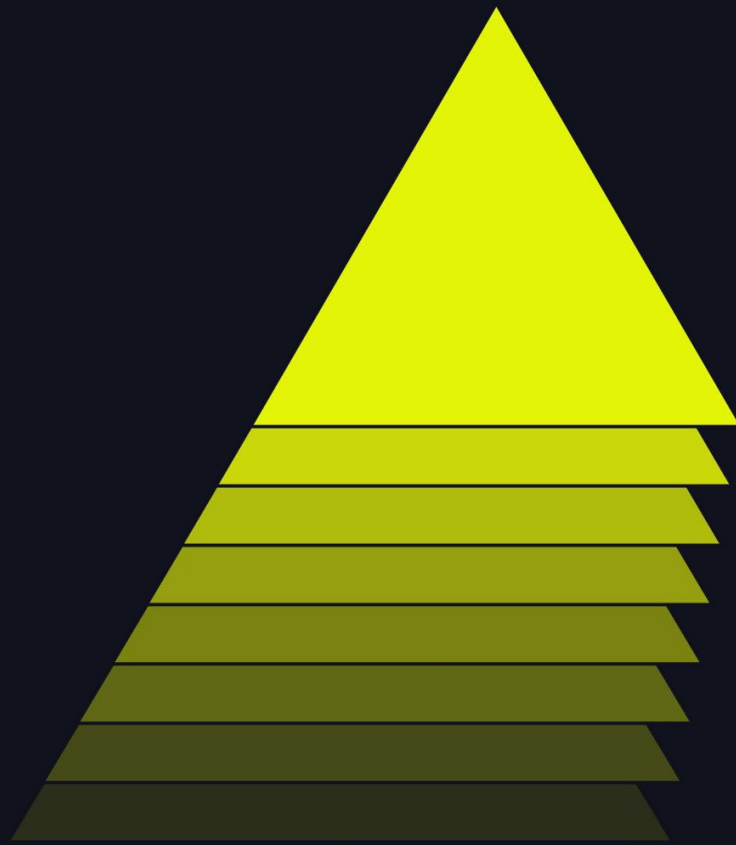


BUILDING SMART
INDUSTRIAL
AUTOMATIONS
WITH THE
DATABRICKS API

JOYCE LIN, VIAM
JUNE 12, 2024



SMART INDUSTRIAL AUTOMATIONS

With the Databricks Statement Execution API



Joyce Lin

Head of Developer Relations at Viam

 joycejtson |viamrobotics




SMART INDUSTRIAL AUTOMATIONS

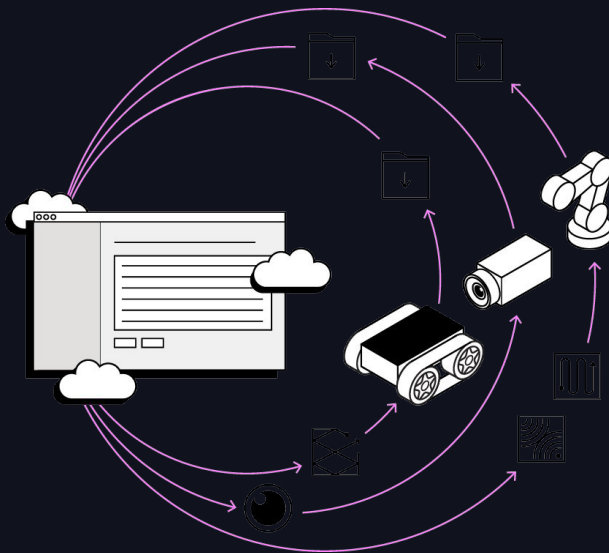
With the Databricks Statement Execution API



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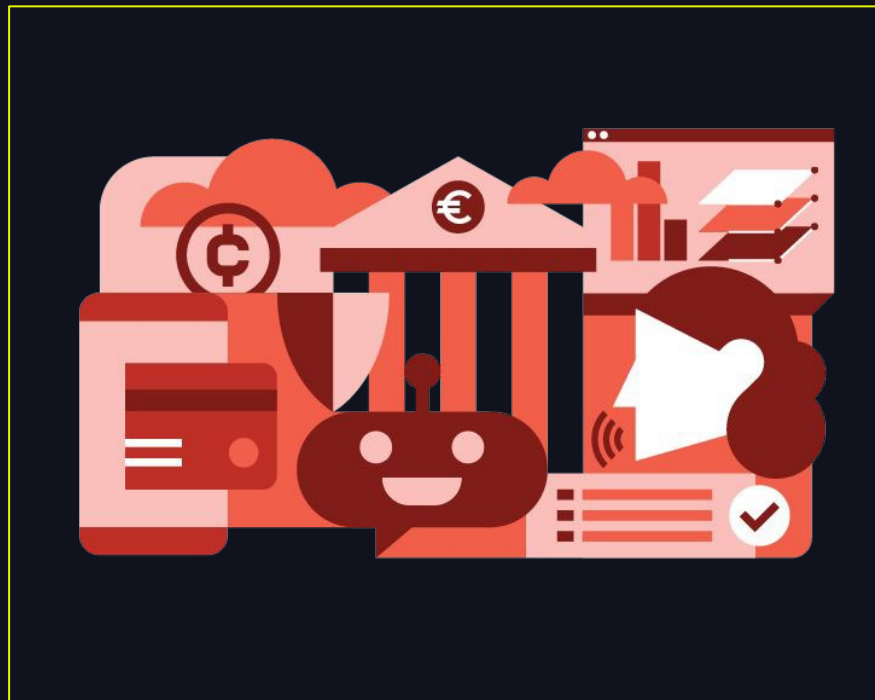
 joycejtson |viamrobotics



SMART INDUSTRIAL AUTOMATIONS

With the Databricks Statement Execution API

- **Databricks Statement Execution API**
- **API automation example**
 - send notification for long-running query
- **Code generation**



WAYS TO CONNECT TO DATABRICKS SQL

Native connectors

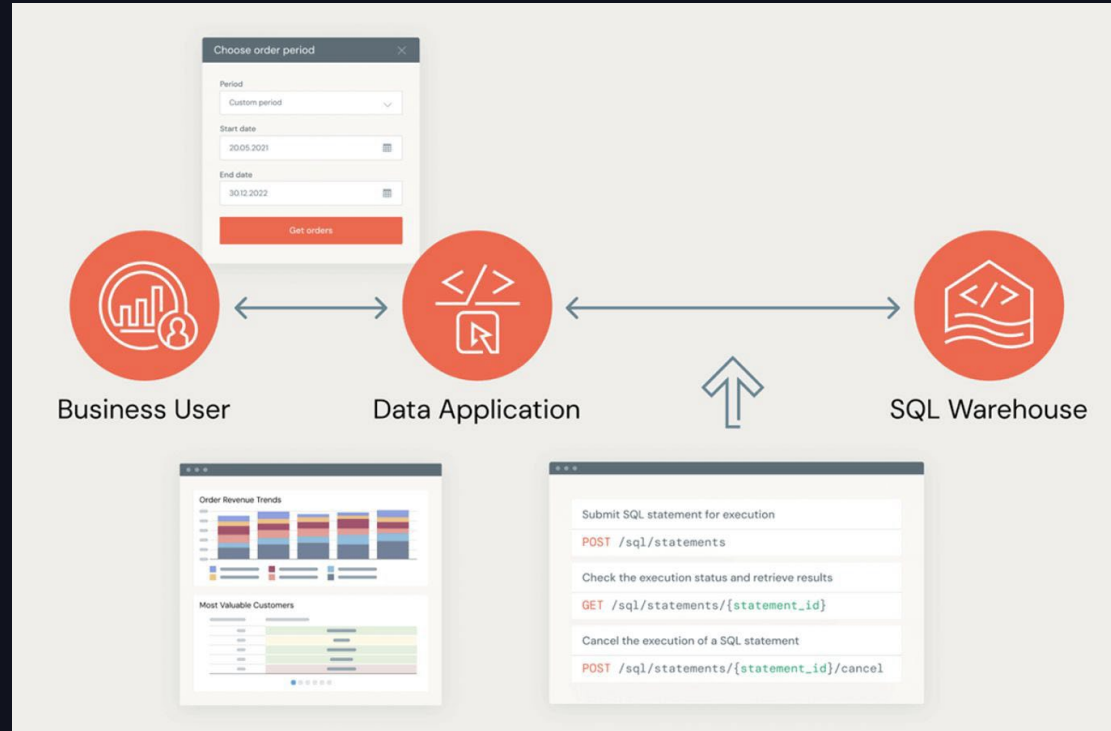


THE DATABRICKS STATEMENT EXECUTION API

DATABRICKS SQL STATEMENT EXECUTION API

HTTP API

- Use the API to connect to your Databricks SQL warehouse over a REST API to access and manipulate data managed by the Databricks Lakehouse Platform.
- Availability
 - Databricks Premium and Enterprise tiers
 - AWS, Azure, GCP (coming soon)



DATABRICKS SQL STATEMENT EXECUTION API

Endpoints

Submit a SQL statement for execution	POST <code>/sql/statements</code>
Check the status and retrieve results	GET <code>/sql/statements/{statement_id}</code> <code>/sql/statements/{statement_id}/result/chunks/{chunk_index}</code>
Cancel a SQL statement execution	POST <code>/sql/statements/{statement_id}/cancel</code>



THREE EXECUTION MODES

Submit a SQL statement for execution

Default



POST

/sql/statements

wait_timeout: "15s"

on_wait_timeout: "CONTINUE"

Fetch results with ID

Asynchronous



POST

/sql/statements

wait_timeout: "0s"

Fetch results with ID

Synchronous



POST

/sql/statements

wait_timeout: "15s"

on_wait_timeout: "CANCEL"

Receive results in same call



API AUTOMATION EXAMPLE

Team Workspace

New Import

POST Long-running query

No environment

- Collections
- Environments
- History
- Data
 - Databricks SQL St... joycejetsen's fork
 - Databricks Tutorial
 - Automation example
 - POST Long-running query
 - GET Check status
 - POST Send notification

Databricks SQL Statement Execution API / Automation example / Long-running query

Save Share

POST https://{{DATABRICKS_HOST}}/api/2.0/sql/statements/

Send

Params Authorization Headers (11) Body Scripts Settings

Cookies

none form-data x-www-form-urlencoded raw binary GraphQL JSON

Beautify

```

1  {
2    "warehouse_id": "{{DATABRICKS_SQL_WAREHOUSE_ID}}",
3    "catalog": "samples",
4    "schema": "nyctaxi",
5    "statement": "SELECT * FROM trips",
6    "wait_timeout": "0s"
7  }

```

Response



Click Send to get a response

SMART INDUSTRIAL AUTOMATIONS

API automation example: send notification for long-running query



Submit long-running query

Check status, and keep checking every so often, until execution completed

Trigger notification on a physical device (or email, SMS, push notif, etc)



SMART INDUSTRIAL AUTOMATIONS

API automation example: authorization

Databricks SQL Statement Execution API

Overview Authorization Scripts Variables Runs

This authorization method will be used for every request in this collection. You can override this by specifying one in the request.

Auth Type
Bearer Token

The authorization header will be automatically generated when you send the request. Learn more about [Bearer Token](#) authorization.

Token
{(DATABRICKS_TOKEN)}

Overview Authorization Scripts Variables

These variables are specific to this collection and its requests. Learn more about [collection variables](#)

Filter variables

	Variable	Initial value	Current value	...
<input checked="" type="checkbox"/>	DATABRICKS_H...	dbc-2b40d431-f...	dbc-2b40d431-f8a7.cloud.databricks.com	
<input checked="" type="checkbox"/>	DATABRICKS_SQ...	04d8301d05621...	04d8301d05621ce5	
<input checked="" type="checkbox"/>	DATABRICKS_TO...	yourDatabricksT...	yourDatabricksToken	
<input checked="" type="checkbox"/>	SQL_STATEMEN...	yourSqlStateme...	yourSqlStatementId	
<input checked="" type="checkbox"/>	google_cloud_fu...	yourFunctionUrl	yourFunctionUrl	

POST Long-running query

HTTP Databricks SQL Statement Execution API / Automation example / Long-running query

POST https://{(DATABRICKS_HOST)}/api/2.0/sql/statements/

Params Authorization Headers (10) Body Scripts Settings

Headers Hide auto-generated headers

	Key	Value	Descrip
<input checked="" type="checkbox"/>	Authorization	
<input checked="" type="checkbox"/>	Cache-Control	no-cache	
<input checked="" type="checkbox"/>	Postman-Token	<calculated when request is sent>	
<input checked="" type="checkbox"/>	Content-Type	application/json	



SMART INDUSTRIAL AUTOMATIONS

API automation example: scripts and execution

statement Execution API / Automation example / Check status

```
https://{{{DATABRICKS_HOST}}}/api/2.0/sql/statements/{{{SQL_STATEMENT_ID}}}
```

Headers (8) Body **Scripts** Settings

```
1 // conditional logic to send a notification or check status again
2 let status = pm.response.json().status.state
3 if (status == "PENDING" || status == "RUNNING") {
4   // if query is not completed, check status again in 2 seconds
5   setTimeout(() => pm.execution.setNextRequest("Check status"), 1000)
6 } else {
7   // if query is completed, send notification
8   pm.execution.setNextRequest("Send notification")
9 }
10 }
```

POST Long-running query • Databricks SQL Stateme + No environment

Databricks SQL Statement Ex... - Run results

Ran today at 17:03:58 · [View all runs](#)

Source	Environment	Iterations	Duration	All tests	Avg. Resp. Time
Runner	none	1	9s 167ms	7	1935 ms

All Tests Passed (7) Failed (0) Skipped (0) [Generate Tests](#) [View Summary](#)

Iteration 1

POST Long-running query
https://dbc-2b40d431-f8a7.cloud.databricks.com/api/2.0/sql/statements/ 200 OK 380 ms 411 B

- PASS Status code is 200
- PASS Response returns statement ID

GET Check status
https://dbc-2b40d431-f8a7.cloud.databricks.com/api/2.0/sql/statements/01ef284f-4483-1c0f-beeb-057e20c3f7b5 200 OK 96 ms 411 B

- PASS Status code is 200
- PASS Response returns statement ID

GET Check status
https://dbc-2b40d431-f8a7.cloud.databricks.com/api/2.0/sql/statements/01ef284f-4483-1c0f-beeb-057e20c3f7b5 200 OK 765 ms 771 B

- PASS Status code is 200
- PASS Response returns statement ID

POST Send notification
https://us-central1-shared-playground-414521.cloudfunctions.net/woopwoopV2/woopwoopV2 200 OK 6500 ms 283 B



SMART INDUSTRIAL AUTOMATIONS

Code examples and generation

Documentation > REST API reference > Statement Execution >

Get result chunk by index

GET /api/2.0/sql/statements/{statement_id}/result/chunks/{chunk_index}

After the statement execution has **SUCCEEDED**, this request can be used to fetch any chunk by index. Whereas the first chunk with `chunk_index=0` is typically fetched with `statementexecution/executestatement` or `statementexecution/getstatement`, this request can be used to fetch subsequent chunks. The response structure is identical to the nested `result` element described in the `statementexecution/getstatement` request, and similarly includes the `next_chunk_index` and `next_chunk_internal_link` fields for simple iteration through the result set.

Path parameters

- `statement_id` required string
- `chunk_index` required int32

Response samples

200


INLINE, JSON_ARRAY, no next chunk

INLINE, JSON_ARRAY, has next chunk

EXTERNAL_LINKS, has next chunk

EXTERNAL_LINKS, no next chunk

```
["0-54-0.8256375429534709",  
 [  
  ["// ... 139799 more rows"  
 ]  
 ]
```




Code snippet

cURL

```
curl -X GET -H 'Content-Type: application/json' \-s 'https://dbc-2b49d431-f8a7.m/api/2.0/sql/statements/301d05621ce5/result/chunks/0'
```

Databricks SQL Statement Execution ...

- Databricks Tutorial
- Automation example
- POST Long-running query
 - Pending
 - GET Check status
 - Succeeded
 - POST Send notification
 - open



land of stevebeli... > woop woop

CONFIGURE CONTROL LOGS CONNECT

PAGE


Code sample

Configure as remote part

API keys

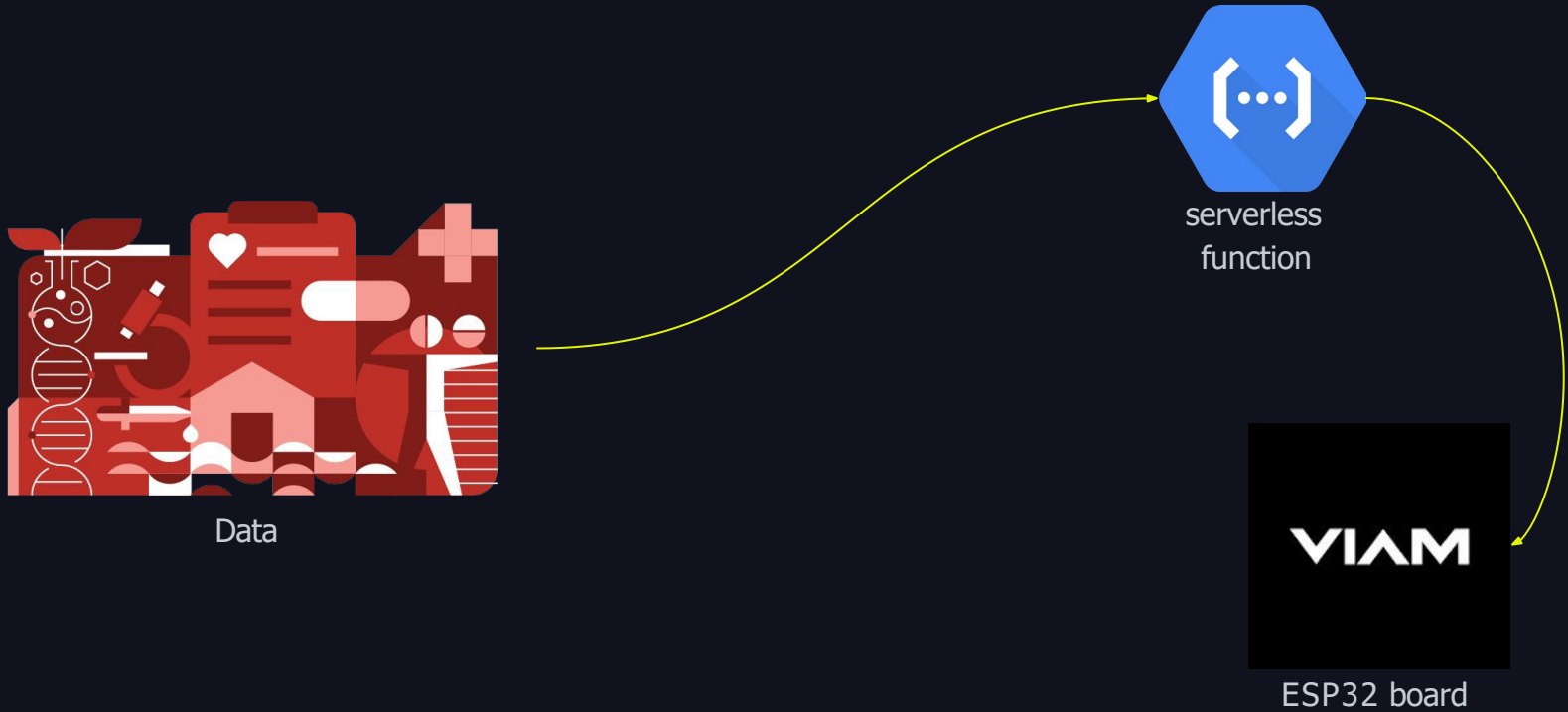
Include secret

```
import asyncio  
  
from viam.robot.client import RobotClient  
from viam.rpc.dial import Credentials, DialOptions  
from viam.components.board import Board  
  
async def connect():  
    opts = RobotClient.Options.with_api_key(  
        # Replace "<API-KEY>" (including brackets) with your machine's api key  
        api_key='<API-KEY>',  
        # Replace "<API-KEY-ID>" (including brackets) with your machine's api key id  
        api_key_id='<API-KEY-ID>'  
    )  
    return await RobotClient.at_address('woop-woop-main.6xs7zv3bxx.viam.cloud')
```



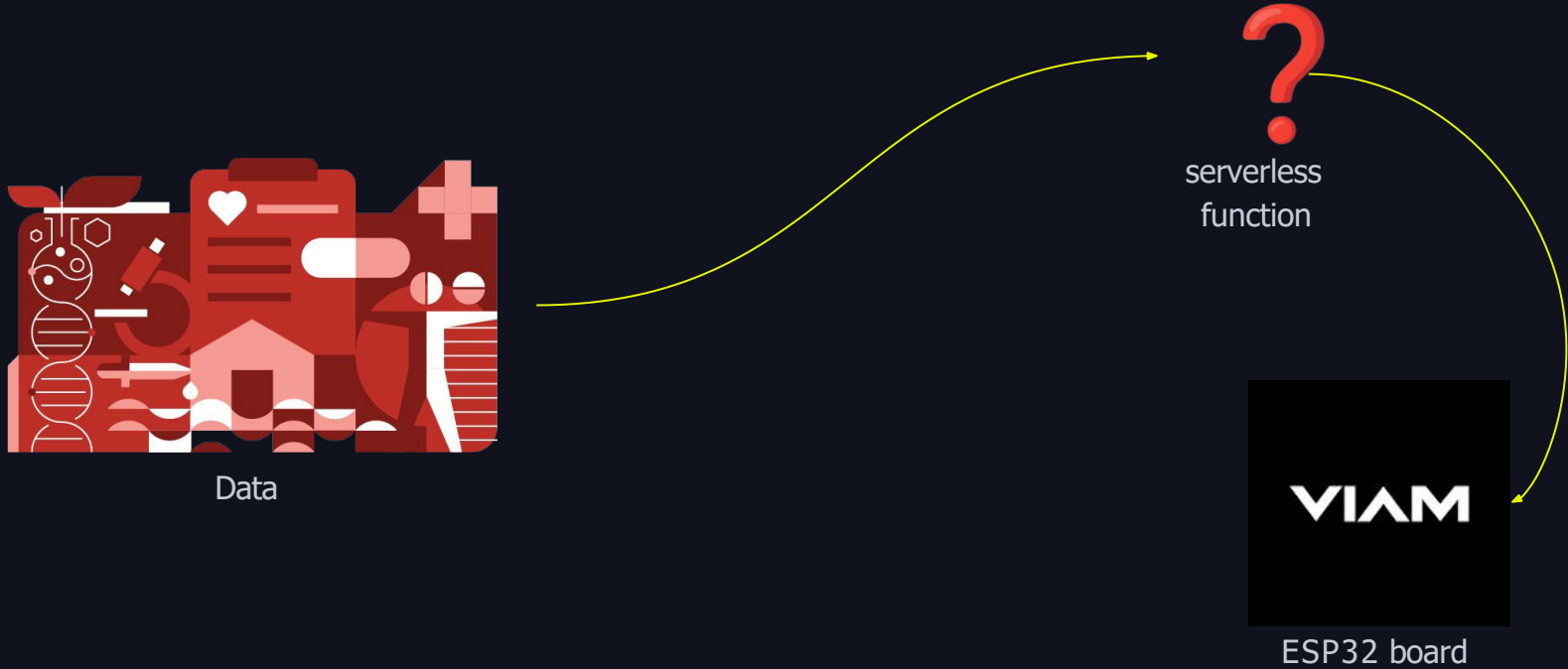
SMART INDUSTRIAL AUTOMATIONS

Automation example architecture



SMART INDUSTRIAL AUTOMATIONS

Automation example architecture



SMART INDUSTRIAL AUTOMATIONS

Automation example architecture



Data



ESP32 board



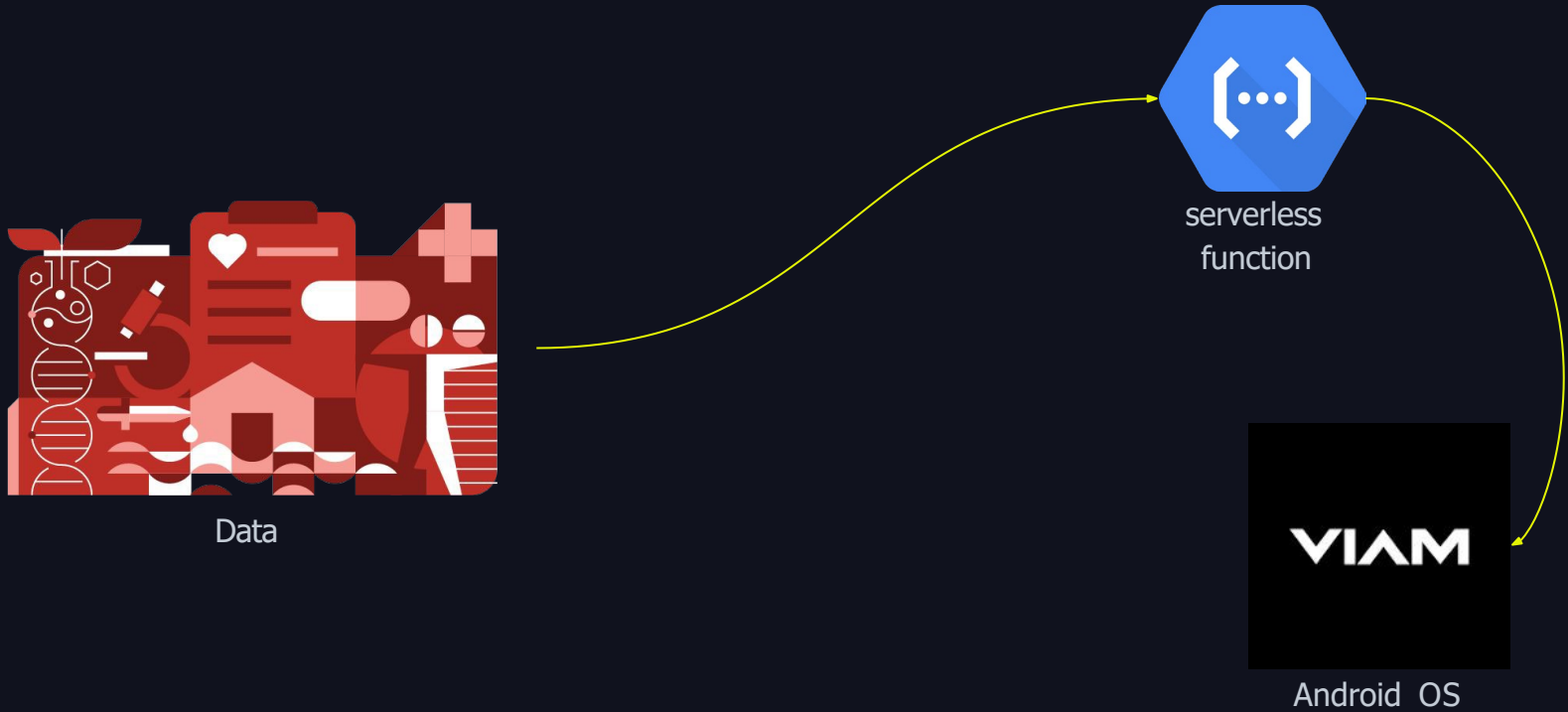
SMART INDUSTRIAL AUTOMATIONS

Automation example architecture



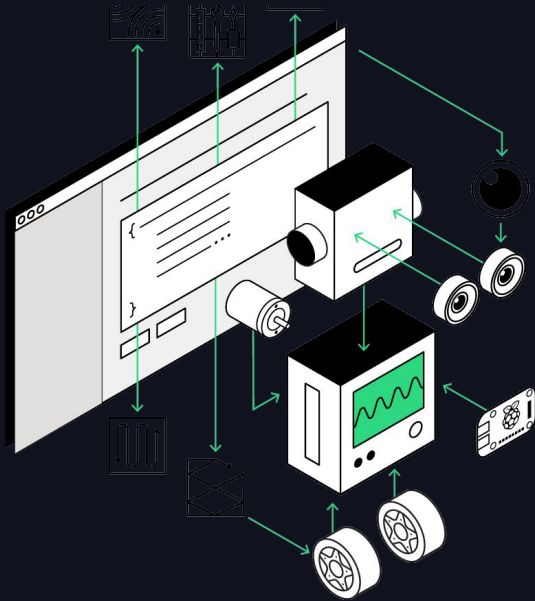
SMART INDUSTRIAL AUTOMATIONS

Automation example architecture



SMART INDUSTRIAL AUTOMATIONS

With the Databricks Statement Execution API



 joycejetsn |viamrobotics

Statement Execution API: Run SQL on warehouses
Statement Execution Reference (by cloud)



Postman collection

VIAM



Try Viam

