
AWS
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TRV402-R

Deliver a connected travel experience with distributed data mesh

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Agenda

Why should you care about this

What challenges await you

How to overcome those challenges

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Sneak peek into a possible future

Beyond Digital Transformation in Aviation

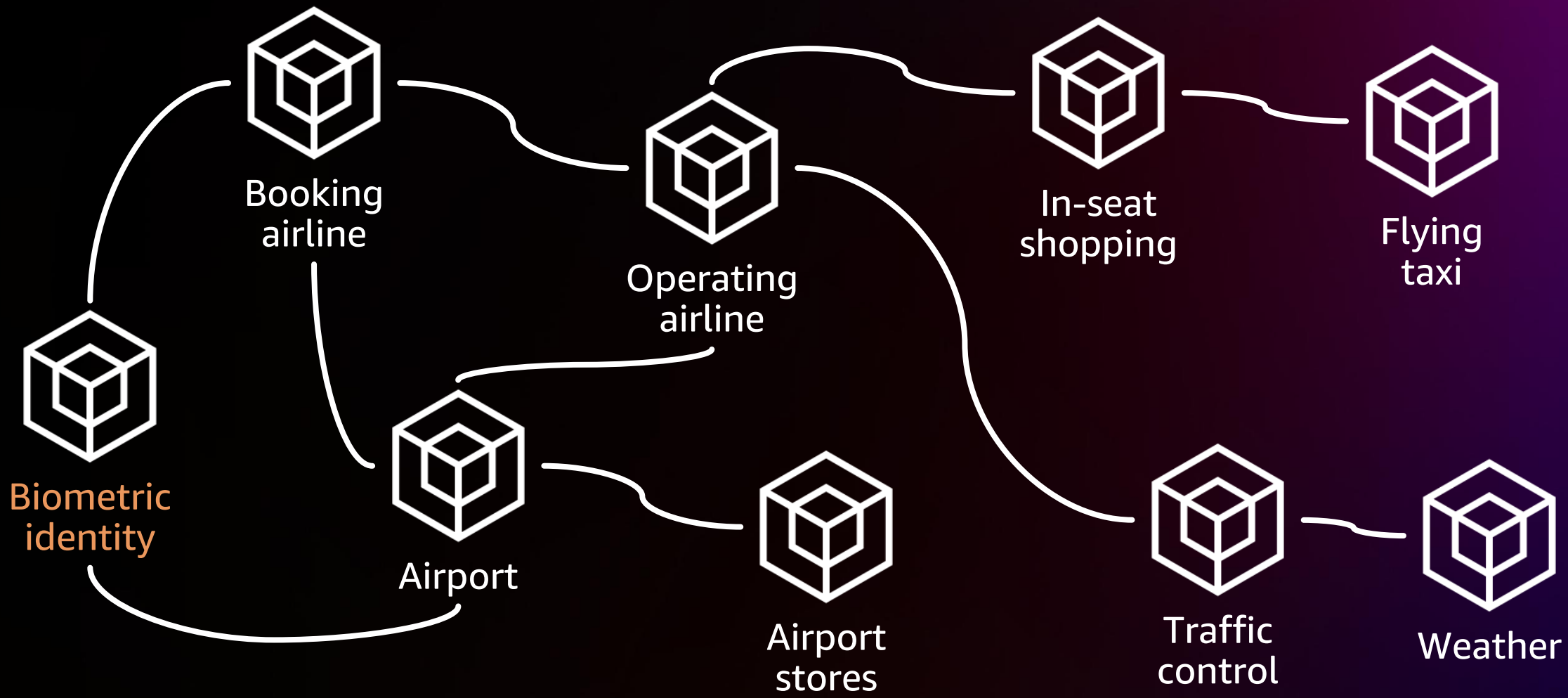
Video created by Thales for ICAO – International Civil Aviation Organization

Publicly available at ICAO.TV
https://bit.ly/icaobeyond



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Typical airline passenger journey



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How far away is it?

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How far away is it?

At Dubai airport, travelers' eyes become their passports

Dubai's airport, the world's busiest for international travel, has introduced an iris-scanner that verifies one's identity and eliminates the need for any human interaction when entering or leaving the country.

from ABC News, March 7, 2021

IATA

Home > Pressroom > 2021 Press Releases

Date: 15 November 2021

Passengers Want to Use Biometrics to Eliminate Queuing Post Pandemic



Translations

国际航协：旅客希望生物识别技术加快行程 减少后疫情时代排队时长 (pdf)
Os passageiros querem usar a biometria para acelerar processos e eliminar filas em aeroportos após a pandemia (pdf)
Pasajeros aéreos apoyan biometría para agilizar procesos de viaje y eliminar colas tras la pandemia (pdf)

Geneva - The International Air Transport Association (IATA) announced the results of its 2021 Global Passenger Survey (GPS), which delivered two main conclusions:

1. Passengers want to use biometric identification if it expedites travel processes.

2. Passengers want to spend less time queuing.

"Passengers have spoken and want technology to work harder, so they spend less time 'being processed' or standing in queues. And they are willing to use biometric data if it delivers this result. Before traffic ramps-up, we have a window of opportunity to ensure a smooth return to travel post pandemic and deliver long-

European Commission

EN English Search

Shaping Europe's digital future

Menu

Home > Funding > European Digital Identity Wallet

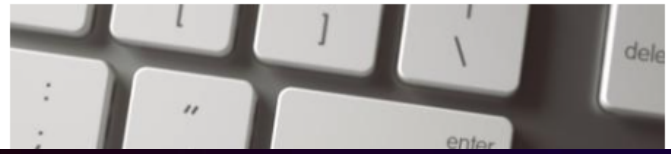
CALL FOR TENDERS | Publication 13 June 2022

European Digital Identity Wallet

Opening: 13 June 2022

Closing: 22 July 2022

The European Commission is looking for a contractor to provide services in support of the infrastructure for a European Digital Identity Wallet.

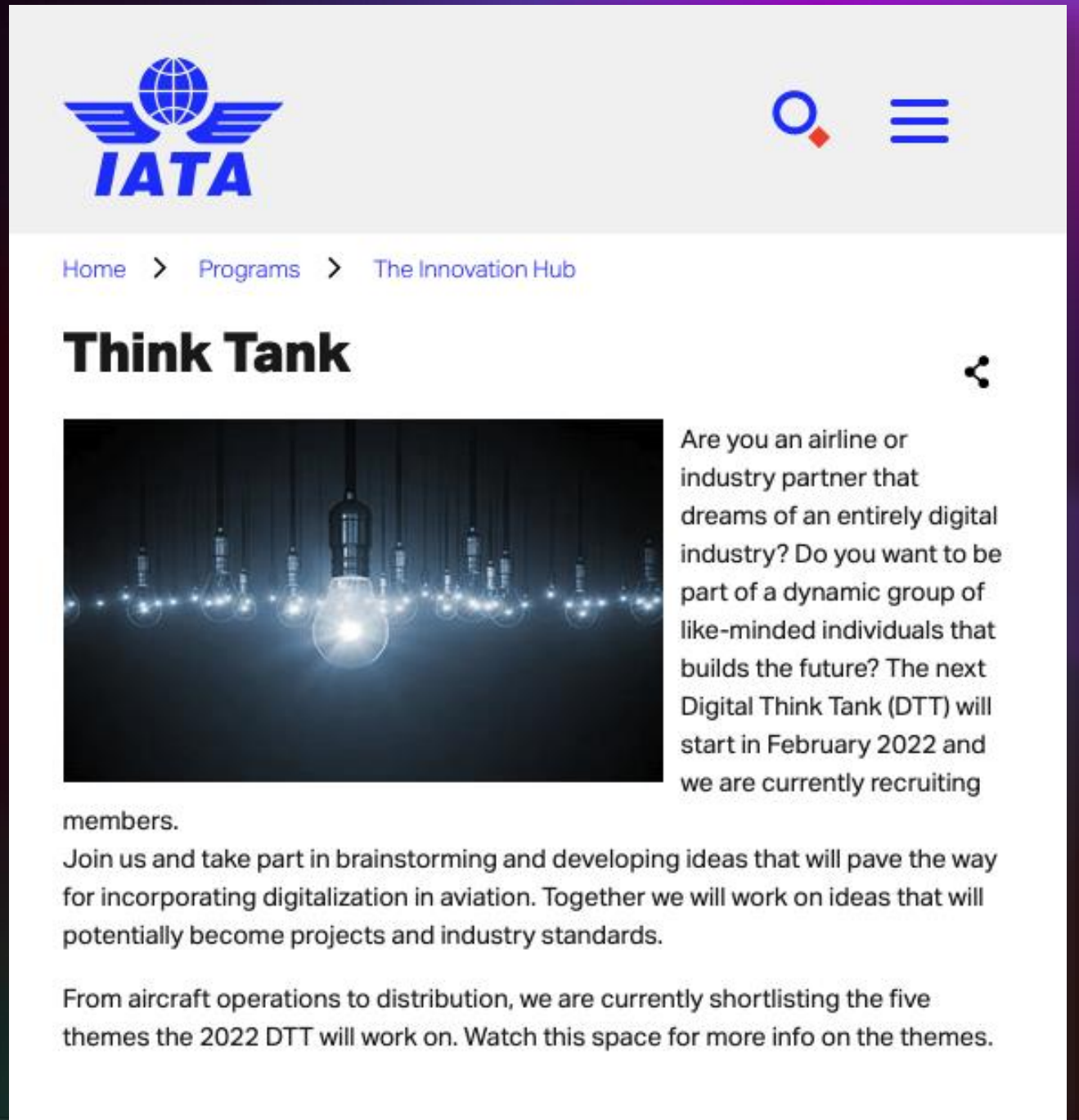


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Demo

Federated computational governance



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Demo VCs

file:///Users/jorgemf/Amazon%20WorkDocs%20Drive/My%20Documents/E...

Workflow	Wallet	Issuing Airline Website	Airline Staff	Associated Airline

Screen Mirroring - ONEPLUS A5000

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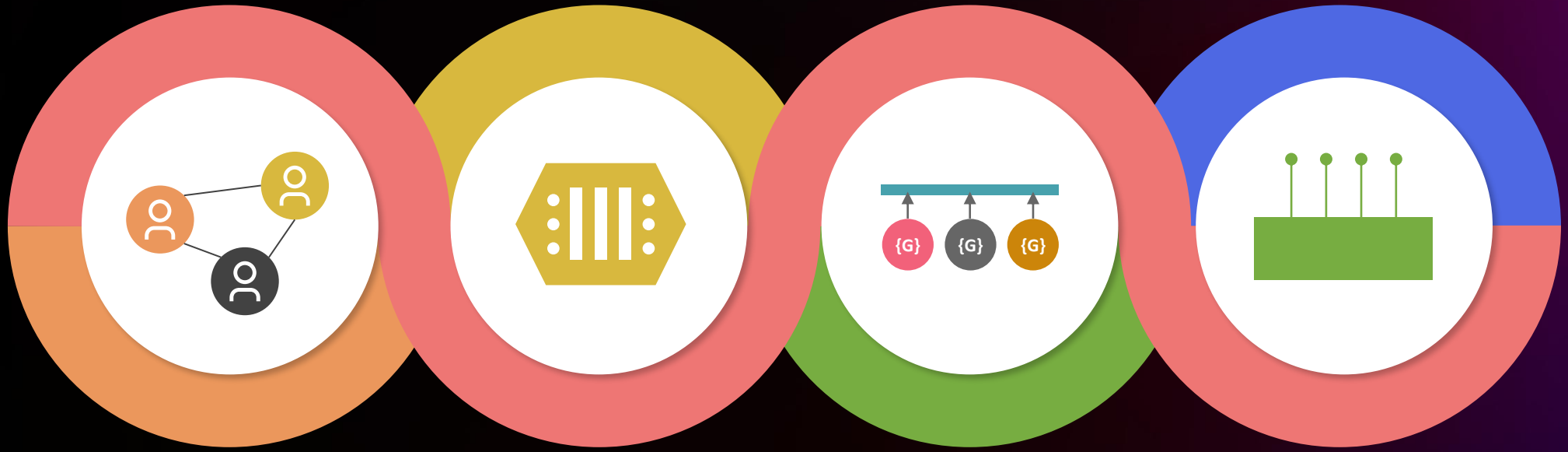
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What is data mesh?



Domain ownership

Data as a product

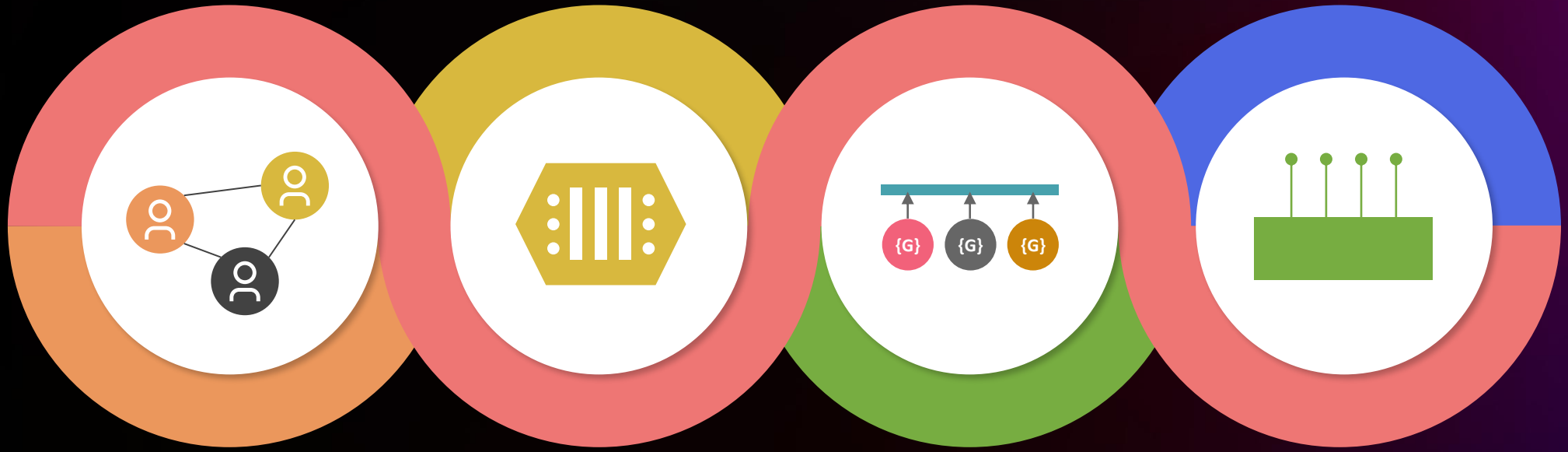
Federated computational governance

Self-serve data platform

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What is data mesh?



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Self-serve data platform

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Self-serve distributed cloud-agnostic data platform

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Self-serve distributed cloud-agnostic data platform

Domain port types:

- Datasets – **SFTP, HTTPS, SaaS integrations**
- Synchronous – **REST API, GraphQL API**
- Asynchronous – **Sagas, callback endpoints**
- Notifications – **Push events, webhooks**
- Streams – **Data streams, event streams**

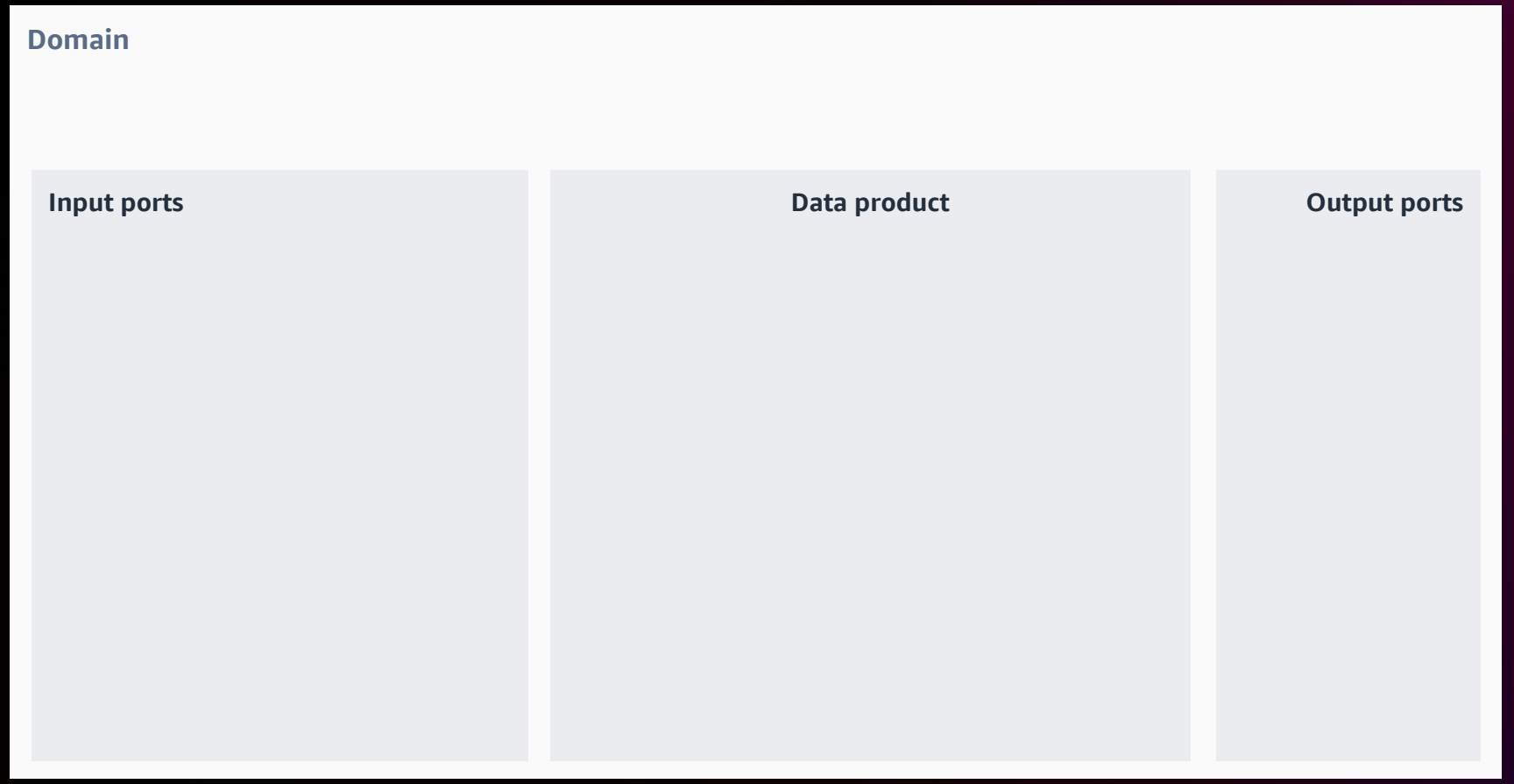
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How to solve this?

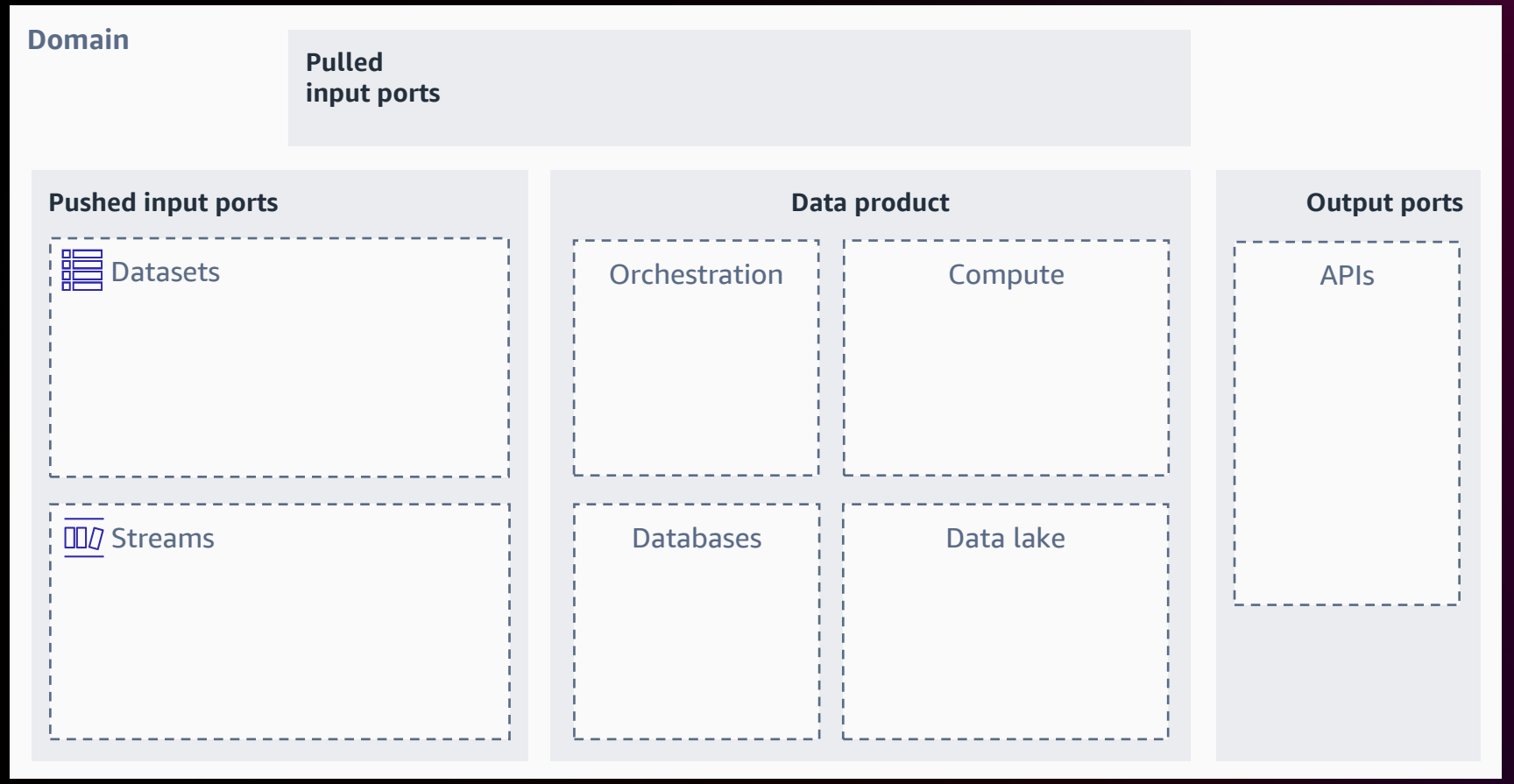
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Architecture



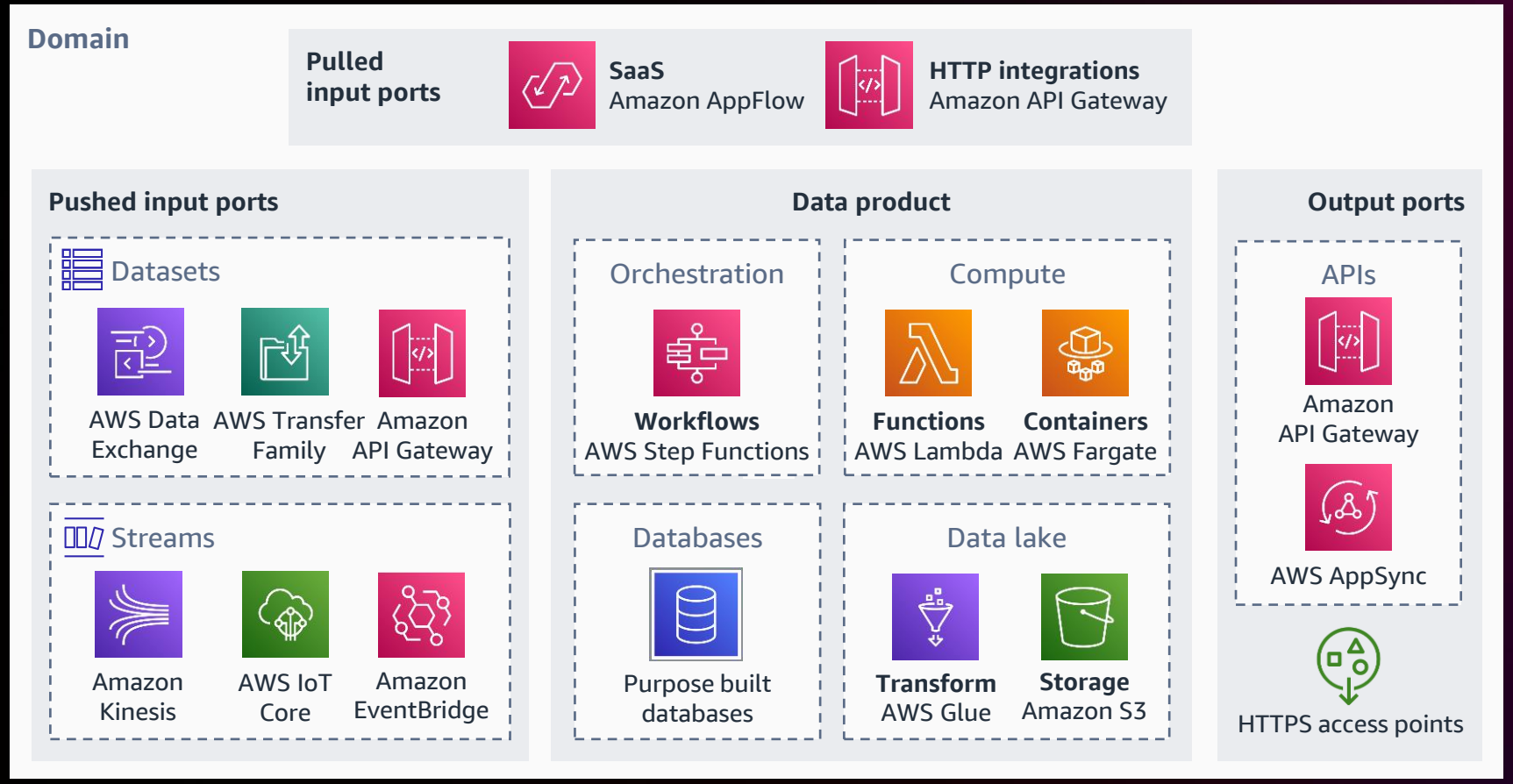
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Architecture



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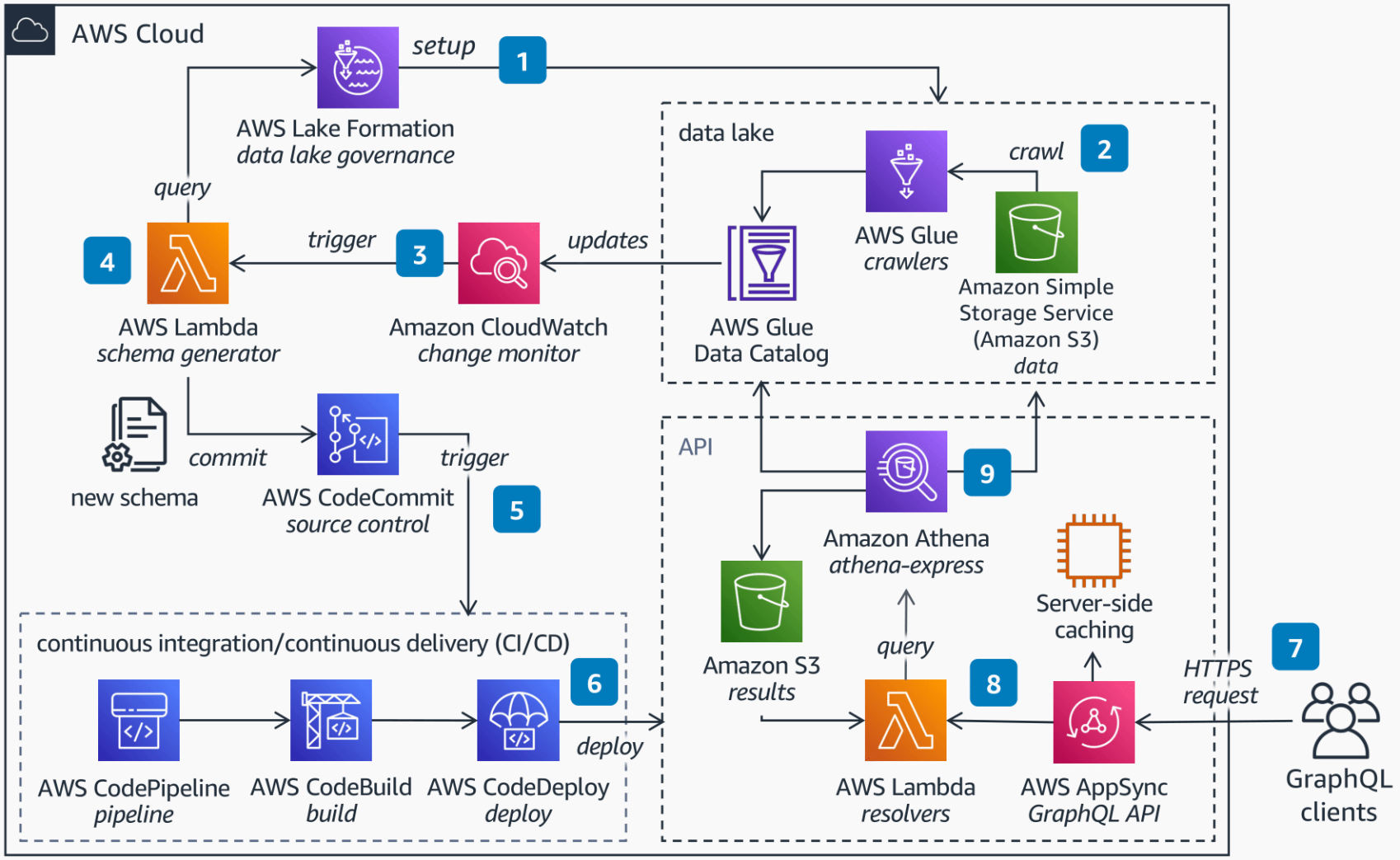
Architecture



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Expose your Data Lake as a GraphQL API

Build a data lake using AWS Lake Formation, then share it as a self-documented GraphQL API, automatically built with a reactive CI/CD pipeline, allowing authorized external clients to query your data lake using GraphQL syntax over HTTPS.



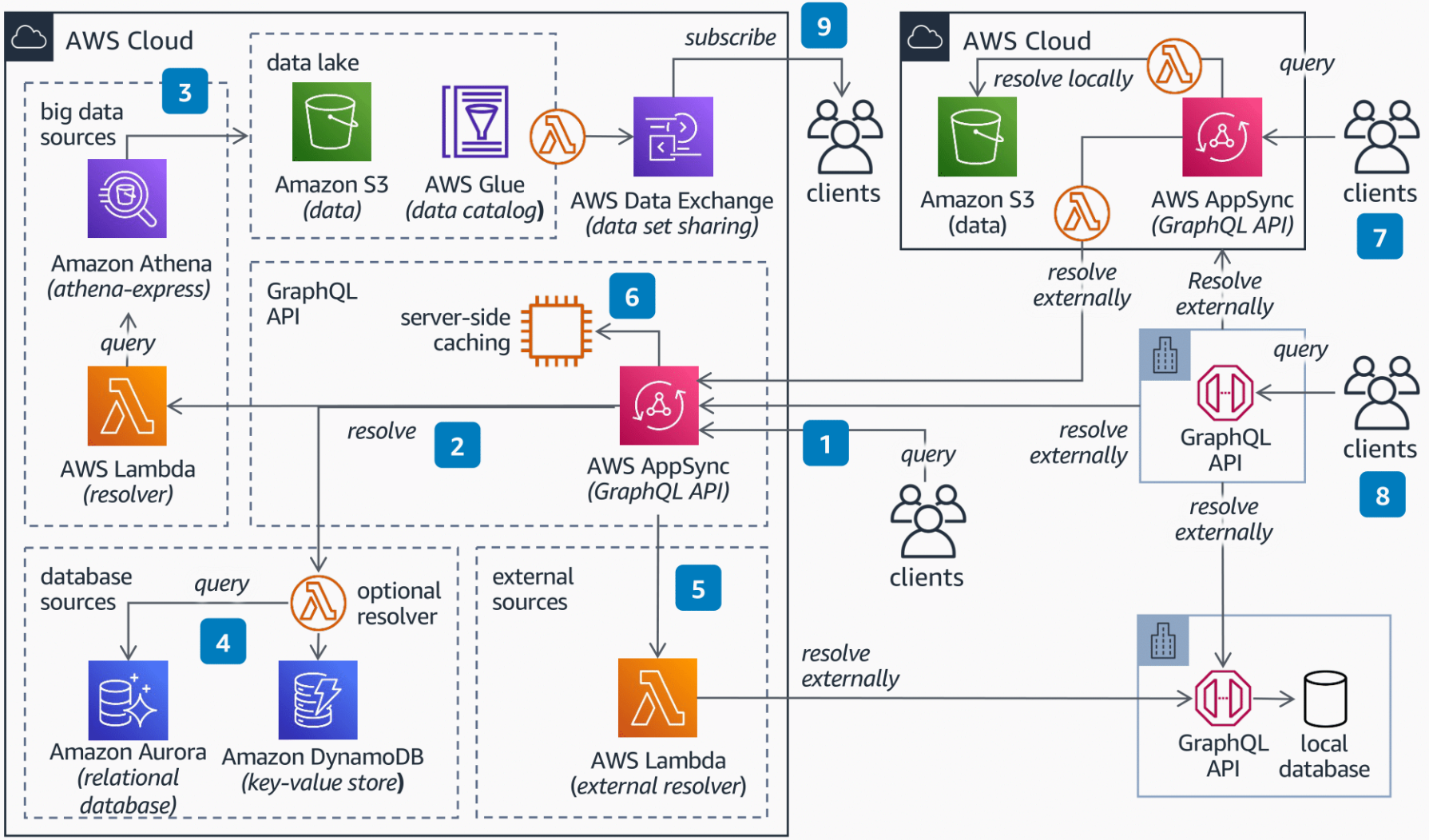
1. Set up a data lake using **AWS Lake Formation** and **Amazon S3**.
2. Crawl the data in the S3 buckets with **AWS Glue** to build a data catalog.
3. Monitor any changes in the **AWS Glue Data Catalog** with **Amazon CloudWatch**, and trigger an **AWS Lambda** function on every catalog change to update the schema of the external API.
4. In the **Lambda** function, query the latest data catalog and security settings, automatically generate source code to build and deploy a new version of the external API's schema and resolvers, and commit the code to **AWS CodeCommit**.
5. Set up **CodeCommit** to automatically start a new CI/CD pipeline on **AWS CodePipeline** after any code commit.
6. Use **CodePipeline** to build a new version of the API with **AWS CodeBuild** using the newly-generated source code, and use **AWS CodeDeploy** to deploy both the new **AWS AppSync** GraphQL API and the new **Lambda** query resolvers.
7. Allow your GraphQL clients to securely invoke the external API over HTTPS with your chosen authentication mechanism. Active the **AppSync** server-side caching.
8. Use the **AppSync Lambda** query resolvers to translate the GraphQL query into SQL queries supported by Amazon Athena.
9. Run **Athena** jobs synchronously with the **Athena**-Express library, appropriately timing out and limiting the result set.

Reviewed for technical accuracy April 25, 2022
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AWS Reference Architecture

Synchronous Data Mesh for GraphQL queries

Use an API composition pattern to build a modern, distributed, and decentralized data architecture. It enables clients to query data where it lives, without first transporting it to a data lake or data warehouse. It also allows domain-specific teams to own and serve data as a product.



1. Expose your domain's schema via an HTTPS API with **AWS AppSync**, allowing users to dynamically query a domain's data with GraphQL syntax.
2. Compose the returning query results with a combination of resolvers built with **AWS Lambda** functions.
3. For data partially available in a data lake, retrieve the data by running SQL queries supported by **Amazon Athena**, running the **Athena** jobs asynchronously with the athena-express library.
4. For data partially available in databases, retrieve the data either directly from **AWS AppSync**, or by using **Lambda** functions as proxy resolvers to your databases.
5. For data partially available in external sources, use **Lambda** resolvers to fetch the data by invoking remote HTTP APIs.
6. To improve your API's performance, enable server-side caching on **AWS AppSync**.
7. Other parties using AWS can replicate this architecture in their domains, also allowing clients to query their APIs using GraphQL, and composing the results with internal and external resolvers – including your domain's GraphQL API.
8. Parties that don't AWS can also expose their domains with GraphQL APIs built with other technologies. This provides a seamless experience to clients, while composing query results with data sets resolved from multiple external APIs.
9. To retrieve large datasets, clients can subscribe to **AWS Data Exchange** instead.

Reviewed for technical accuracy April 25, 2022

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AWS Reference Architecture

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Closing thoughts

Why should you care about this?
Because it will be disruptive and it’s around the corner

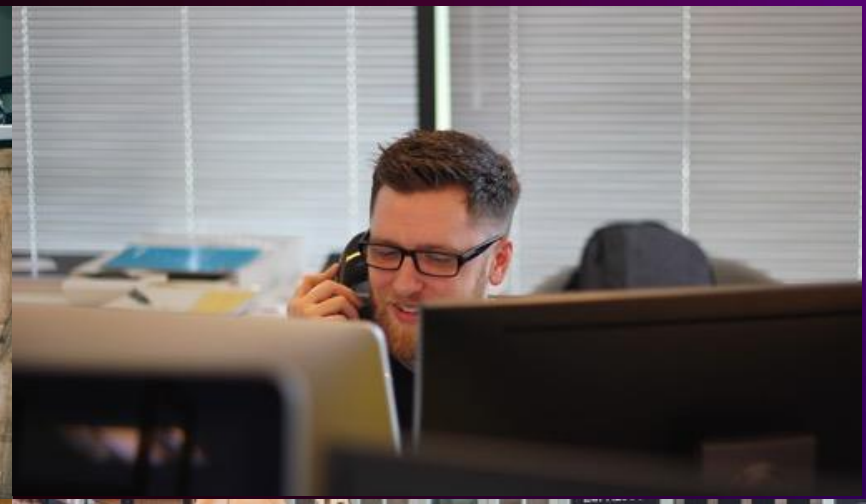
What challenges await you?
Interoperability with self-service

How to overcome those challenges?
Implement web standards with managed services

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AWS is transforming the travel and hospitality industry









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Thank you!

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