

D.O.O.F. Data Ownership Orchestration Framework

An Open Source Framework for decentralized consent management

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Ecoteer technologies: Consent Management Framework

DATA OWNERSHIP ORCHESTRATION FRAMEWORK

- Technology: orchestration framework for decentralized consent management
- Functionalities: standardizes the development and deployment of applications that utilize PETs and adds data ownership functionalities, streamlining the process for developers and businesses alike
- Open-source

Ecosteer technologies: Privacy Enhancing Encryption Schemes

DATA VISIBILITY CONTROL OVERLAY

Applicable on: **DATA STREAMS**

multicast end-to-end encryption scheme

- Functionalities: data owners unilaterally grant and revoke visibility over data streams generated by connected devices to selected data recipients
- Patent: 'Multicast Encryption Scheme for Data Ownership Platform' (Patents granted in US, EU, CAN, Japan, Singapore, etc.)

RECORD LEVEL ENCRYPTION

Applicable on: **DATA SETS**

encryption scheme for data records

- Functionalities: data owners unilaterally grant visibility over data records maintained by service providers to selected data recipients
- Patent pending

EU Data Strategy

GDPR

**ENFORCED IN
MAY 2018**

Consent must be **granted** separately for each specific **purpose of use**.

Revoking consent must be as **easy** as granting it.

DATA GOVERNANCE ACT

**ENFORCED IN
SEPTEMBER 2023**

Create a framework to foster a new business model:

data intermediation services.

Provides a trusted and secure environment for companies and individuals to share data

DATA ACT

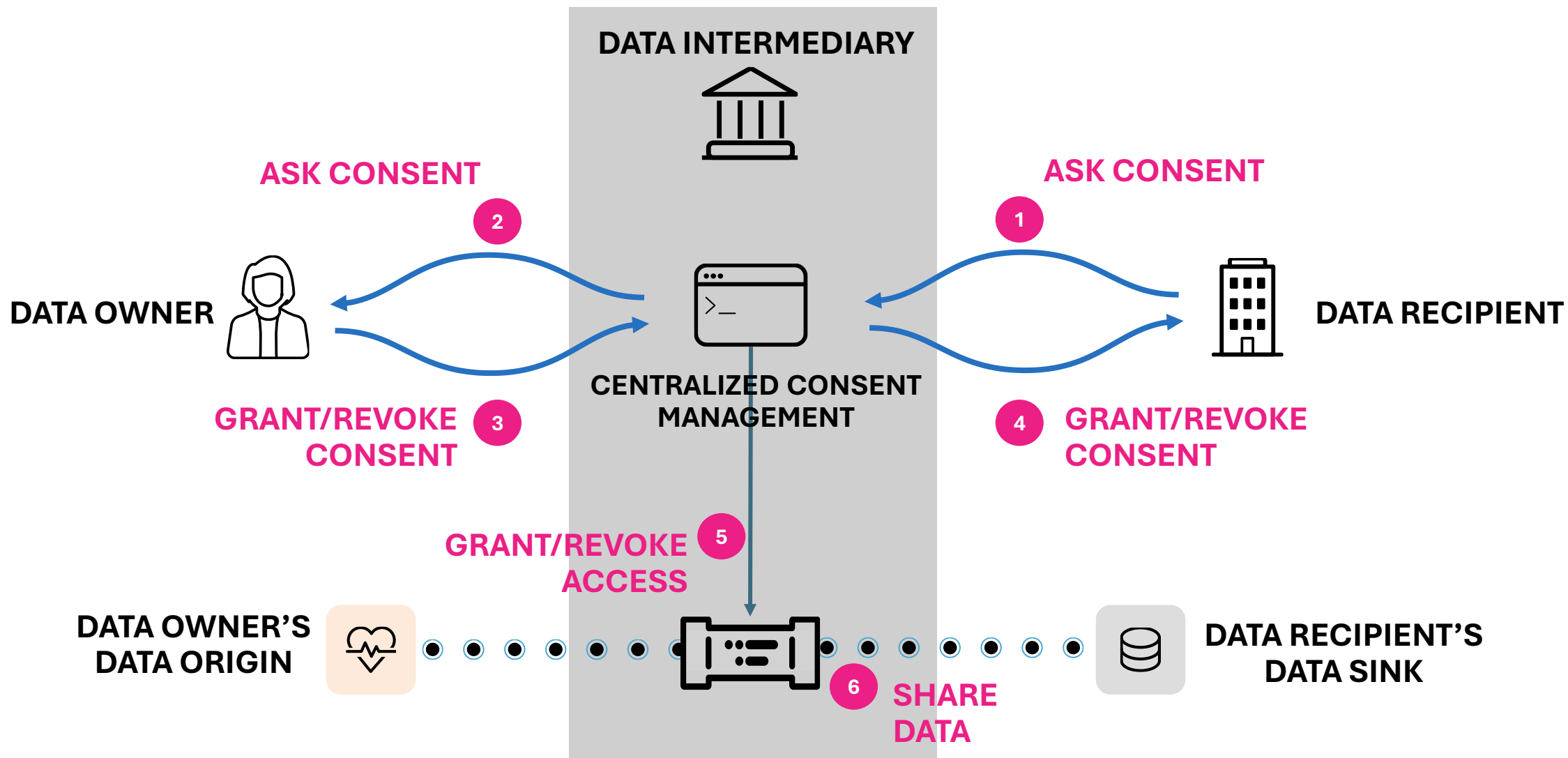
**ENFORCED FROM
SEPTEMBER 2025**

Users of **connected products** and related applications must be enabled to **share their data** with third parties of their choice

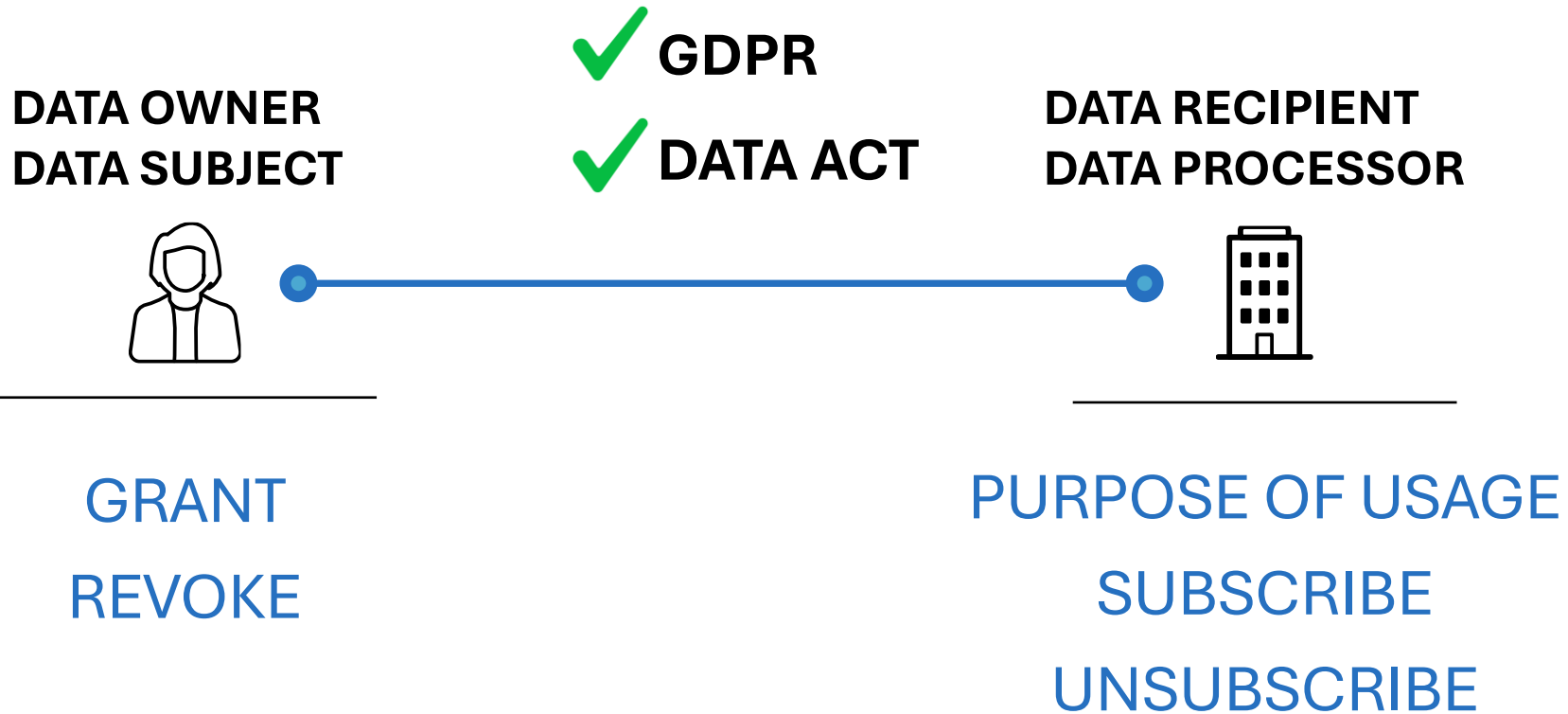
* <https://digital-strategy.ec.europa.eu/en/policies/data-intermediary-services>

** <https://gdpr.eu/gdpr-consent-requirements/>

Centralized approach: data intermediary costs and legal liabilities

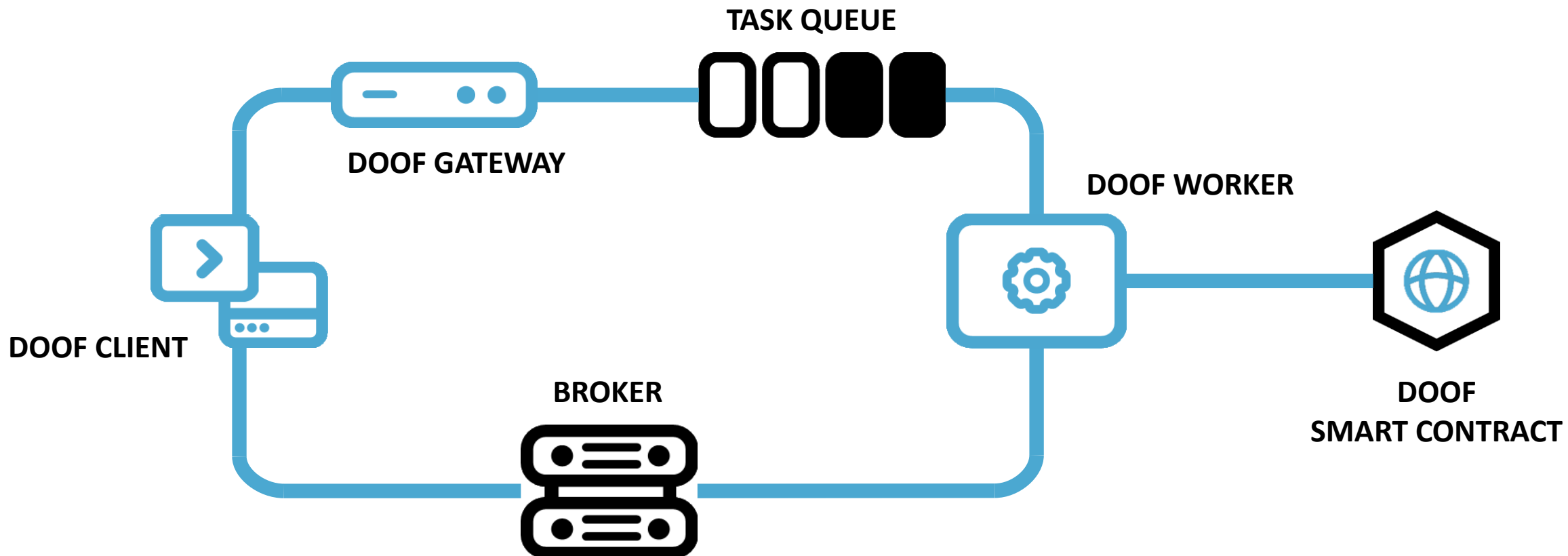


DOOF: the PILLARS

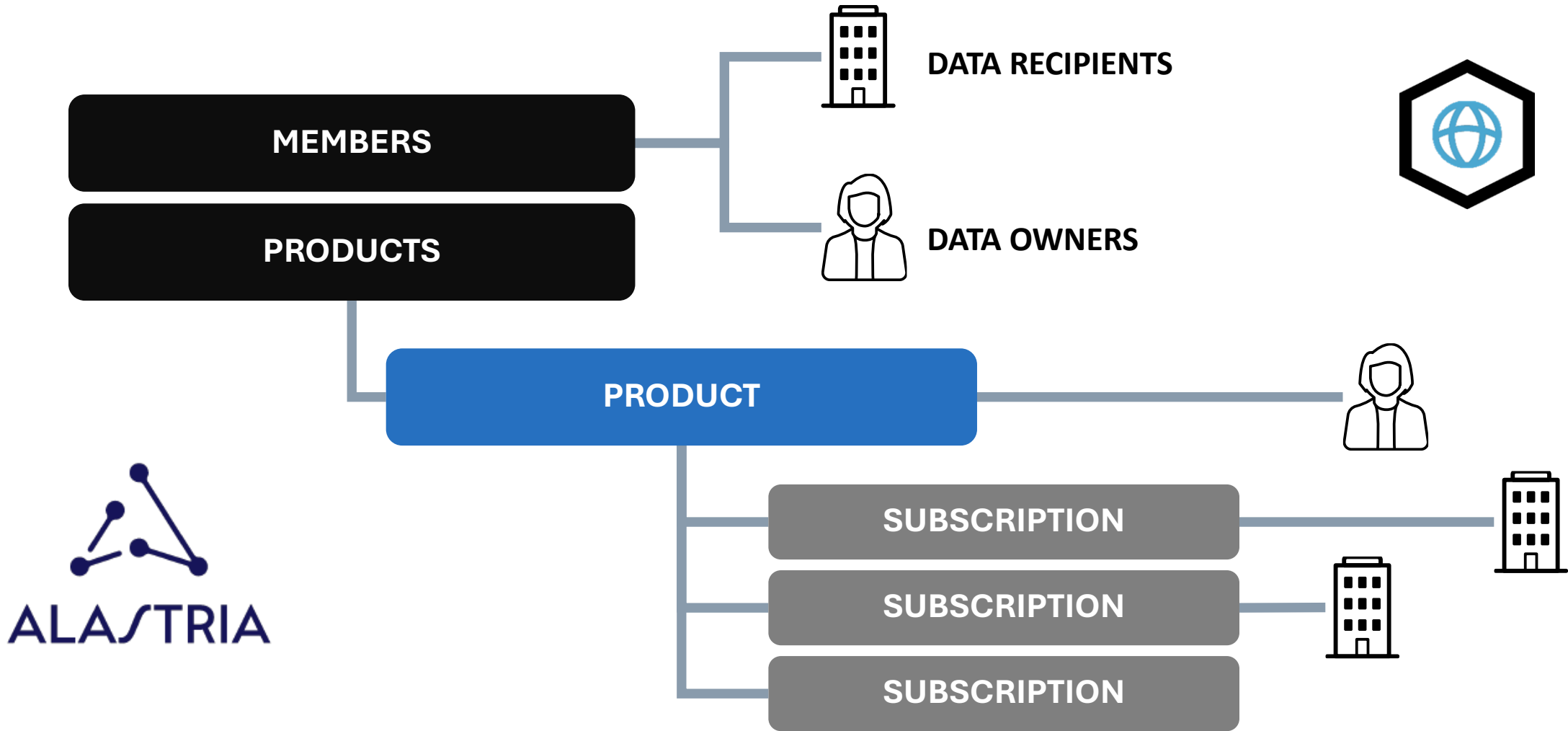


DOOF Architecture

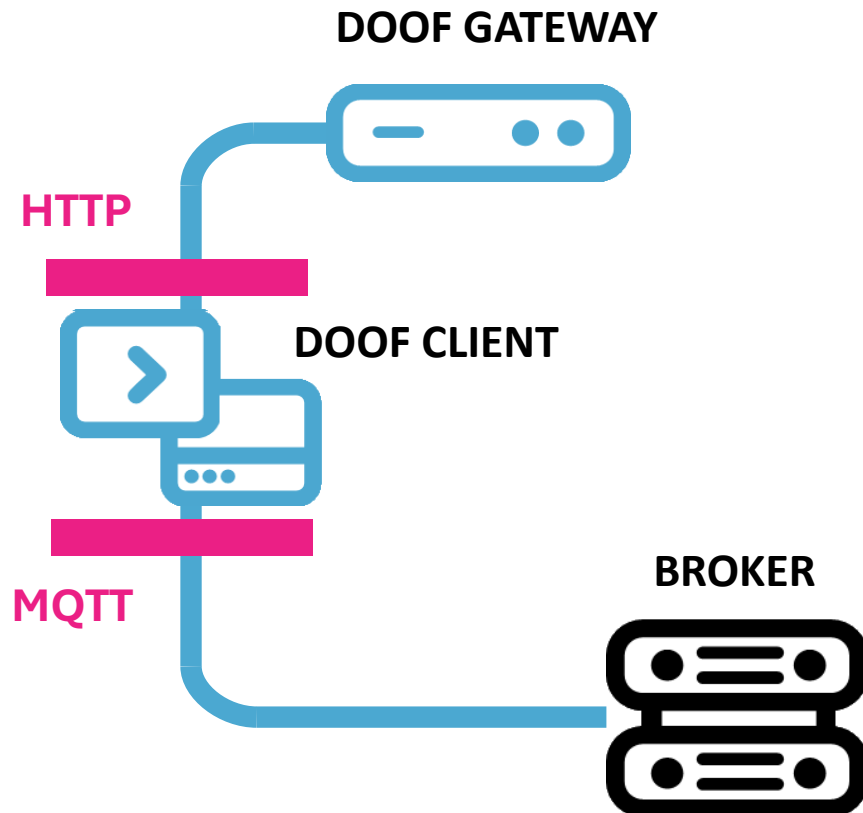
Data Ownership Orchestration Framework



DOOF Smart Contract

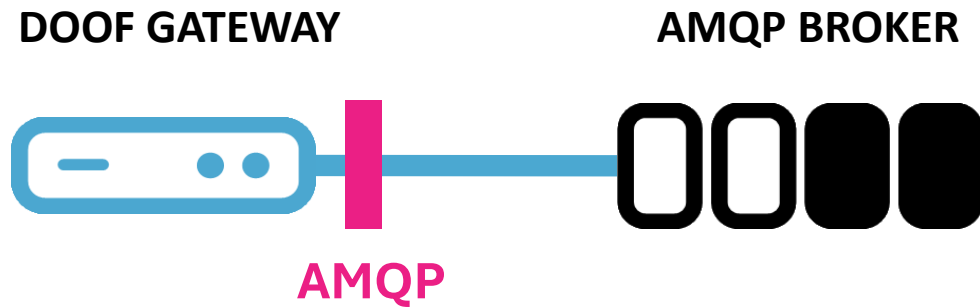


DOOF Client



```
{  
  "session": "8abbc354-7258-11e9-a923-1681be663d3e",  
  "task": 1,  
  "event": "dop_subscription_grant",  
  "params": {  
    "auth_token": "25db23fd0515445e93fd6388762cf556",  
    "subscription_id": "022C84FF-3DA3-4BE0-9C1C-0A4E9ED1BE5A"  
  }  
}
```

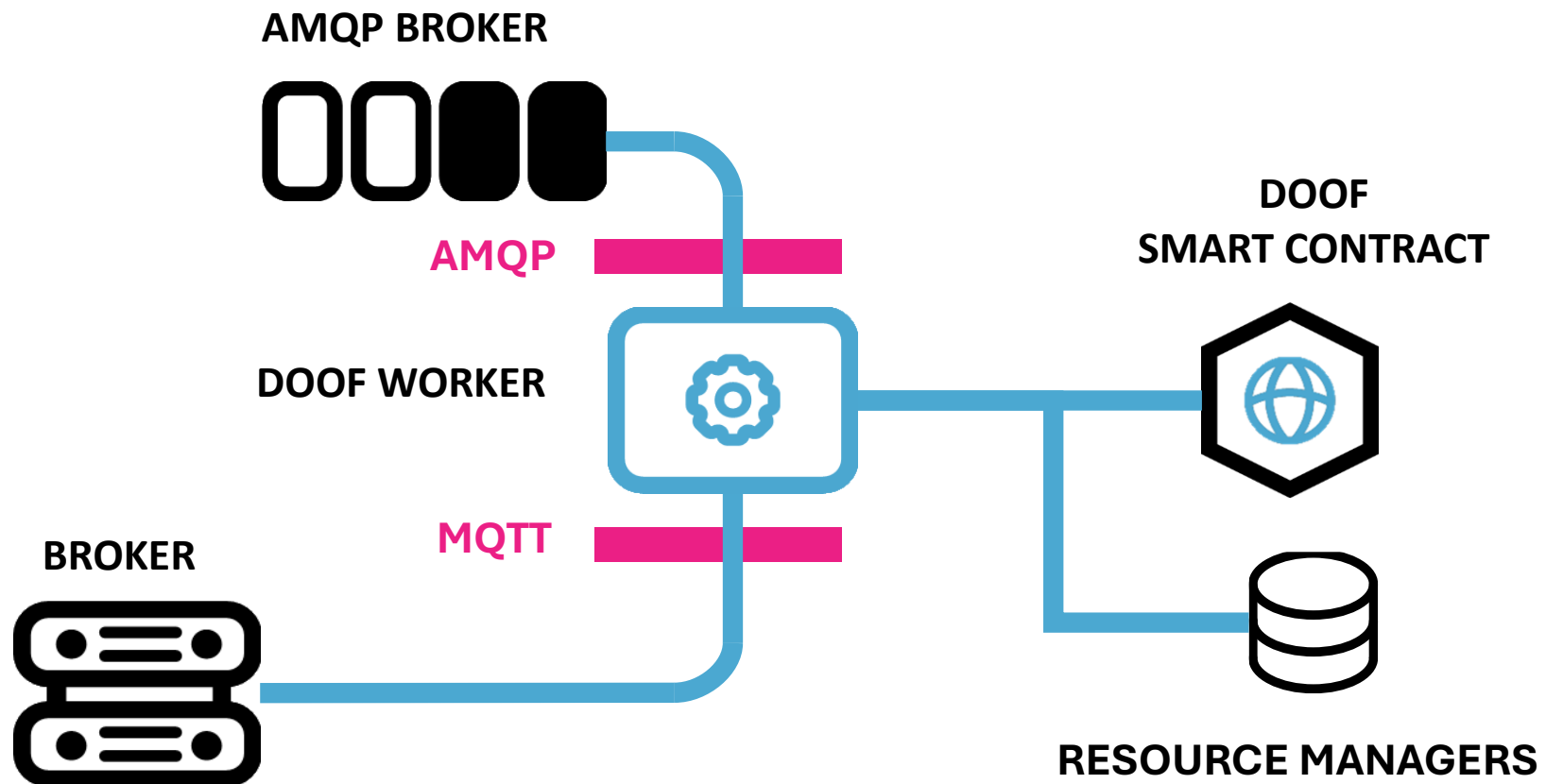
DOOF Gateway



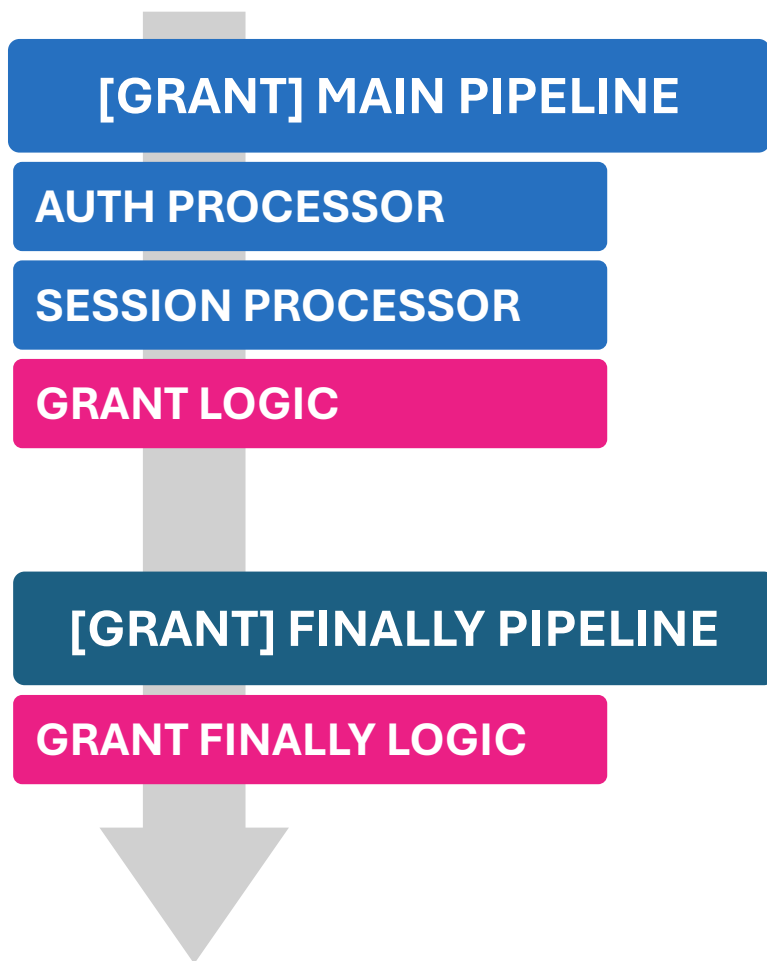
Standard HTTP Server deployment:

- Security via HTTPS
- Validates requests and forwards them to work queue (AMQP) for scalability
- Authentication (outside the scope of the DOOF Gateway)

DOOF Worker



DOOF Worker Execution Framework



```
"dop_subscription_grant" :  
  {  
    "main": [  
      "$AUTH_MACRO",  
      "$UPDATE_SESSION_MACRO",  
      "$MLE_LOOKUP",  
      {  
        "path": "/home/user/doof/provider/processor/dop_subscription_grant.py",  
        "class": "DopSubscriptionGrantProcessor",  
        "configuration": ""  
      }  
    ],  
    "finally": ["$FINALLY_MLE_ENCRYPT"]  
  }
```

Worker execution phases

```
{  
...  
  "event":  
  "dop_subscription_grant",  
  "params": {...}  
}
```



INPUT VALIDATION

- ✓ JSON
- ✓ «event» is present

Worker execution phases



Worker execution phases

```
{  
...  
  "event":  
  "dop_subscription_grant",  
  "params": {...}  
}
```



INPUT VALIDATION

PIPELINE SELECTION

PIPELINE EXECUTION



JSON



«event» is present

Worker execution phases

```
{  
...  
  "event":  
  "dop_subscription_grant",  
  "params": {...}  
}
```



Worker execution phases

```
{  
...  
  "event":  
  "dop_subscription_grant",  
  "params": {...}  
}
```



INPUT VALIDATION

PIPELINE SELECTION



PIPELINE EXECUTION



FINALLY PIPELINE



NOTIFICATION

```
{  
"task": 1,  
  "event":  
  "dop_subscription_grant",  
  "params": {"err": 0 ,  
  "phase" :1 }  
}
```

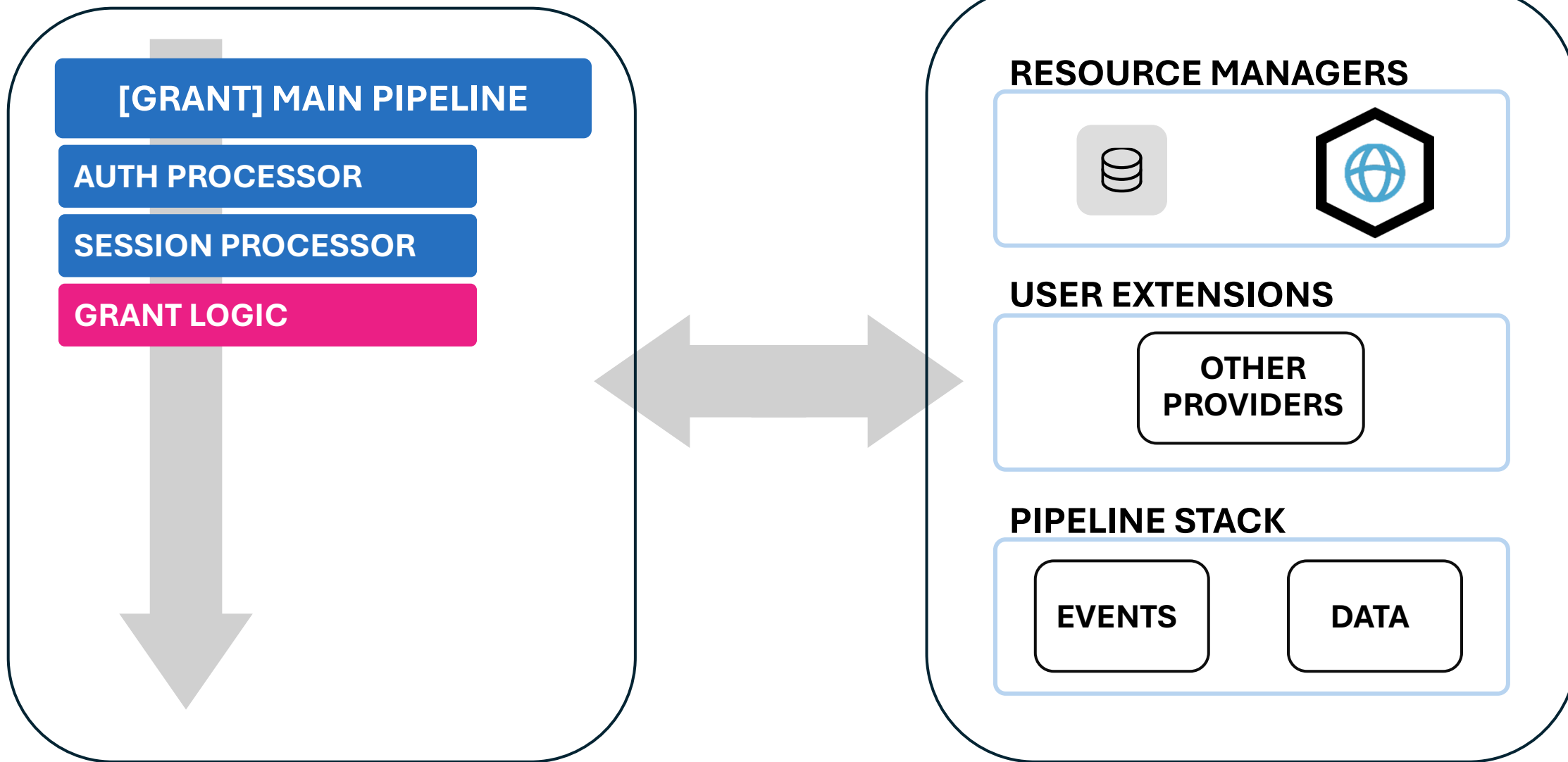


JSON

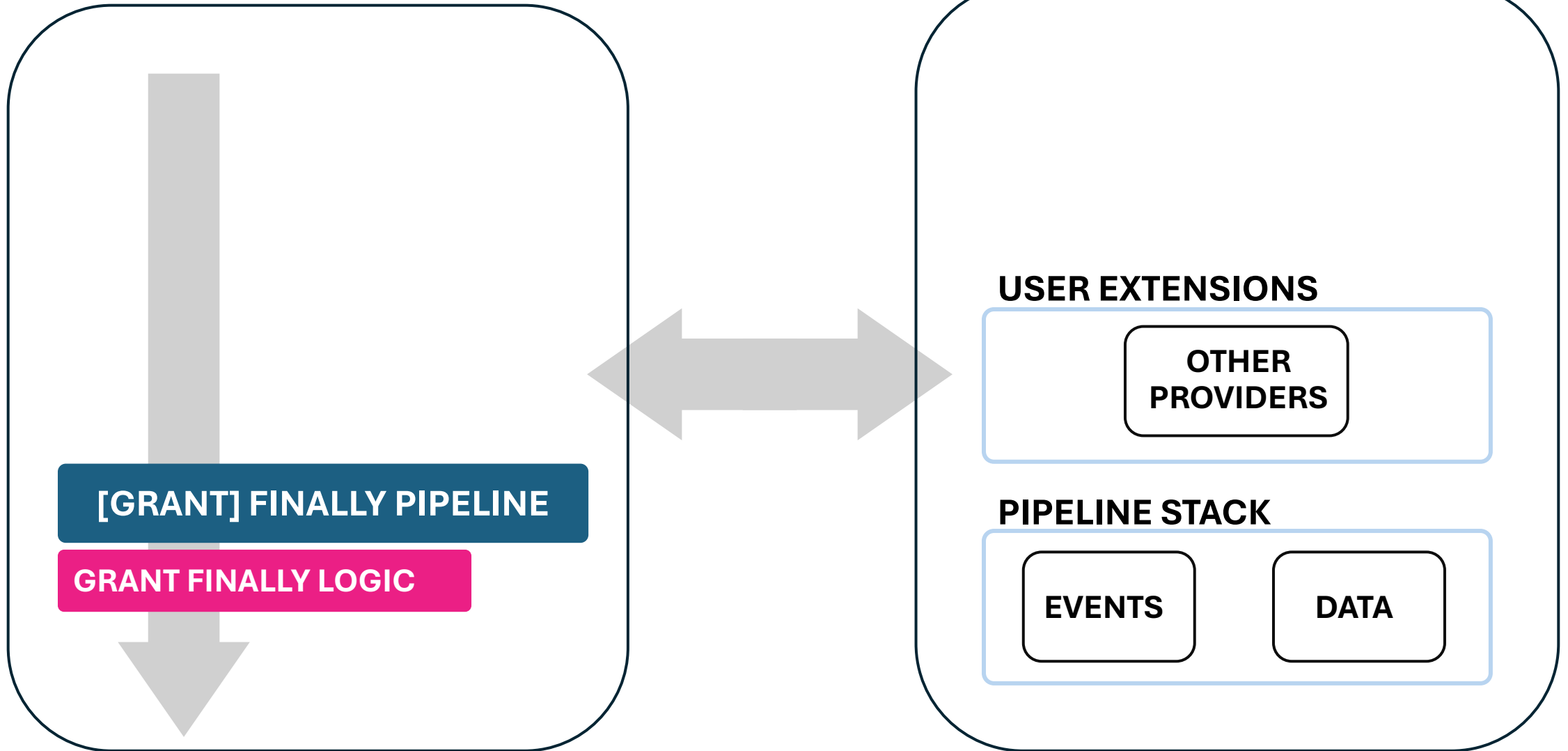


«event» is present

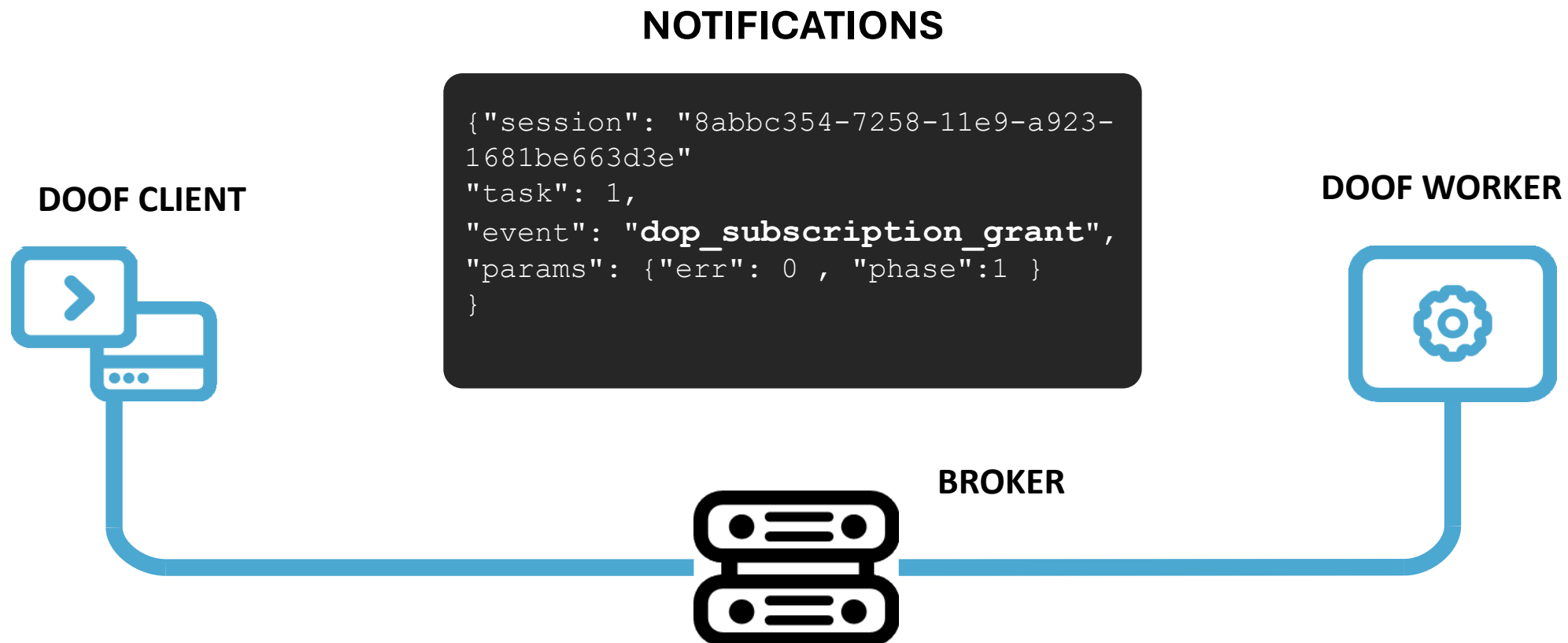
DOOF Worker Main Pipeline Design



DOOF Worker Finally Pipeline Design



DOOF Worker Notification



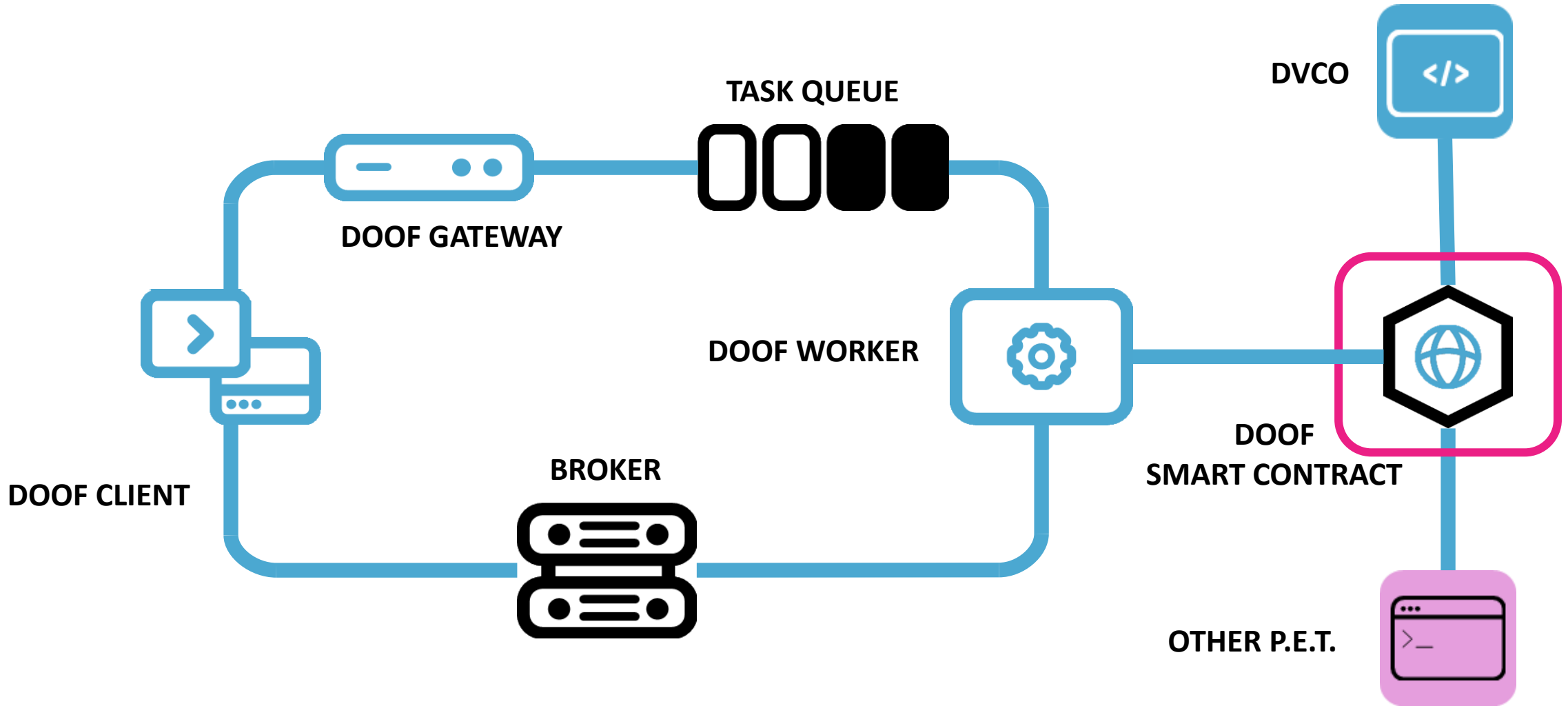
Air Quality Data Exchange

The screenshot shows a web interface titled "Data Exchange" for user "Gabi San" (gabisan@ecosteer.com). The left sidebar contains navigation options: Billboard, Assets (highlighted), Notifications, Messages, Useful Info, Settings, and Sign Out. The main content area shows "Qubee 000138" with a date of "17 mag 2024". It features two status buttons: "3 Approved" and "0 Not Approved". Below this, there are three data request entries, each with a green checkmark, a requester name, a request date, and a "See my own data" or "Purpose of usage" link.

The screenshot shows a "Data Owner's Subscription App" interface for user "georgib@ecosteer.com". It displays a "TVOC VALUE" of 252 in a circular gauge. To the right is a line graph showing TVOC levels over time from 16:24:23 to 16:25:12. The y-axis ranges from 252.0 to 257.0. The graph shows a peak around 16:24:40 and a sharp decline thereafter.

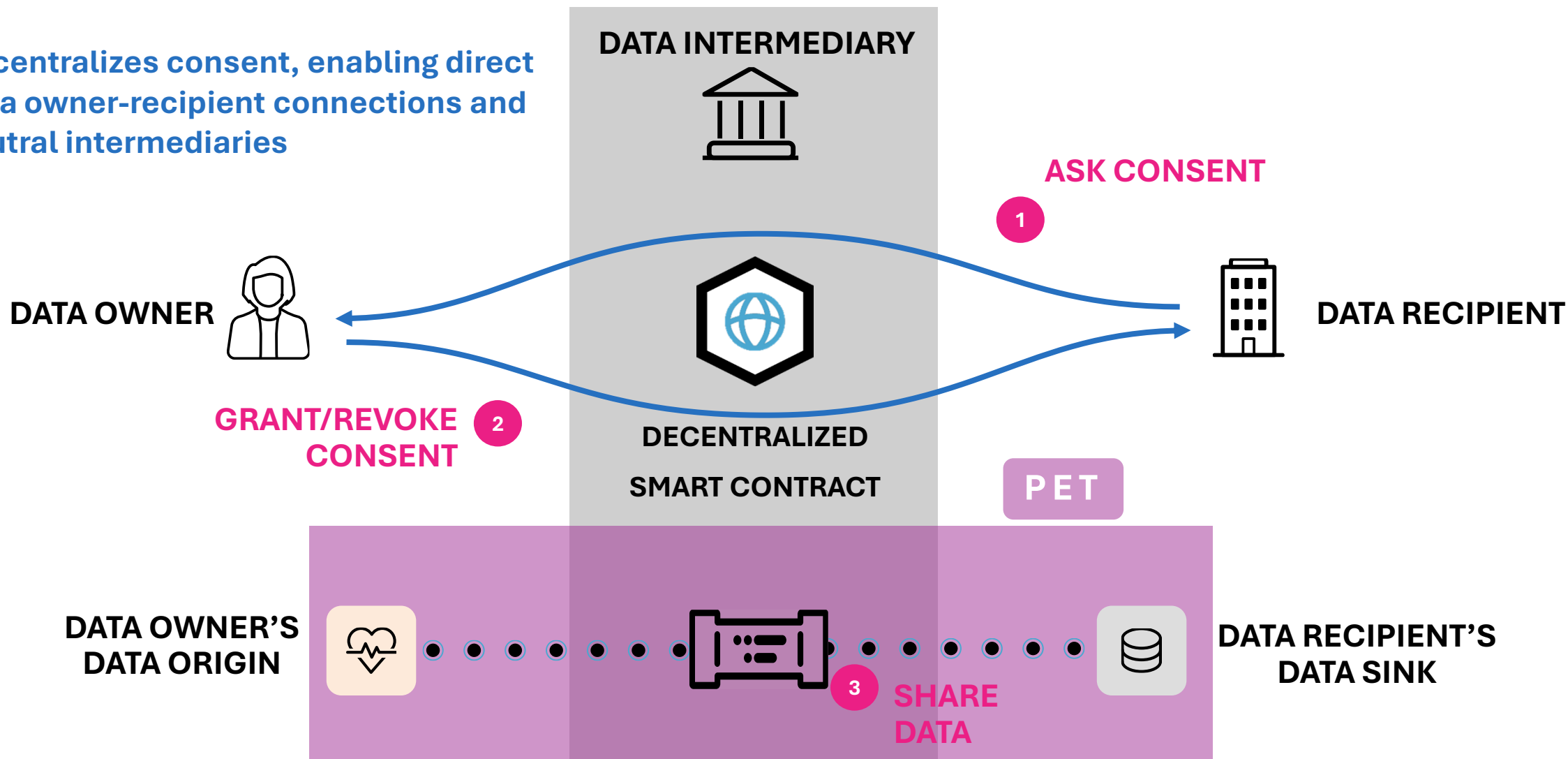


Integration with Privacy Enhancing Technologies (PETs)



Decentralization and Neutral Data Intermediaries

Decentralizes consent, enabling direct data owner-recipient connections and neutral intermediaries



Horizontal Solution

Flexible, cross-sector architecture supports various data and access types



Energy



Mobility

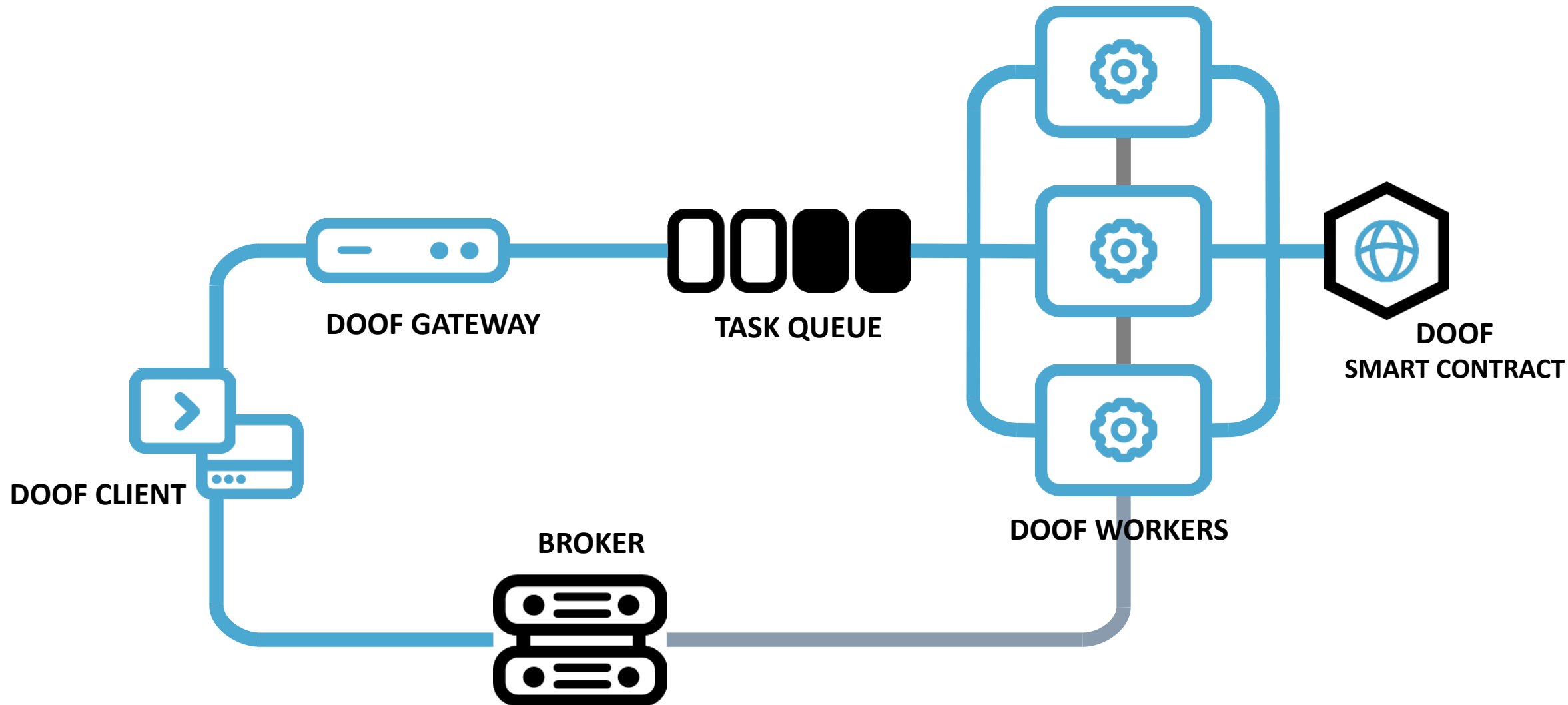


Healthcare



Banking

Scalability and Availability



DOOF

DOOF.

Decentralized Consent
Management

Technical
Implementation of
GDPR Principles

Scalable Extendible
Pipeline

Thank you!

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