

Self-Hosting DBOS at Scale Durability Anywhere

Introducing DBOS Conductor

April 17, 2025

Agenda

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03 Architecture

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DBOS Overview - Build Reliable Software Effortlessly



Ultra-lightweight open source
durable execution library



Serverless DBOS Transact
application hosting on AWS



Scaling, Monitoring,
Management for
Self-hosted DBOS Transact

DBOS Overview - Build Reliable Software Effortlessly

widget_store.py

```
@DBOS.step()
```

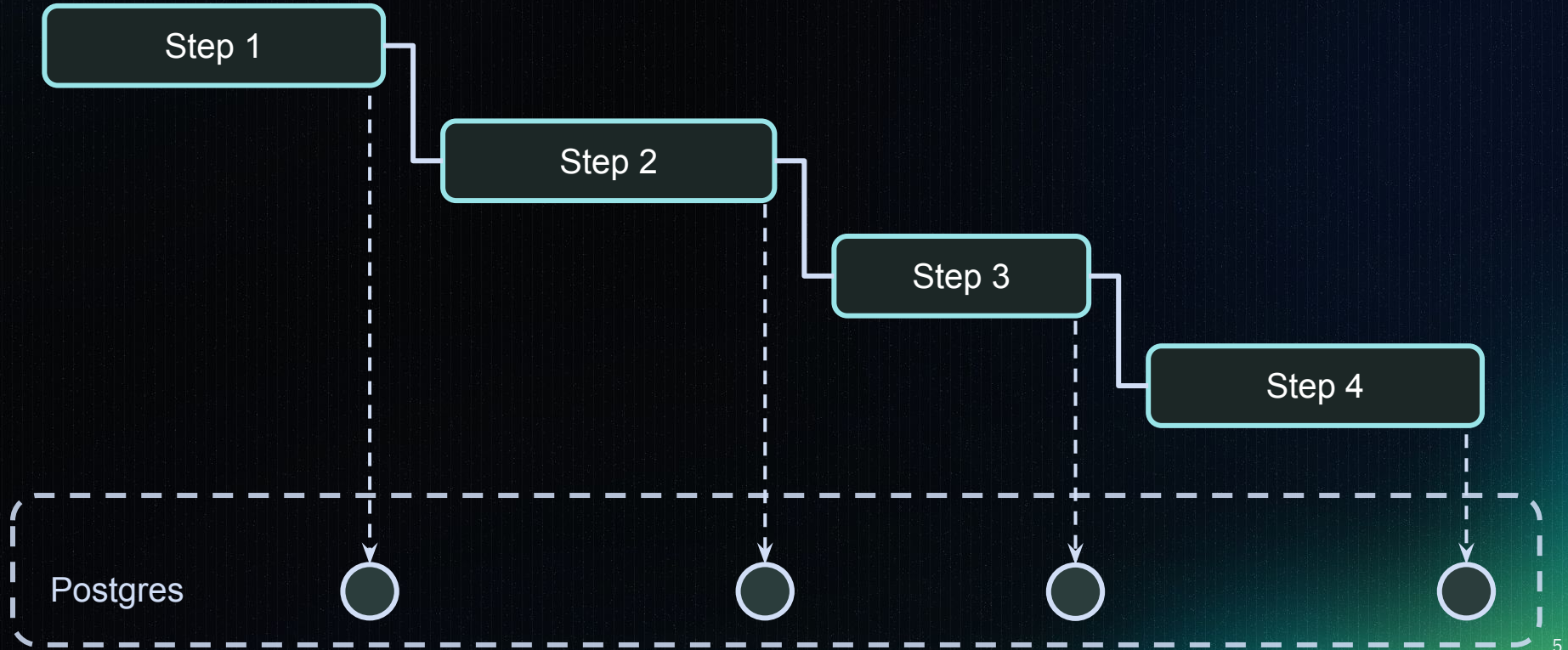
```
def create_order():  
    ...
```

```
@DBOS.workflow()
```

```
def checkout(items):  
    order = create_order()  
    reserve_inventory(order, items)  
    payment_status = process_payment(order, items)  
    if payment_status == 'paid':  
        fulfill_order(order)  
    else:  
        undo_reserve_inventory(order, items)  
        cancel_order(order)
```

- Write normal code
- Annotate with decorators
 - `@DBOS.workflow()`
 - `@DBOS.step()`
- No need to code differently or re-architect your app
- Annotate just a few functions, or all your code
- No 3rd party runtime dependency to harm your reliability

DBOS Overview - Build Reliable Software Effortlessly



DBOS Conductor: Self-Hosting at Scale

- Support both Python and TypeScript
- Distributed automatic workflow recovery
- Dashboards for workflow/queue observability + management
- Totally out of band: not a runtime dependency
- No access to your network or private database
- 30-day free trial for new users

Conductor Demo

- Run dbos-app-starter locally on a laptop and connect to DBOS Conductor

Home > Conductor

Self-Host DBOS Cloud

 Register an App

 Applications

Register an Application with DBOS Conductor

<> To connect your application to Conductor, first register your application.
The name you register must match the name you give your application in its configuration.

Enter application name

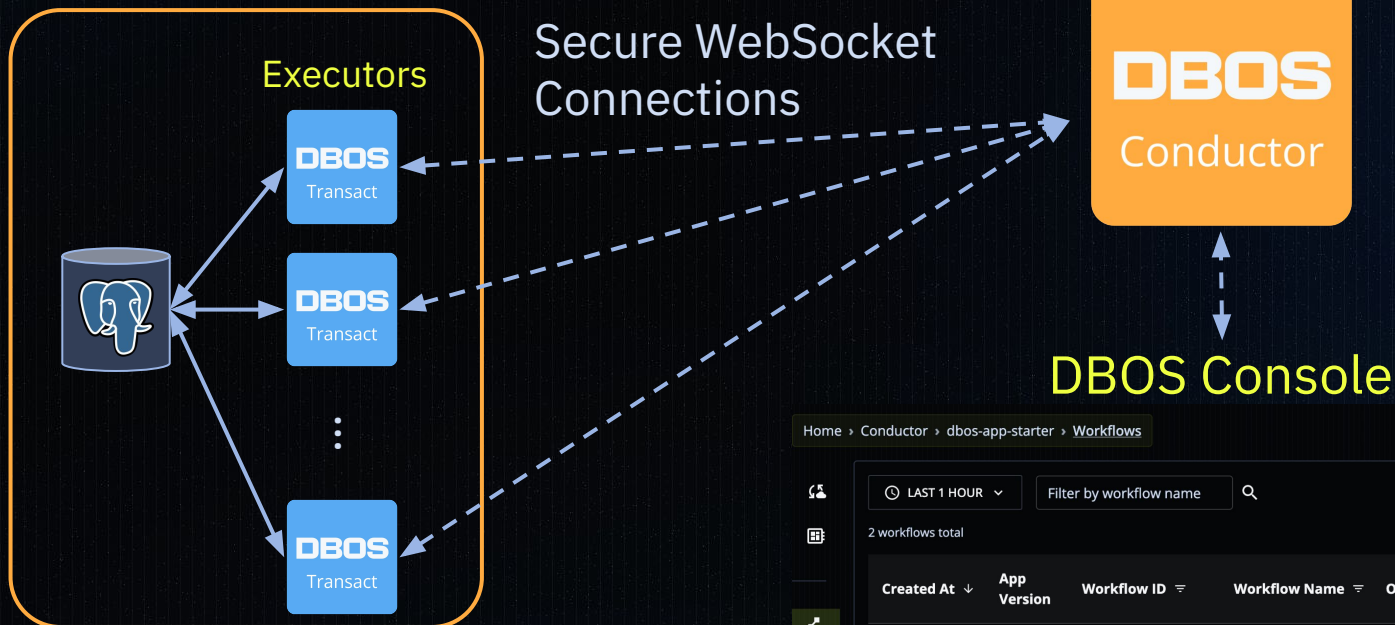
dbos-app-starter

✓ Must be between 3 to 30 characters long and contain only lowercase letters, numbers, dashes, and underscores

Register Application

Conductor Architecture

Self-Hosted Infra



Home > Conductor > dbos-app-starter > Workflows

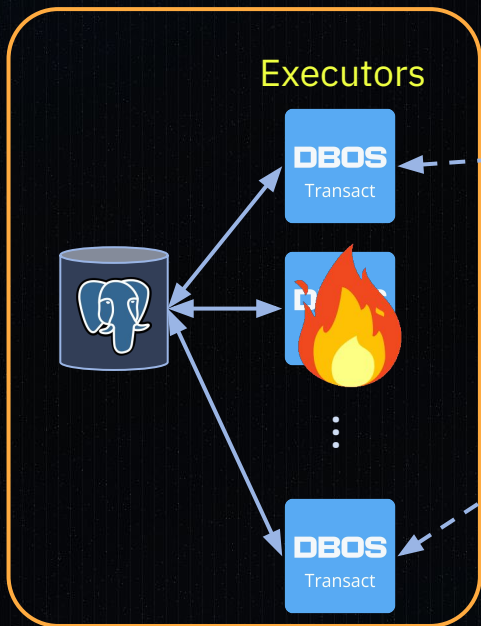
👤 LAST 1 HOUR ▾ Filter by workflow name 🔍

📅 2 workflows total

Created At ▾	App Version	Workflow ID ▾	Workflow Name ▾	Output	Status ▾	Controls
2025-04-14 1...	c1e4cc8...	5a9f6604-2d57-47...	workflow	-	SUCCESS	✕ ▶ ↺
2025-04-14 1...	c1e4cc8...	C7VFEA	workflow	-	SUCCESS	✕ ▶ ↺

Distributed Workflow Recovery

Self-Hosted Infra



- Automatically detects disconnected executors
- After a grace period, recover pending workflows on healthy executors with matched versions

Workflow and Queue Observability

- View workflows and queues
- Cancel, resume, restart workflows
- Conductor retrieves workflow metadata via secure websocket connections

The screenshot displays the DBOS Console interface for monitoring workflows. The breadcrumb navigation shows the path: Home > Conductor > dbos-app-starter > Workflows. The main area features a table of workflows with columns for Created At, App Version, Workflow ID, Workflow Name, Output, Status, and Controls. A filter for 'LAST 1 HOUR' and a search bar for 'Filter by workflow name' are present. The table lists five workflows, all with a 'SUCCESS' status. The first workflow is highlighted in green. To the right, the 'Workflow Details' panel for the selected workflow 'workflow' (ID: j6aHv7) is shown. It includes controls for CANCEL, RESUME, and RESTART, and sections for Basic Information (Workflow Name, Class Name, Config Name, ID, Executor ID, Application Version) and Status Information (Status: SUCCESS, Created At, Updated At). The Data section shows the Workflow Input as `{'args': [], 'kwargs': {}}` and the Workflow Output as an empty field.

DBOS Console Blog Documentation

Home > Conductor > dbos-app-starter > Workflows

5 workflows total

Created At	App Version	Workflow ID	Workflow Name	Output	Status	Controls
2025-04-16 17...	c1e4cc8a...	j6aHv7	workflow	-	SUCCESS	[X] [▶] [↺]
2025-04-16 17...	c1e4cc8a...	e37b960a-e200-405...	workflow	-	SUCCESS	[X] [▶] [↺]
2025-04-16 17...	c1e4cc8a...	c0d6dcc5-ea09-4e8...	workflow	-	SUCCESS	[X] [▶] [↺]
2025-04-16 17...	c1e4cc8a...	uIA75X	workflow	-	SUCCESS	[X] [▶] [↺]
2025-04-16 17...	c1e4cc8a...	9x7W8Q	workflow	-	SUCCESS	[X] [▶] [↺]

Workflow Details

[CANCEL] [RESUME] [RESTART]

Basic Information

Workflow Name
workflow

Workflow Class Name
-

Workflow Config Name
-

Workflow ID
j6aHv7

Executor ID
02792108-e90f-4d1c-8f10-28258...

Application Version
c1e4cc8ae36146e0038170ffcbb9d058

Status Information

Status
SUCCESS

Created At
2025-04-16 17:28:22.664 (PDT)

Updated At
2025-04-16 17:28:37.765 (PDT)

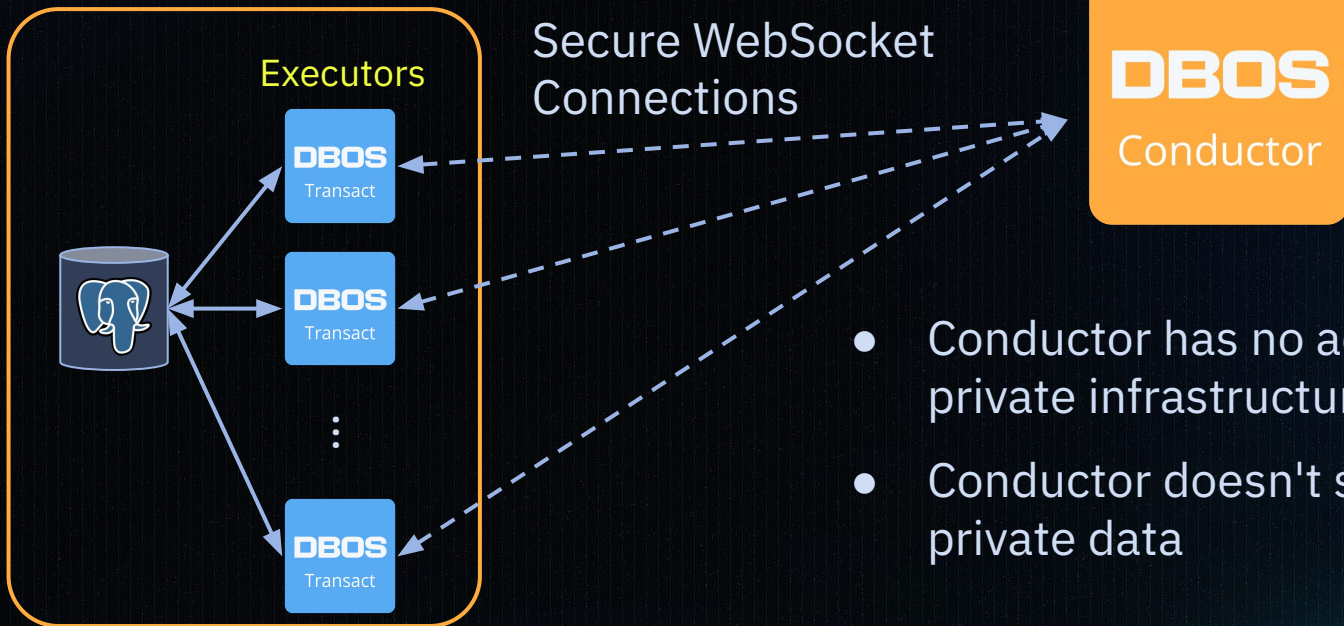
Data

Workflow Input
{'args': [], 'kwargs': {}}

Workflow Output

Security and Privacy

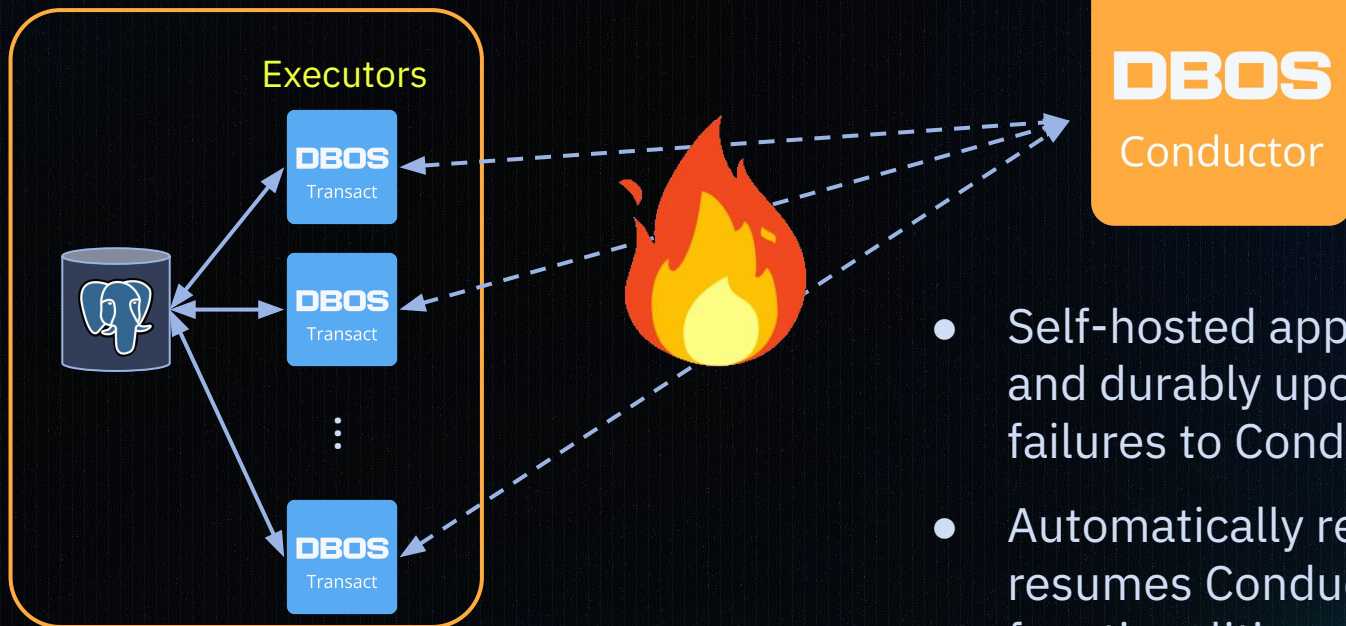
Self-Hosted Infra



- Conductor has no access to your private infrastructure
- Conductor doesn't store your private data

Totally Out-of-Band

Self-Hosted Infra



- Self-hosted apps run normally and durably upon connection failures to Conductor
- Automatically reconnects and resumes Conductor functionalities

Conductor Roadmap

Work-in-progress:

- Workflow graph visualization
- Workflow "fork": restart from a specific step

Upcoming soon:

- Configurable data retention policies for self-hosted apps
- Workflow metrics dashboards

Workflow Graph Visualization

- Visualize workflow steps and their status
- Visualize parent-child workflow relationships
 - E.g., fan-out patterns when a workflow enqueues multiple parallel tasks

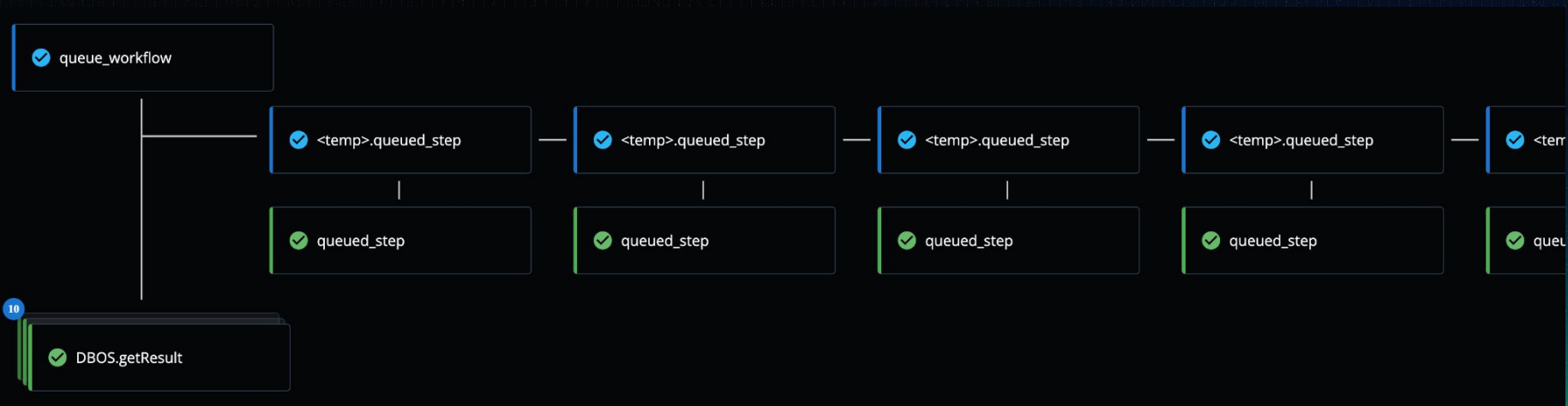
Workflow Graph Visualization (Preview)

- Example: dbos-app-starter workflow



Workflow Graph Visualization (Preview)

- Example: dbos-toolbox queue workflow

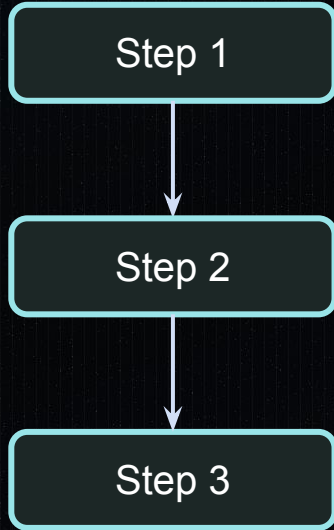


Workflow Fork

- Restart a workflow from a specific step with the newer version
- Useful for recovering from failures or bugs

Workflow Fork for Bug Fixing

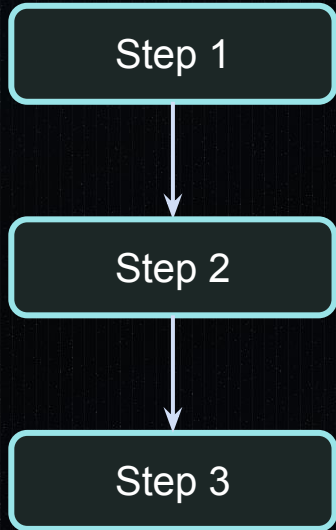
Workflow ID: V1



Step 2 had a bug and caused Step 3 to fail!

Workflow Fork for Bug Fixing

Workflow ID: V1



Fork from step 2

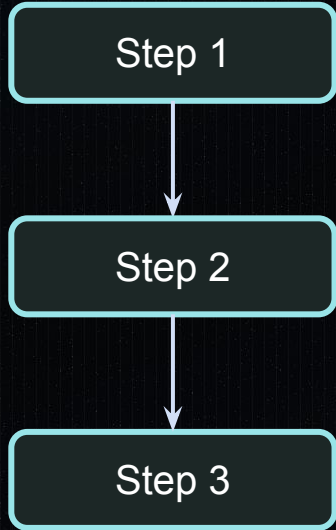
- Create a new workflow ID
- Copy workflow input and Step 1 output
- Resume execution from the new Step 2

Workflow ID: V1-fixed



Workflow Fork for Bug Fixing

Workflow ID: V1



Fork from step 2
----->
Bug fixed!

Workflow ID: V1-fixed



Questions?

Start your DBOS project:

- Learn more: <https://dbos.dev>
- Open DBOS Transact:
 - Python: <https://github.com/dbos-inc/dbos-transact-py>
 - TypeScript: <https://github.com/dbos-inc/dbos-transact-ts>
- DBOS Pro Console:
 - Free 30-day trial: <https://console.dbos.dev/>
 - Includes DBOS Conductor & DBOS Cloud functionality
- Meet us on the DBOS Discord:
 - <https://discord.com/invite/jsmC6pXGgX>