Multitenancy

state of the union

Airflow Summit

Let's flow together

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About us

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What is multi-tenancy?

Initial multi-tenancy goals

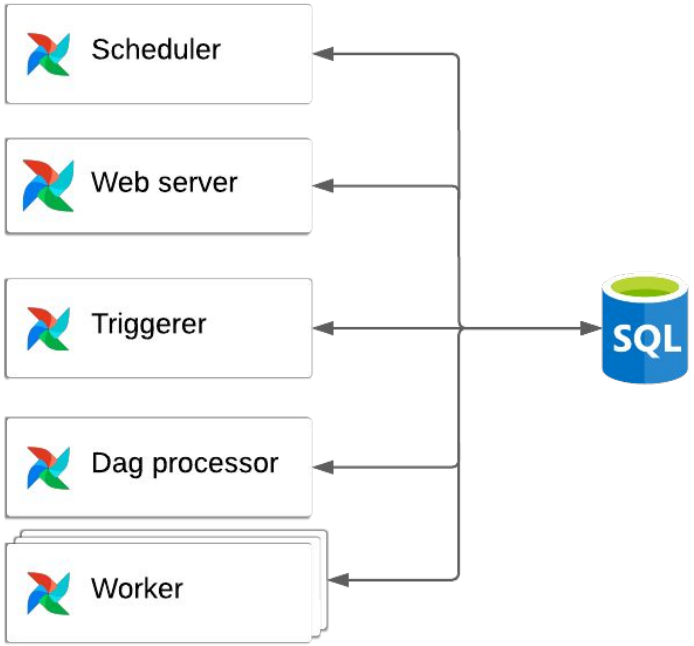
- Single database
- Shared scheduler and webserver instances
- Allow multiple teams to have isolated environments
- Isolated/different code dependencies
- Authentication integrated with (some) SSO

Who needs multi-tenancy ?

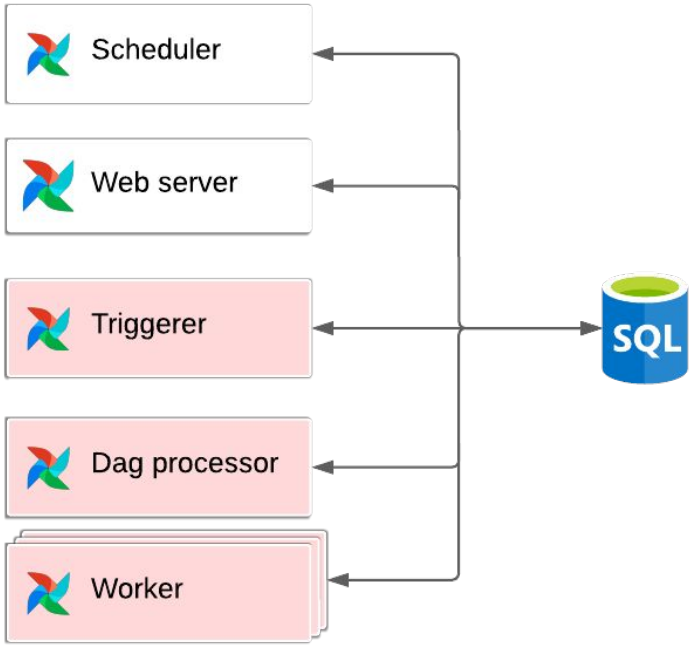
- Individual / Small teams?
  - No
- Medium / Big companies
  - Most likely
- Service providers
  - Multi-tenancy per customer

AIP-44
Internal API

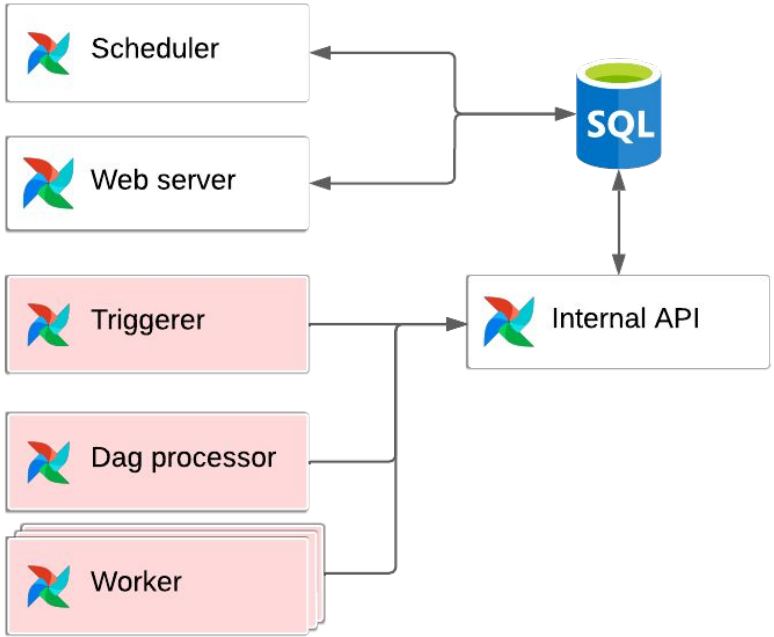
AIP-44 Why?



AIP-44 Why?



AIP-44 How?

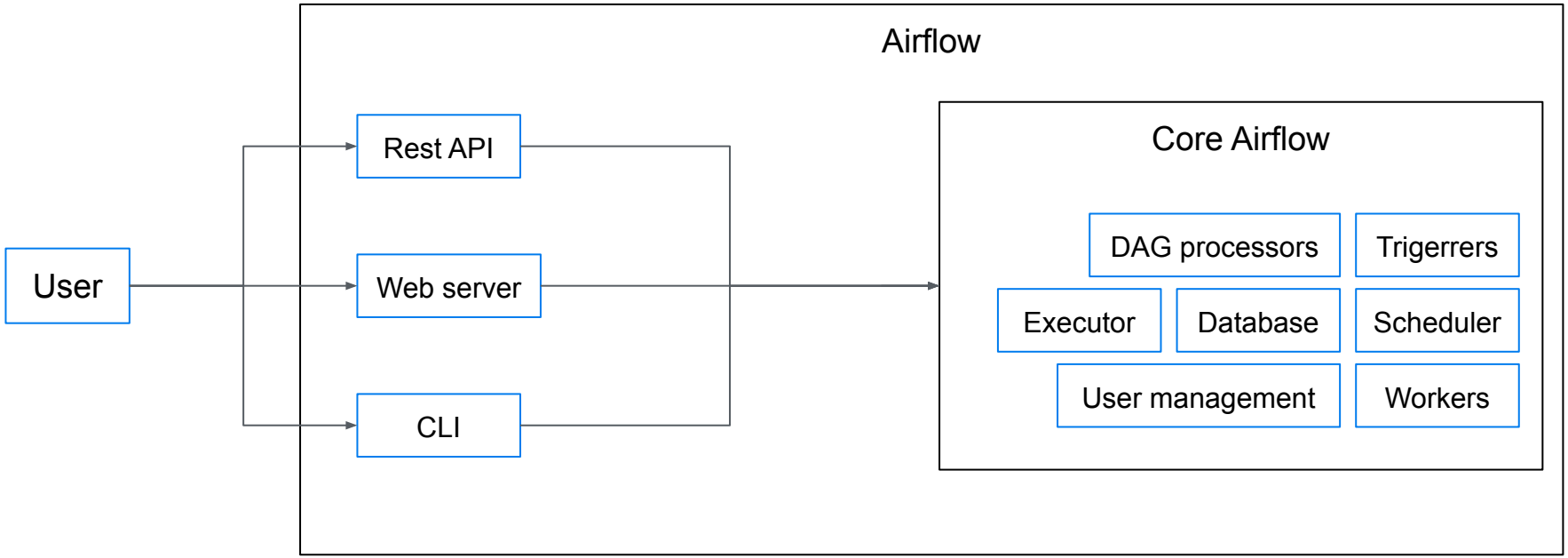

Scheduler
Web server
SQL
Triggerer
Internal API
Dag processor
Worker

AIP-44 Status

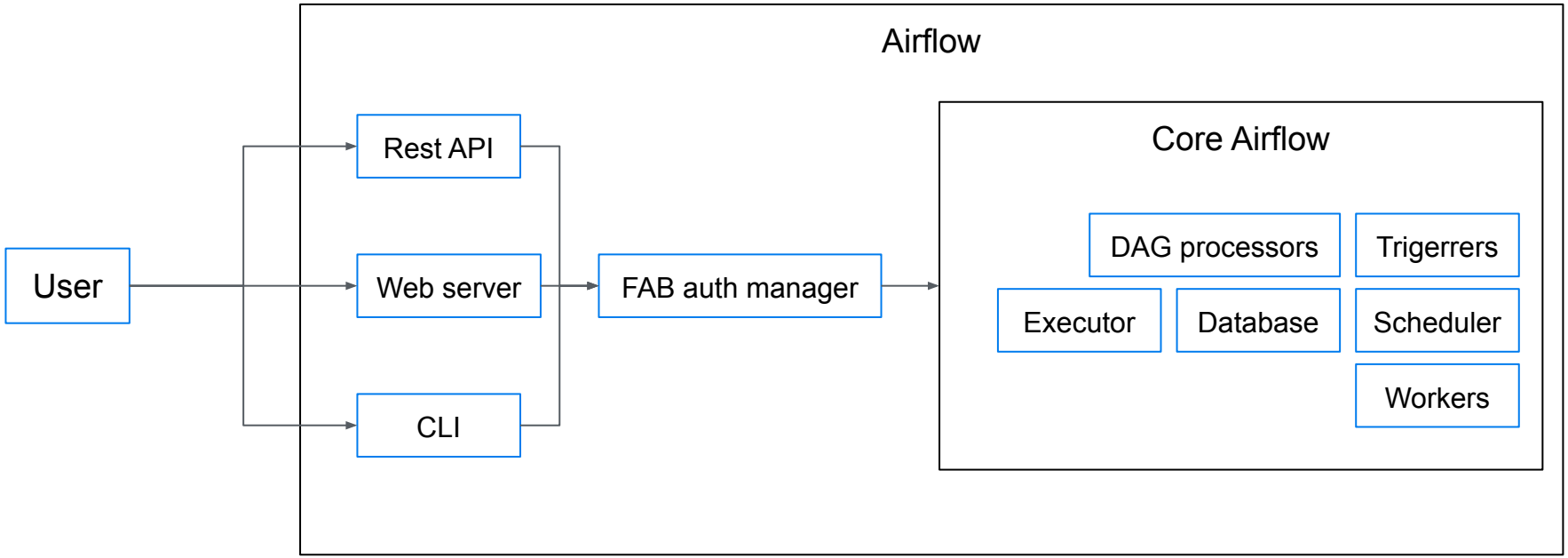
- New Component - done
- Migration of all methods to Internal API - almost there
- Migration of Operators code - not done
- Running CI tests in DBless mode is - not done
- Regressions and performance tests - not done

AIP-56
Extensible user management

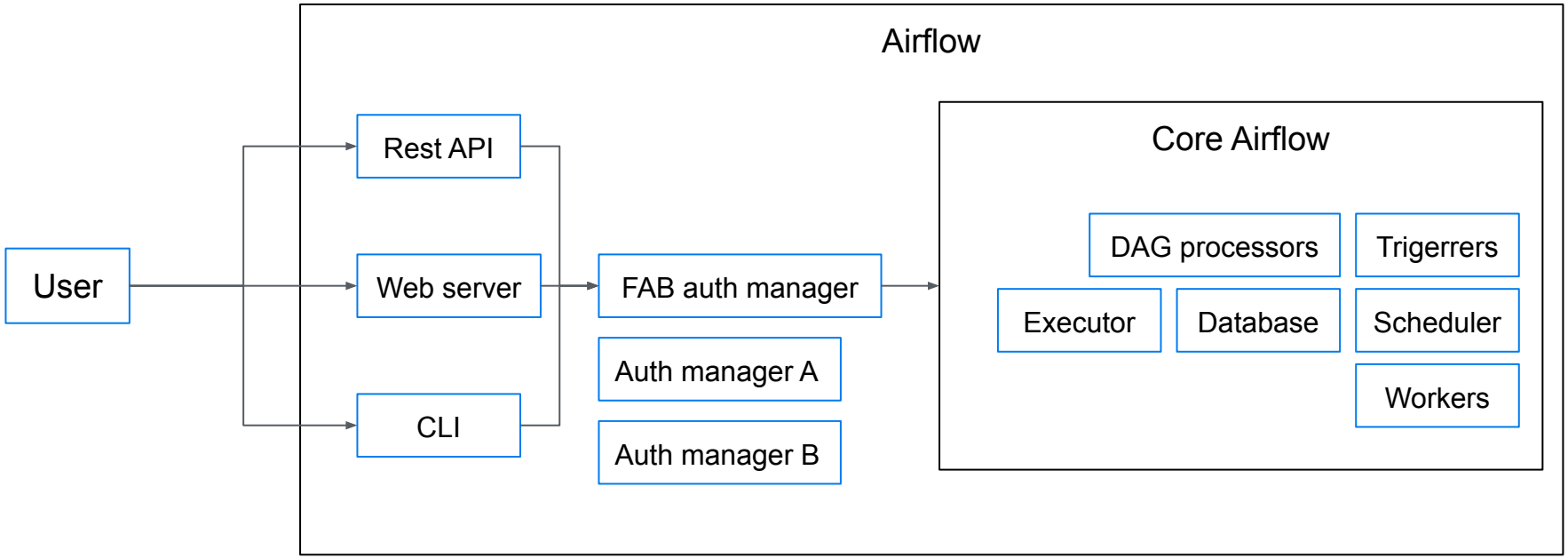
What is AIP-56?



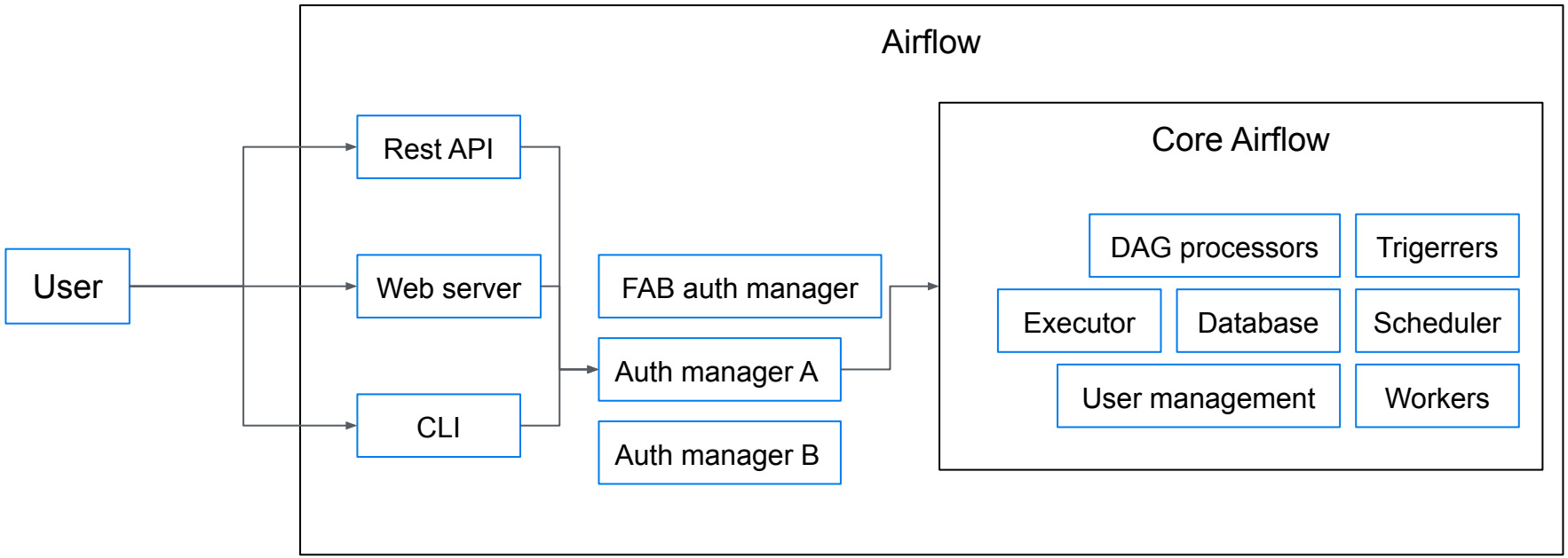
What is AIP-56?



What is AIP-56?

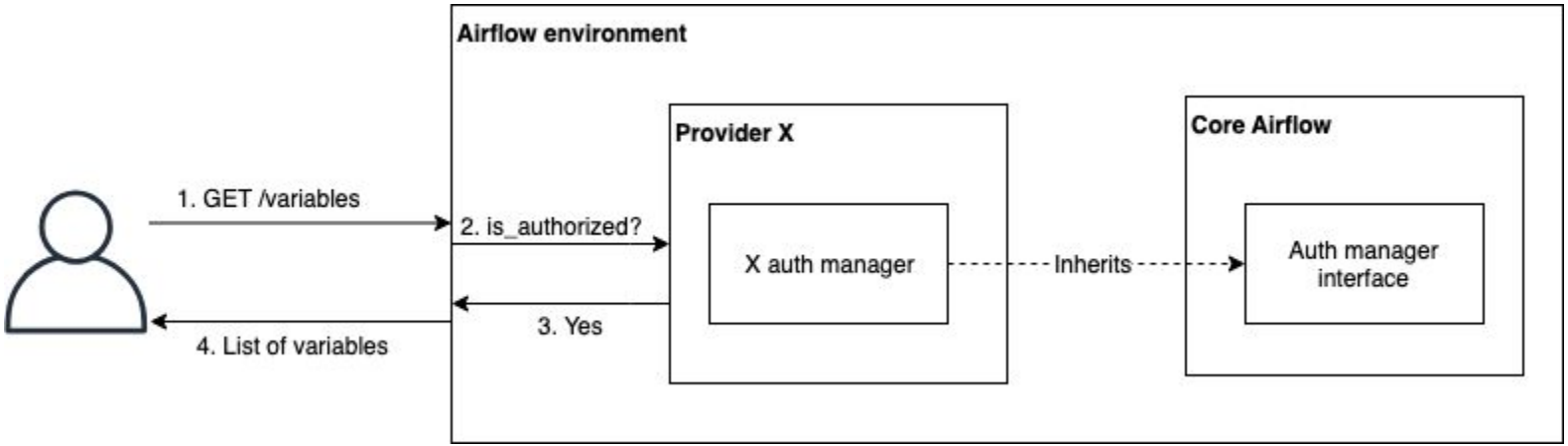


What is AIP-56?



What is an auth manager?

1. User management API
    a. User authentication
    b. User authorization



What is the status of AIP-56?

1. Defining auth manager interface. *90% done*.
2. Migrating Airflow code to use auth manager API. 40% done.
3. Implementing FAB auth manager. 60% done.
4. Implementing another auth manager based on external tools (e.g. KeyCloak). Not started.

Where are we now?

Multitenancy as a platform

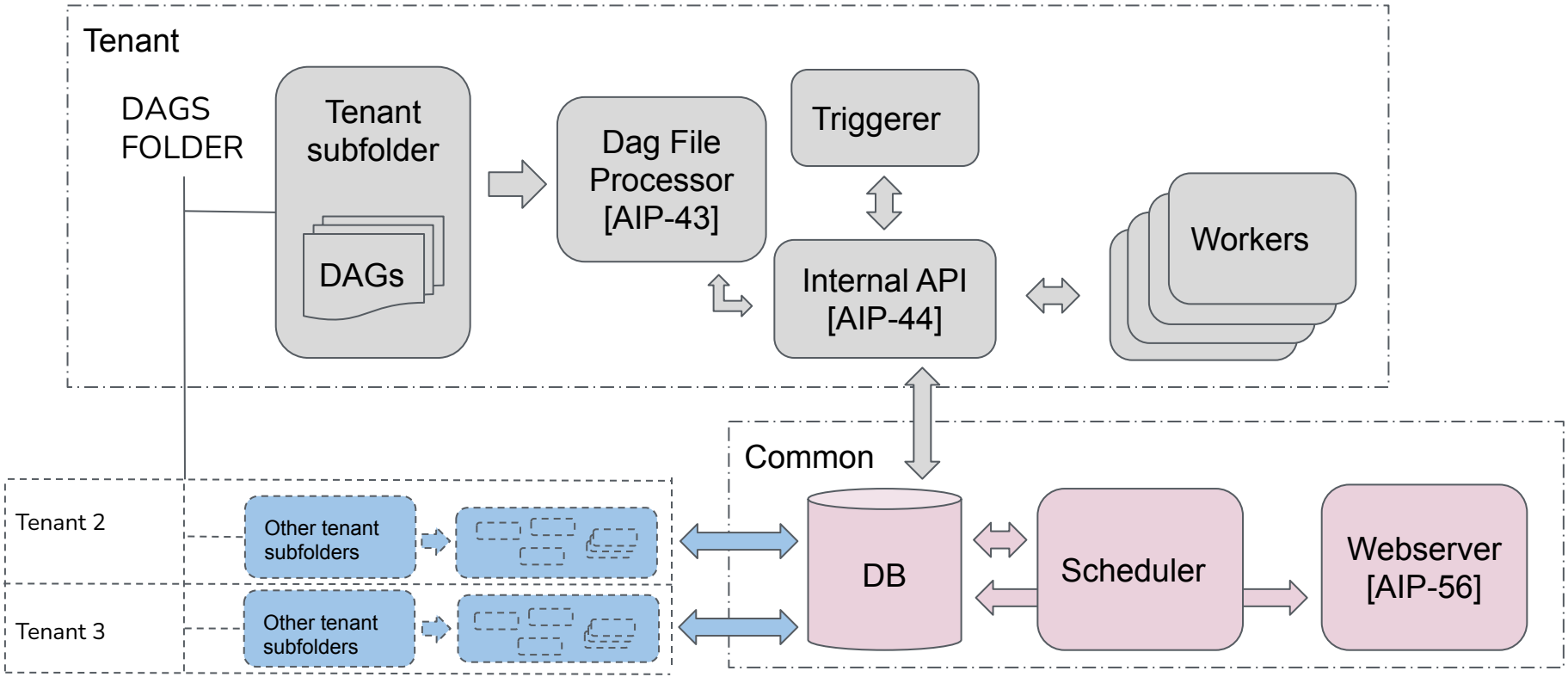
- Airflow is a platform
- Multi-tenancy is not a (simple) feature to turn on
- Enabling building blocks
  - AIP-43 Dag Processor Separation
  - AIP-44 Internal API
  - AIP-56 Extensible User Management
  - ??? What do we miss ??

Proposed next steps

What do we miss ?

- Documenting how to approach it
  - Absolutely
- Per tenant access to resources ?
  - Yes
- Per tenant Python / System dependencies
  - Certainly
- Per task authorization to API calls ?
  - Probably not

Tenant


Tenant
DAGS FOLDER
Tenant subfolder
DAGs
Dag File Processor [AIP-43]
Triggerer
Internal API [AIP-44]
Workers
Common
DB
Scheduler
Webserver [AIP-56]
Tenant 2
Other tenant subfolders
Tenant 3
Other tenant subfolders

Kill all birds with single stone?

Queues

Queue == Tenant

Queues (alias tenant) in DAG File Processor

- One DAG subfolder = one queue = one tenant
- Per-tenant standalone processor
- `airflow dag-processor --tenant`
- **`Force`** `queue = tenant`
- Per-tenant environment (per-tenant image)

Queues (alias tenant) in Triggerer

- Per tenant triggerer
- `airflow triggerer --tenant`
- Pick only deferred tasks with **queue** = tenant
- Per-tenant environment (same per-tenant image)

Queues (alias tenant) in Workers (k8s Pods)

- Per tenant worker
- `airflow celery worker --tenant (alias for --queue)`
- Pick only tasks with **queue** = tenant
- Per-tenant environment (same per-tenant image)

Queues (alias tenant) in internal-api server

- Per tenant internal-api
- `airflow internal-api --tenant`
- Only accepts calls for DAGs with **queue** = tenant
- Per-tenant environment (same per-tenant image)
- Per tenant connections and variables (new ‘tenant’ field for DB and secret backends)

Tenants in webserver

- AIP-56 to the rescue
- Auth Manager with queue = tenant access mapping

AIP-58 ?

Multi-tenancy is (almost) here

Q&A

Multitenancy: state of the union