



Beyond the bundle

AIP-85+

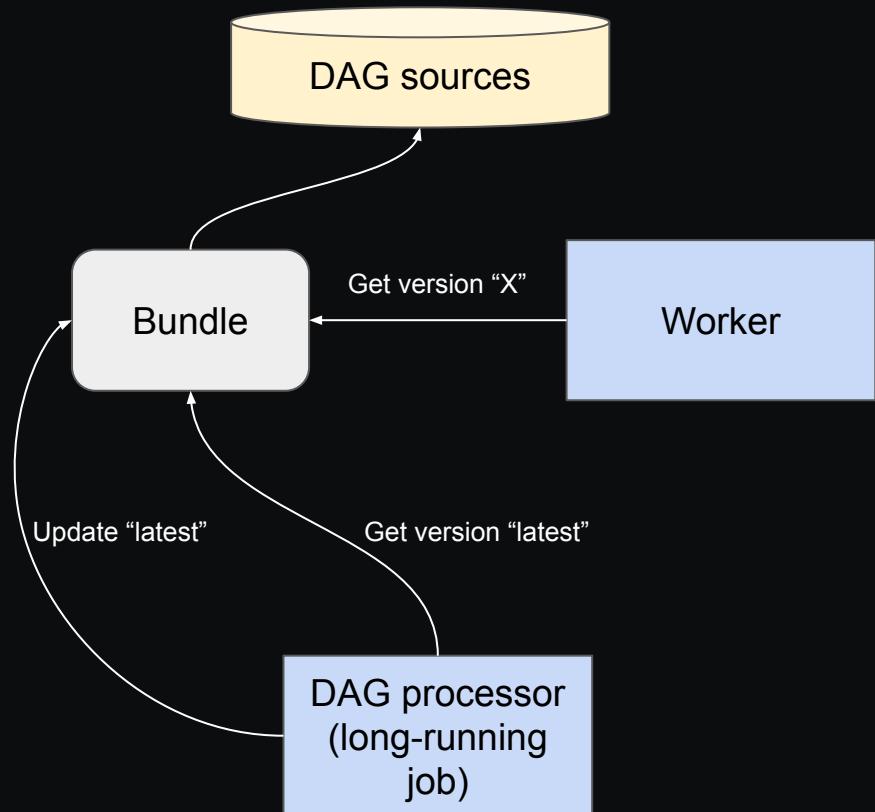
Igor Kholopov
Cloud Composer, Google

3.0

Bundles in Airflow 3

Bundles (introduced in AIP-66 by @jedcunningham):

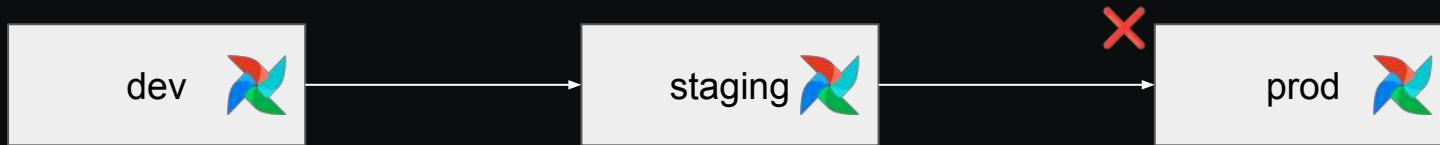
- Consistency of version within a DAG run
- Customizable refresh of the latest version
- Many-to-one bundles to DAG processor support
- Operates within existing Airflow “eventual consistency” paradigm with source of truth being DAG sources storage (Git repo, FS, S3, etc.)



A case for “strong consistency” in DAG processing

- Feature of “continuous processing” can easily become a bug:
 - Transient DAG processing errors can affect effective DAG availability
 - AIP-92 introduces additional hops in DAG processing path => higher availability requirements for hops to maintain the same DAG availability

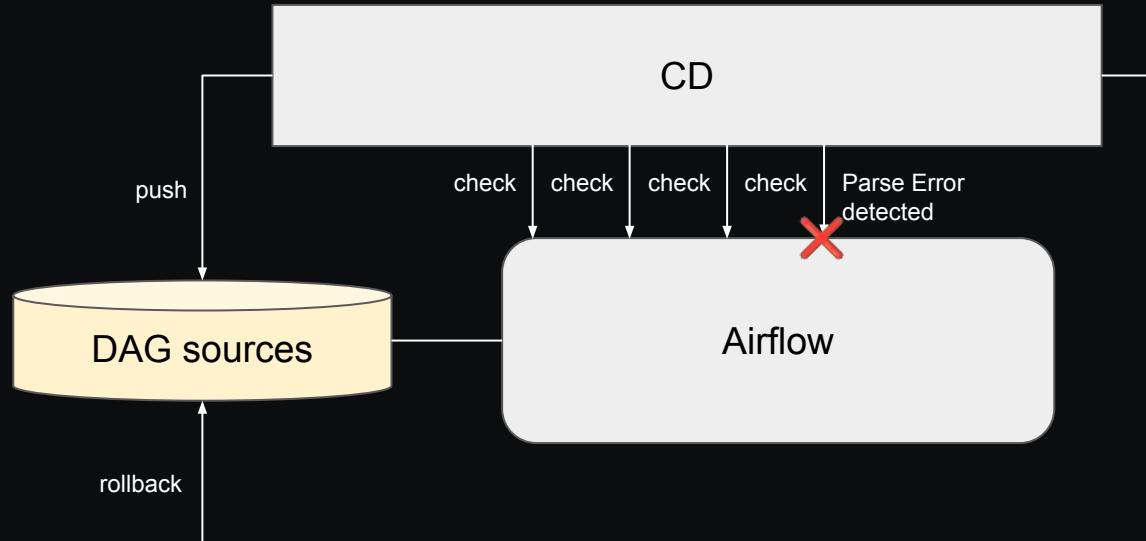
A case for “strong consistency” in DAG processing



- A classic deployment between different “environments” works well up to a certain DAG codebase size
- A more reliable approach is introduction of canarying

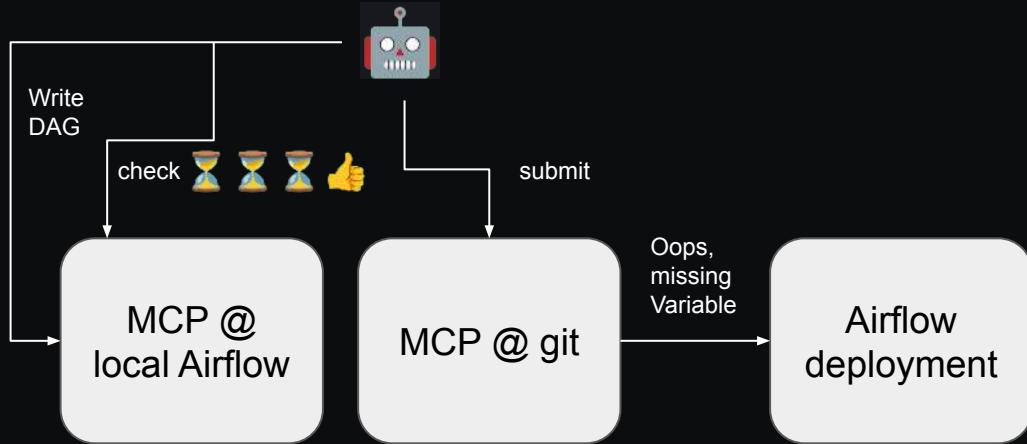
A case for “strong consistency” in DAG processing

- Safe continuous delivery in Airflow requires offloading a lot of complexity to CI/CD implementation
- Multiple asynchronous checks for all DAGs to be re-parsed

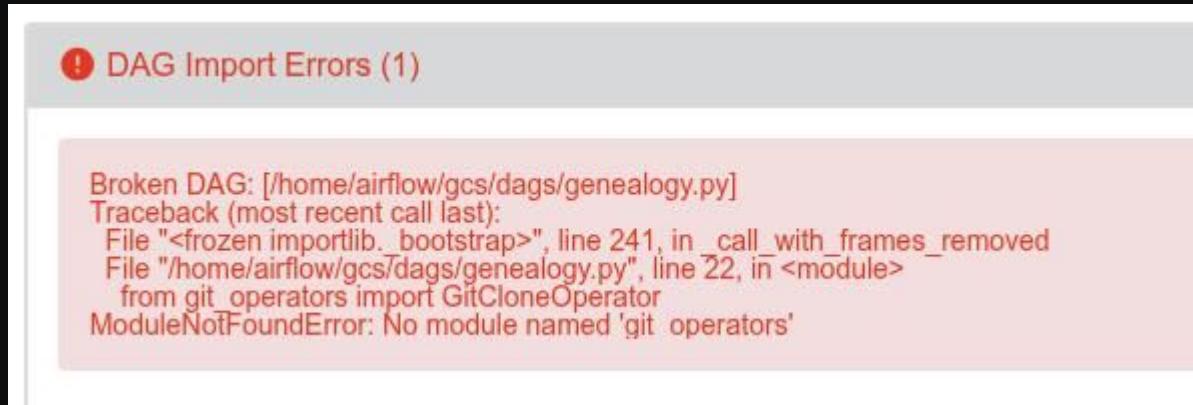


A case for “strong consistency” in DAG processing

- AI agents need a reliable and a fast way to evaluate authored DAGs
- Preferably in the environment with the final target context

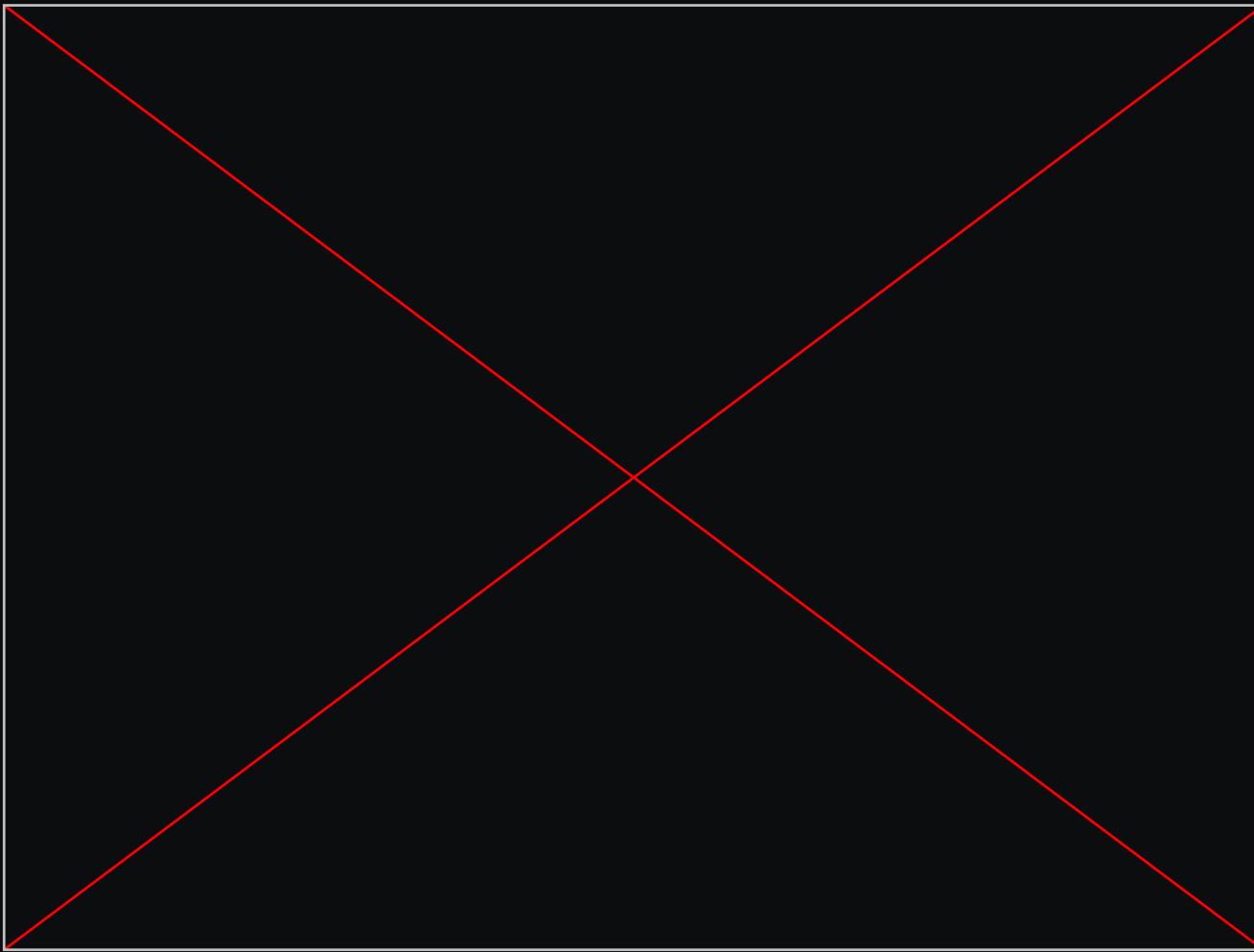


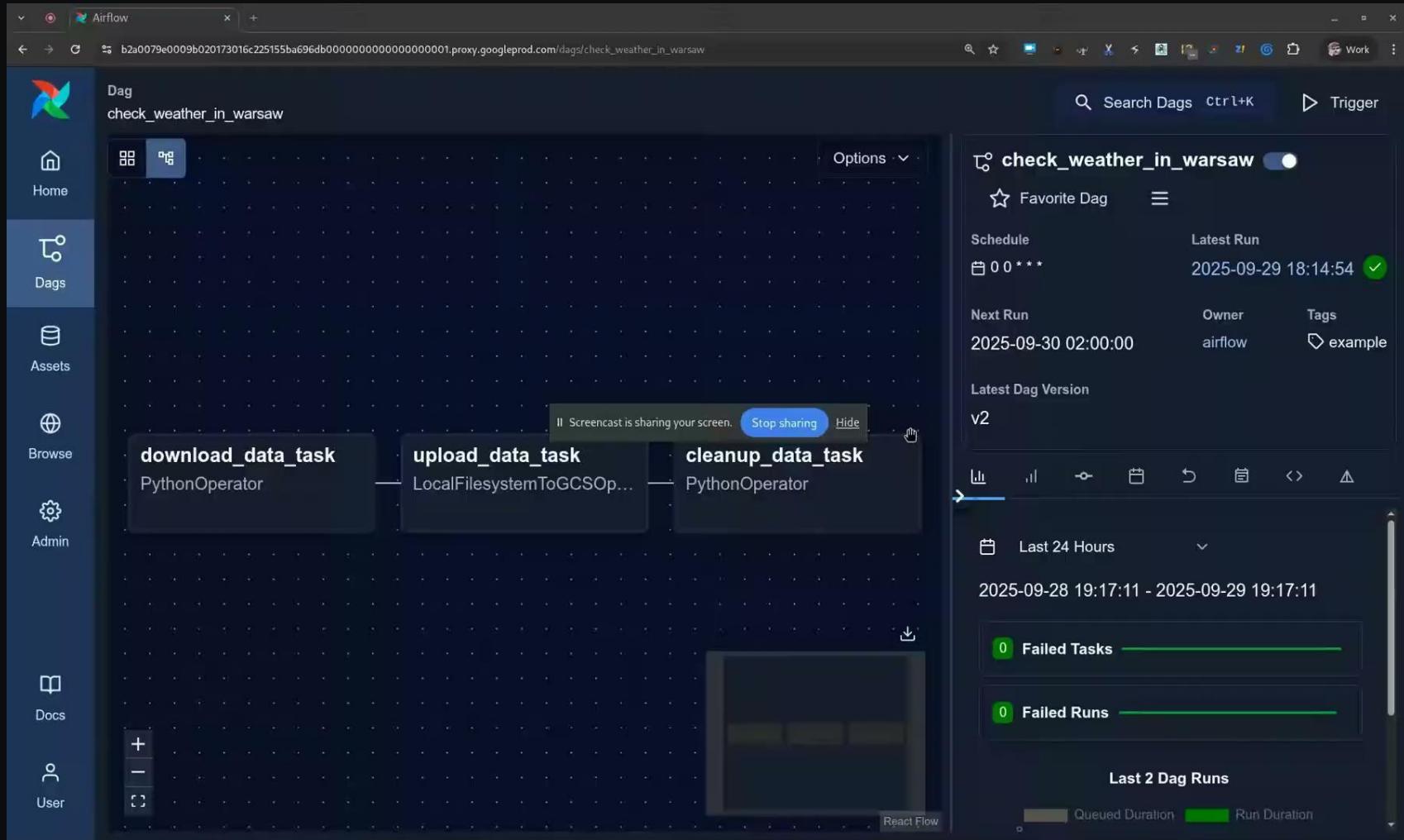
A case for “strong consistency” in DAG processing



Phase 1
Demo

3.0

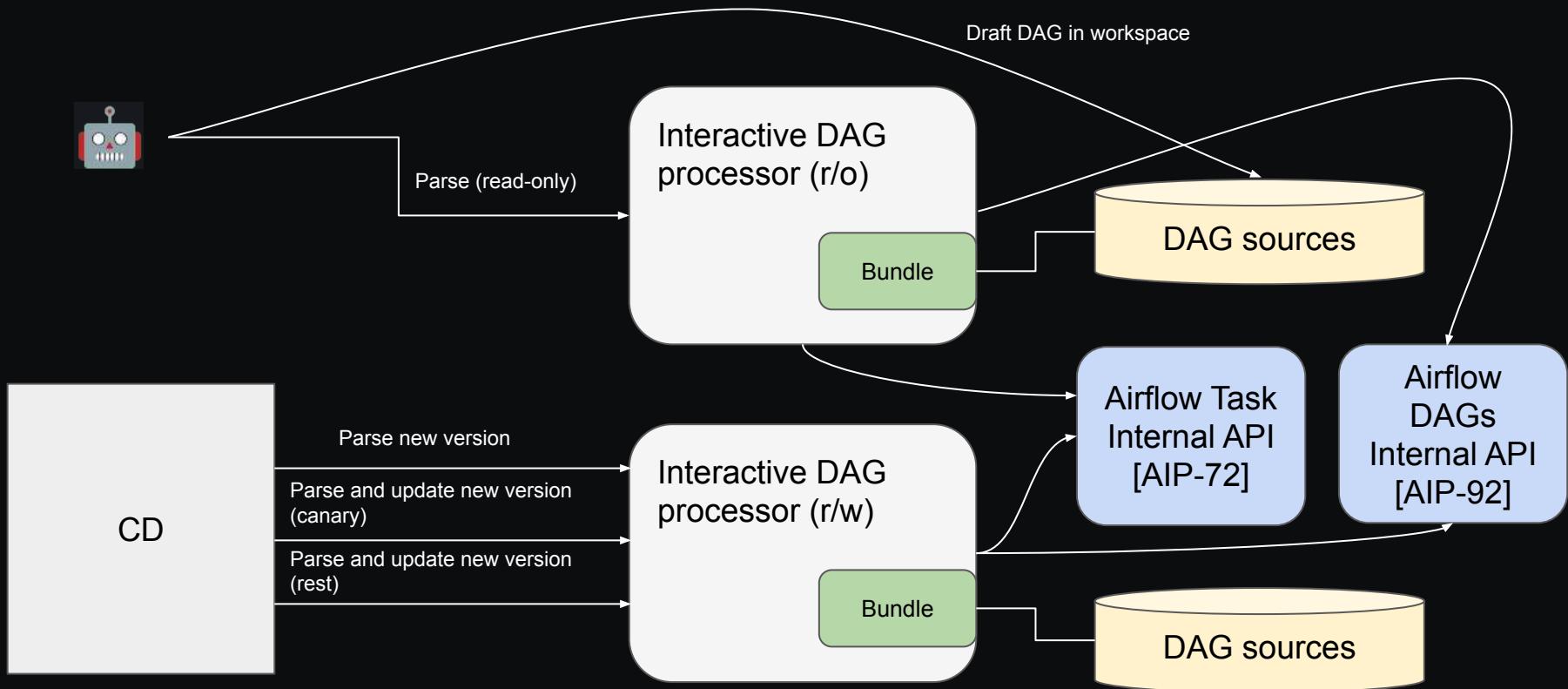




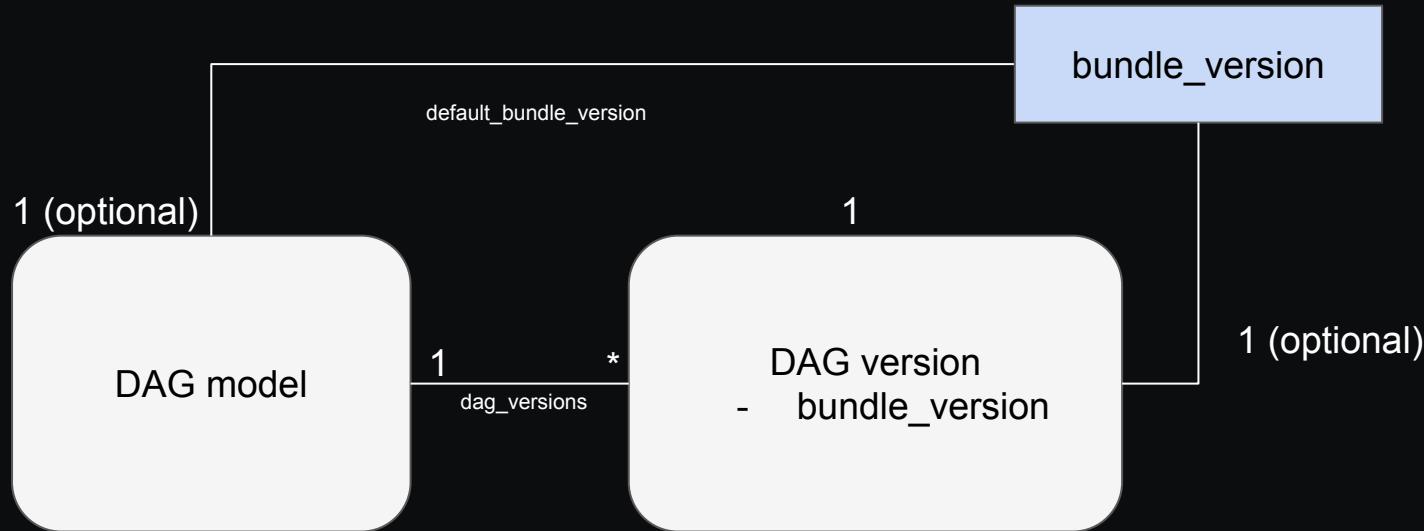
Phase 1: Interactive DAG processor

- POST /bundle/parse { "bundle", "path", "version" } -> { "import_errors", "dags" }
- POST /bundle/parse_update { "bundle", "path", "version" } -> { "import_errors", "dags", "version" }
- DELETE /bundle {"bundle", "path", "dag_ids" }
- GET /bundle -> { "bundle", "version" }
- POST /bundle/set_version { "bundle", "dag_ids", "version" }

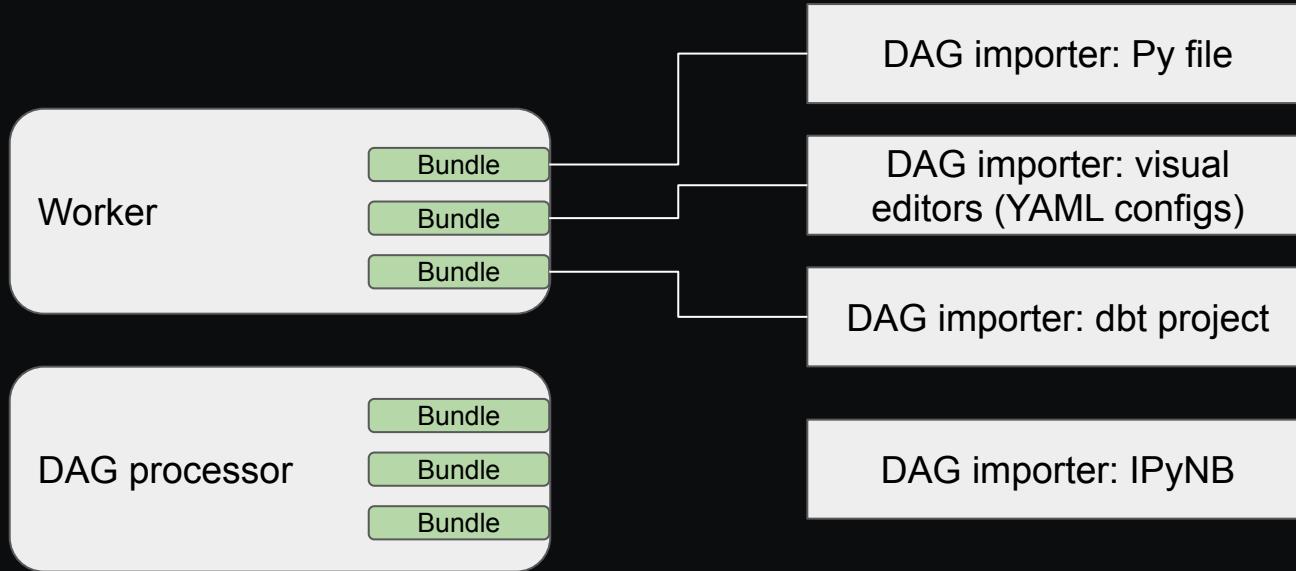
Phase 1: Interactive DAG processor



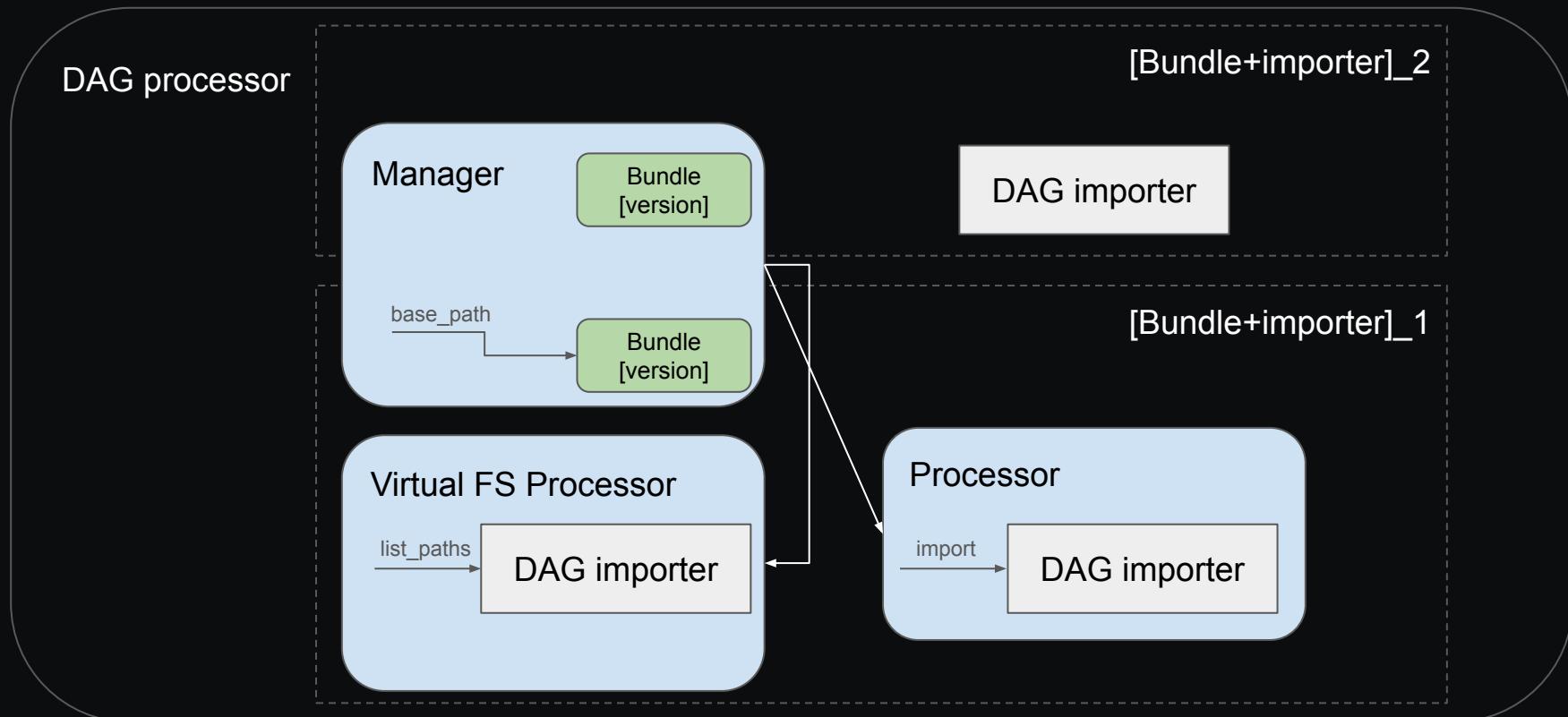
Model extension



Phase 2: Abstract DAG importer



DAG importer - bundle interaction



DAG importer interface

- `import_path(path, options) -> Iterable[DagsImportResult]`
- `list_paths(subpath) -> Iterable[Path]`
- `dag_path_exists(dagpath) -> bool`
- `modified_time(dagpath) -> timestamp`

Split of responsibility

DAG processor	DAG bundle	DAG importer
<ul style="list-style-type: none">- What DAGs are ingested- When DAGs are ingested- Airflow metadata updates (through API after AIP-92)	<ul style="list-style-type: none">- DAG sources storage management (as a “bundle” unit)- DAG sources version control (as a “bundle” unit)	<ul style="list-style-type: none">- How the DAG is constructed from sources- What DAG paths exist in the sources within a bundle

Phase 2
Demo

3.0

Explorer + Add data

Search for resources

- Home
- Starred
- Job history
- ikholopov-dag-api-plg
 - Datasets
 - External connections
 - Queries
 - (Classic) Queries
 - Notebooks
 - Data canvases
 - Data preparations
 - Pipelines
 - Repositories
- bigrquery-public-data
- concord-prod

demo-pipeline1 Run Schedule Share Ask Agent Compiled

Pipeline Executions Settings

Add task 35%

Query updated X

DAG bundle x DAG importer compatibility

FS bundles	File importers
<ul style="list-style-type: none">- git- LocalFS- S3	<ul style="list-style-type: none">- Local FS Python- Local FS Notebook- BQ pipeline YAML-format
Synthetic bundles (virtual path, pass version to importer)	External importers (no files to import, produce “paths” and DAGs directly) <ul style="list-style-type: none">- BQ Pipelines importer

Example: BQ pipeline (unversioned-online)

Synthetic FS Bundle

```
path = /fixed/mnt-point  
dag_importer=BQPIPelinesImporter
```

BQ Pipelines Importer

- list_paths ->
 - /fixed/mnt-point/pipeline_a
 - /fixed/mnt-point/pipeline_b
- import_path ->
 - rpc://Dataform.CreateCompilationResult
 - rpc://Dataform.QueryCompilationResultAction
 - Translate BQ Action -> Airflow task

Example: BQ pipeline (versioned-local)

git Bundle

```
path = /checkedout/version  
dag_importer=YAMLPipelinesImporter
```

Local BQ Pipelines Importer

- list_paths -> os.listdir()
- import_path ->
 - Run local compilation of YAML
 - Translate BQ Action -> Airflow task

Questions?

Email: ikholopov@google.com

Airflow Slack: Igor Kholopov

AIP-85: [wiki](#)

Dev list thread:
tinyurl.com/aip-85-dev-thread