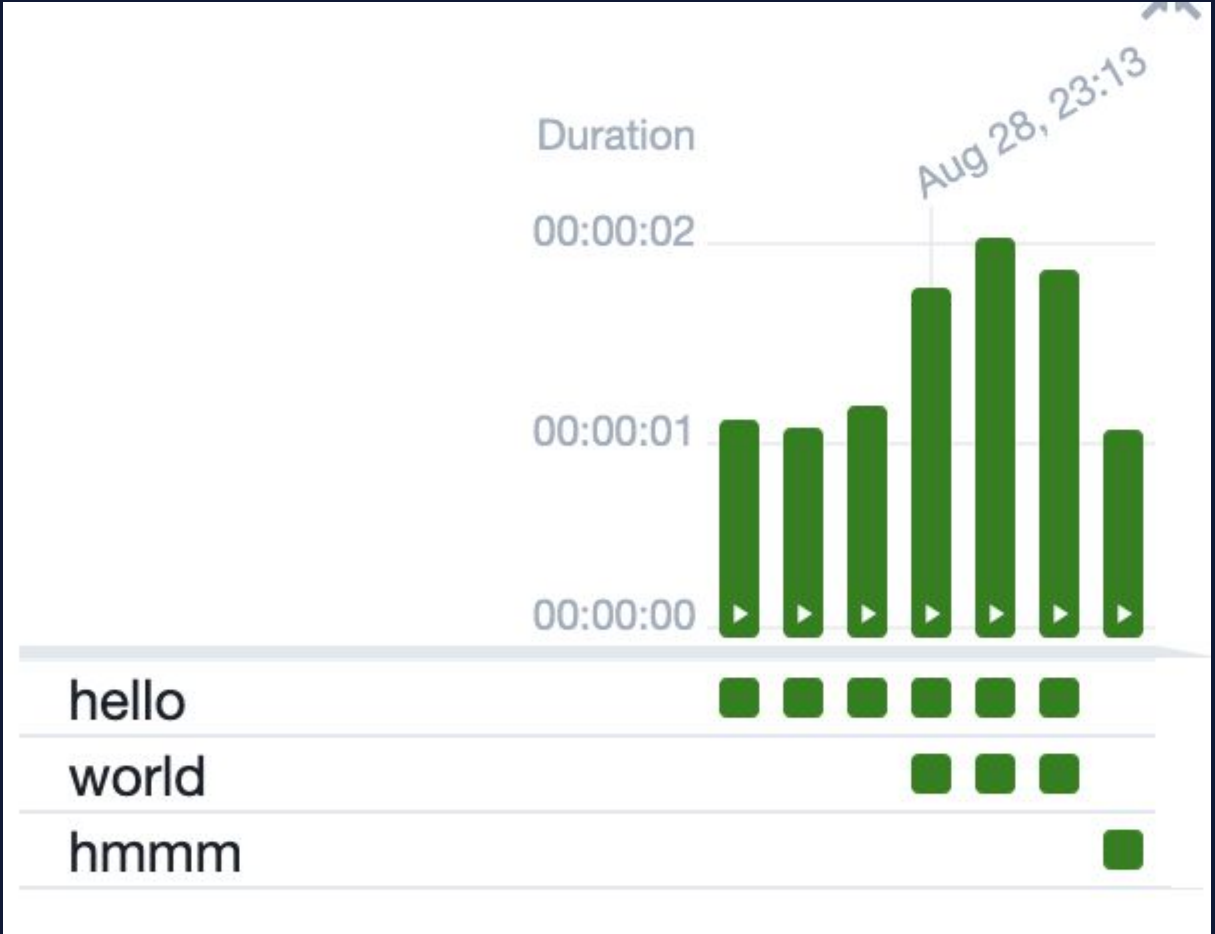
EmptyOperator

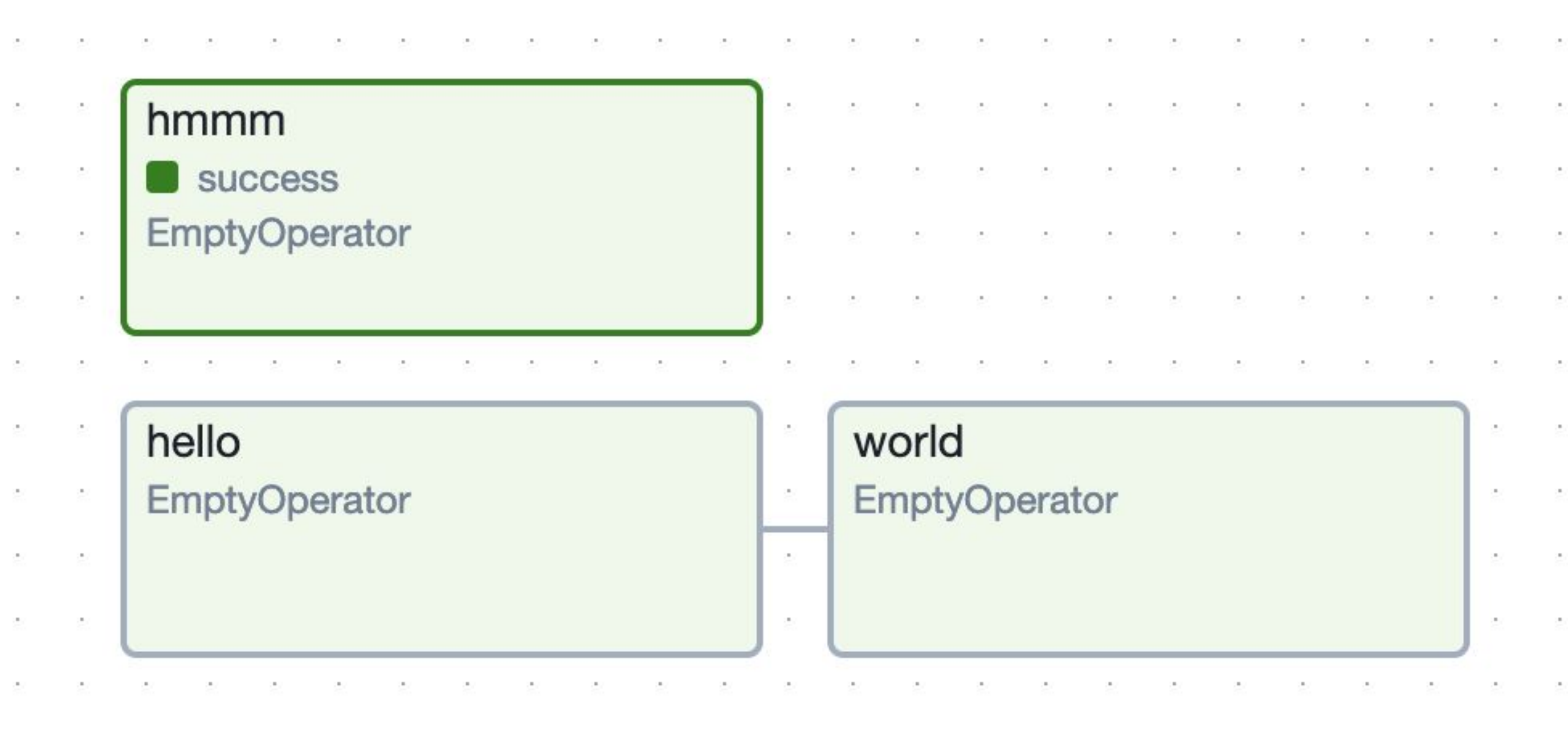


```
with DAG(“airflow summit 2025”):
    EmptyOperator(task_id=”hmm”)
```



hmmm


Aug 28, 23:13
Duration
00:00:02
00:00:01
00:00:00
hello
world
hmmm


hmmm
🟩 success
EmptyOperator
hello
EmptyOperator
world
EmptyOperator

Dag Versioning

Execution
(requires config)

UI
(automatic)

Dag Bundle

collection of Dags and other files

Types of Dag Bundles

Versioned vs not

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Run task using a specific version of

Dag code

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Dag code from
many sources

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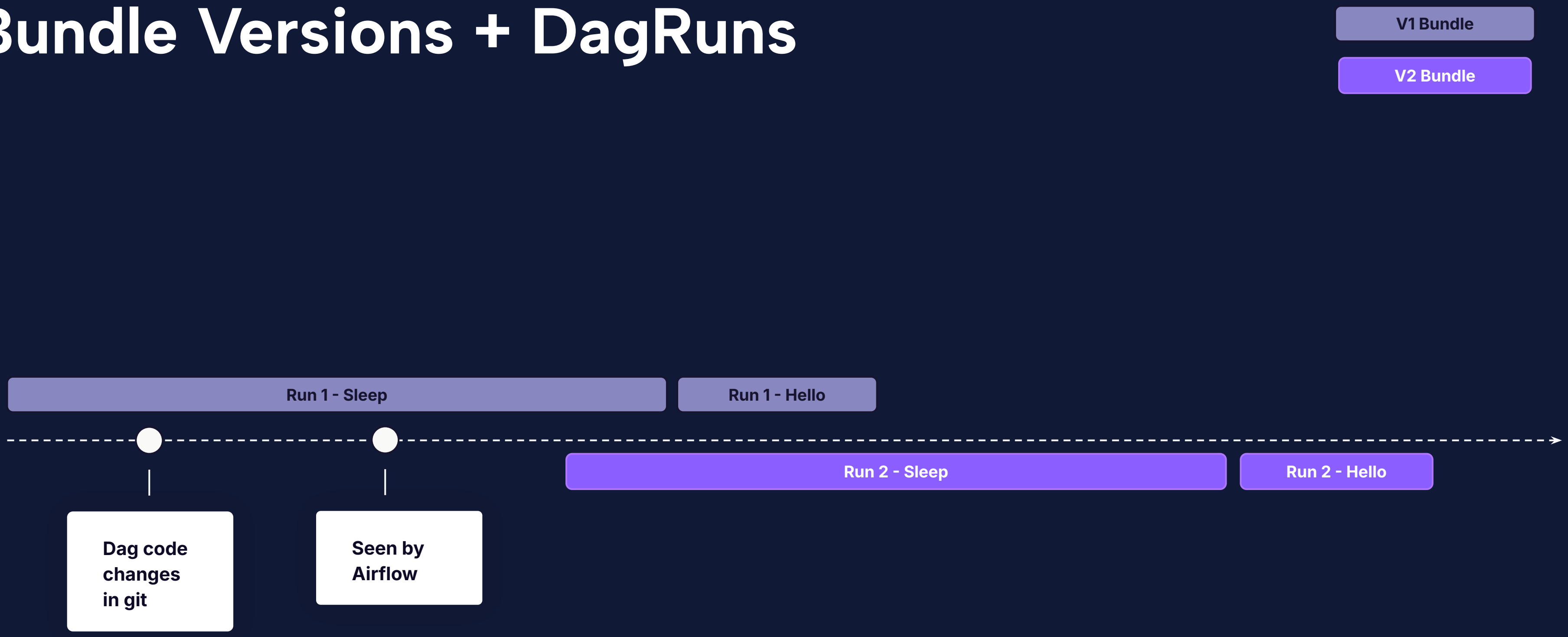
Bundle Versions + DagRuns



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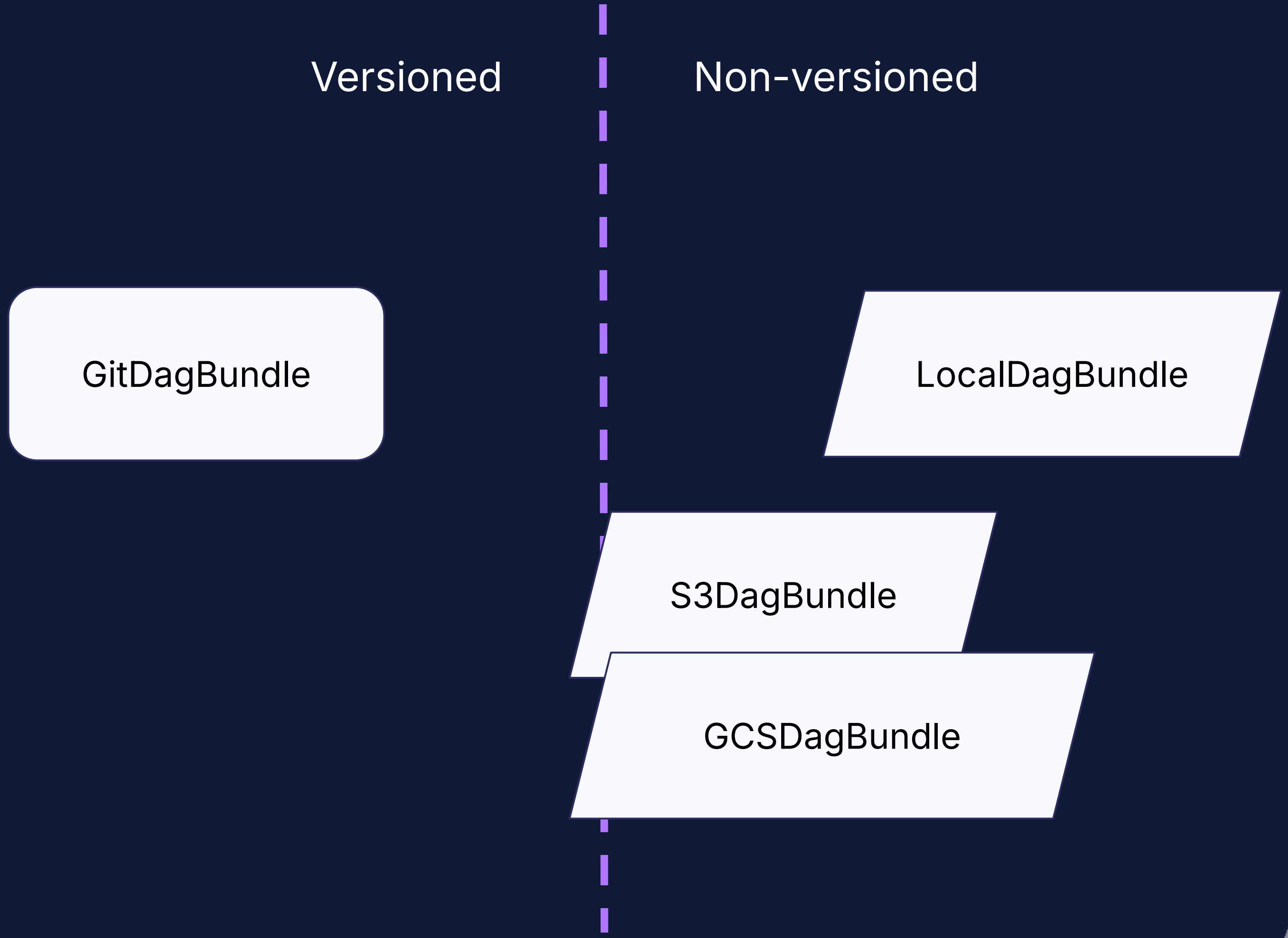


Versioned

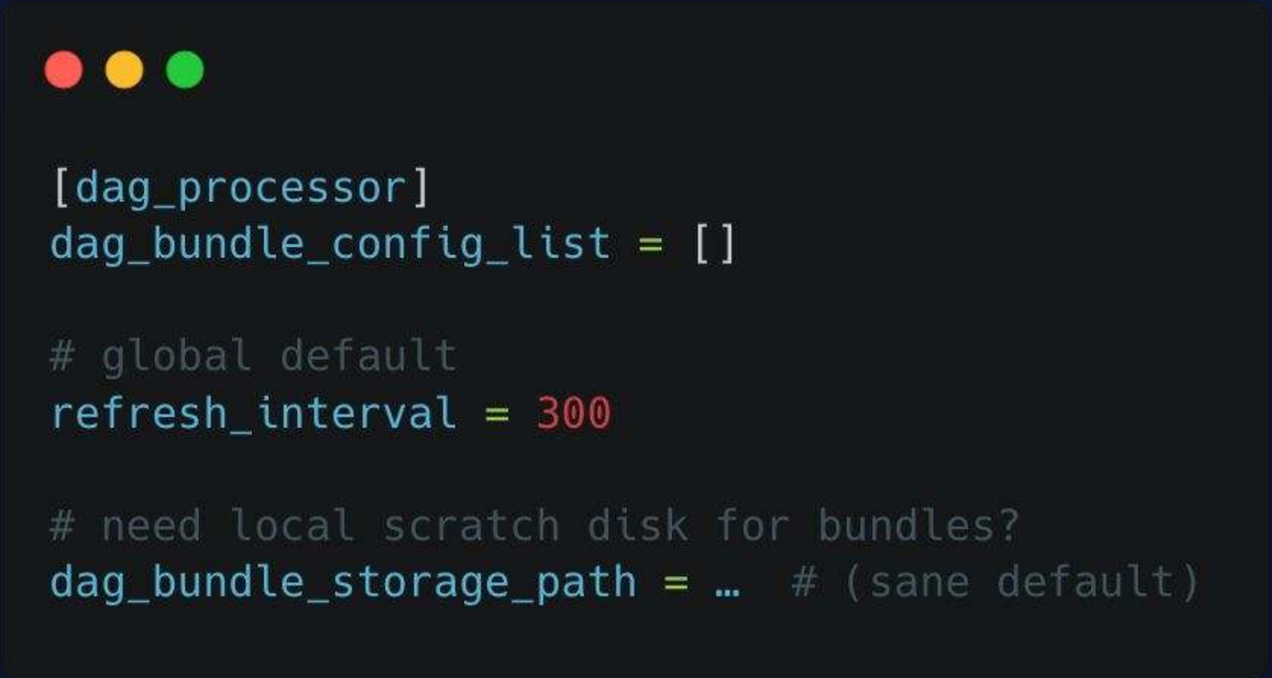
Non-versioned

GitDagBundle

LocalDagBundle

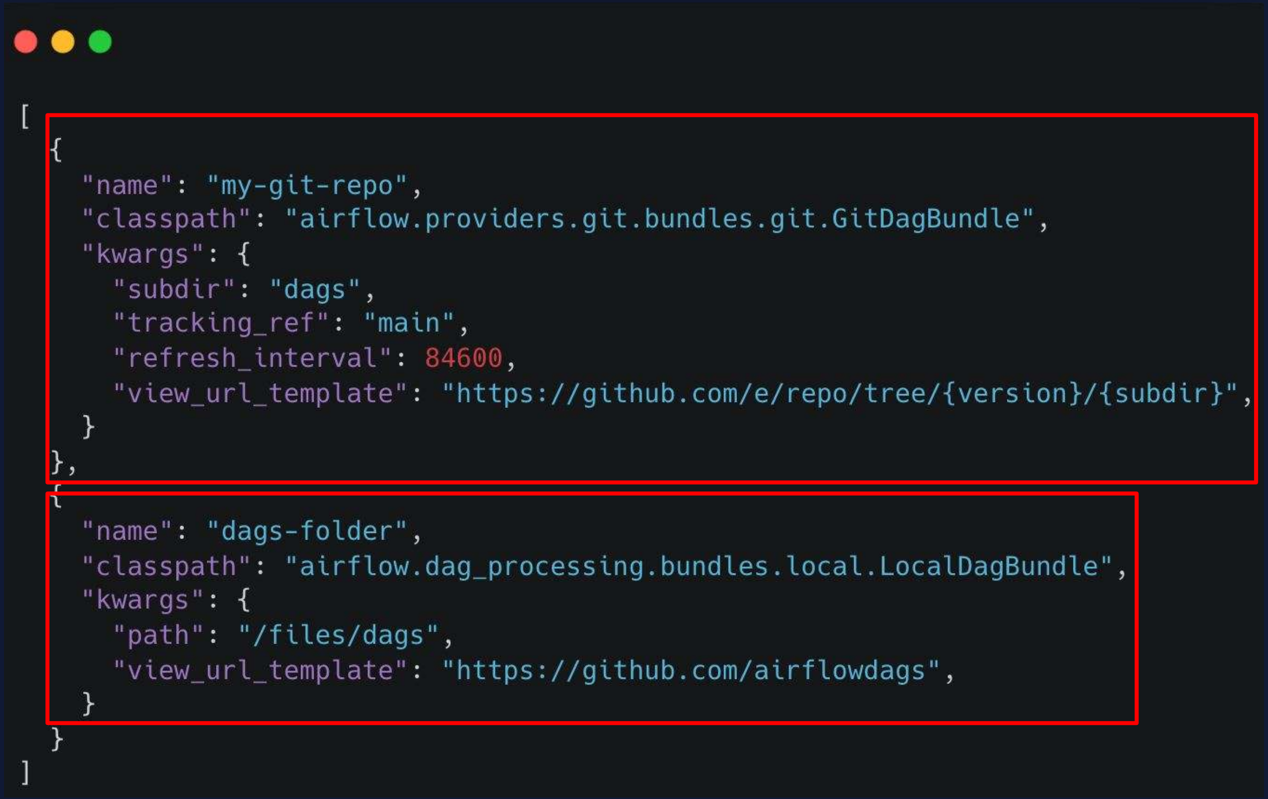
S3DagBundle

GCSDagBundle



```
[dag_processor]
dag_bundle_config_list = []

# global default
refresh_interval = 300

# need local scratch disk for bundles?
dag_bundle_storage_path = …  # (sane default)
```

[dag_processor] dag_bundle_config_list

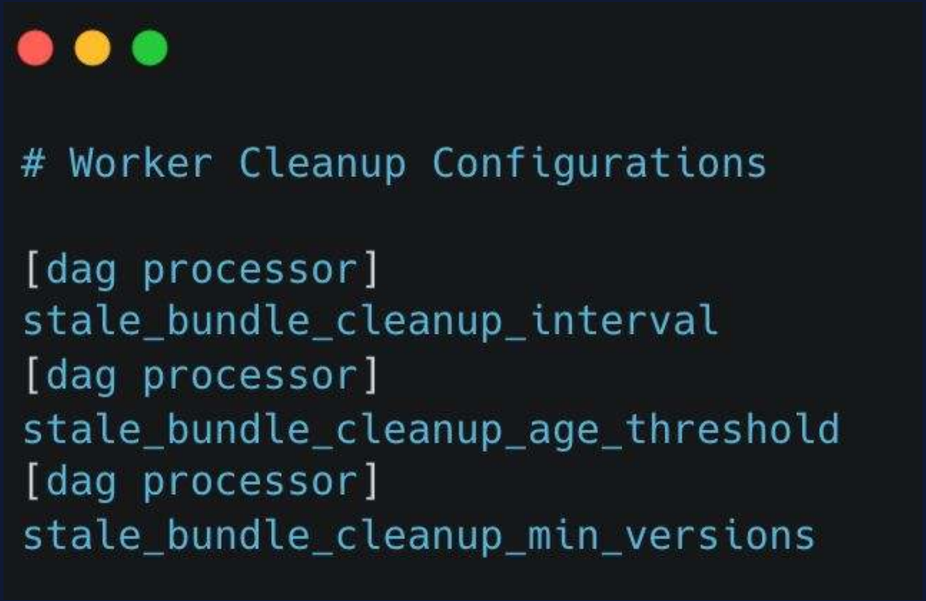


```
[
  {
    "name": "my-git-repo",
    "classpath": "airflow.providers.git.bundles.git.GitDagBundle",
    "kwargs": {
      "subdir": "dags",
      "tracking_ref": "main",
      "refresh_interval": 84600,
      "view_url_template": "https://github.com/e/repo/tree/{version}/{subdir}",
    }
  },
  {
    "name": "dags-folder",
    "classpath": "airflow.dag_processing.bundles.local.LocalDagBundle",
    "kwargs": {
      "path": "/files/dags",
      "view_url_template": "https://github.com/airflowdags",
    }
  }
]
```

Dag bundles lifecycle

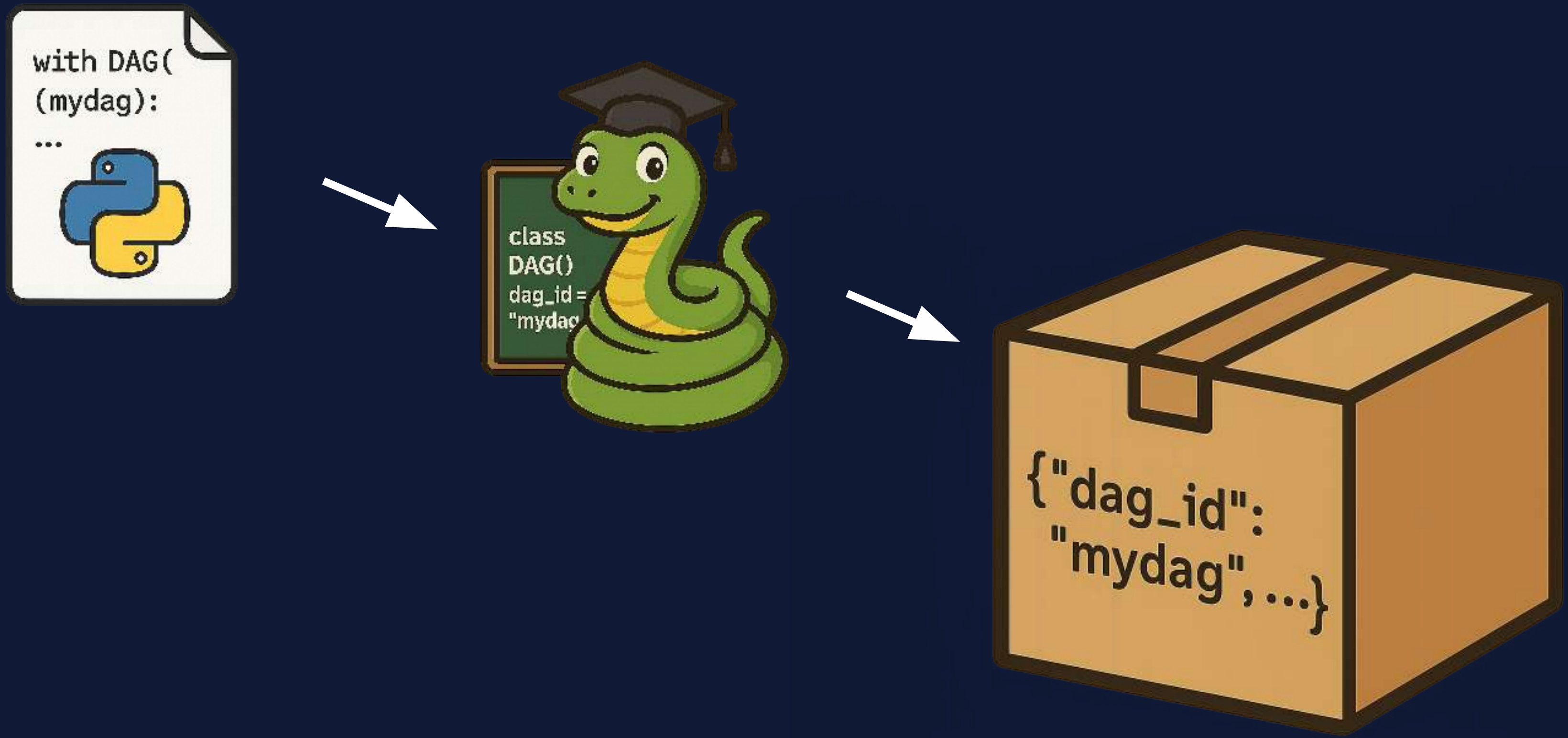
Discovery

- refresh_interval



```
# Worker Cleanup Configurations

[dag processor]
stale_bundle_cleanup_interval
[dag processor]
stale_bundle_cleanup_age_threshold
[dag processor]
stale_bundle_cleanup_min_versions
```

Observed dag version

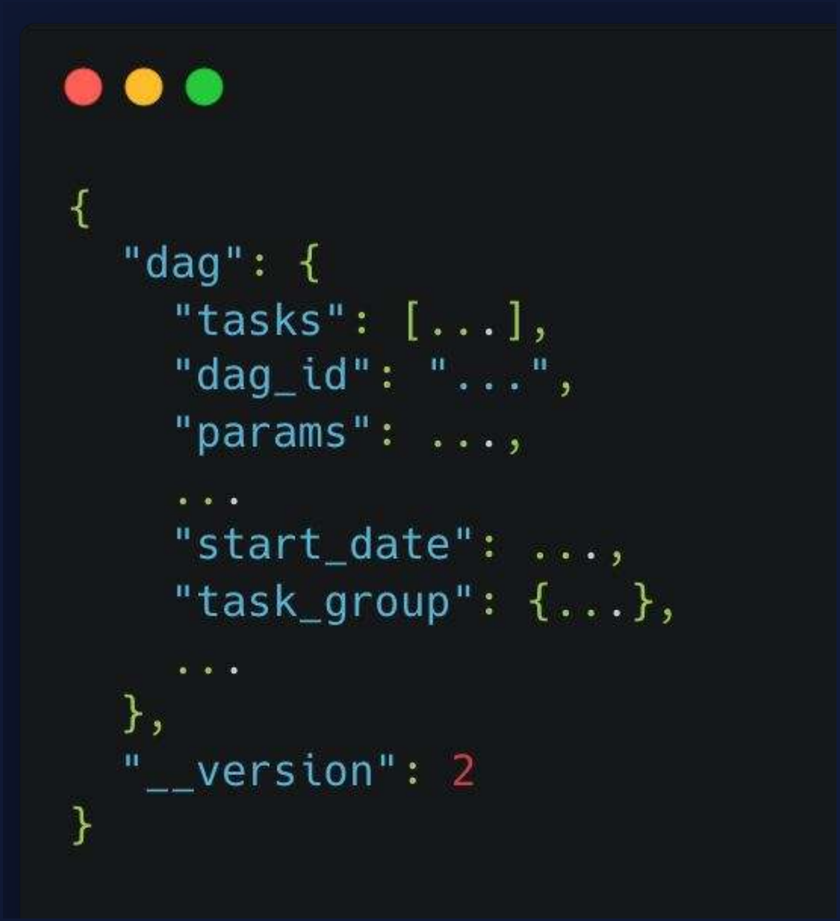


```
with DAG(
(mydag):
...
```

```
class
DAG()
dag_id =
"mydag
```

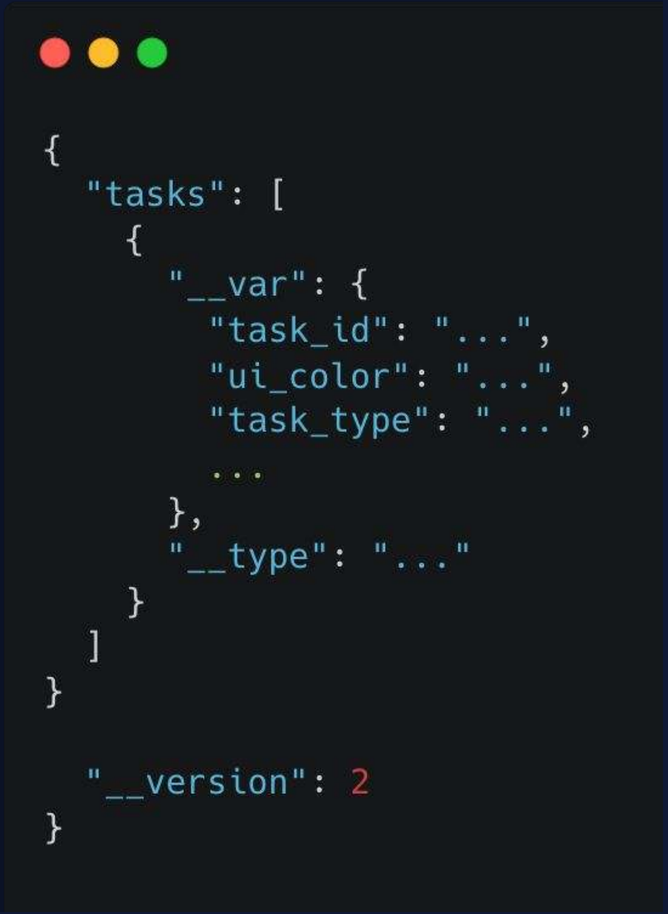
```
{"dag_id":
 "mydag",...}
```

Sample JSON Serialization



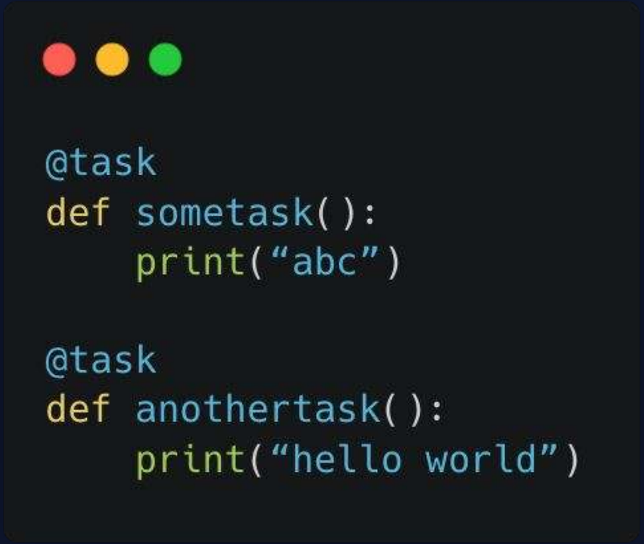
```
{
  "dag": {
    "tasks": [...],
    "dag_id": "...",
    "params": ...,
    ...
    "start_date": ...,
    "task_group": {...},
    ...
  },
  "__version": 2
}
```

Sample JSON Serialization

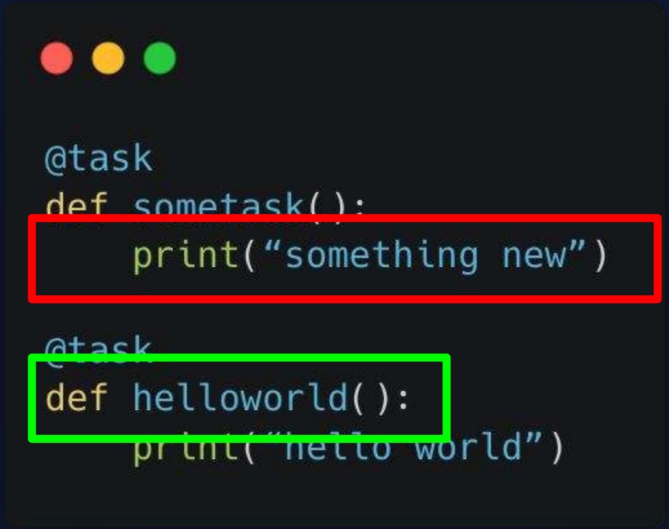


```
{
  "tasks": [
    {
      "__var": {
        "task_id": "...",
        "ui_color": "...",
        "task_type": "...",
        ...
      },
      "__type": "..."
    }
  ]
}

  "__version": 2
}
```

Observed dag version

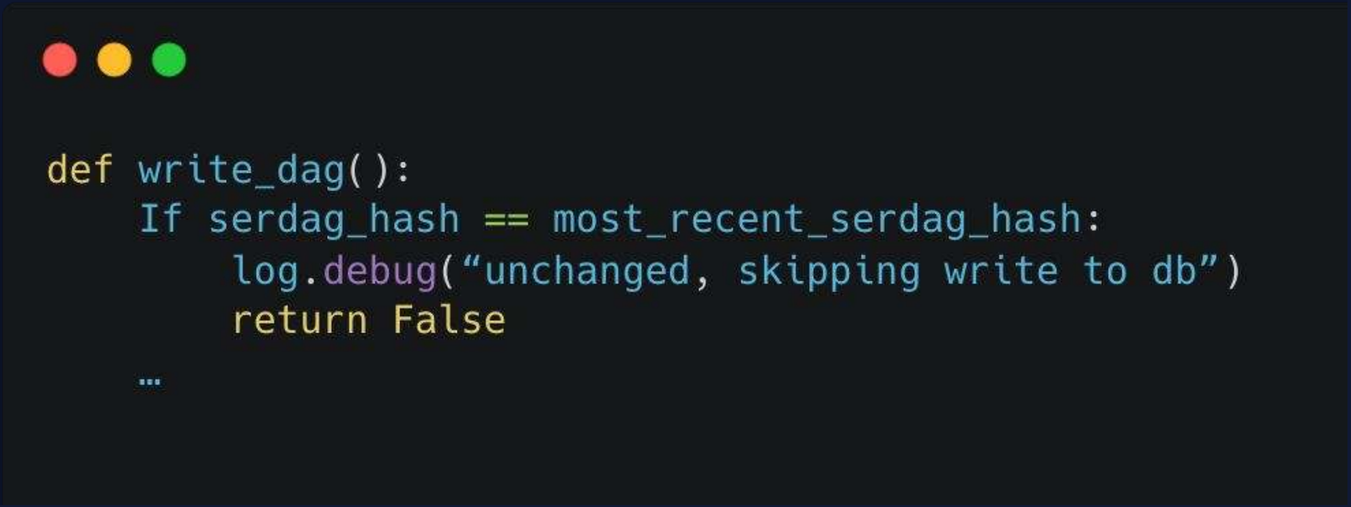


```
@task
def sometask():
    print(“abc”)

@task
def anothertask():
    print(“hello world”)
```

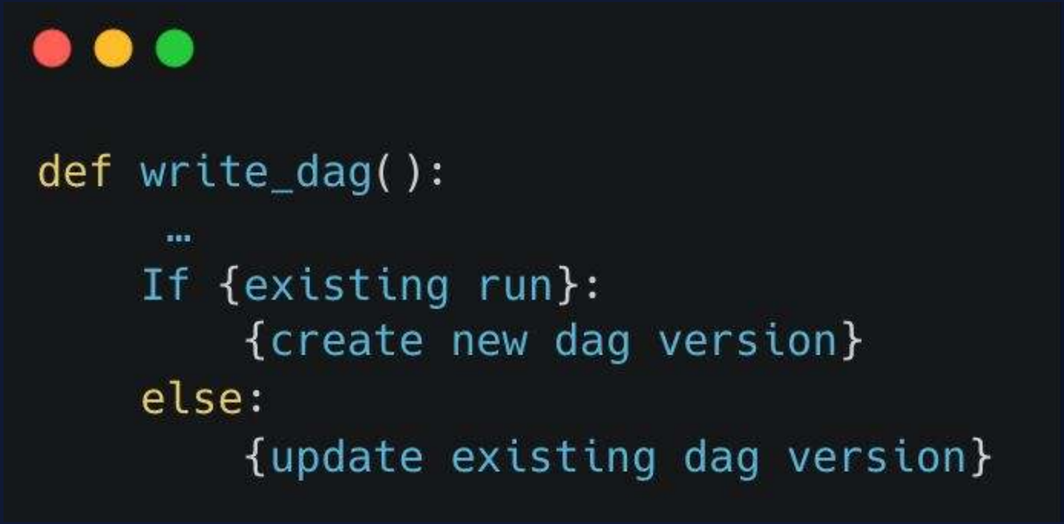


```
@task
def sometask():
    print(“something new”)

@task
def helloworld():
    print(“hello world”)
```

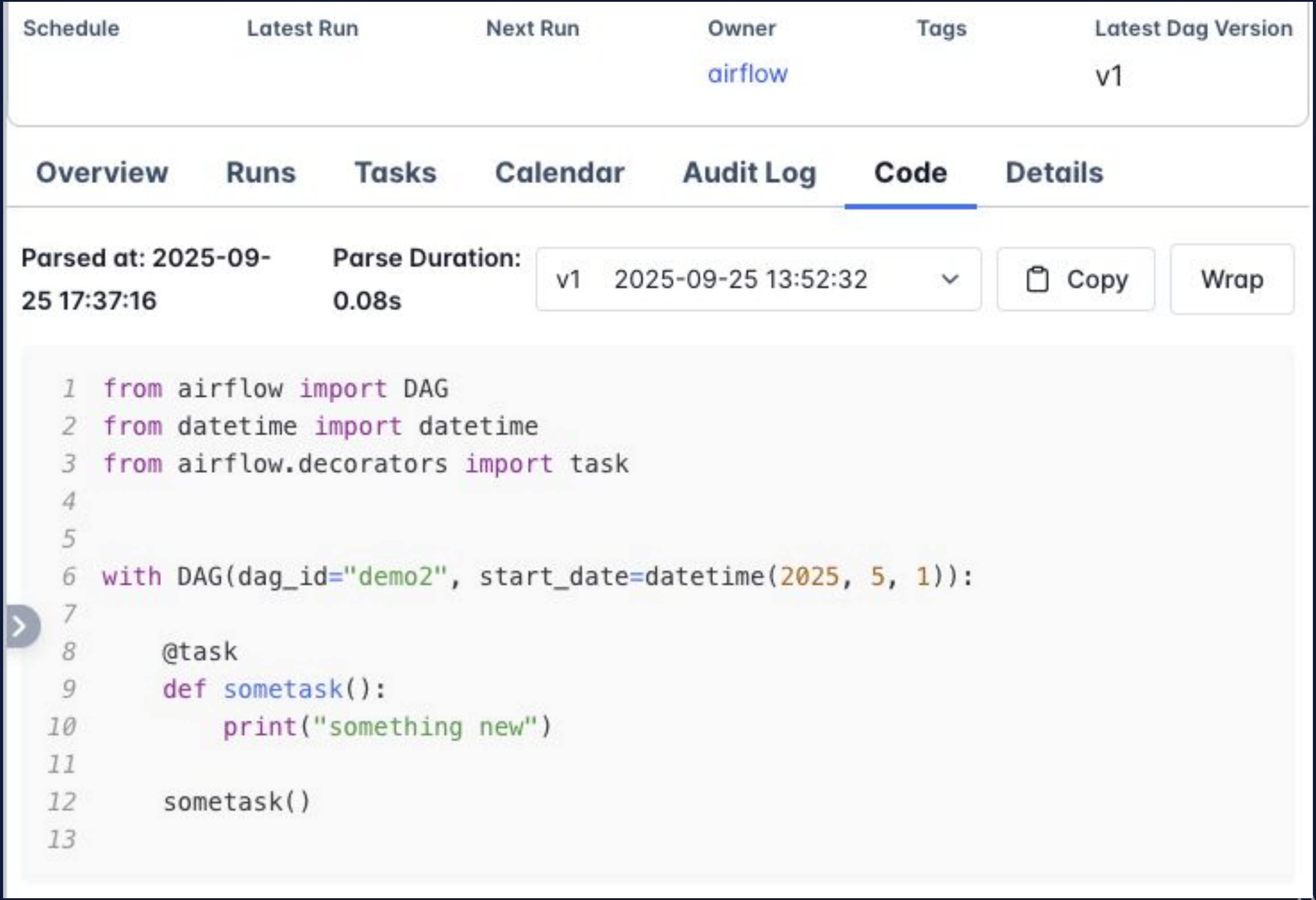
How do we create new observed dag versions?



```
def write_dag():
    If serdag_hash == most_recent_serdag_hash:
        log.debug(“unchanged, skipping write to db”)
        return False
    …
```



```
def write_dag():
     …
    If {existing run}:
        {create new dag version}
    else:
        {update existing dag version}
```



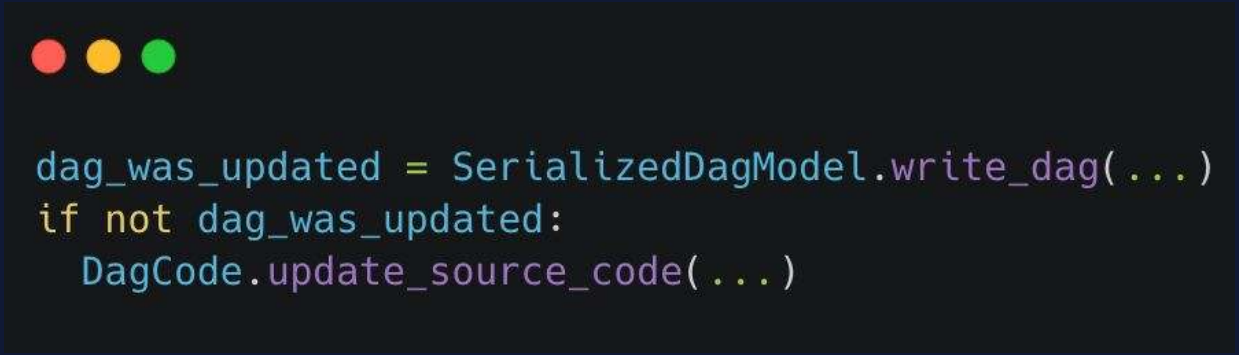
Schedule	Latest Run	Next Run	Owner	Tags	Latest Dag Version
			airflow		v1

Parsed at: 2025-09-25 17:37:16

Parse Duration: 0.08s

v1 2025-09-25 13:52:32

```python
from airflow import DAG
from datetime import datetime
from airflow.decorators import task


with DAG(dag_id="demo2", start_date=datetime(2025, 5, 1)):

    @task
    def sometask():
        print("something new")

    sometask()

```



```
dag_was_updated = SerializedDagModel.write_dag(...)
if not dag_was_updated:
  DagCode.update_source_code(...)
```

How are bundles versioned?

Bundle and Observed dag version, what is the difference?

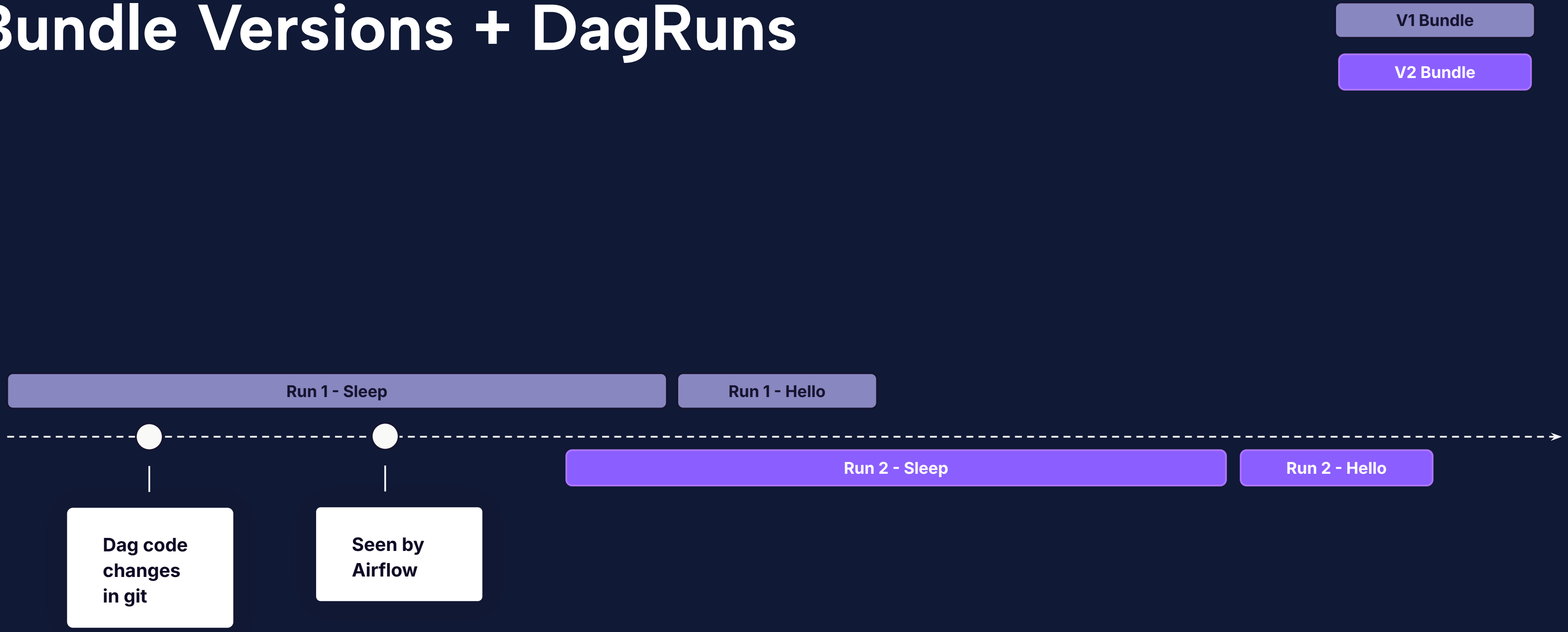
Bundle version → The version of a Dag bundle (the whole code snapshot)

DAG version → The version of a single Dag definition as observed after parsing/serialization.

A look into dag parsing loop

- **Version-aware refresh**
- **Per-bundle discovery**
- **Reconciliation after refresh:**
  - Removed files & import errors
- **Isolation & parallelism by file**

Bundle Versions + DagRuns



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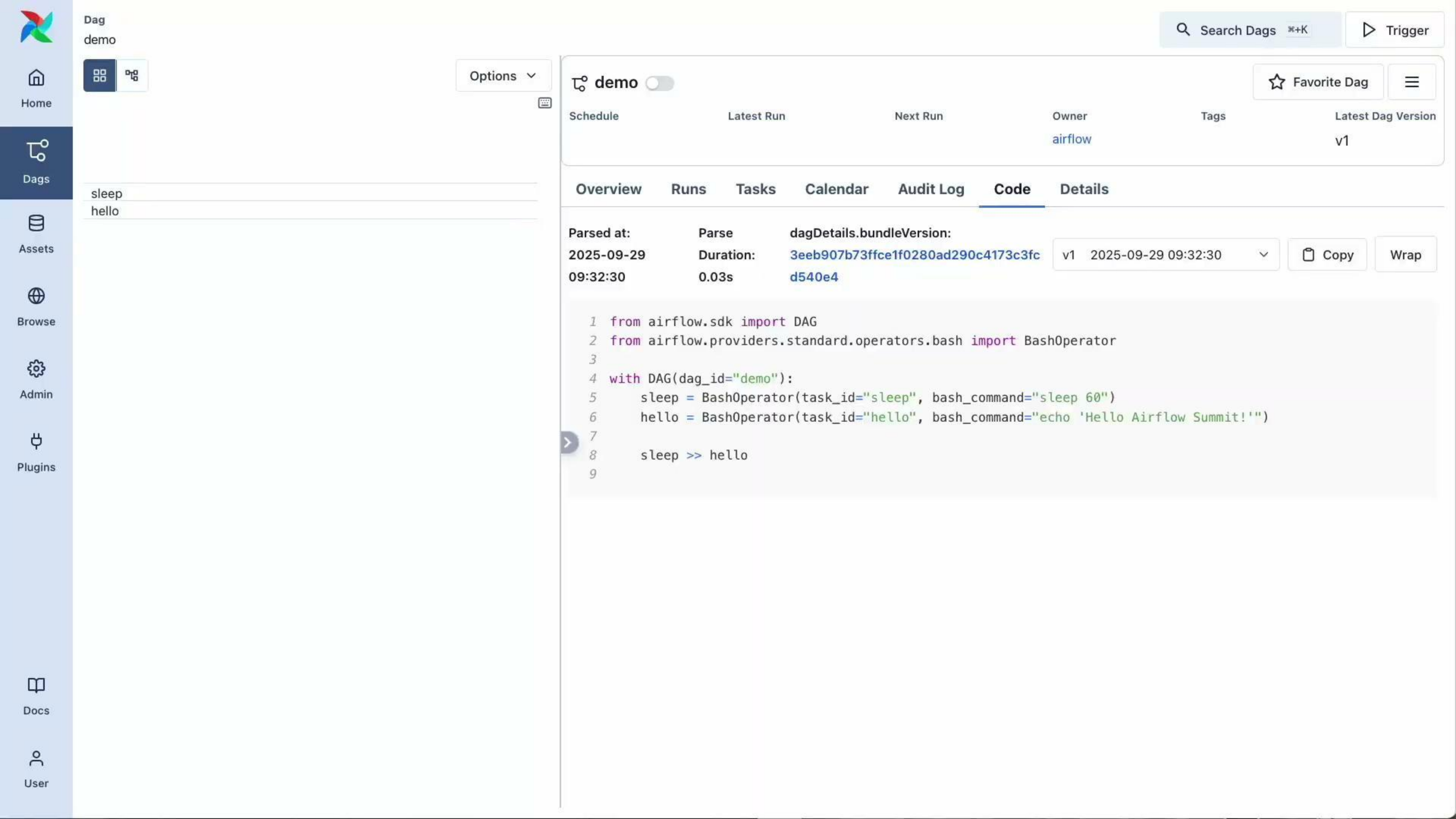


Owner: airflow

Latest Dag Version: v1

Parsed at: 2025-09-29 09:32:30

Parse Duration: 0.03s

dagDetails.bundleVersion: 3eeb907b73ffce1f0280ad290c4173c3fcd540e4

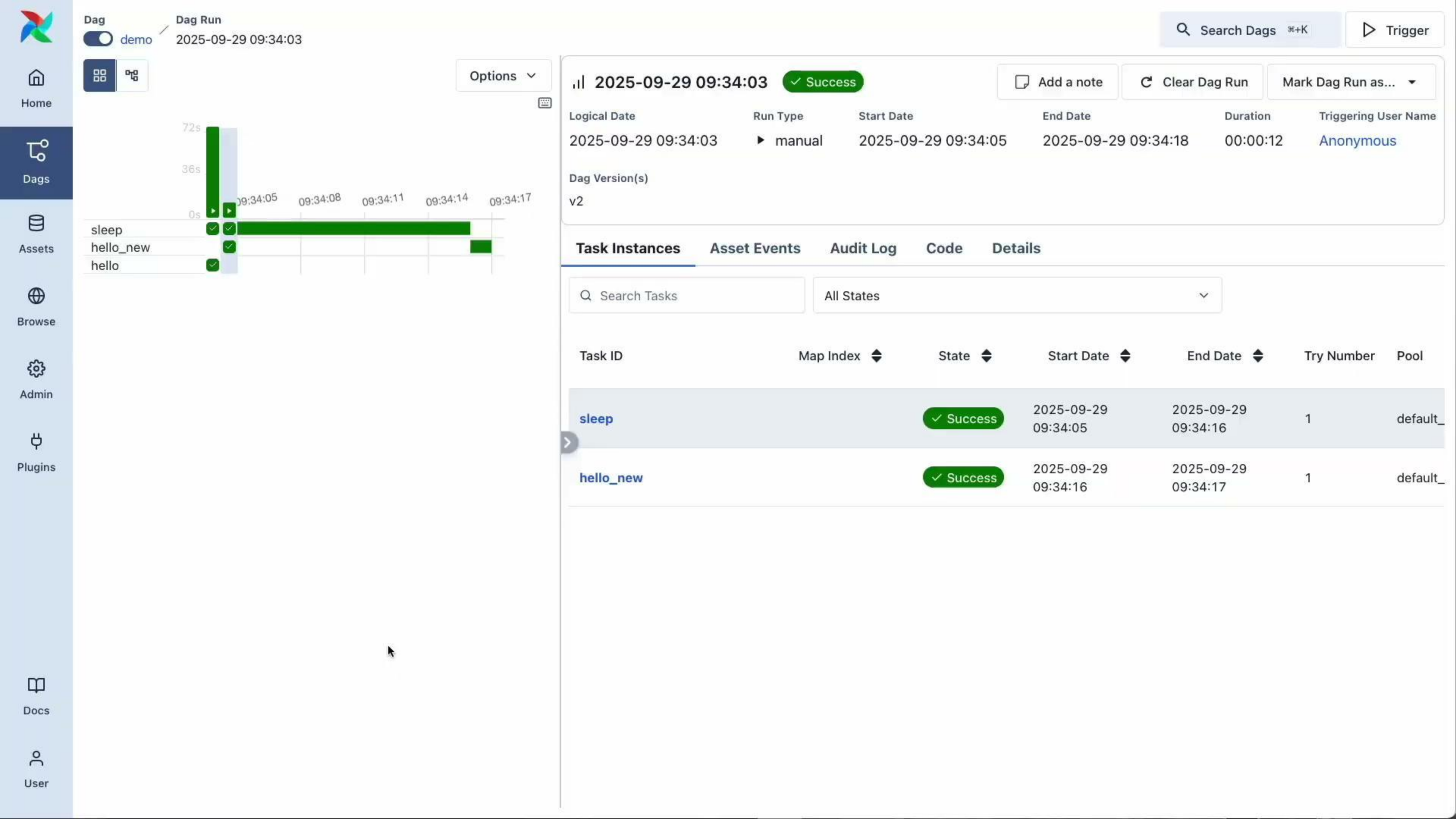
v1 2025-09-29 09:32:30

```python
from airflow.sdk import DAG
from airflow.providers.standard.operators.bash import BashOperator

with DAG(dag_id="demo"):
    sleep = BashOperator(task_id="sleep", bash_command="sleep 60")
    hello = BashOperator(task_id="hello", bash_command="echo 'Hello Airflow Summit!'")

    sleep >> hello

```



Dag: demo / Dag Run: 2025-09-29 09:34:03

2025-09-29 09:34:03 ✓ Success

Logical Date	Run Type	Start Date	End Date	Duration	Triggering User Name
2025-09-29 09:34:03	manual	2025-09-29 09:34:05	2025-09-29 09:34:18	00:00:12	Anonymous

Dag Version(s)
v2

Task ID	Map Index	State	Start Date	End Date	Try Number	Pool
sleep		✓ Success	2025-09-29 09:34:05	2025-09-29 09:34:16	1	default_
hello_new		✓ Success	2025-09-29 09:34:16	2025-09-29 09:34:17	1	default_

3.1+ only

Rerunning dags/taskinstance: versioning behaviour

3.1+ only

When you clear a dag/task instances

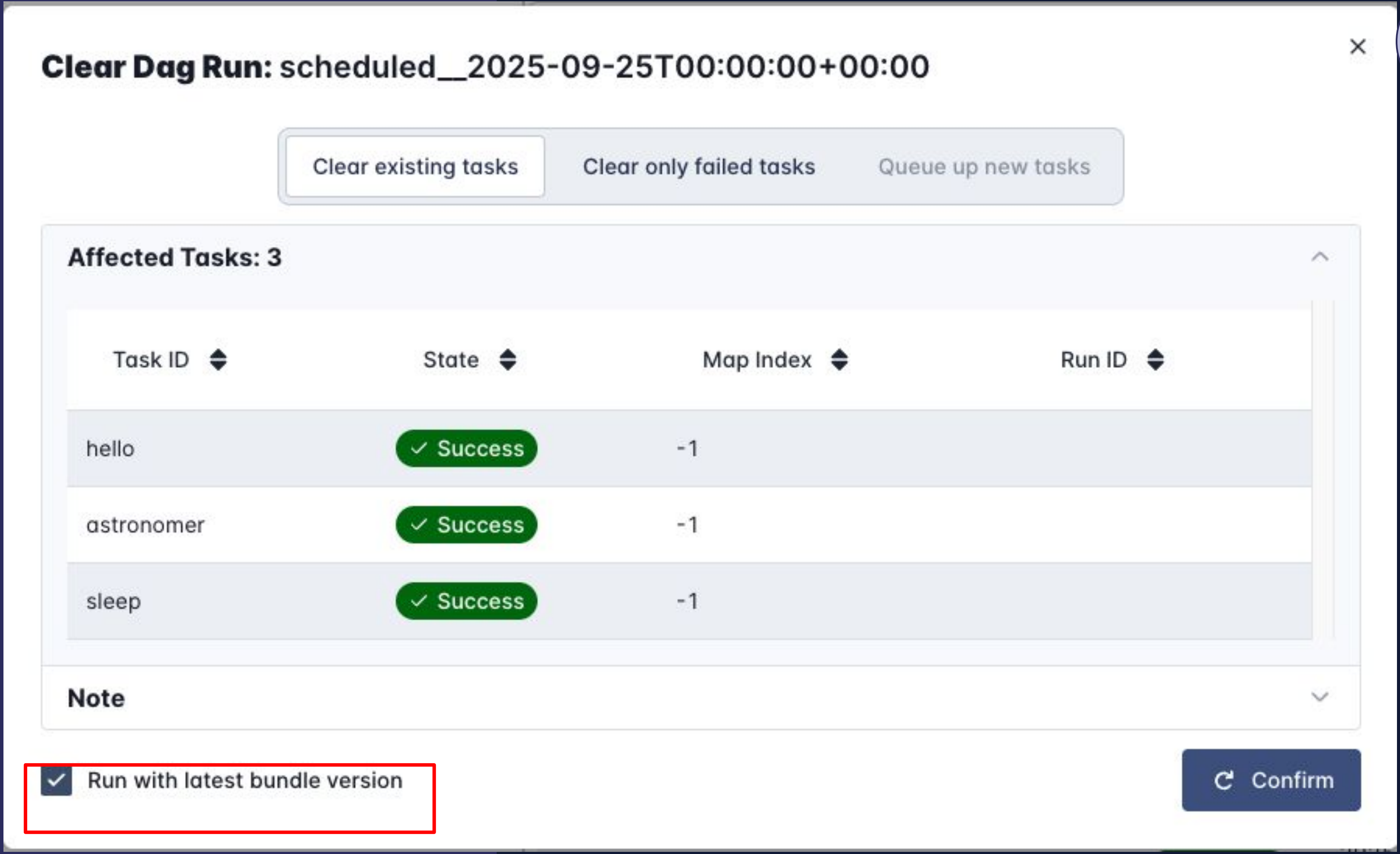
You have two options:

1. **Original serialized dag/bundle version (default)**

2. **Latest dag/bundle version**

∗Only applicable to versioned bundles*

3.1+ only



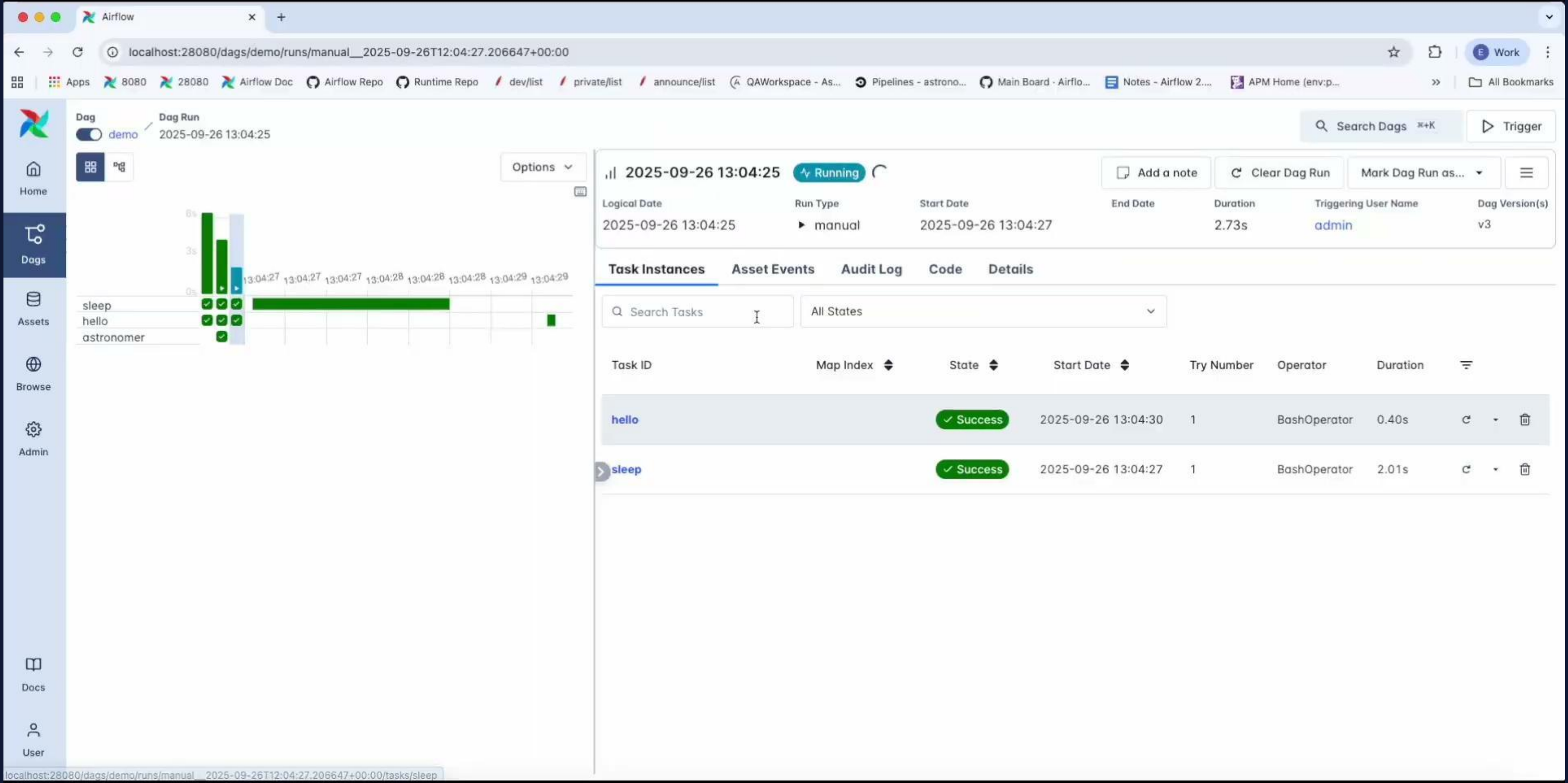
Clear Dag Run: scheduled__2025-09-25T00:00:00+00:00

Affected Tasks: 3

Task ID	State	Map Index	Run ID
hello	✓ Success	-1	
astronomer	✓ Success	-1	
sleep	✓ Success	-1	

Note

☑ Run with latest bundle version



Dag: demo / Dag Run: 2025-09-26 13:04:25

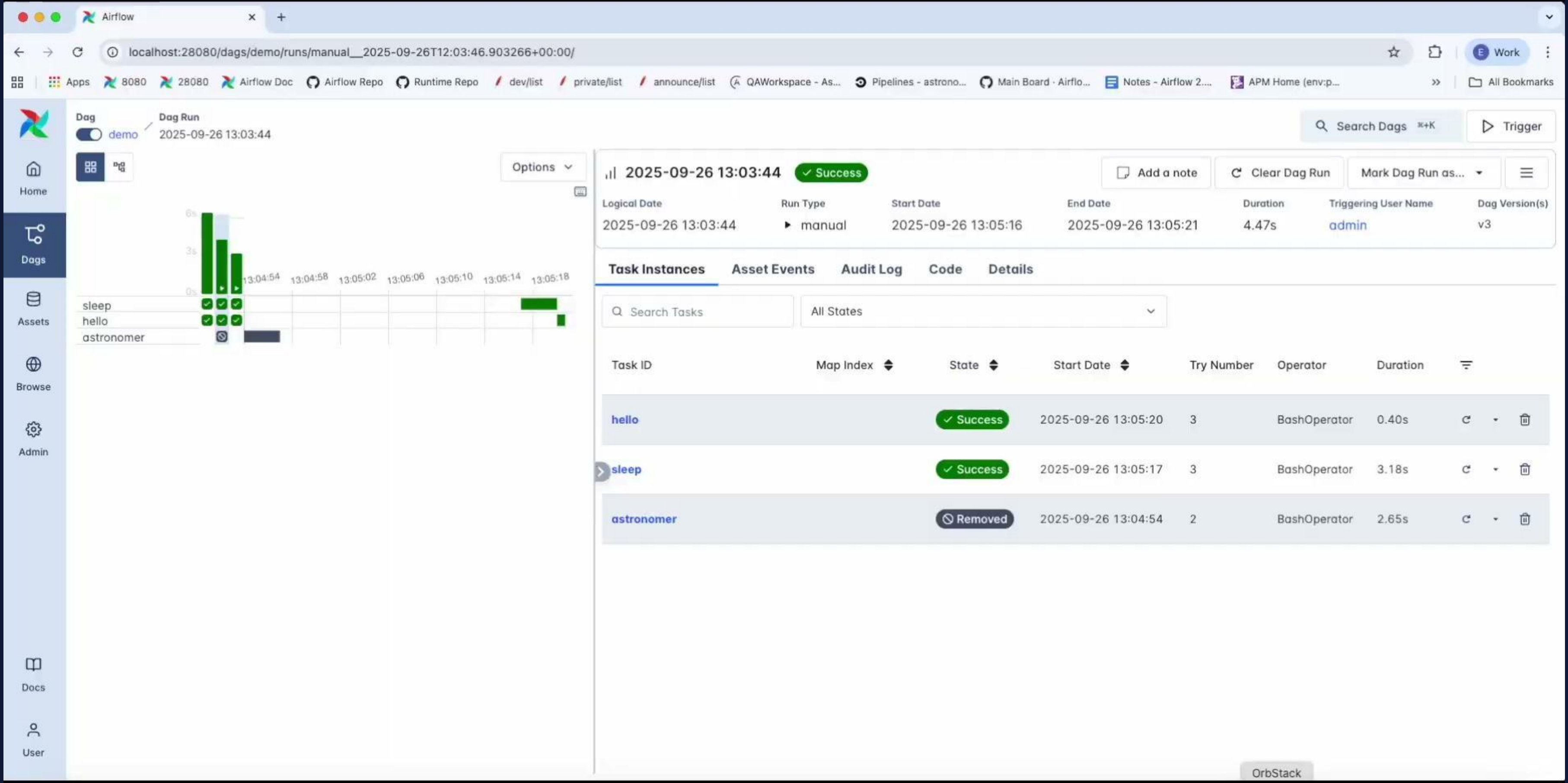
2025-09-26 13:04:25 Running

Logical Date	Run Type	Start Date	End Date	Duration	Triggering User Name	Dag Version(s)
2025-09-26 13:04:25	manual	2025-09-26 13:04:27		2.73s	admin	v3

Task ID	Map Index	State	Start Date	Try Number	Operator	Duration
hello		✓ Success	2025-09-26 13:04:30	1	BashOperator	0.40s
sleep		✓ Success	2025-09-26 13:04:27	1	BashOperator	2.01s

localhost:28080/dags/demo/runs/manual__2025-09-26T12:04:27.206647+00:00/tasks/sleep

MER

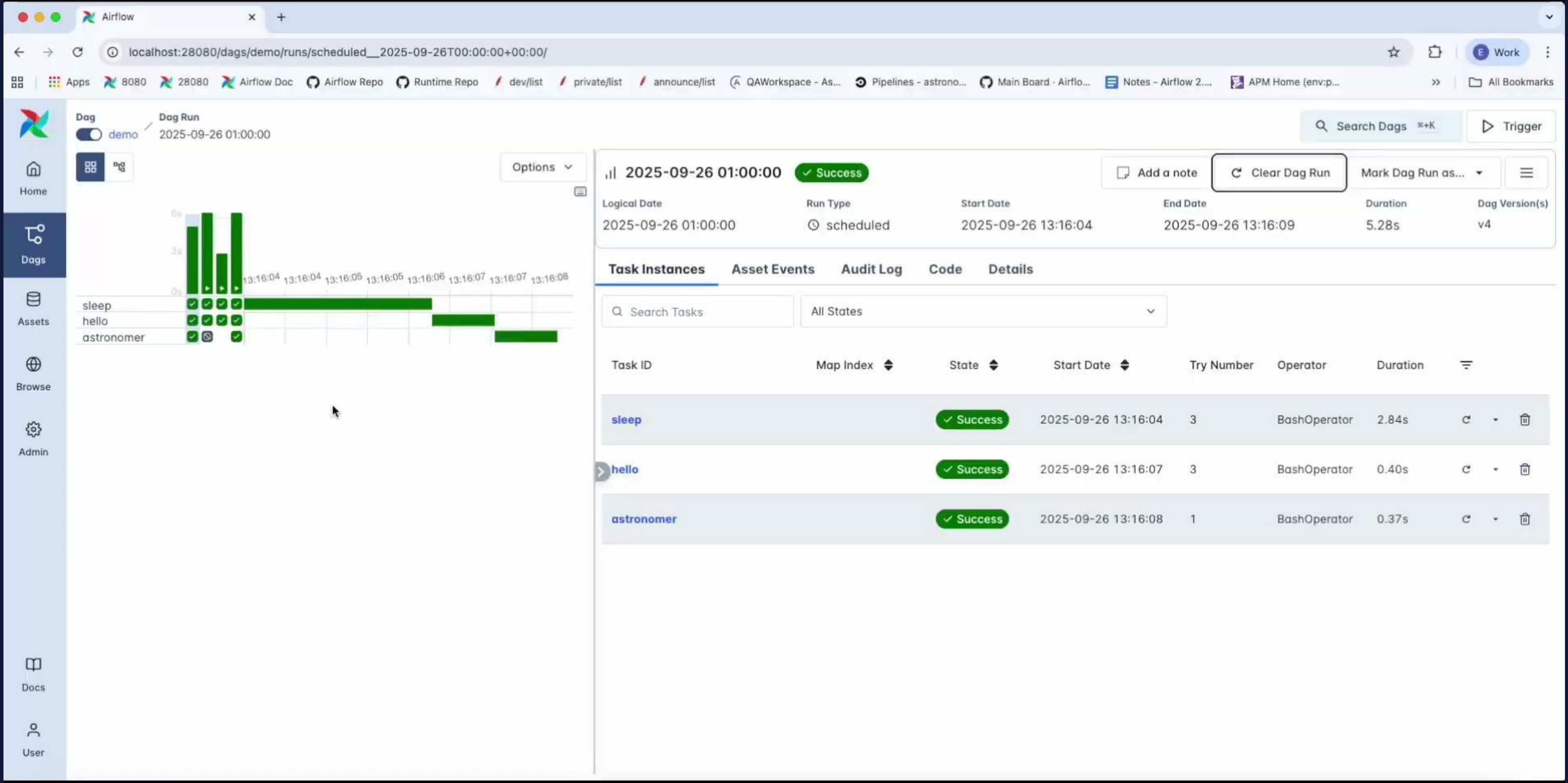


Dag: demo / Dag Run: 2025-09-26 13:03:44

2025-09-26 13:03:44 ✓ Success

Logical Date	Run Type	Start Date	End Date	Duration	Triggering User Name	Dag Version(s)
2025-09-26 13:03:44	manual	2025-09-26 13:05:16	2025-09-26 13:05:21	4.47s	admin	v3

Task ID	Map Index	State	Start Date	Try Number	Operator	Duration
hello		✓ Success	2025-09-26 13:05:20	3	BashOperator	0.40s
sleep		✓ Success	2025-09-26 13:05:17	3	BashOperator	3.18s
astronomer		Removed	2025-09-26 13:04:54	2	BashOperator	2.65s



Dag
demo

Dag Run
2025-09-26 01:00:00

2025-09-26 01:00:00 ✓ Success

Logical Date	Run Type	Start Date	End Date	Duration	Dag Version(s)
2025-09-26 01:00:00	scheduled	2025-09-26 13:16:04	2025-09-26 13:16:09	5.28s	v4

Task Instances | Asset Events | Audit Log | Code | Details

Search Tasks
All States

Task ID	Map Index	State	Start Date	Try Number	Operator	Duration
sleep		✓ Success	2025-09-26 13:16:04	3	BashOperator	2.84s
hello		✓ Success	2025-09-26 13:16:07	3	BashOperator	0.40s
astronomer		✓ Success	2025-09-26 13:16:08	1	BashOperator	0.37s

MER

3.1+ only

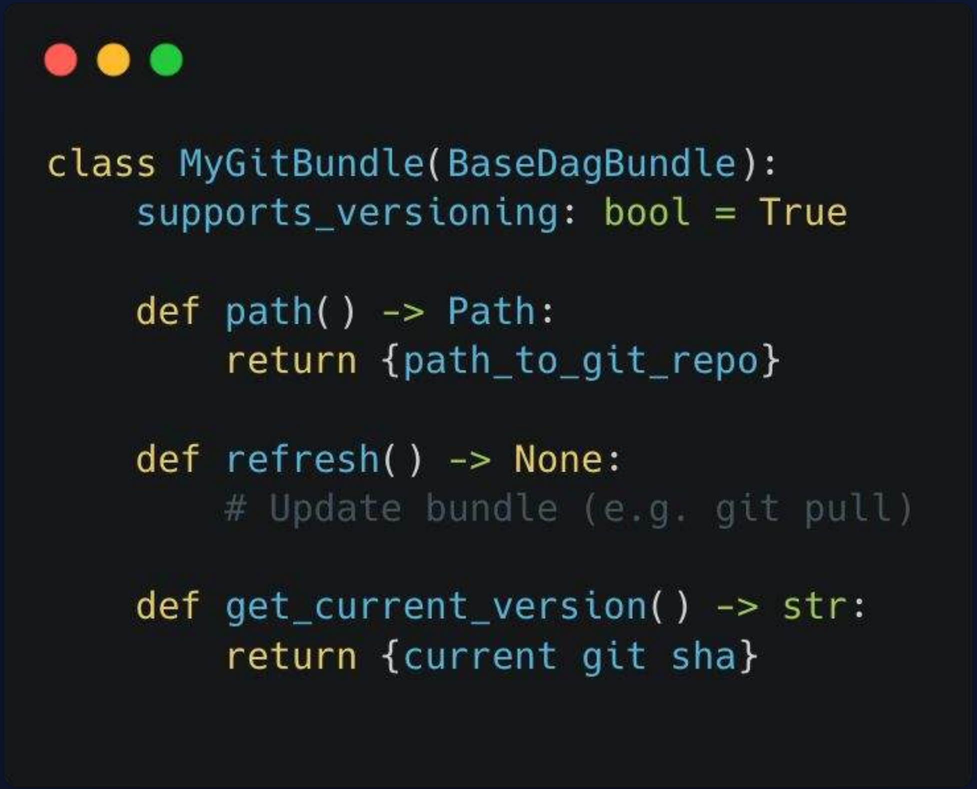
Clearing DAGs / Task Instances; What Changes vs. What Doesn’t

Only versions change: Updates Serialized Dag Version and Bundle Version on your request.

Topology: Because of the above request, a new task can be added or tasks marked removed but the TIs on the dagrun are never removed

Non-versioned bundle: No option to clear with the latest bundle version since it runs always with the latest version change

Custom Bundles 📦?
Of course!

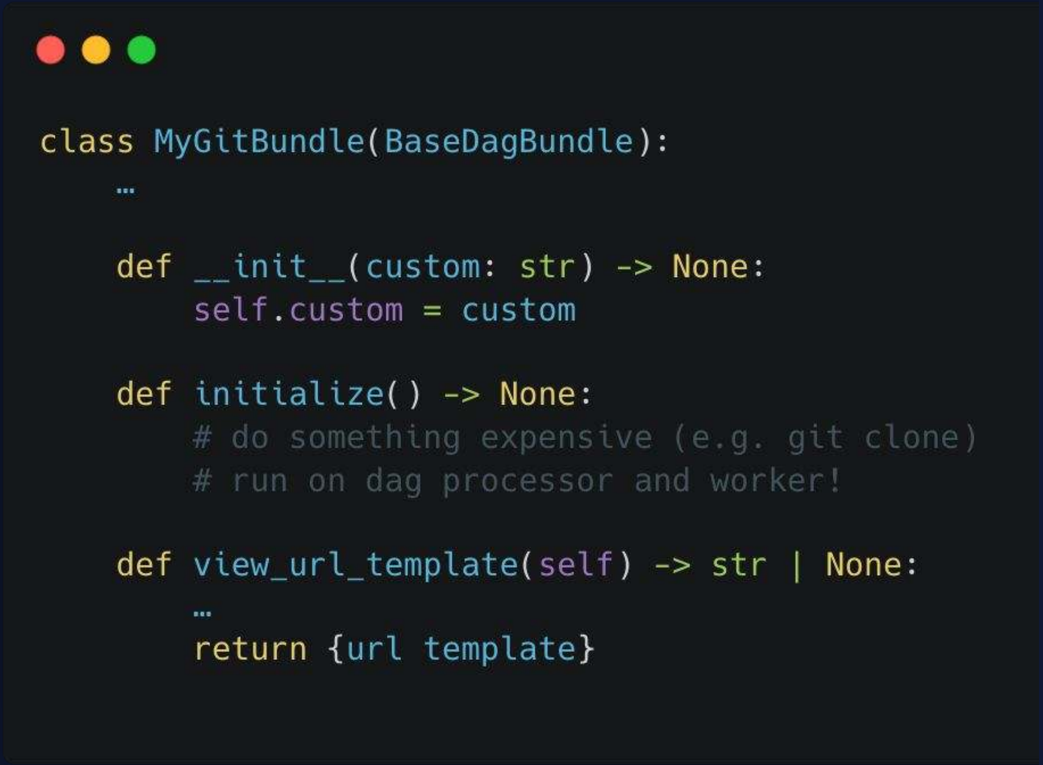


```
class MyGitBundle(BaseDagBundle):
    supports_versioning: bool = True

    def path() -> Path:
        return {path_to_git_repo}

    def refresh() -> None:
        # Update bundle (e.g. git pull)

    def get_current_version() -> str:
        return {current git sha}
```



```python
class MyGitBundle(BaseDagBundle):
    …

    def __init__(custom: str) -> None:
        self.custom = custom

    def initialize() -> None:
        # do something expensive (e.g. git clone)
        # run on dag processor and worker!

    def view_url_template(self) -> str | None:
        …
        return {url template}
```

Slido for questions

OR

Join link:
https://app.sli.do/event/tFD2BRhuH4jT3rD2nBwntg

Recap 🍻

Dag Versioning

Execution
(requires config)

UI
(automatic)

Bundles for

code versioning

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Dag versions for history:

UI + scheduler

The 2025 Apache Airflow® Survey is here!

Fill it out to for a free Airflow 3 Fundamentals or DAG Authoring in Airflow 3 certification code

Questions!
slido?

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