AWS re:Invent

NOV. 29 – DEC. 3, 2021 | LAS VEGAS, NV

LFS304

Accelerate science by unifying data silos across the enterprise

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Introducing AWS for Health

Accelerating innovation from benchtop to bedside

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Solutions across biopharma



Research and discovery

Clinical development

Manufacturing and supply chain

Commercial and medical affairs

Security and compliance

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Health equity funding: Deadline extended

Program categories



Increase access to health services



Reduce disparities by addressing social determinants of health



Leverage data to promote equitable and inclusive systems of care

Apply before Dec 15, 2021 here:
http://aws.amazon.com/health/health-equity

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Visit other Healthcare & Life Sciences sessions

HLC307 (Workshop): Using Fast Healthcare Interoperability Resources (FHIR) on AWS

Wed 5:30 PM - 7:45 PM

LFS302 (Builders' Session): Smarter pharmacovigilance with AWS machine learning

Thu 4:00 PM - 5:00 PM

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Healthcare & Life Sciences Lounge

Join us at our networking lounge every day for post-session speaker meet-and-greets, ask-the-experts, featured topic deep dives, and informal discussions

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Wynn, Level 1

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Show your hands!

If you've worked within life sciences…

If you've worked with analytics, data lakes…

If you've heard of a Data Mesh…

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Agenda

- AWS for Health – Solutions for life sciences
- Working backwards: Clinical trial manager's decision
- Incorporating Data Mesh
- End-to-end Data Mesh implementation
- Key roles
- Workshop walkthrough

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Working backwards: Clinical trial managers

- Designing a clinical trial for a new treatment of sinusitis (inflammation or swelling of the tissue lining the sinuses)
- Big decision: patient (cohort) membership rule
  - Include patients ONLY if no recent influenza vaccination?
  - If yes, harder to recruit
  - If no, possible interaction with study treatment
- Get data to make the decision
  - Data Producer 1: Prior similar clinical trials
  - Data Producer 2: Real-world patients data to model cohorts



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Challenges

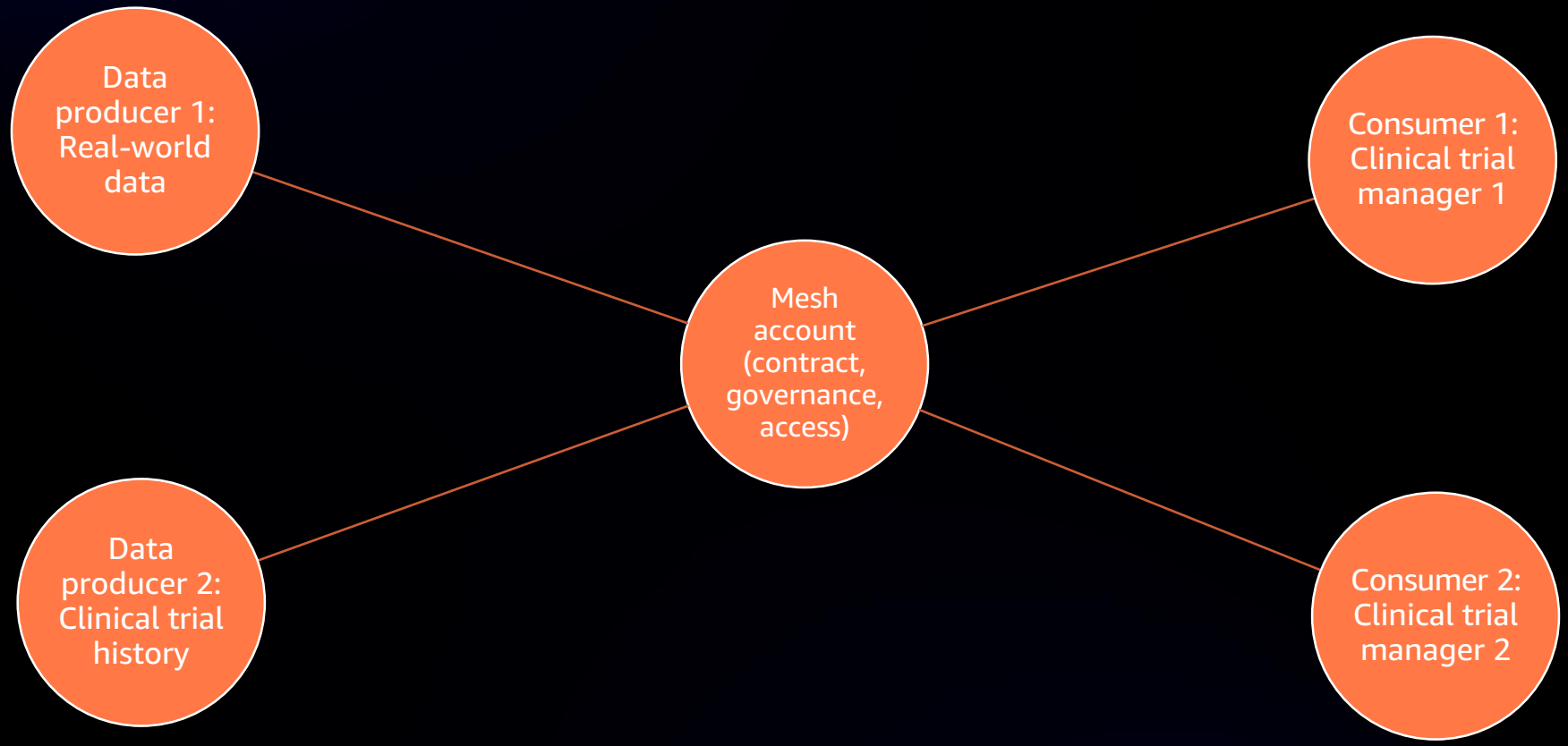
"It's not easy for me to find the datasets, and then it takes me even longer to get access to data."

"Some of the data are already transformed, which is limiting my analysis."

"Datasets are sometimes in formats that I don't understand."

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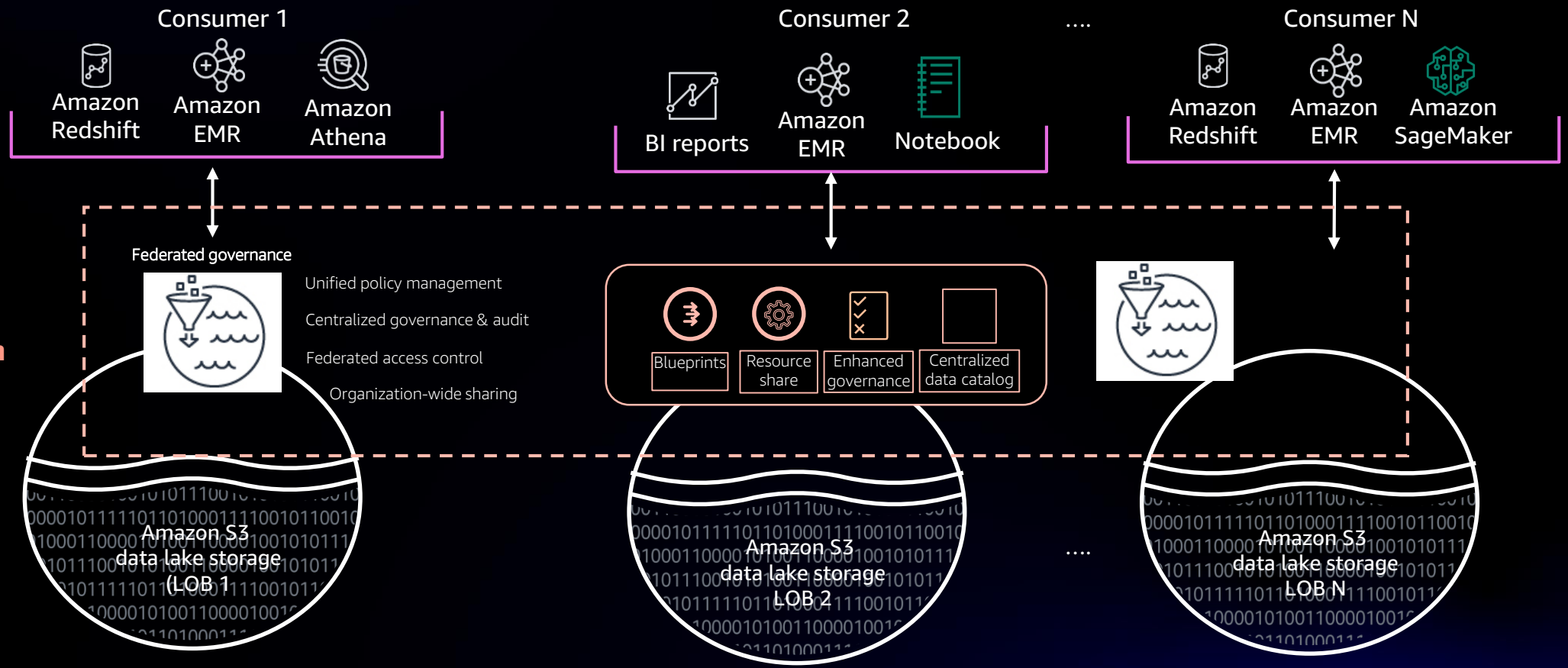
Incorporating Data Mesh



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What is Data Mesh?

A decentralized, domain-oriented data system to drive governed sharing using lake house architecture design pattern



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Data producers

- Each organizational domain owns its data end to end
- Data producers are responsible for building, operating, serving, and resolving any issues arising from the use of their data
- Ingestion framework is managed via a common framework (blueprint) that gets implemented at each domain to curate and transform data
- Common roles: domain data product owner/data steward, data experts, data engineers

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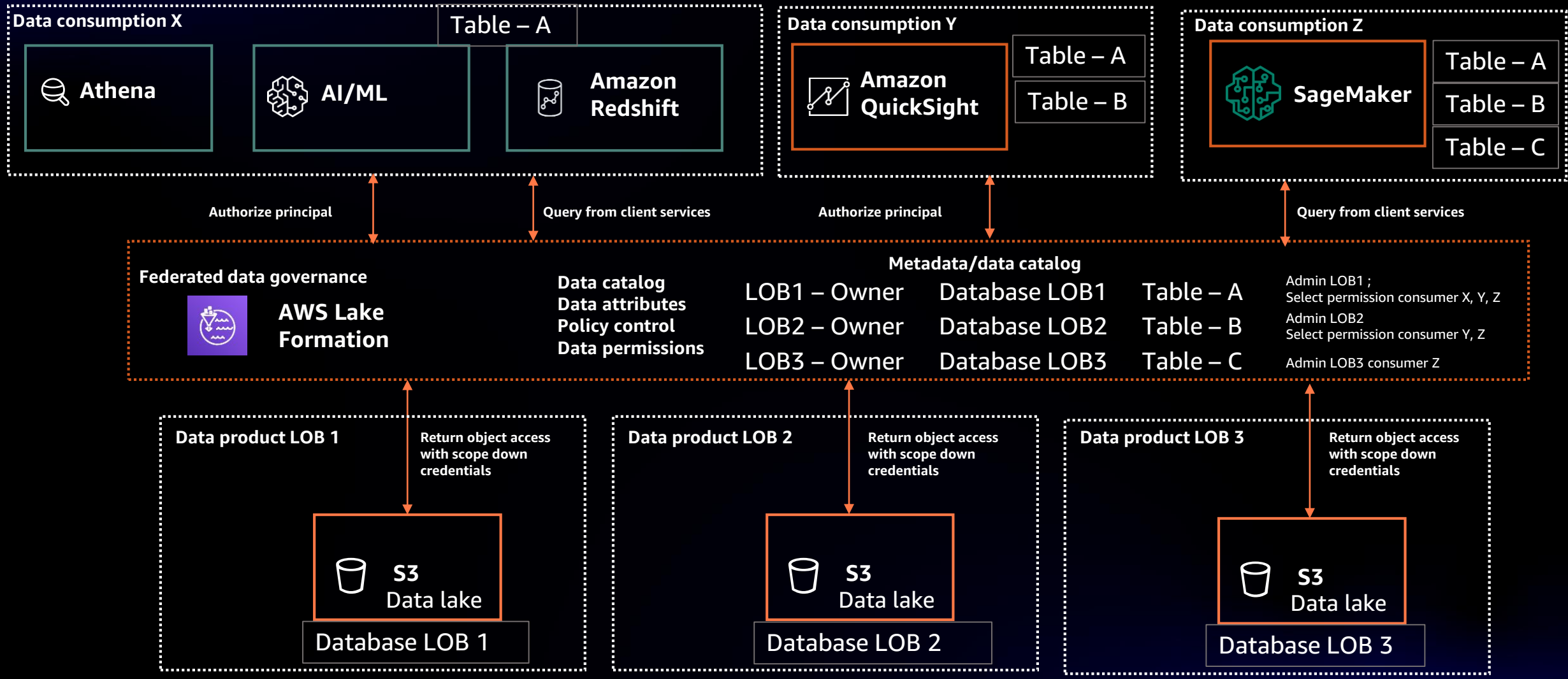
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Data governance

- Data governance ensures data are secure, accurate, and not misused
- Data lineage and monitoring are managed by a common governance framework
- Business catalog and metadata management
- Fine-grained access control using attribute-/tag-based access control (ABAC/TBAC)

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Data consumption – Common access (cross-account)



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Pros and cons of Data Mesh

Pros

- Acknowledges and further builds on ownership of data
- Allows business units to innovate in the way that makes sense for them
- Removes requirement for teams to solve “horizontal” problems that impede sharing
- (Mostly) technology agnostic
- Scales with time and teams
- Can provide strong data security governance and protection

Cons

- Does not implement automated tooling governance (to be developed)
- More complex for analysts than using “one data warehouse”
- Required skills are more aligned to data domain ownership

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Data Mesh: Key roles

Producers

- Data expert
- Data engineer
- Domain data product owner (data steward)

Consumers

- Data analyst
- Data scientist
- MLOps engineer
- Data engineer

Governance

- Data governance lead
- EDP/Mesh product owner
- Data lake admin
- Data custodian
- DevOps engineer

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The workshop: Five personas



DP1: RWD

Data producer 1: set up real-world data (RWD) dataset



DP2: CTH

Data producer 2: set up clinical trial history dataset



DME

Data Mesh engineer: set up governance account



C1: CTMgr1

Consumer 1: clinical trial manager A

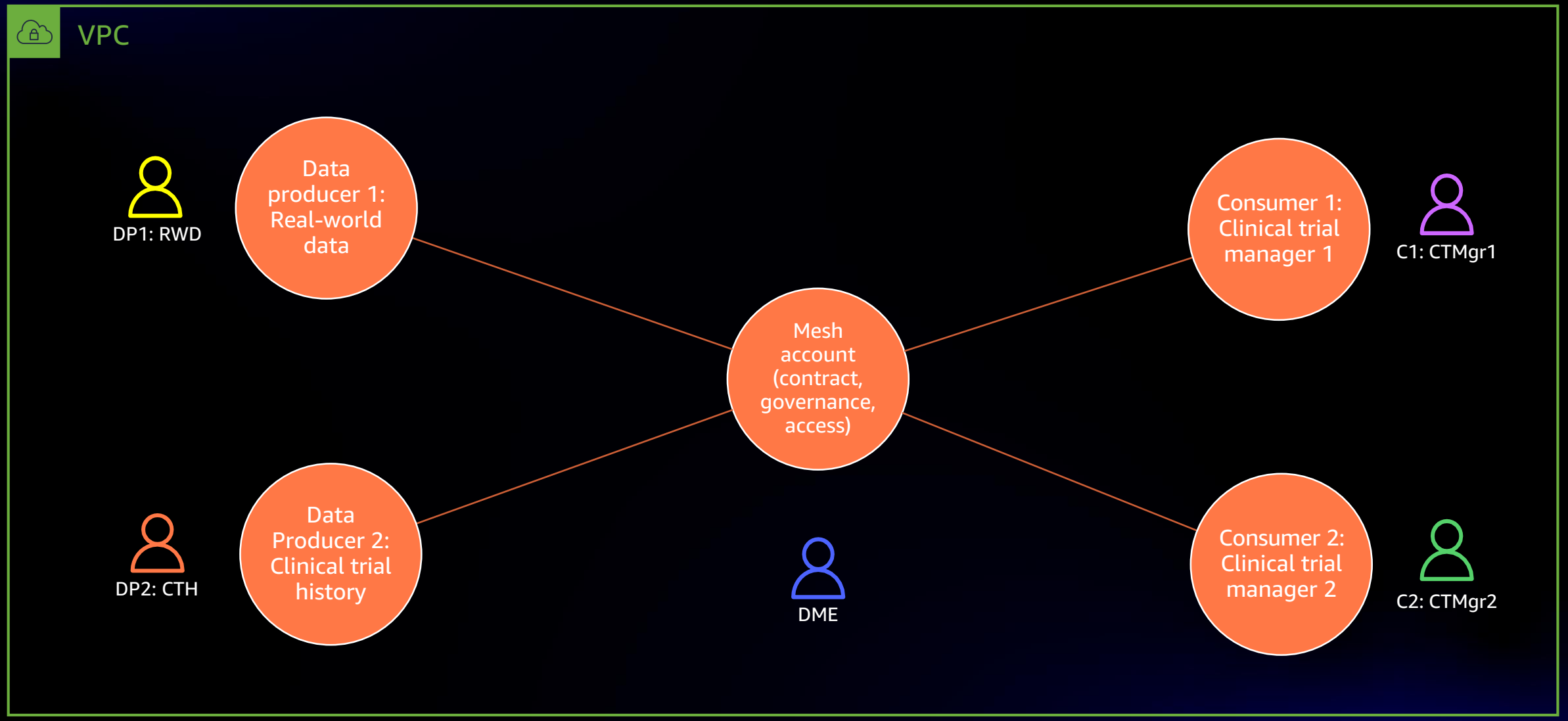


C2: CTMgr2

Consumer 2: clinical trial manager B

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Workshop Data Mesh: high level



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Workshop mission

The goal

1) As the Clinical Trial Manager, find prior similar trials with recruiting problems.
2) As the Clinical Trial Manager, decide if “ONLY patients with no recent influenza vaccine” should be an enrollment rule
   - Apply rule only if more than 100 patients can be found in the RWD Data Product
   - Assess the question from perspective of two Clinical Trial Managers

The twist

- CTMgr1 has a basic subscription status while CTMgr2 has an enhanced subscription

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Workshop walkthrough

Note the persona icons shown in each step in the workshop



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Thank you!

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