

Theory vs Practice

Implementing a Data Mesh Architecture in Azure

with Paul Andrew



About Me



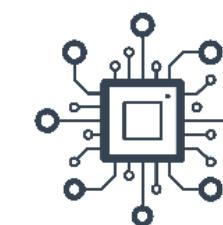
@MrPaulAndrew

In/MrPaulAndrew

c/MrPaulAndrew

MrPaulAndrew.com

/MrPaulAndrew



Mr Paul Andrew
Consulting Ltd

CommunityEvents
Demo code, content and slides from various community events.

C++



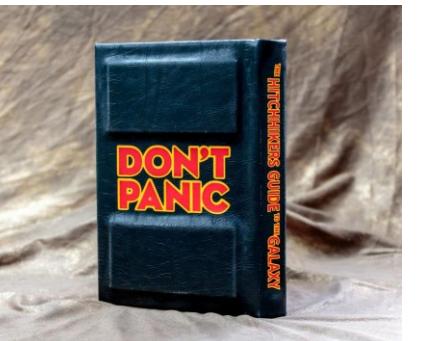
Slides

Context



What is the answer...
to life...
the universe...
and everything?

Answer:
42



Answer:
It depends! ✓

What is the goal of our data solutions?

Data
Collection

Data
Sources

*Paul's Magic Box -
From the Hogwarts School of
Witches & Wizardry*

Data
Insight

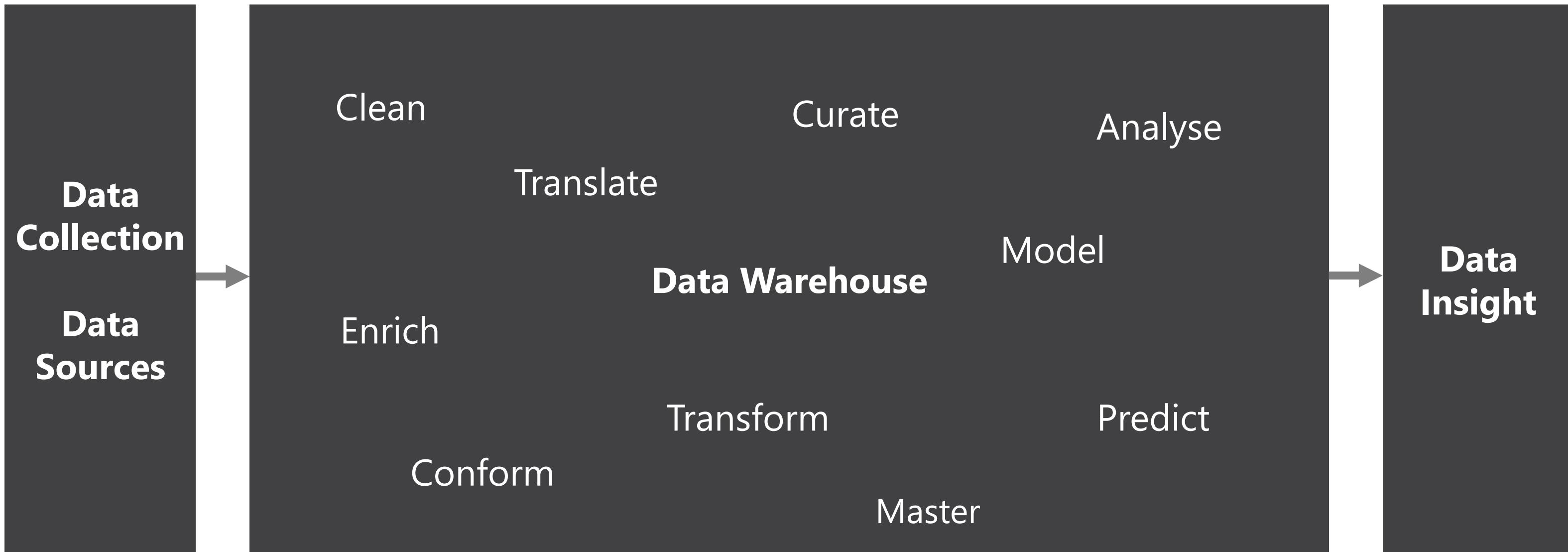
Data = Information = Knowledge = Power

What is the goal of our data solutions?

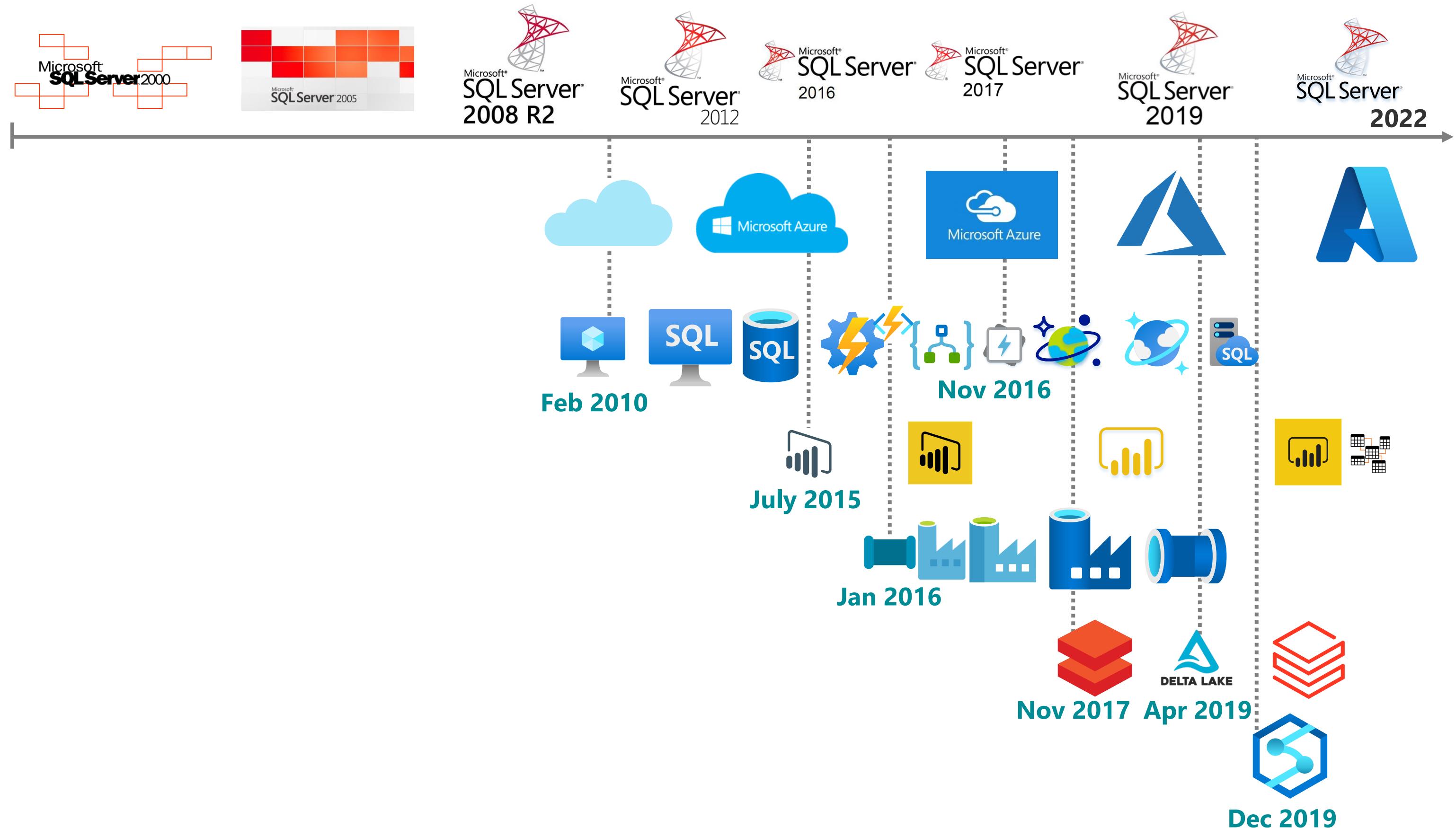




What is the goal of our data solutions?

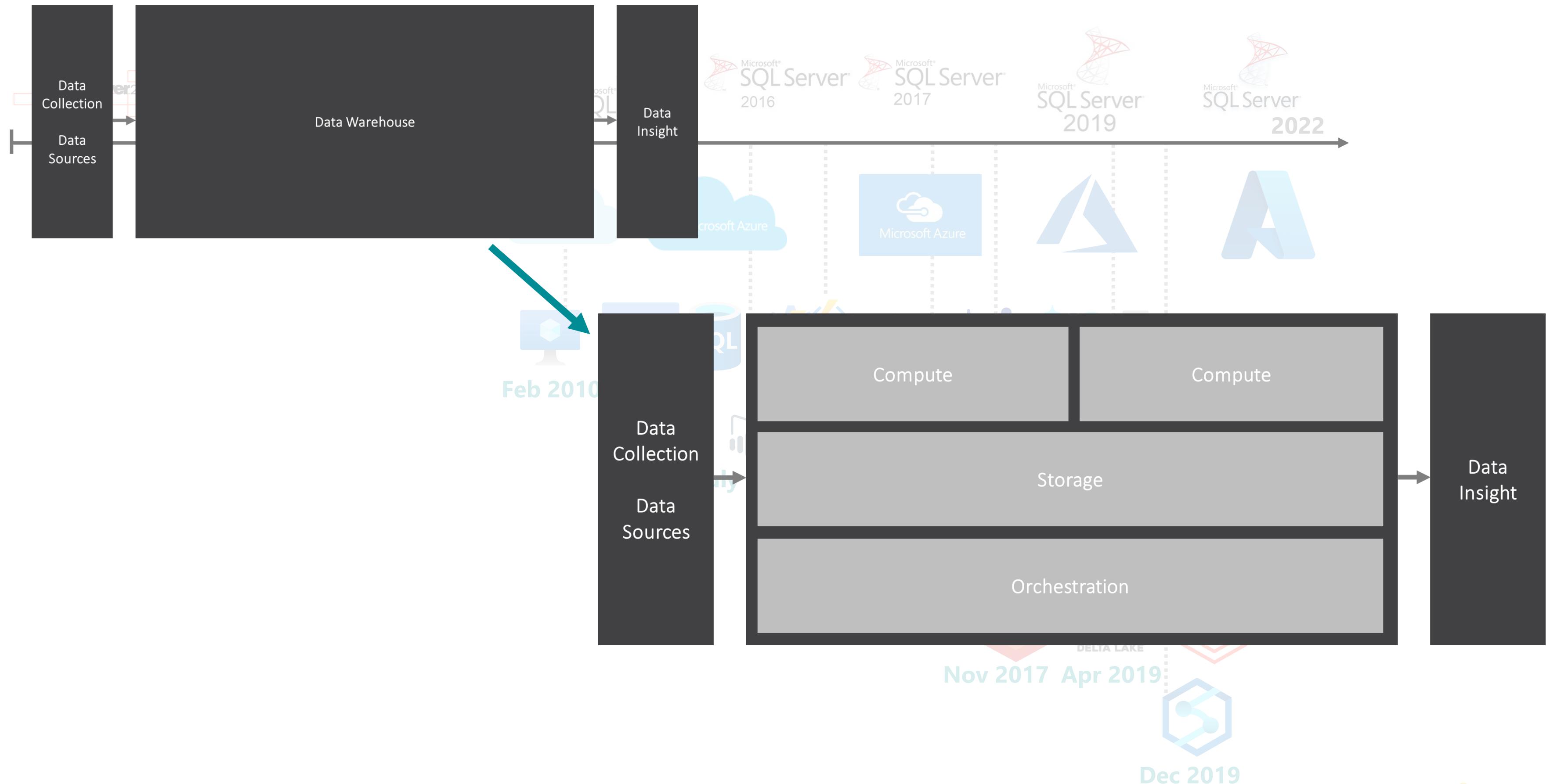


An Evolution of Data Platforms



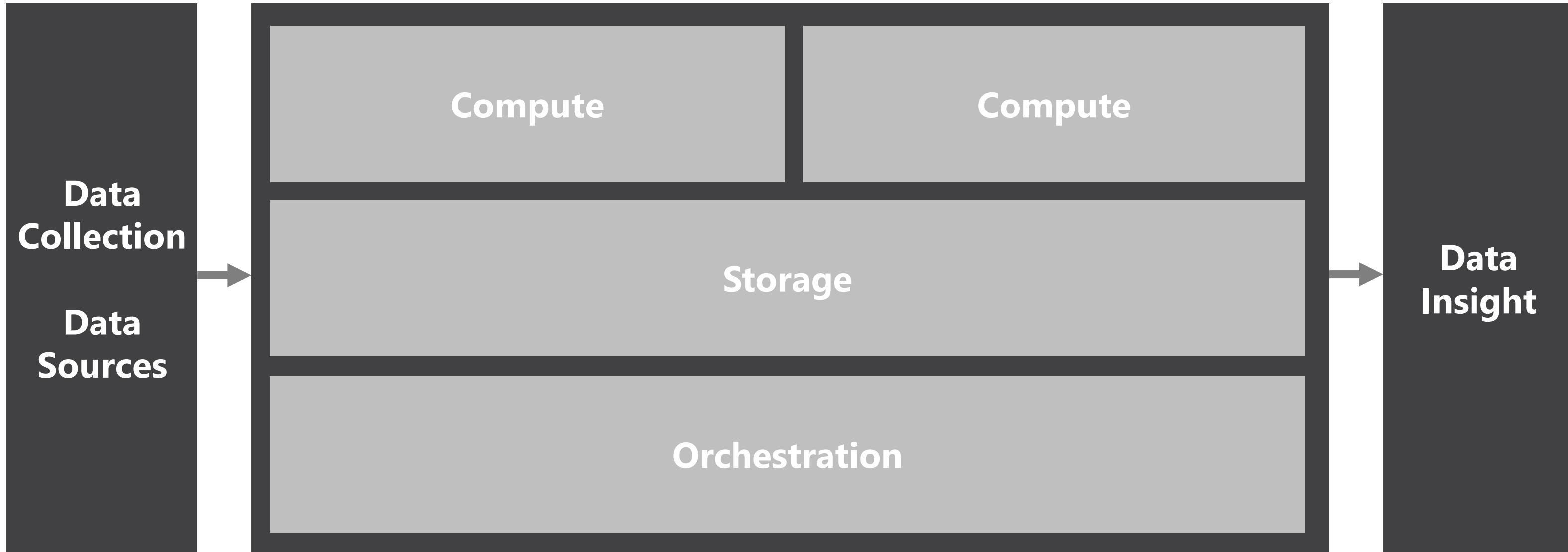


An Evolution of Data Platforms



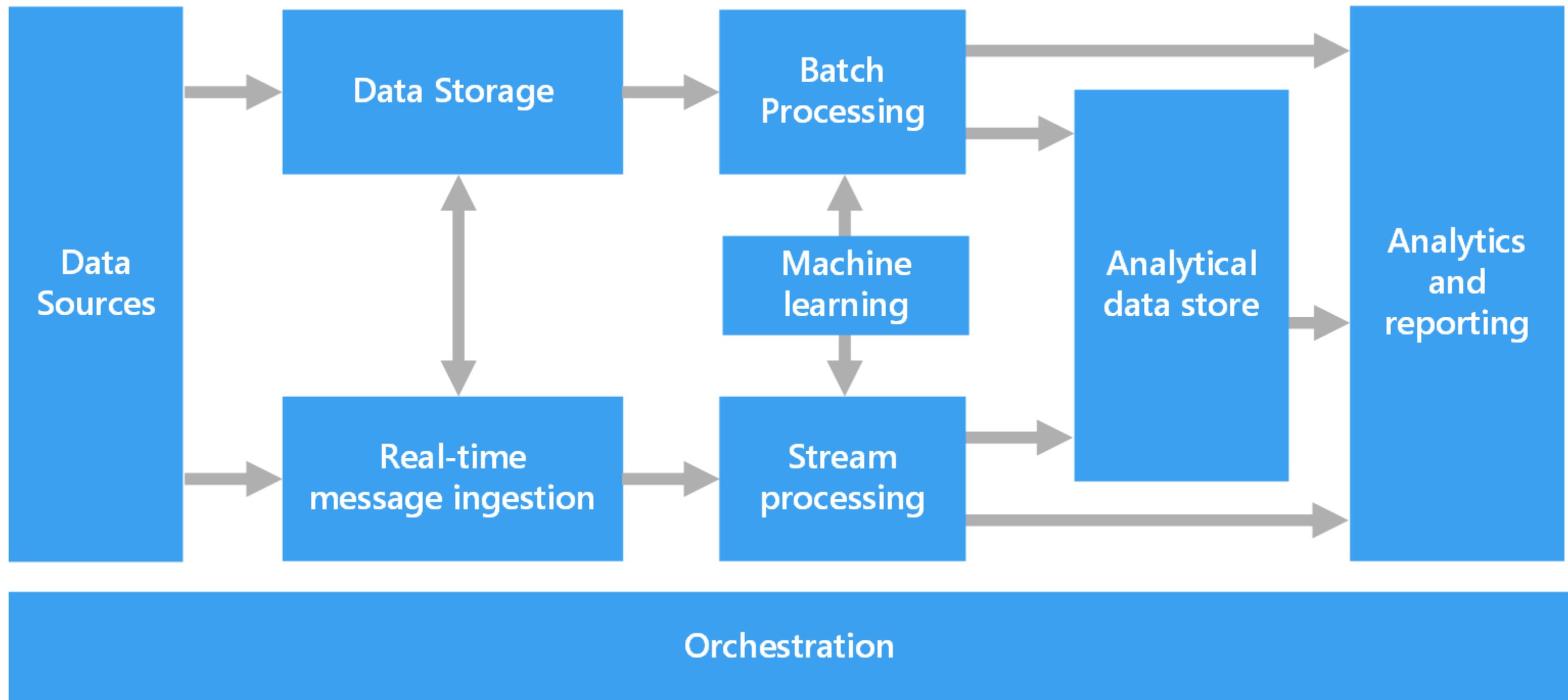


An Evolution of Data Platforms





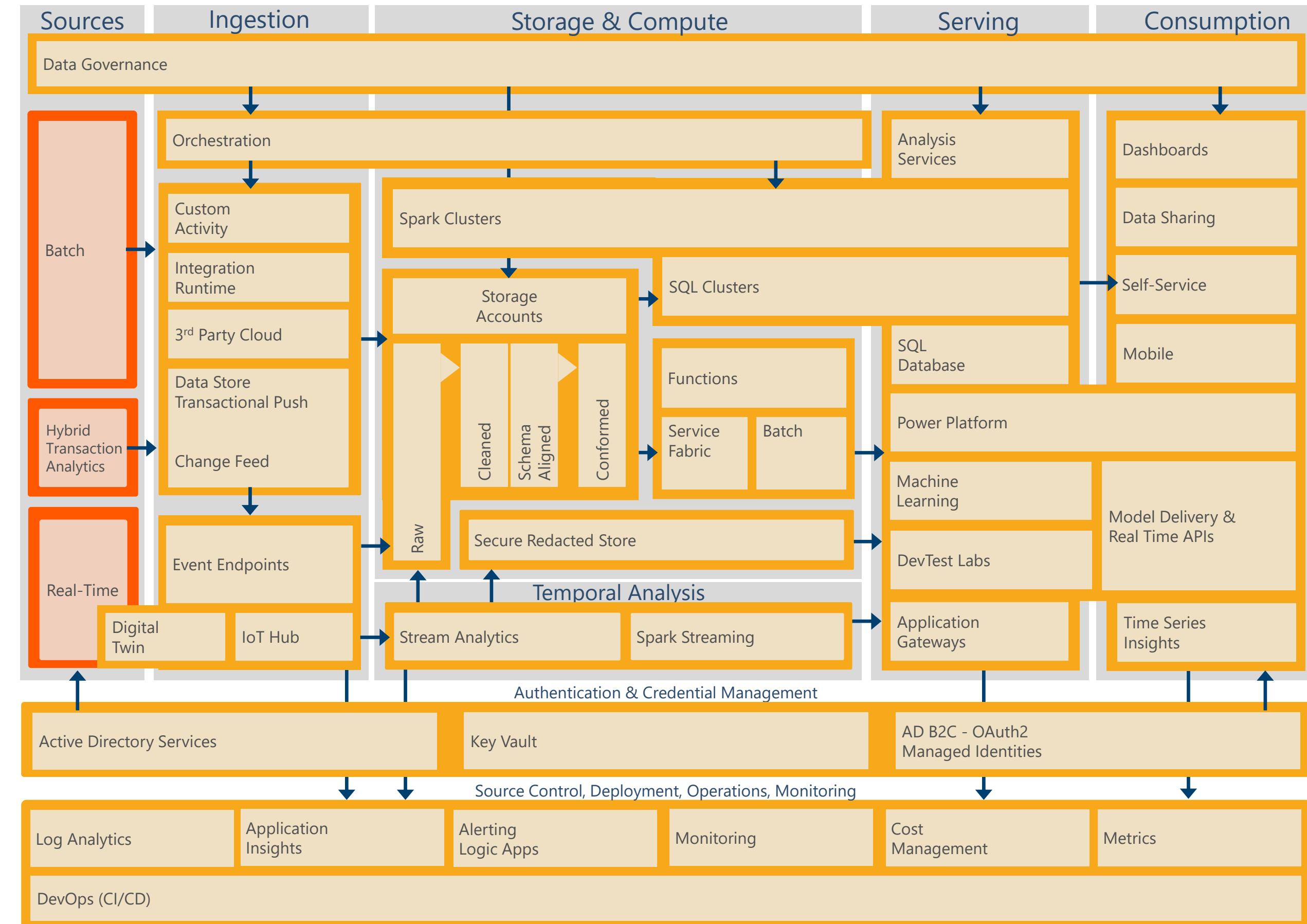
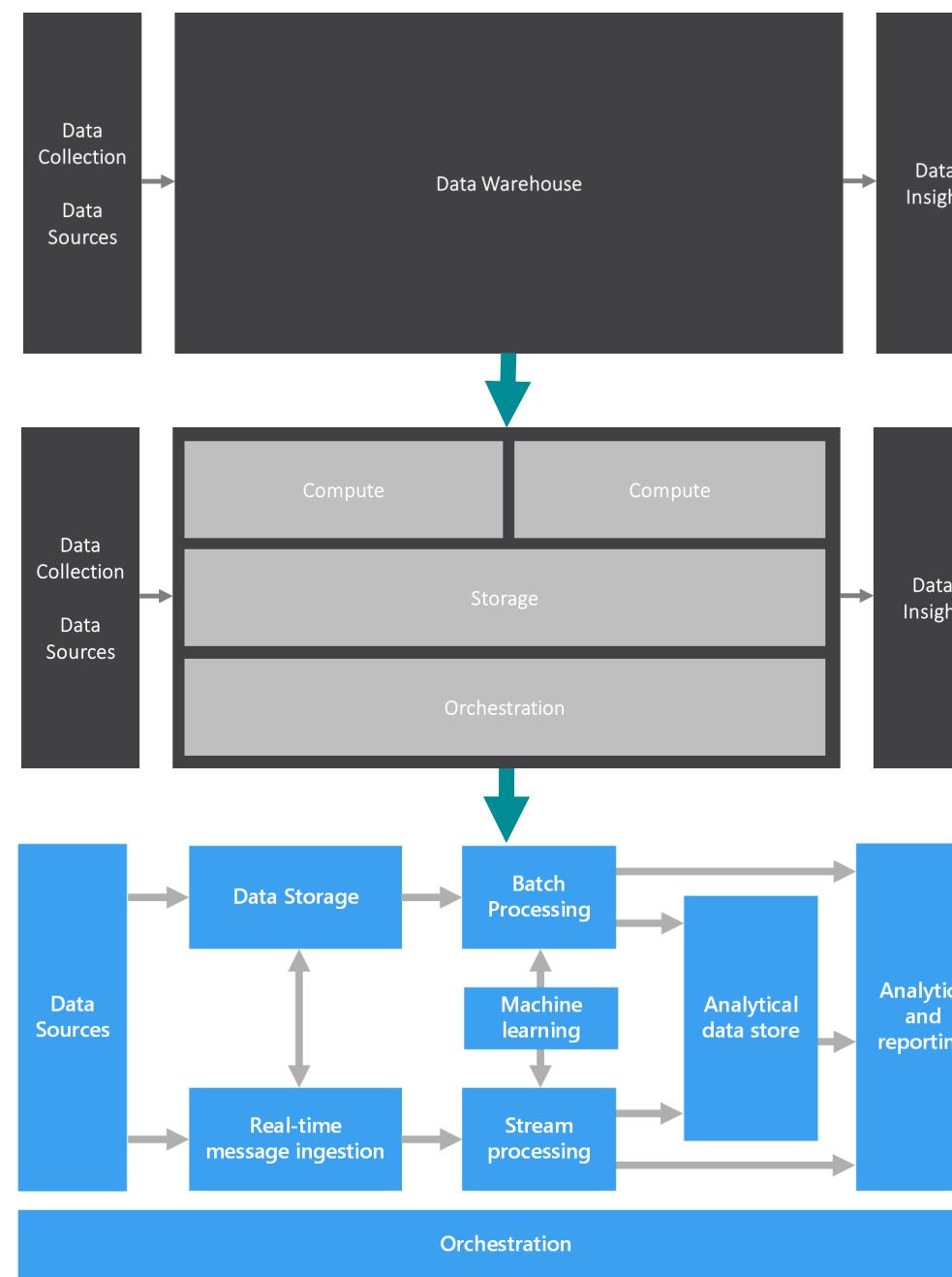
Microsoft's Components of a Big Data Architecture





A Logical Data Architecture

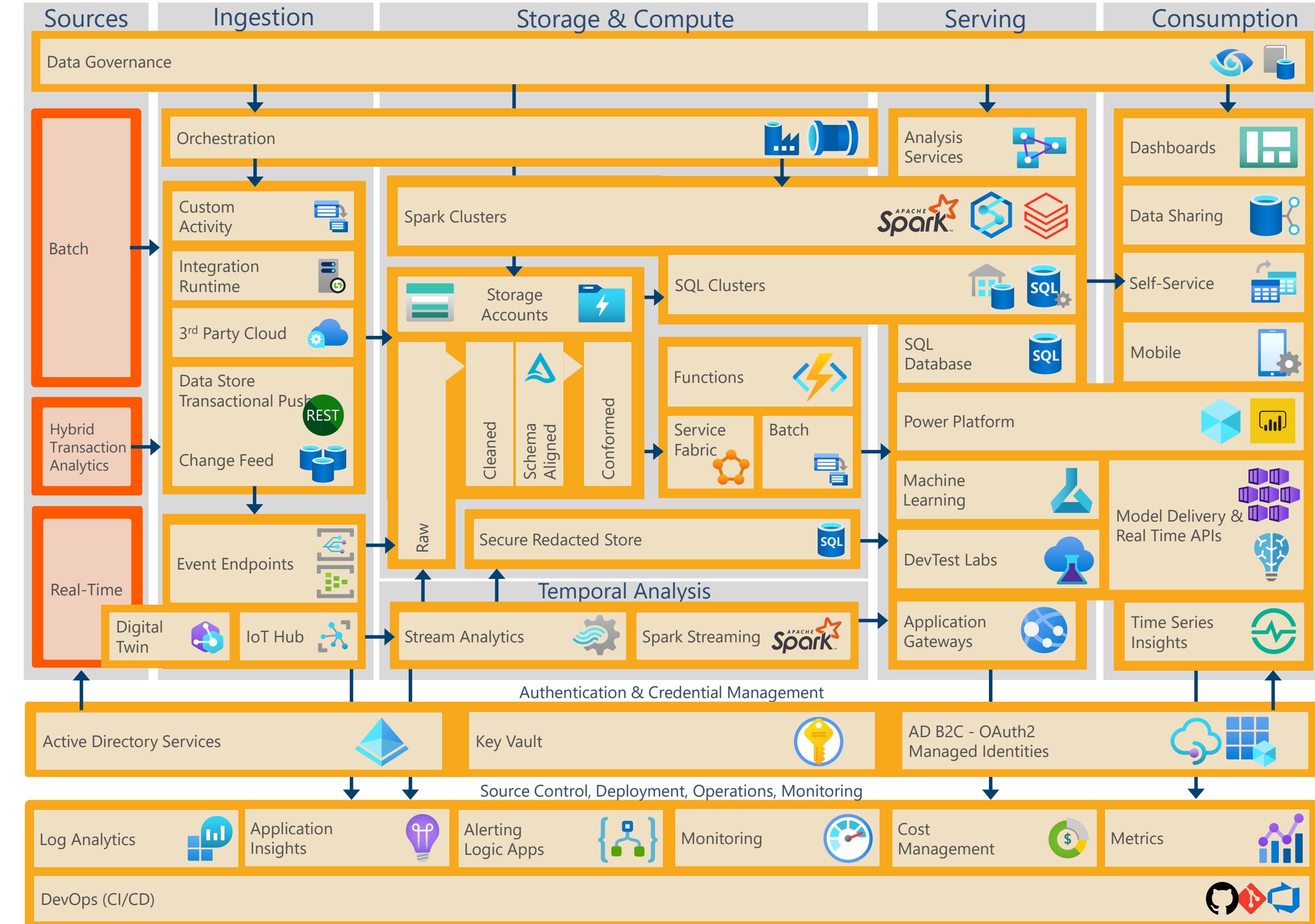
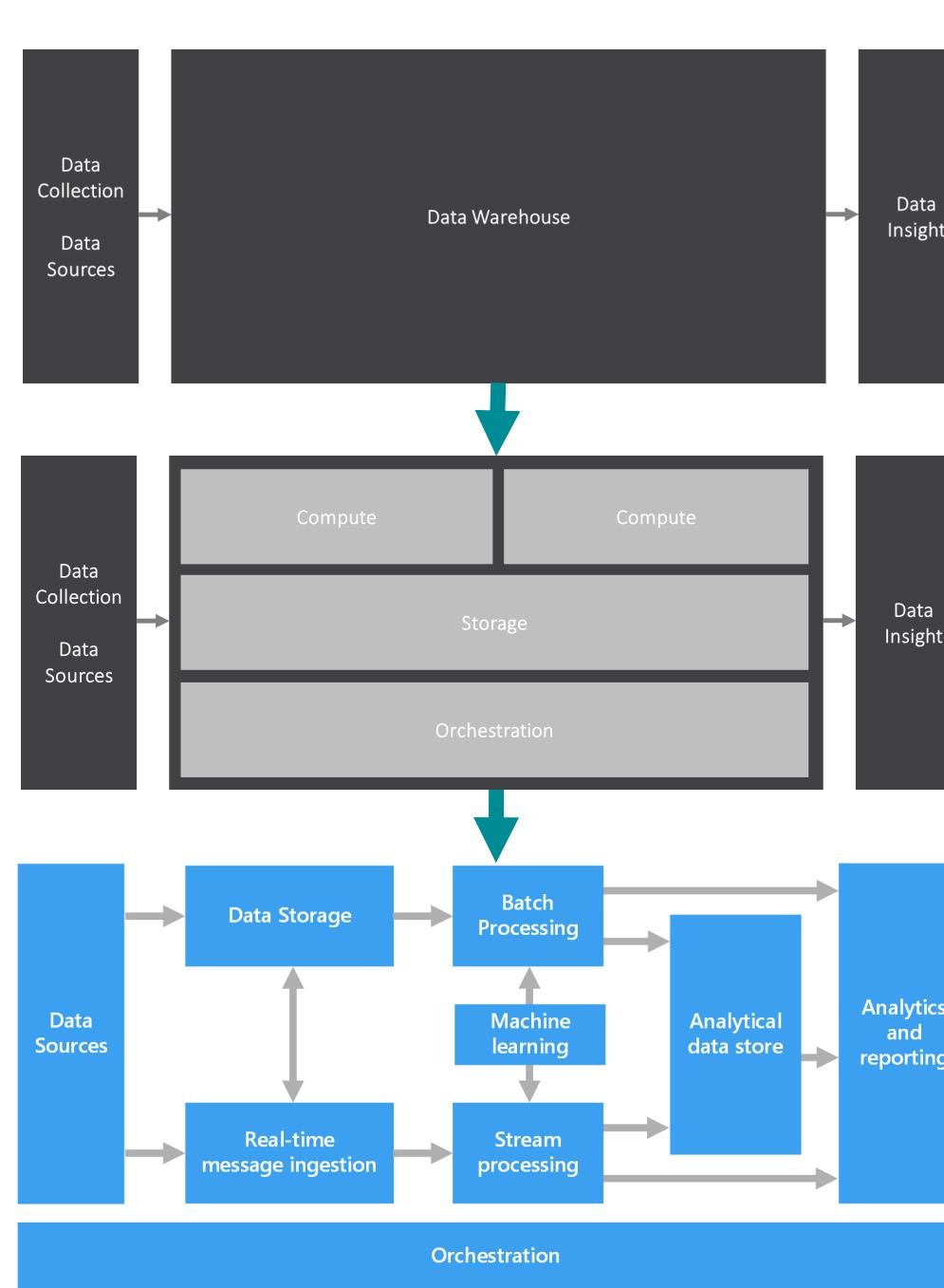
█ Inputs
█ Resources
█ Layers





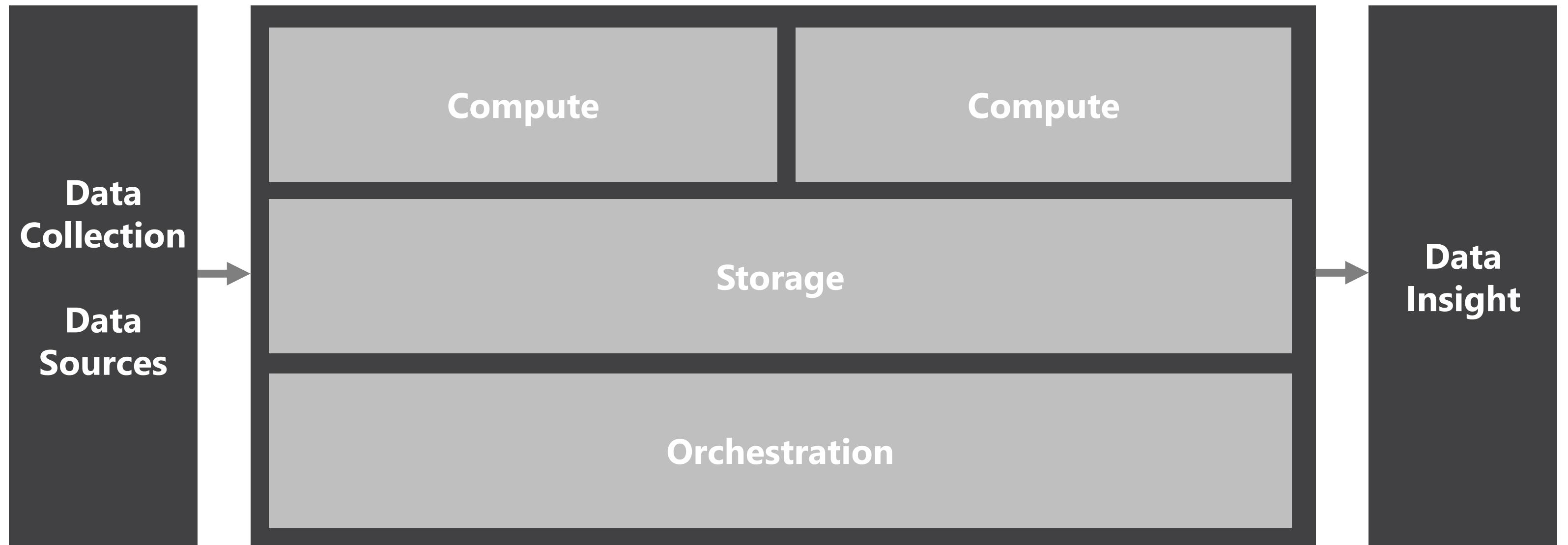
A Logical Data Architecture

█ Inputs
█ Resources
█ Layers



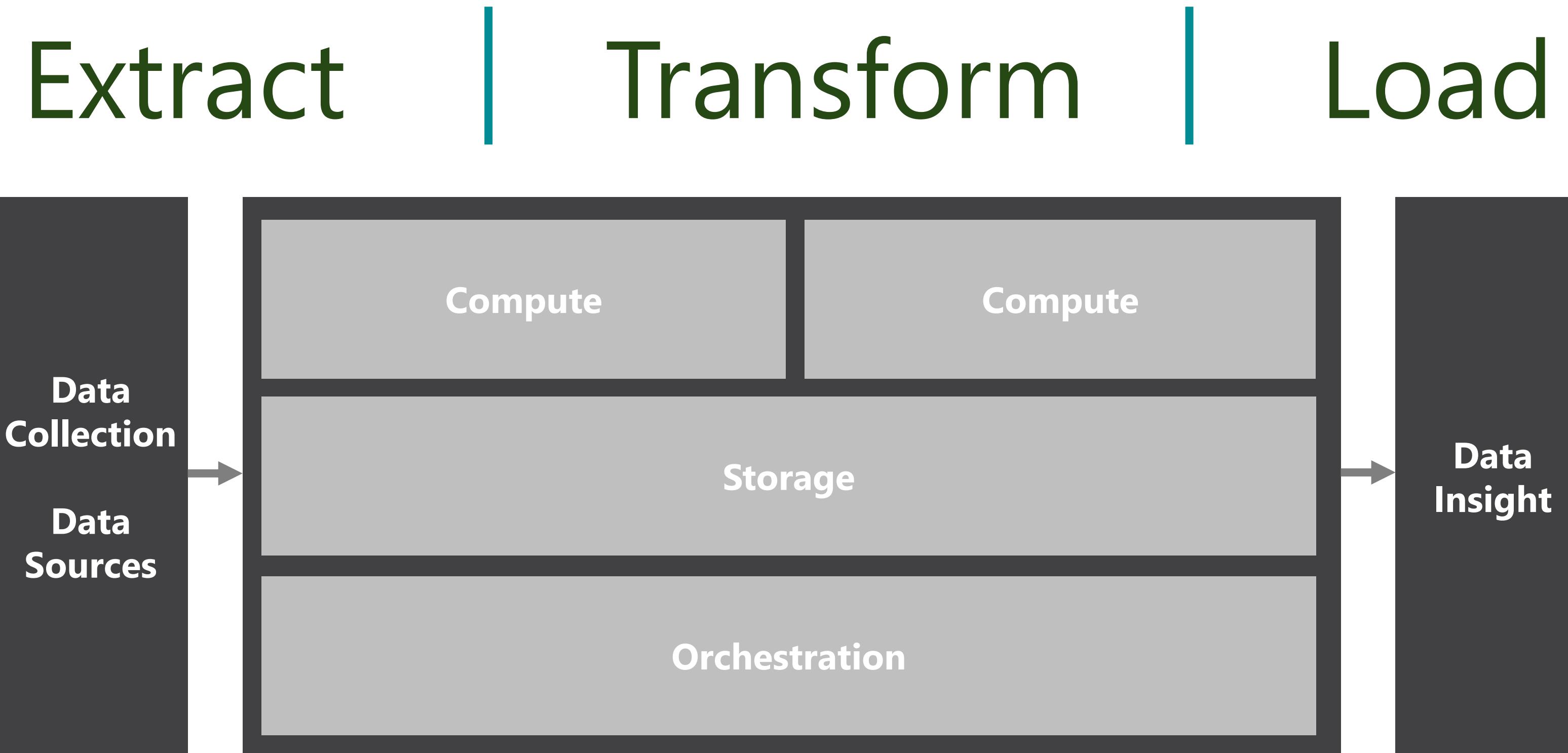


The Goal Of Our Data Platform





The Goal Requirements For Our Data Platform



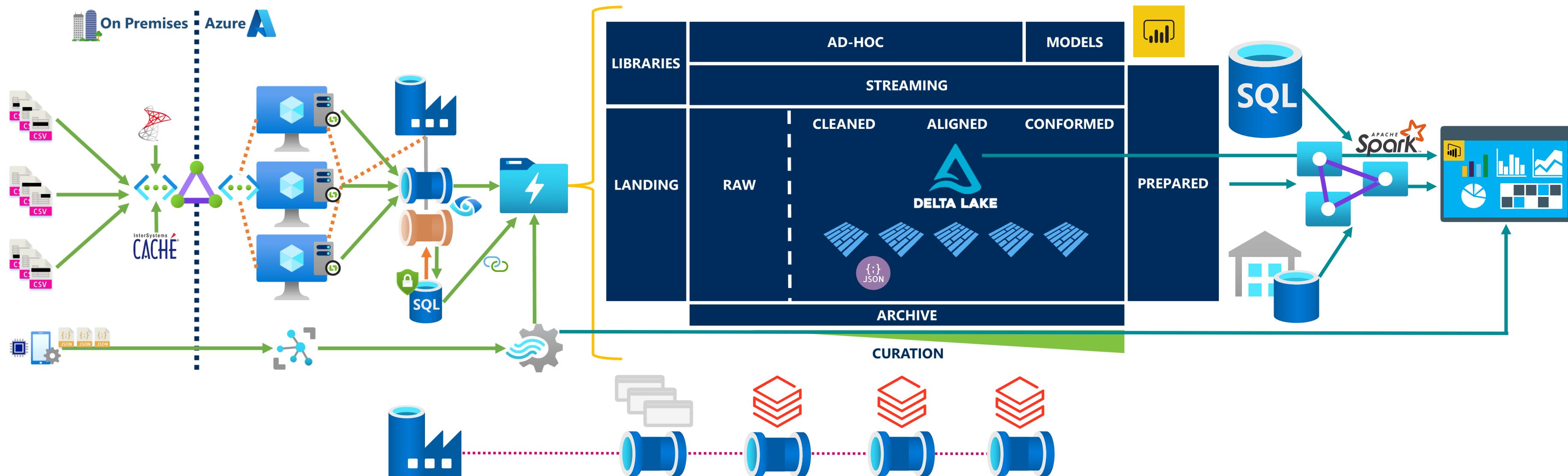


The Goal Requirements For Our Data Platform

Extract

Transform

Load



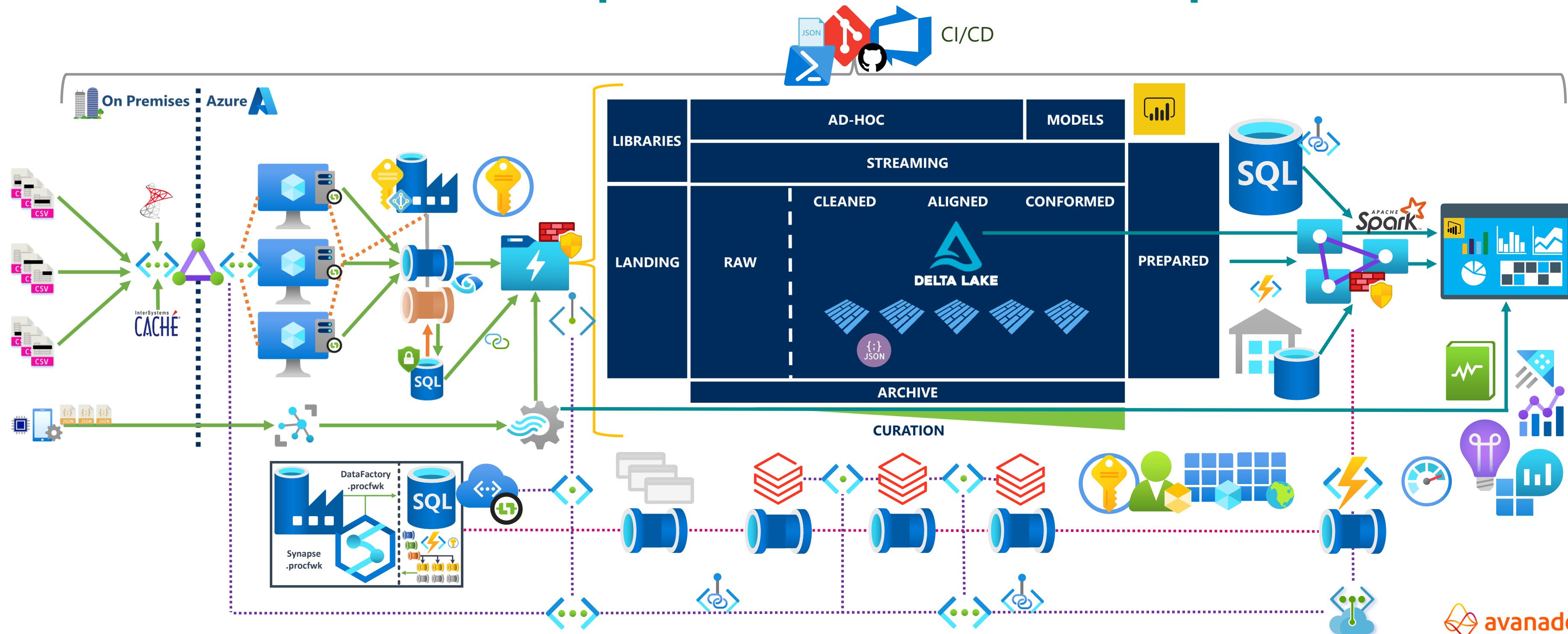


The Goal Requirements For Our Data Platform

Extract

Transform

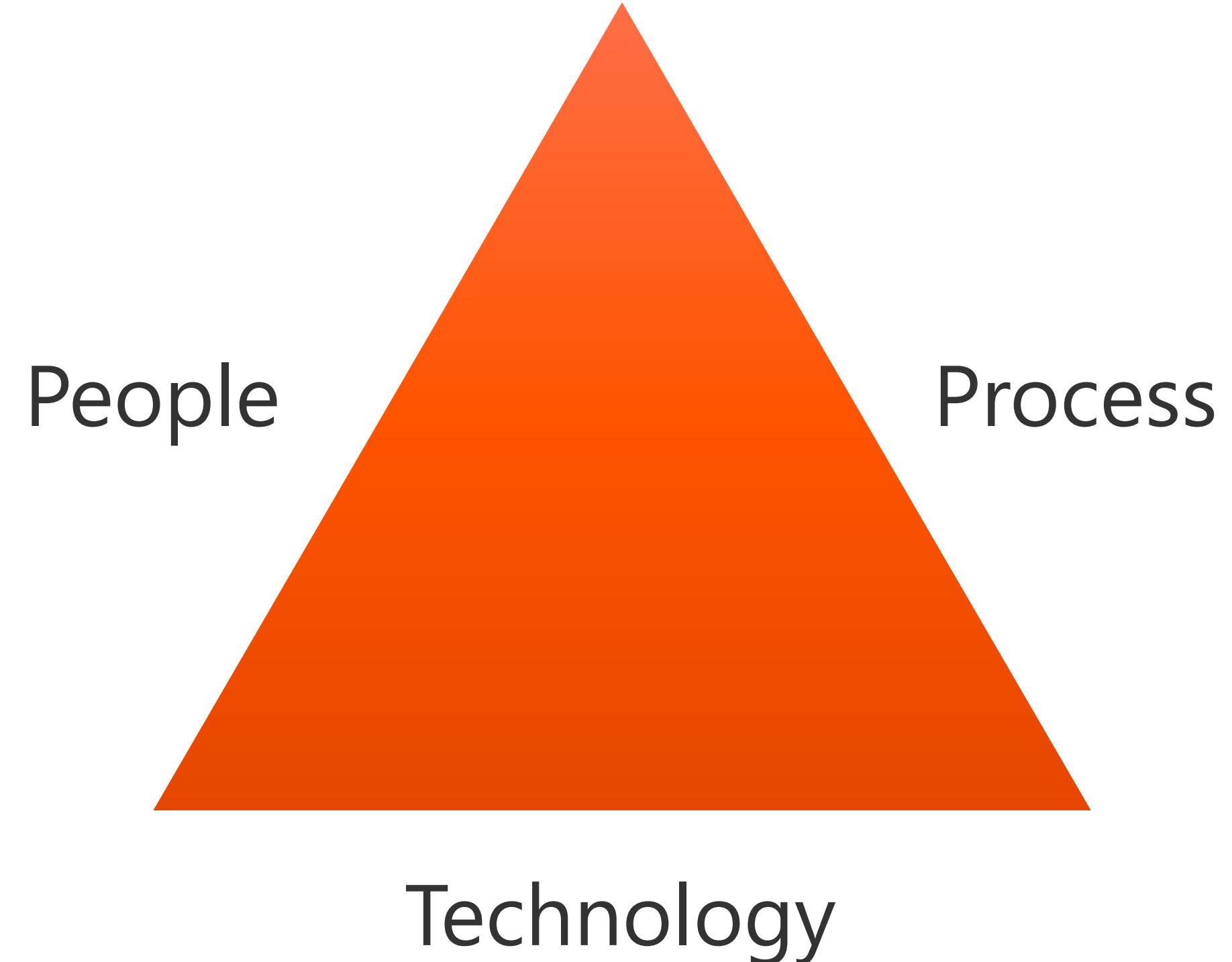
Load



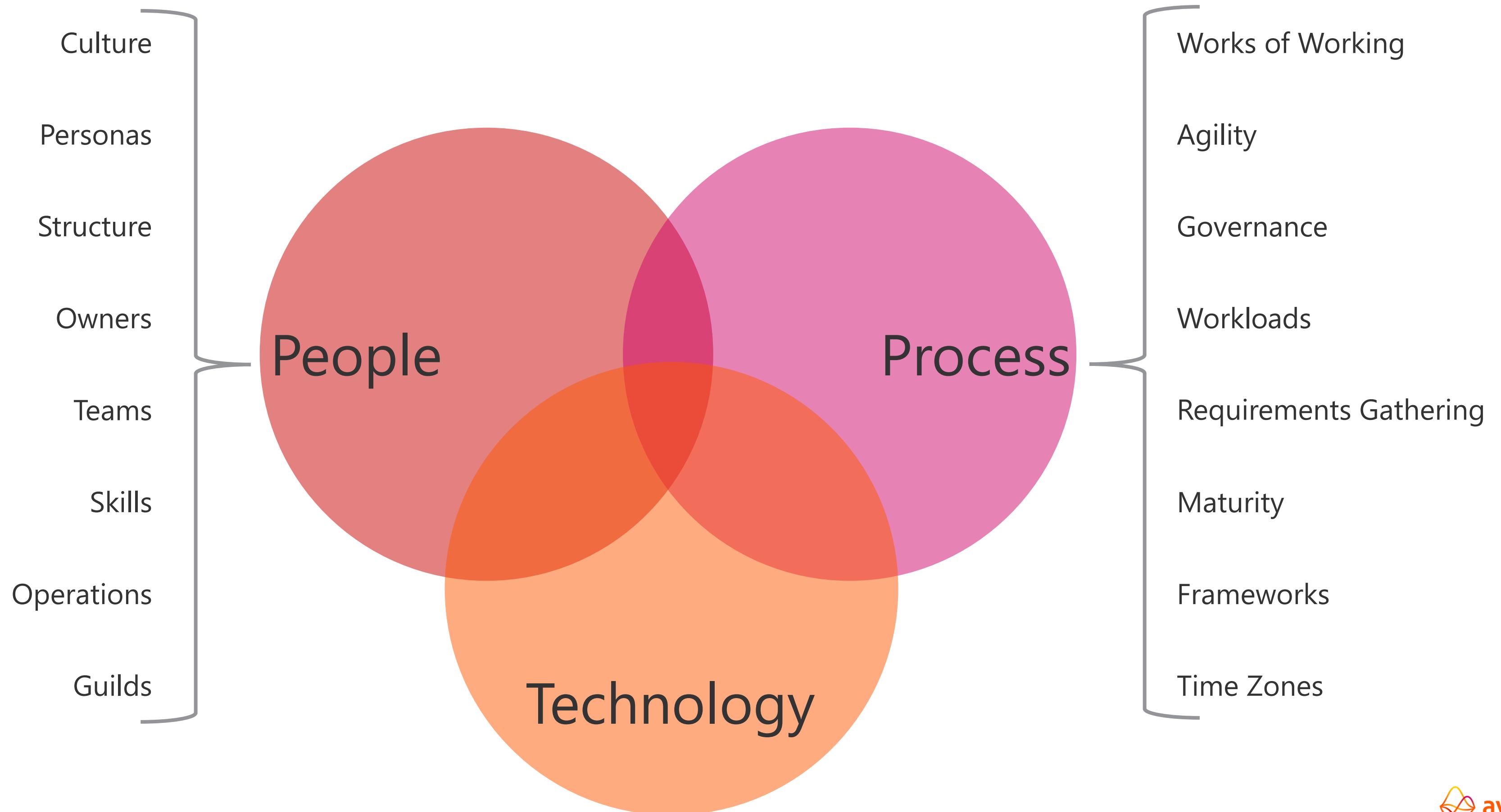
Data Mesh



Introducing the Data Mesh



Introducing the Data Mesh



Introducing the Data Mesh



Technology



Introducing the Data Mesh

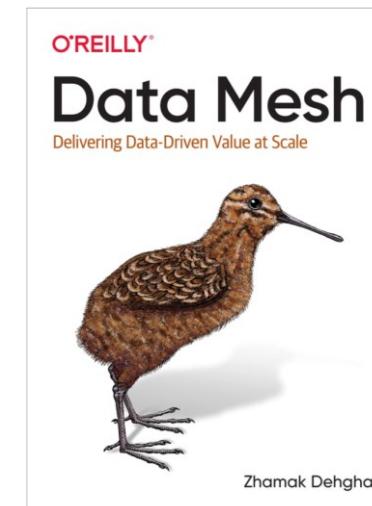
- *Zhamak Dehghani*
@zhamakd



<https://martinfowler.com/articles/data-mesh-principles.html>

ISBN-10
1492092398

ISBN-13
978-1492092391

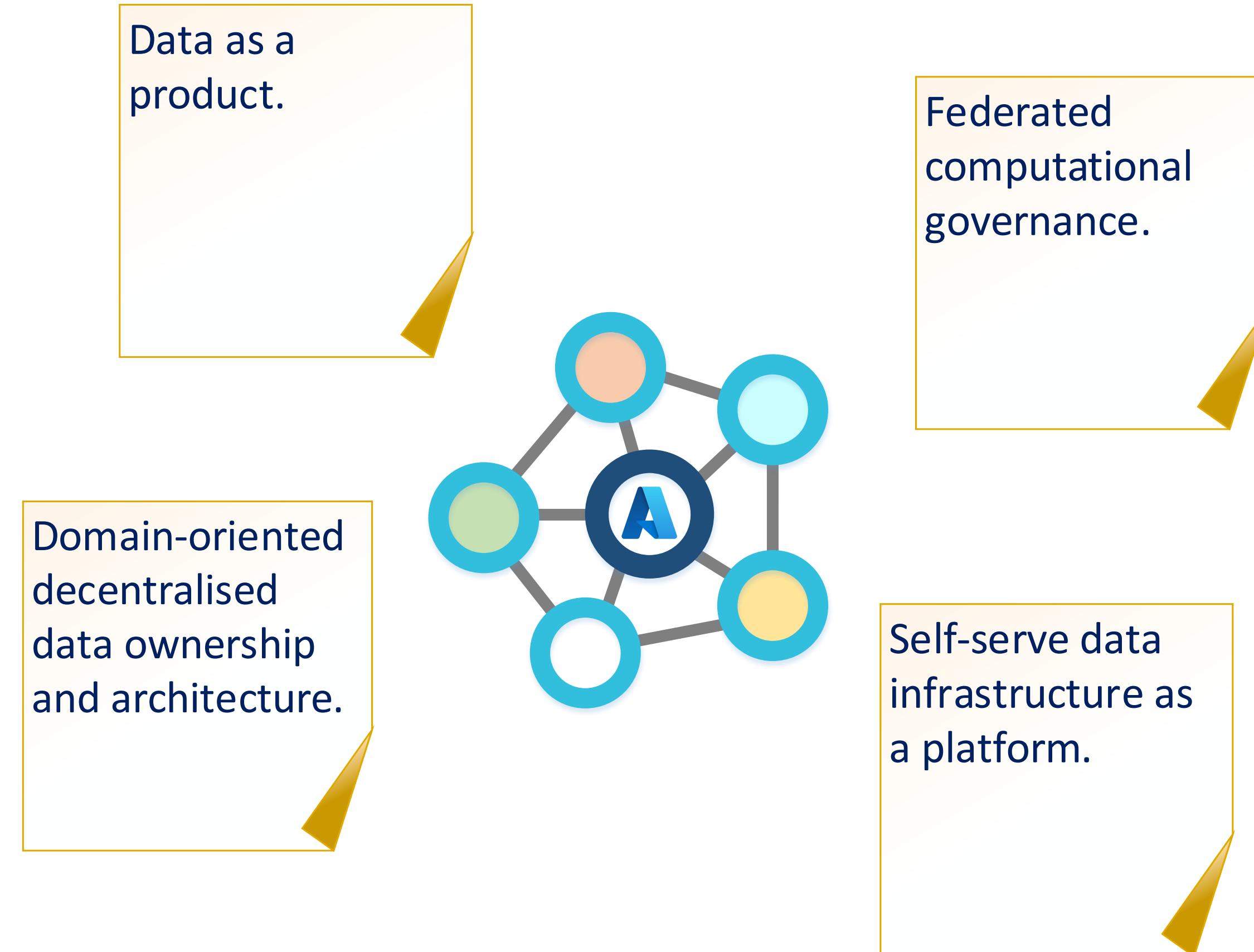


- 1. Domain-oriented decentralised data ownership and architecture.
- 2. Data as a product.
- 3. Self-serve data infrastructure as a platform.
- 4. Federated computational governance.

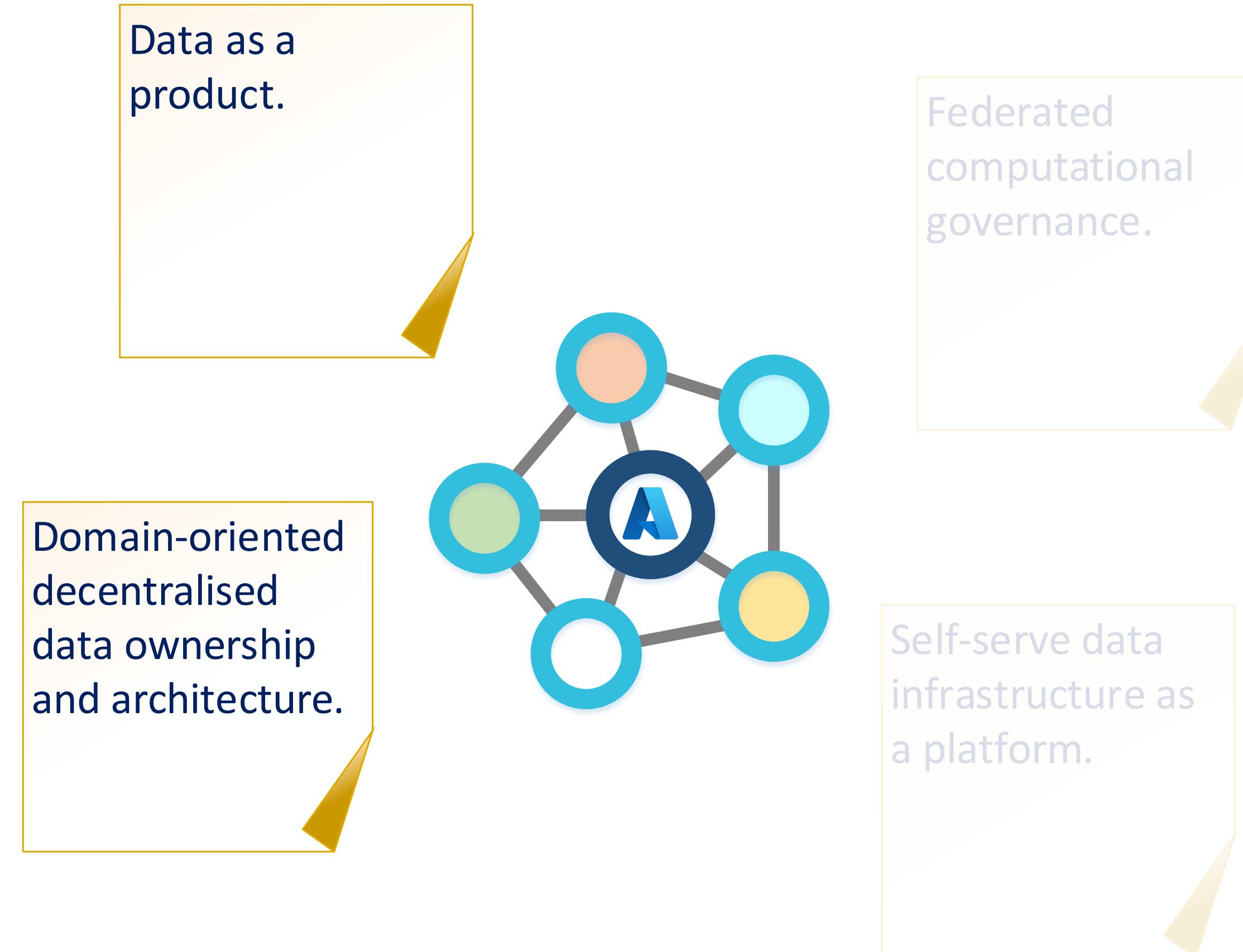
Data Mesh Principals

1. Domain-oriented decentralised data ownership and architecture.
2. Data as a product.
3. Self-serve data infrastructure as a platform.
4. Federated computational governance.

Data Mesh Principals - Theory vs Practice

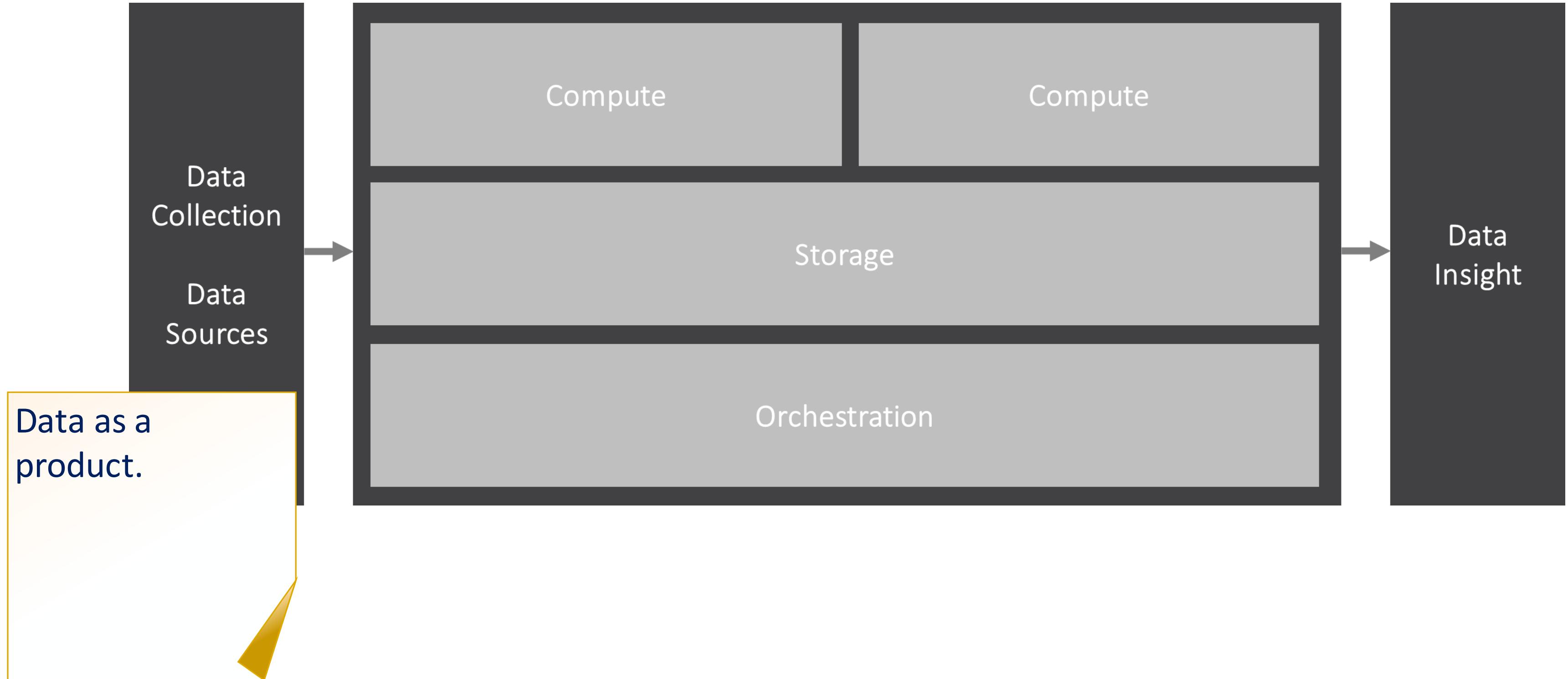


Data Mesh Principals - Theory vs Practice

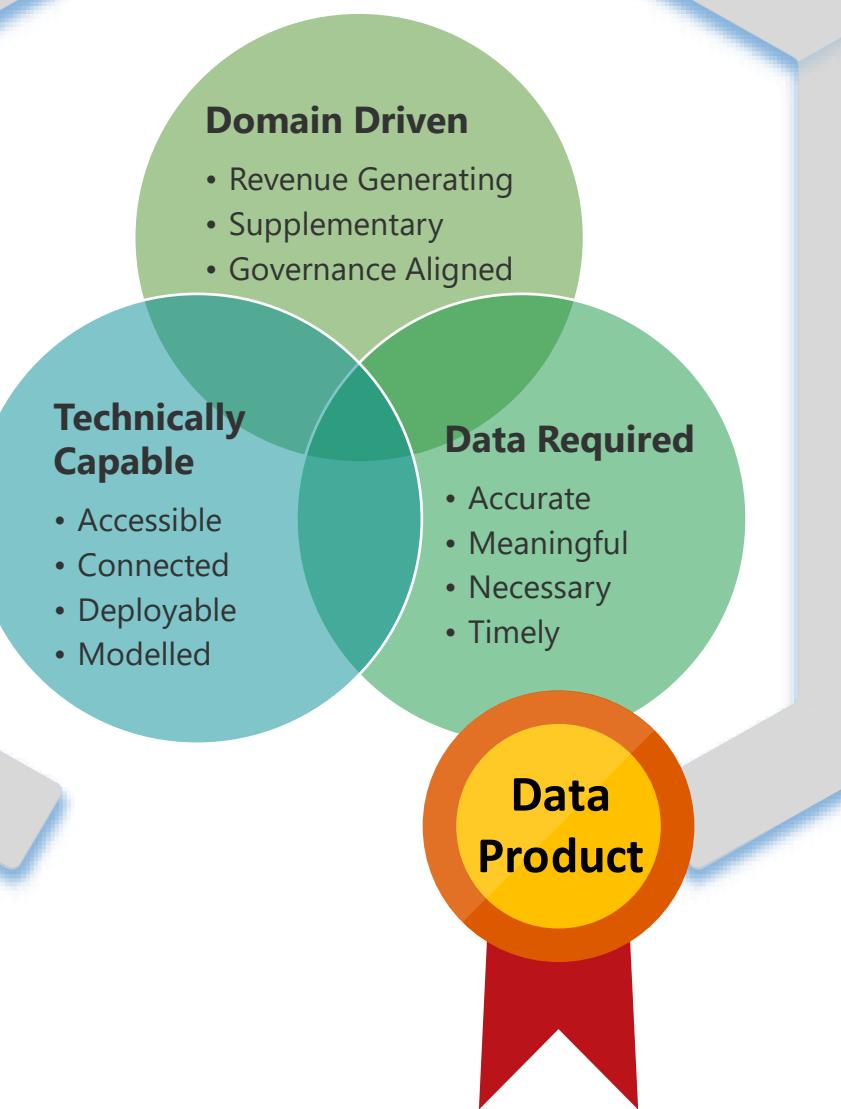
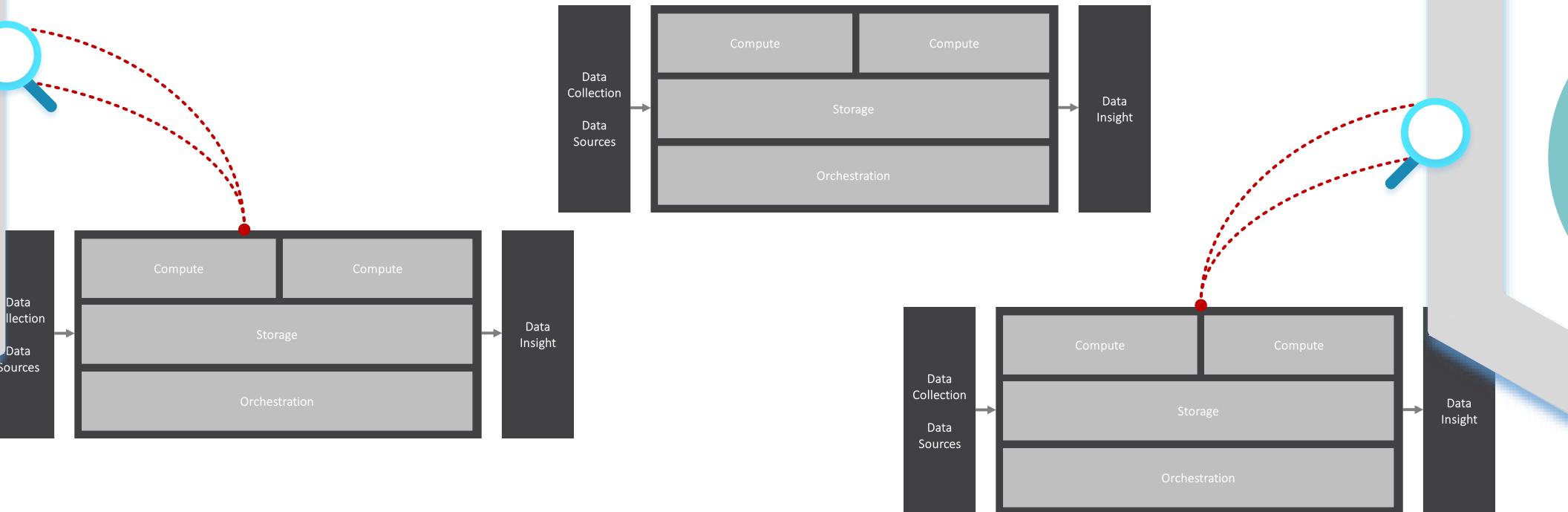
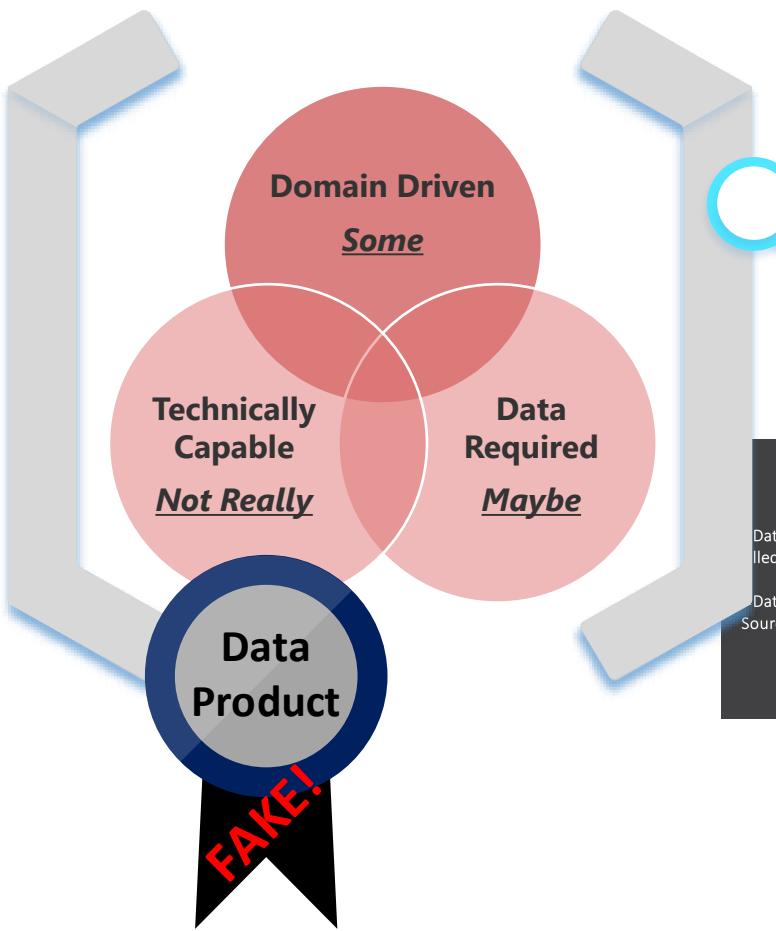




Data Products

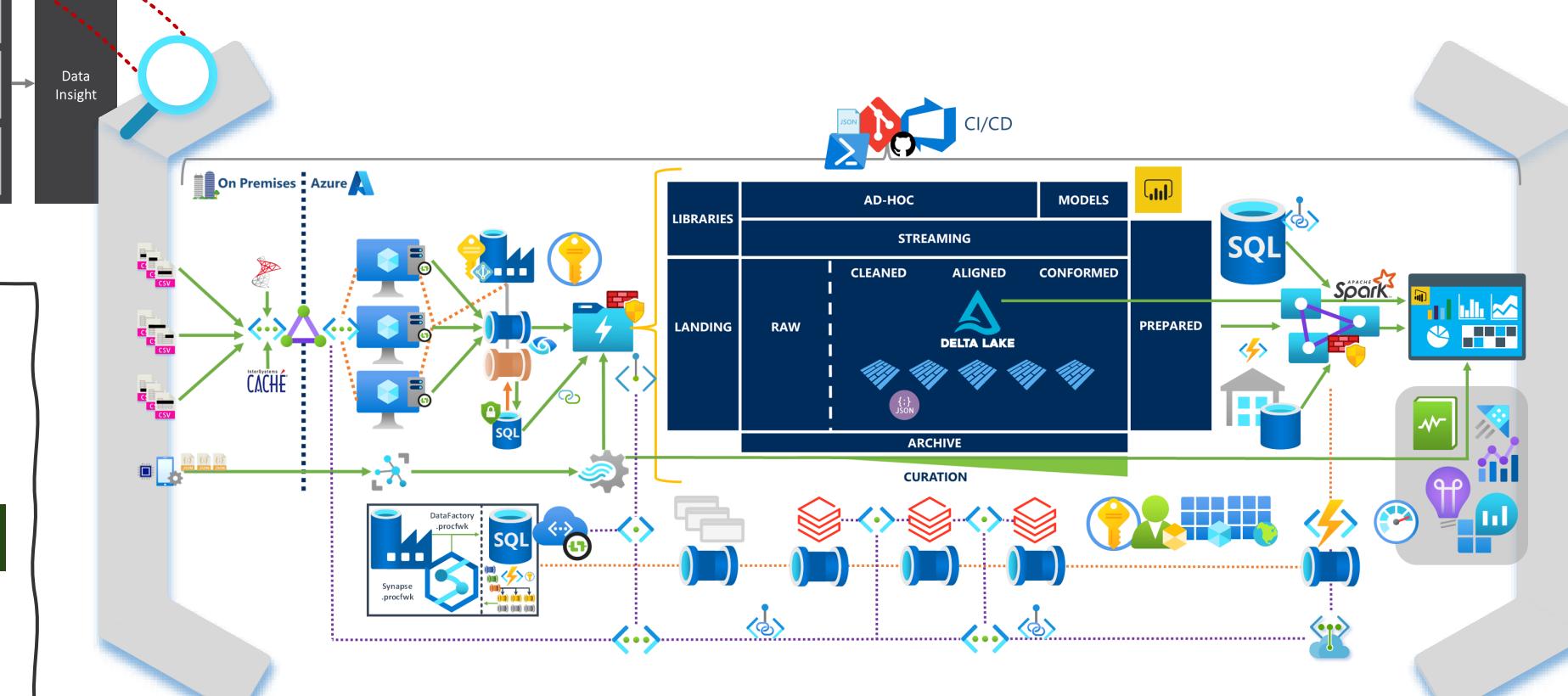


Data Products



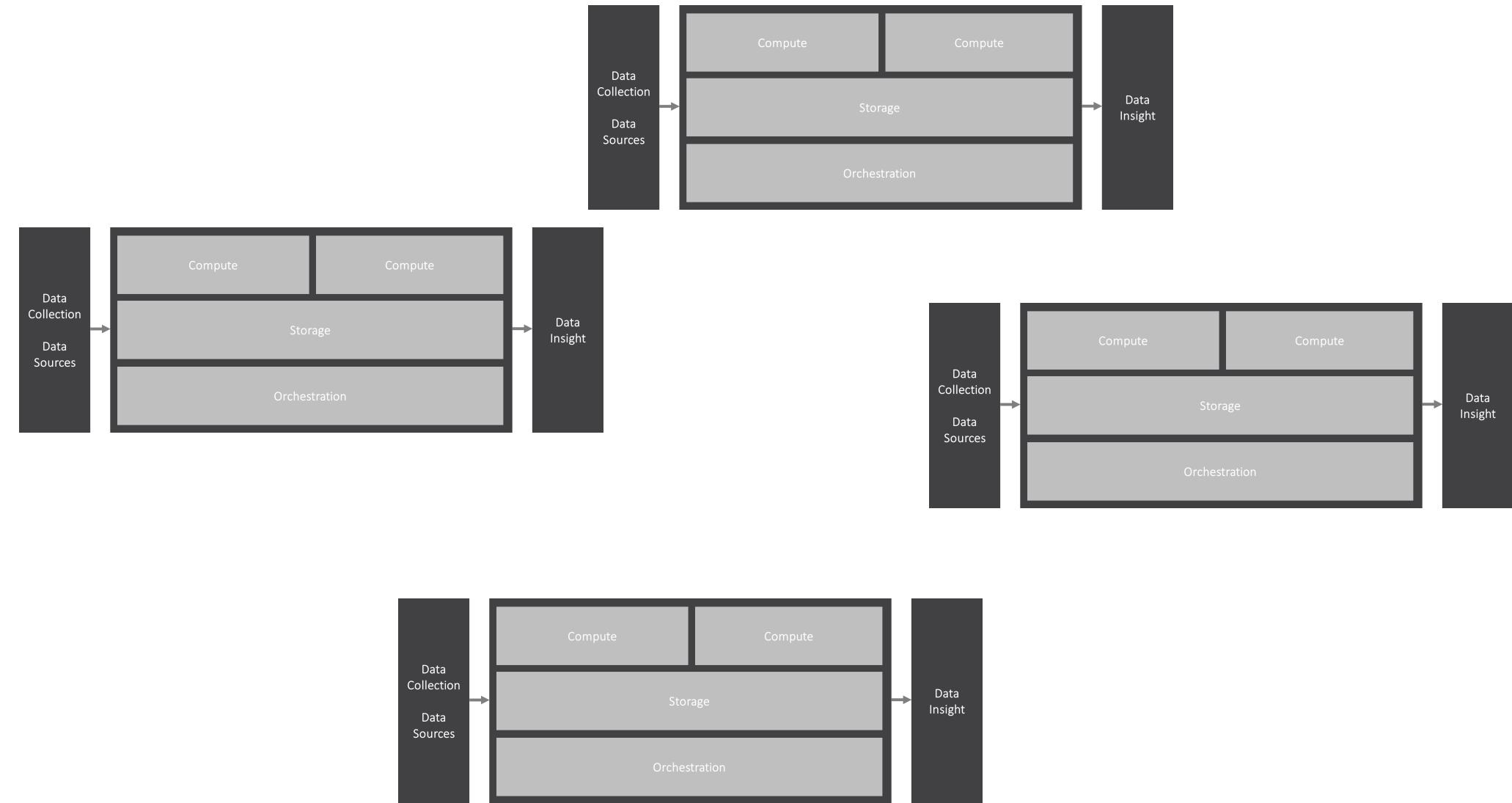
Data as a product.

Q1: Should a data product handle both transactional/operational and analytical data?

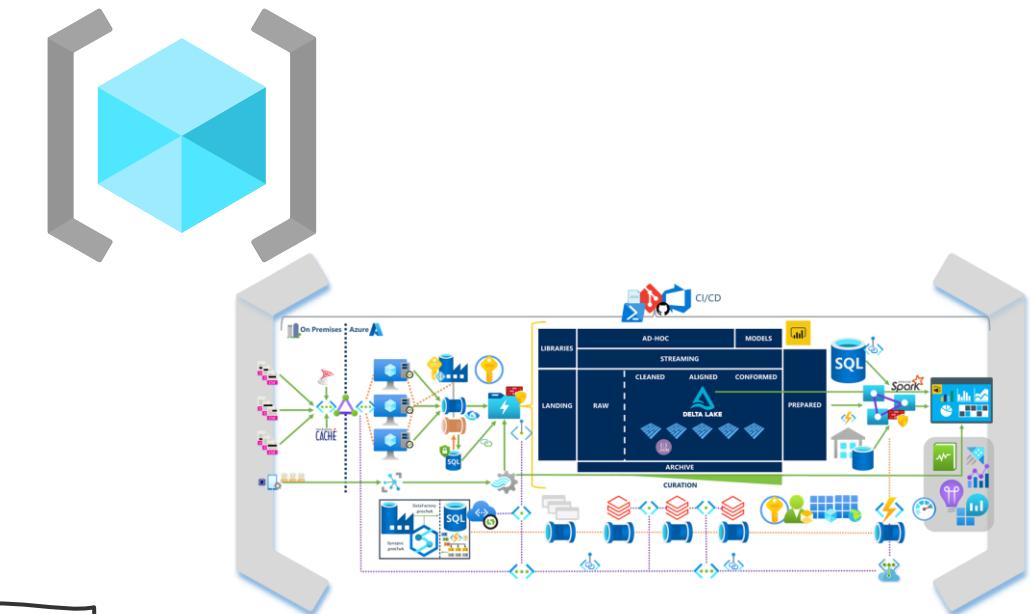
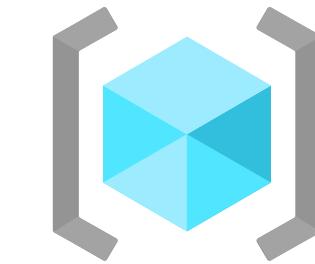
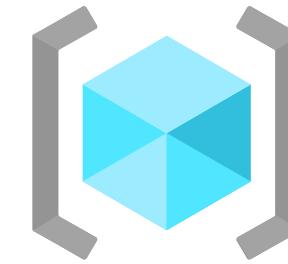
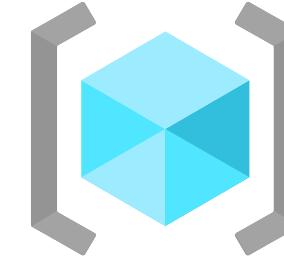




Data Products in Azure

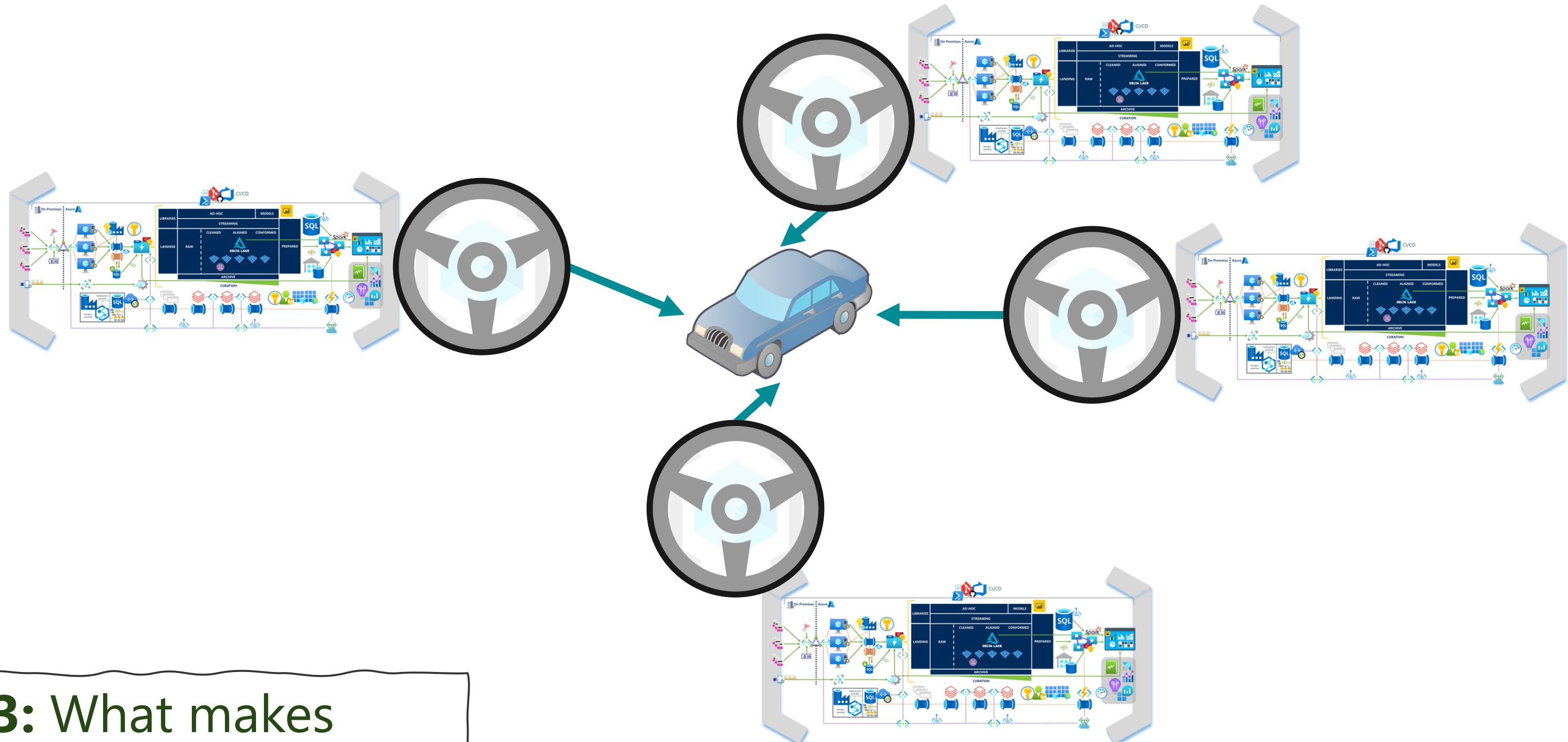


Data Products in Azure



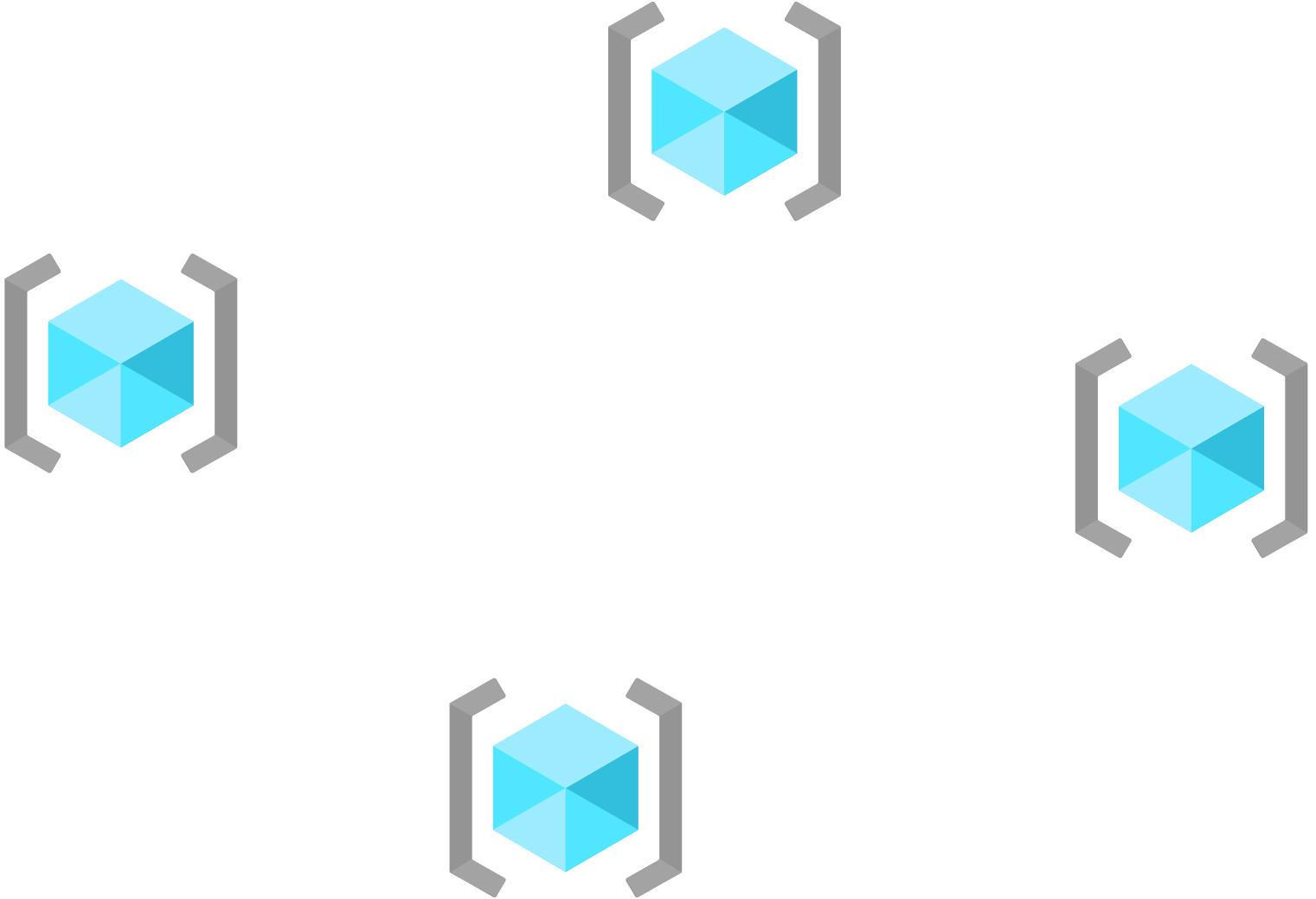
Q2: When does a data platform become a Data Mesh?

Data Products in Azure



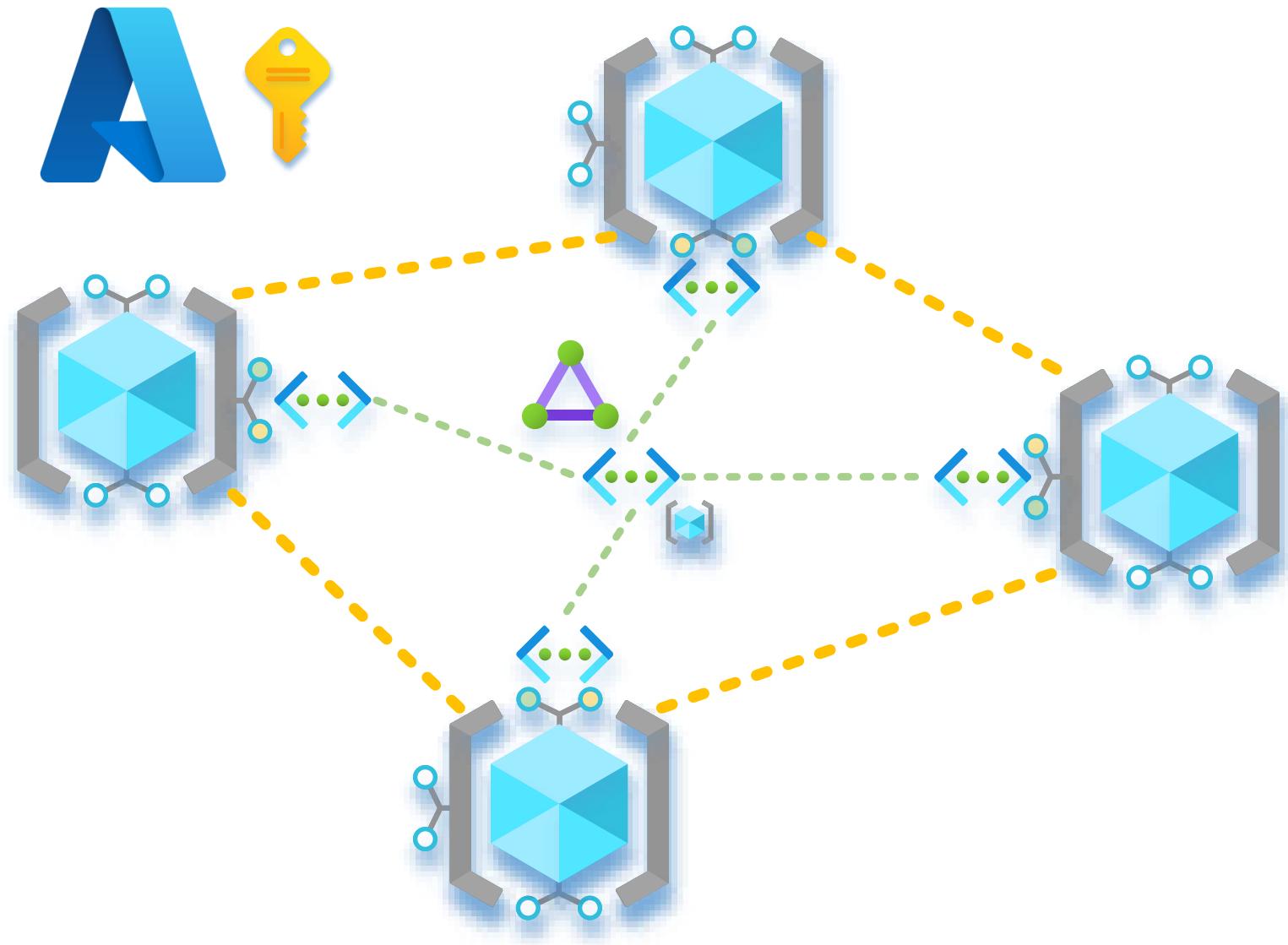
Q3: What makes minimum viable Data Mesh contain?

Data Products in Azure

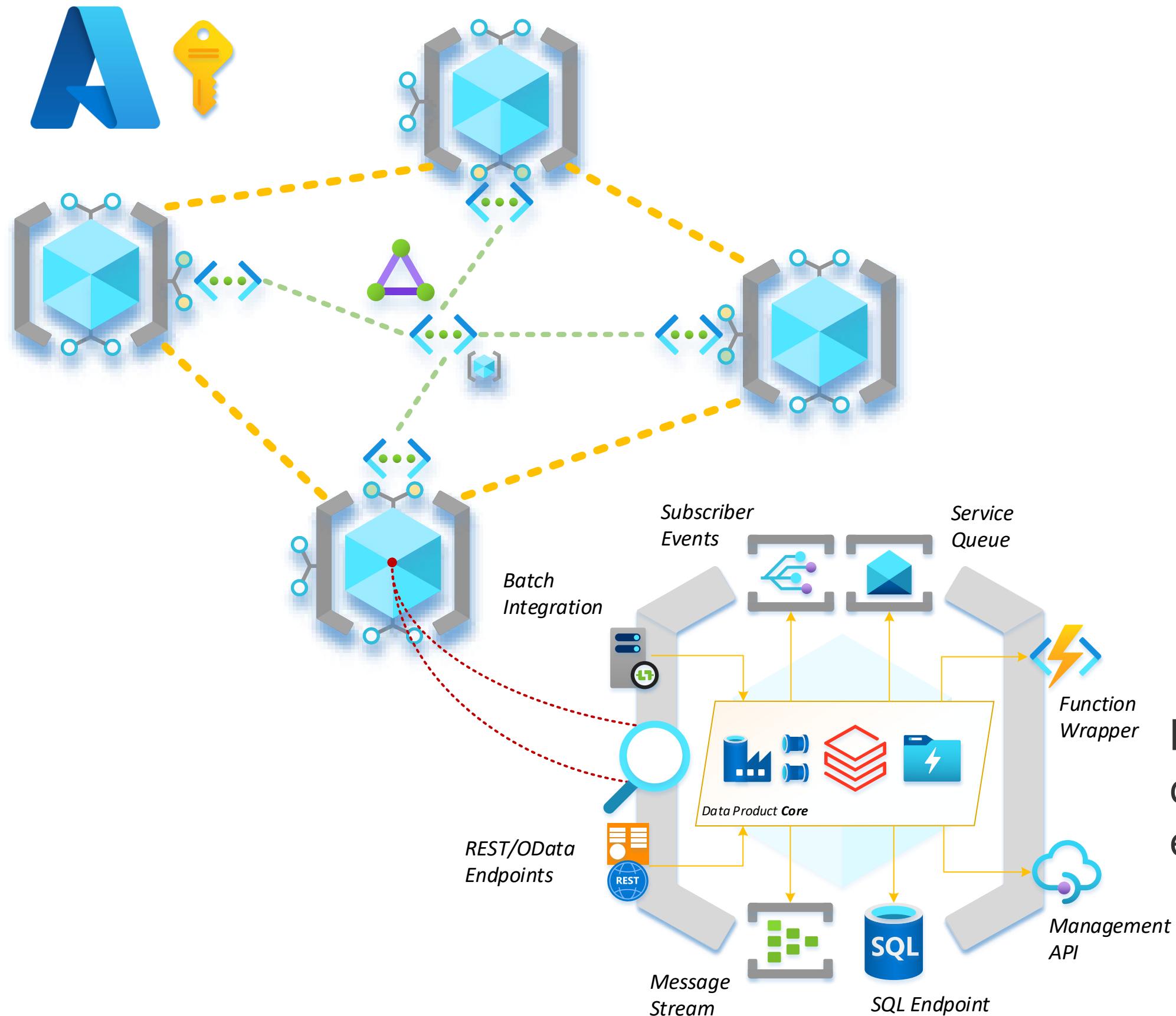




Data Products - Azure Interfaces

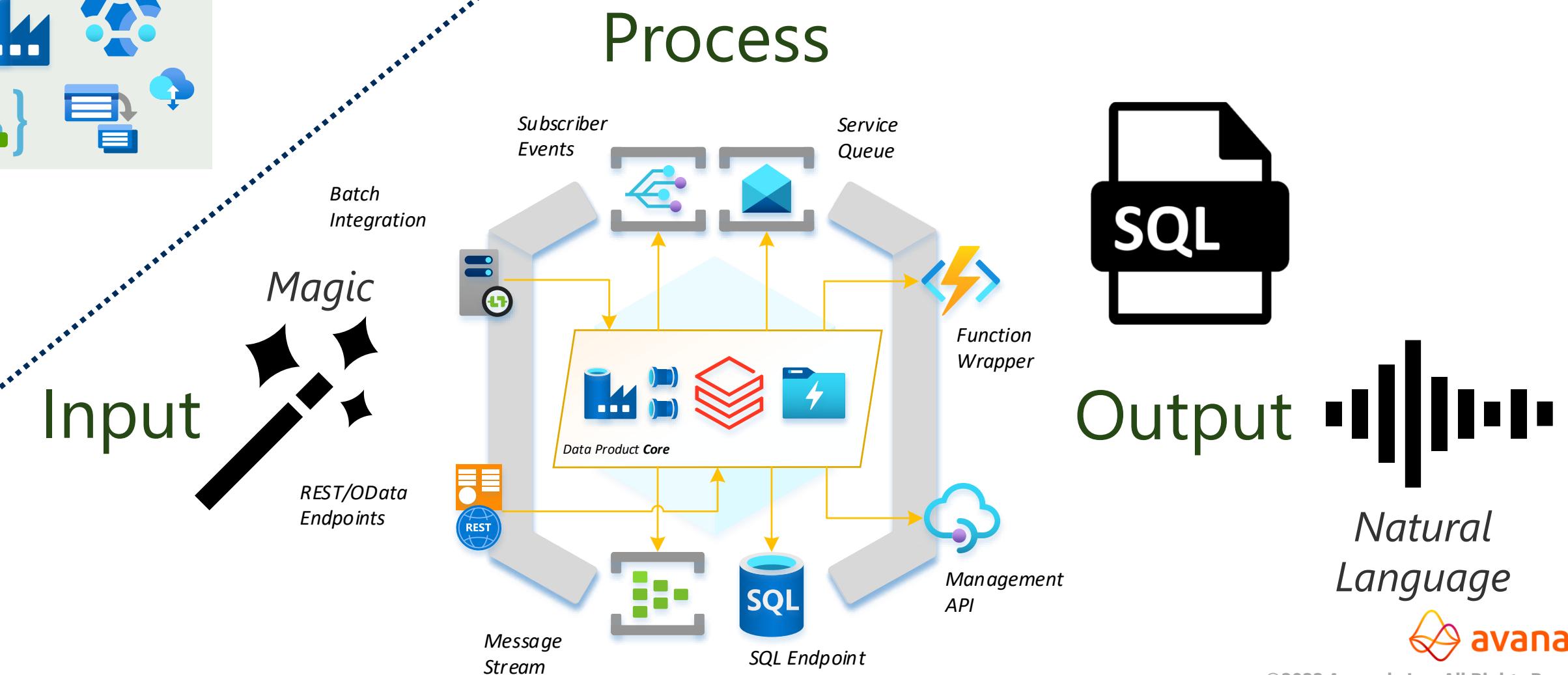
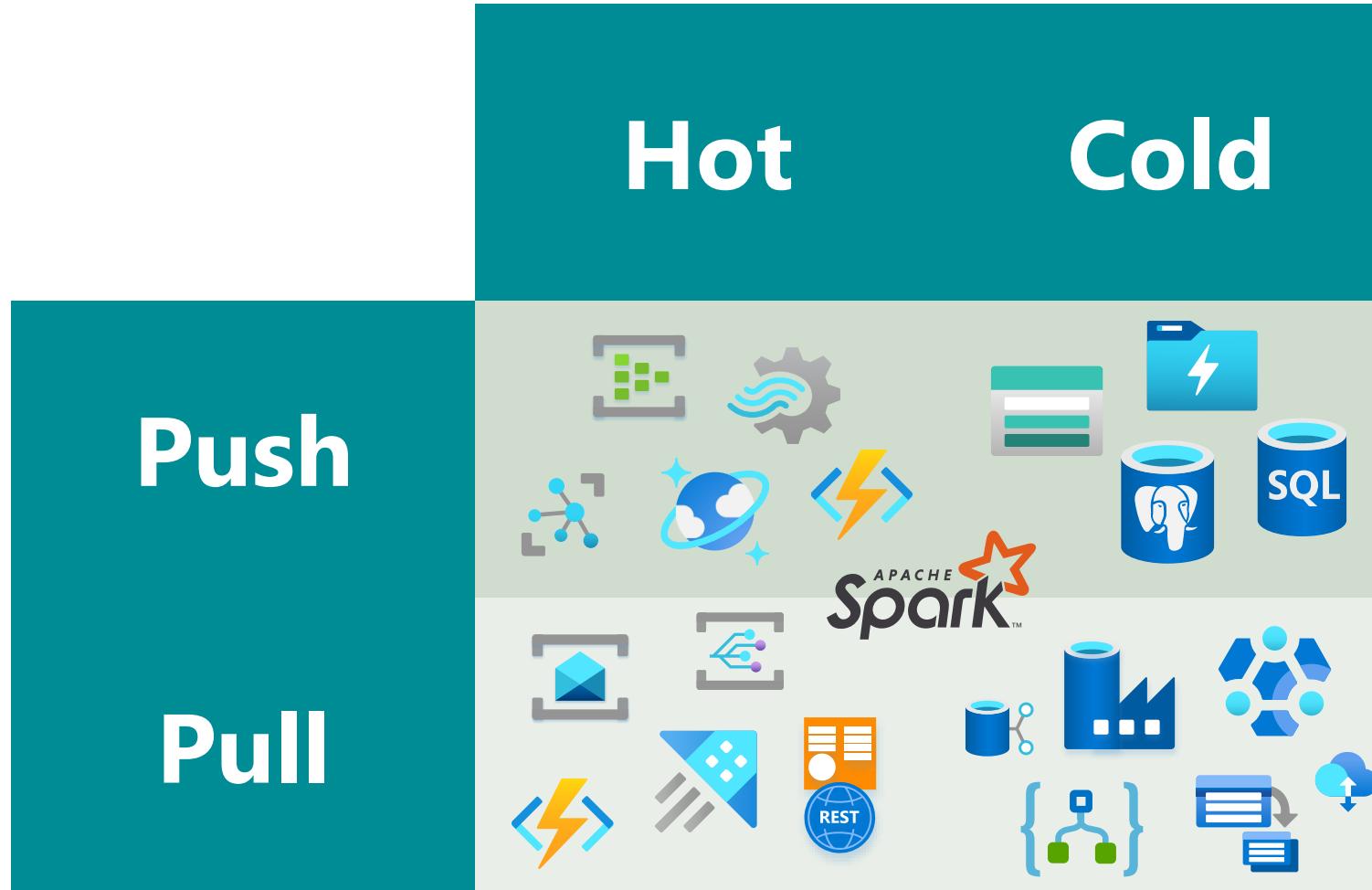


Data Products - Azure Interfaces

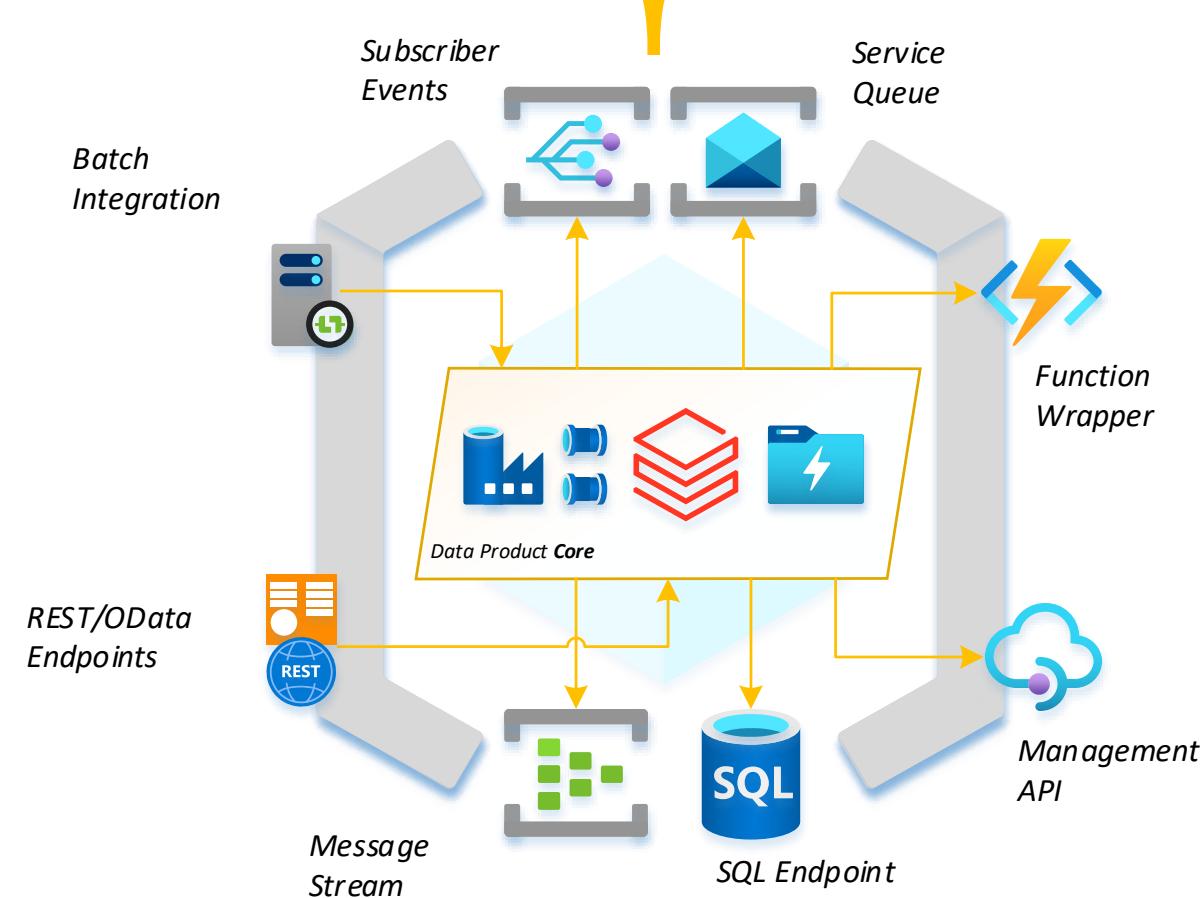
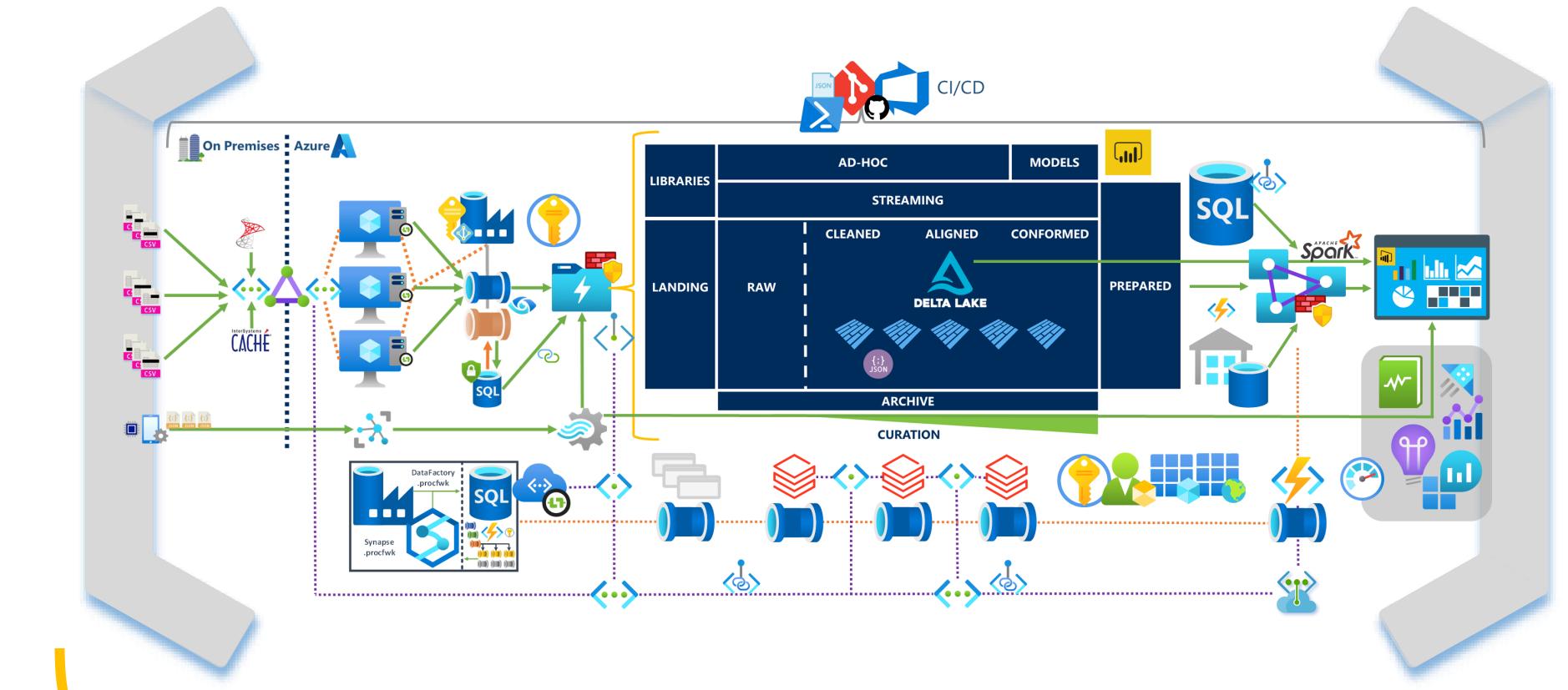


Primary Interfaces –
data integration and
exchange.

Data Products - Azure Interfaces

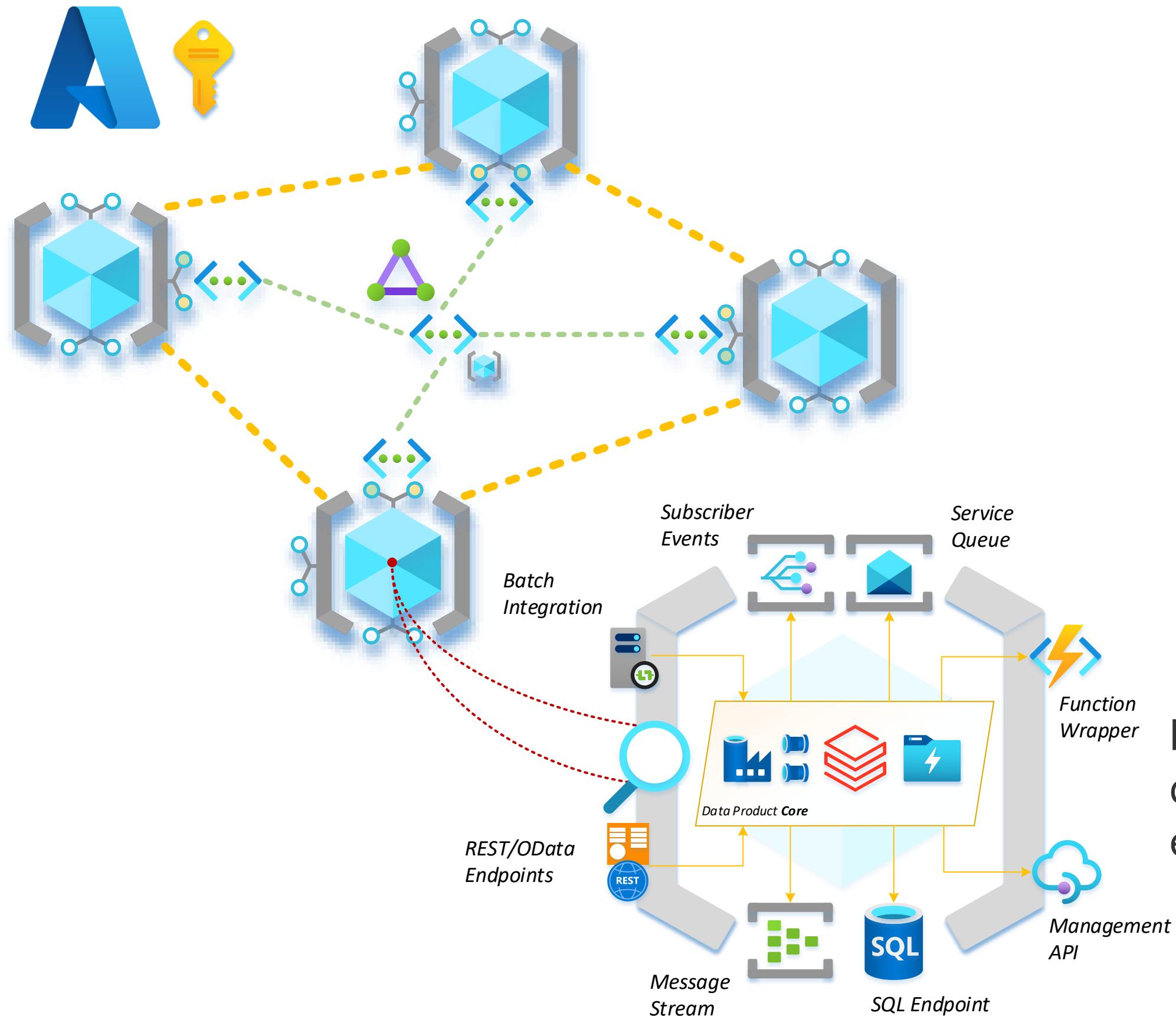


Data Products in Azure with Interfaces



Primary Interfaces –
data integration and
exchange.

Data Products - Azure Interfaces

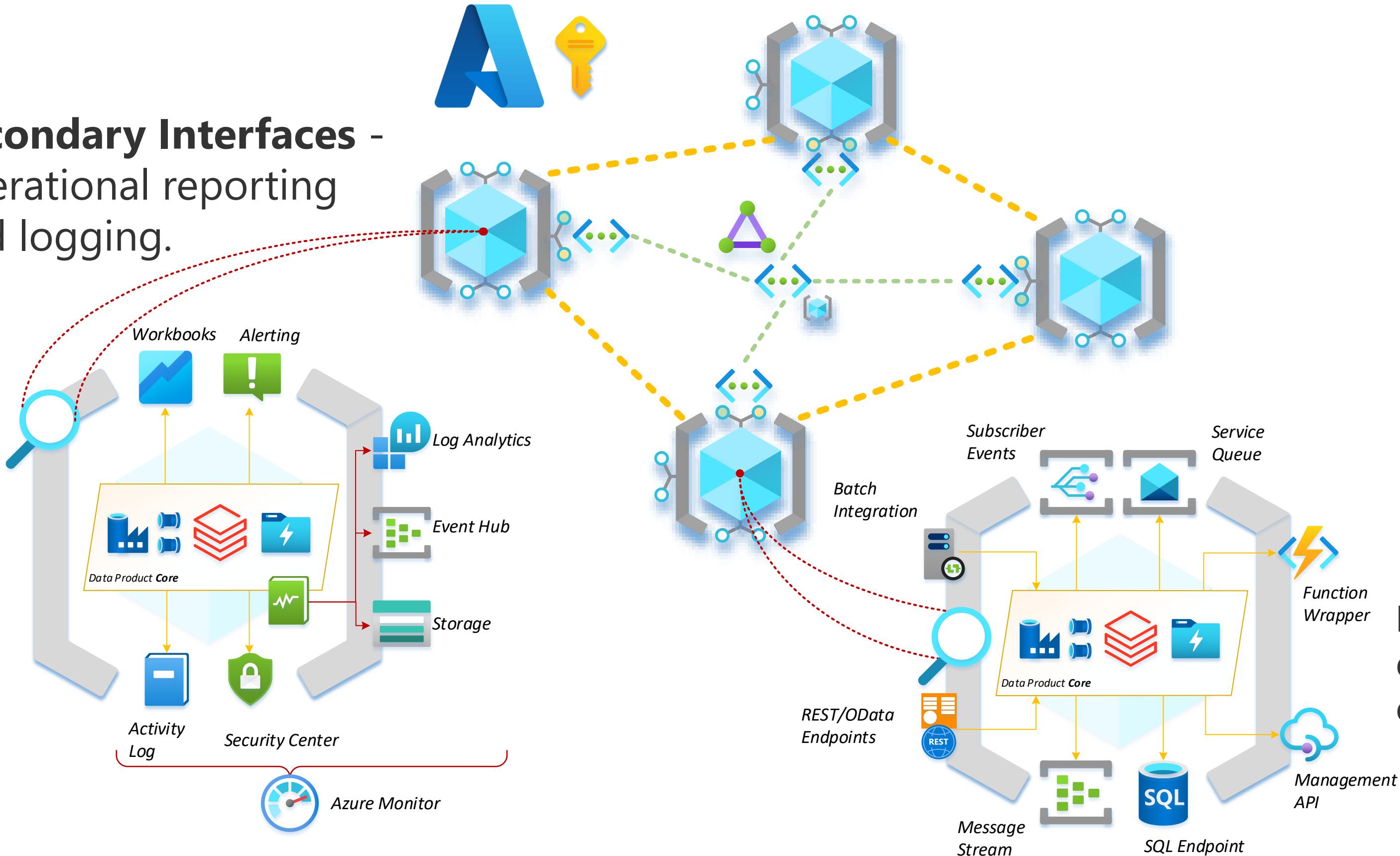


Primary Interfaces –
data integration and
exchange.

Data Products - Azure Interfaces



Secondary Interfaces –
operational reporting
and logging.

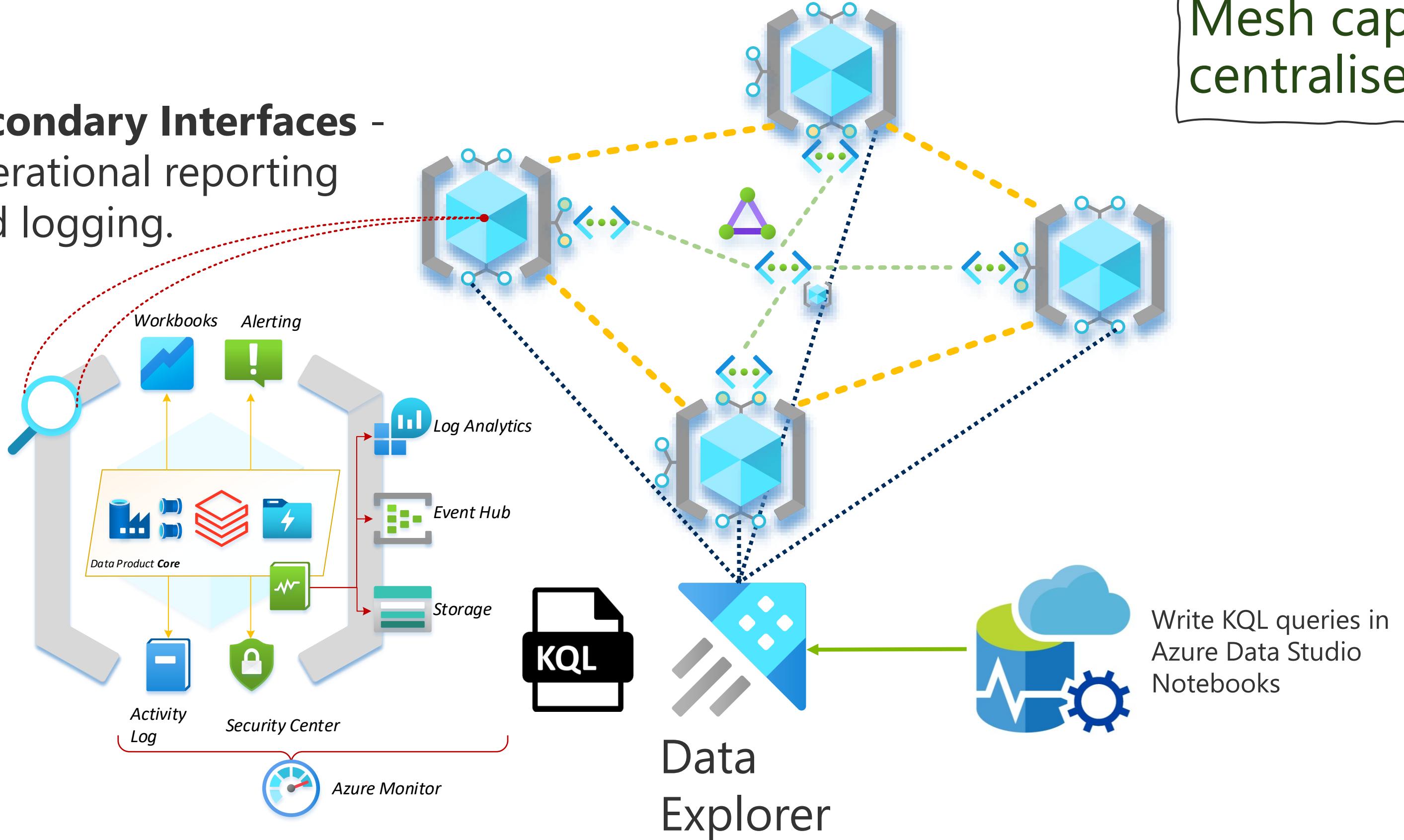


Primary Interfaces –
data integration and
exchange.



Data Products - Azure Interfaces

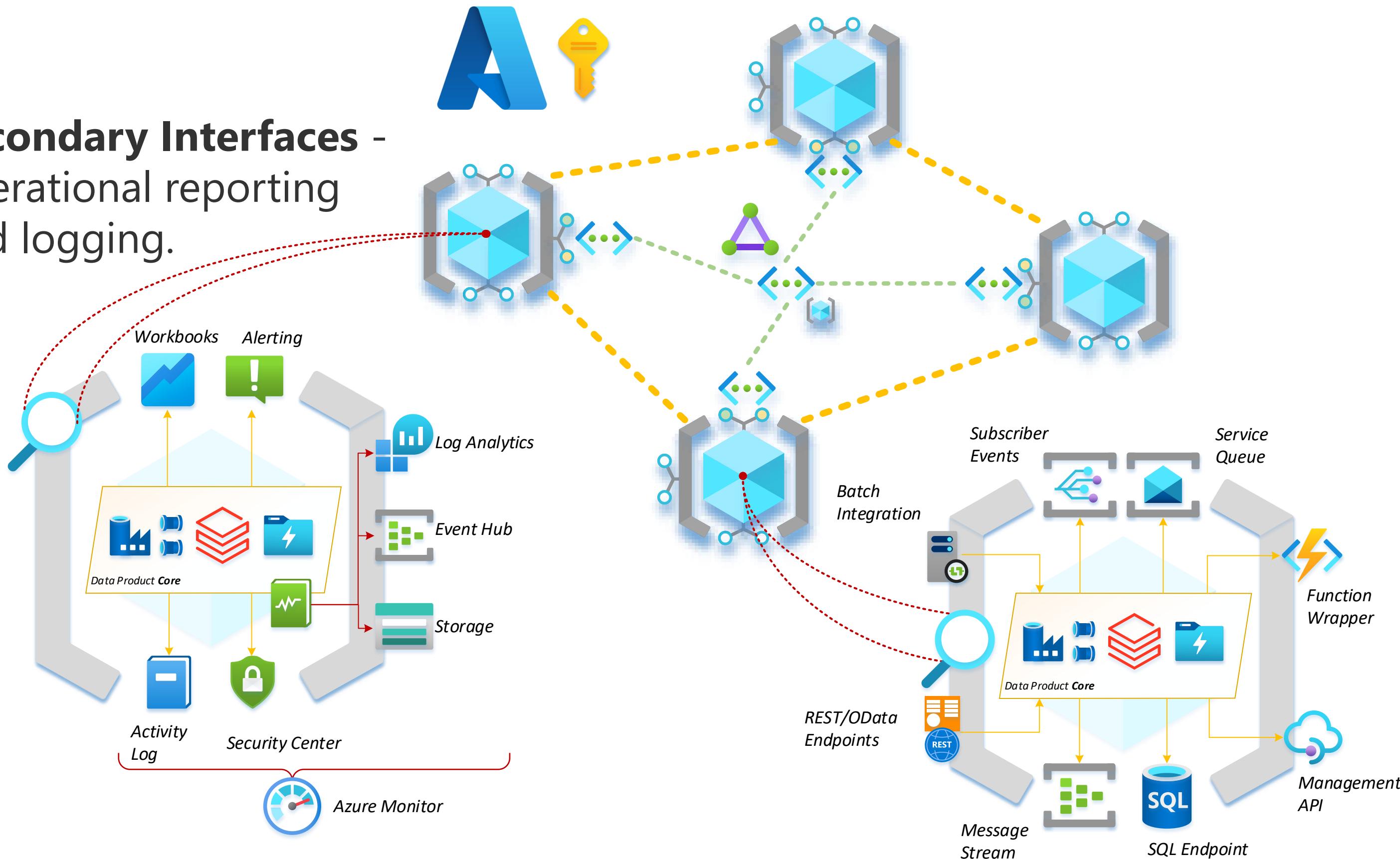
Secondary Interfaces -
operational reporting
and logging.



Data Products - Azure Interfaces



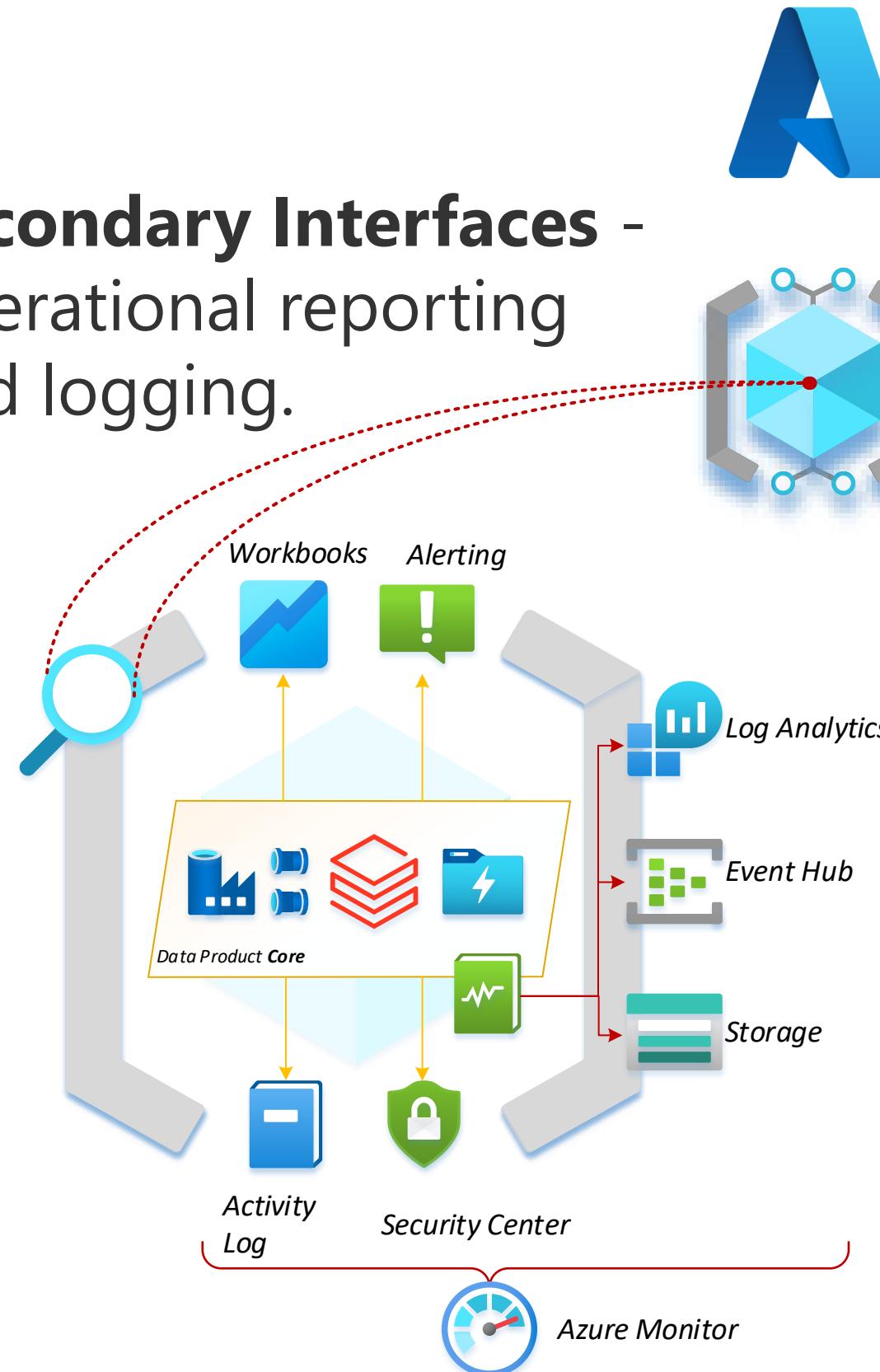
Secondary Interfaces -
operational reporting
and logging.



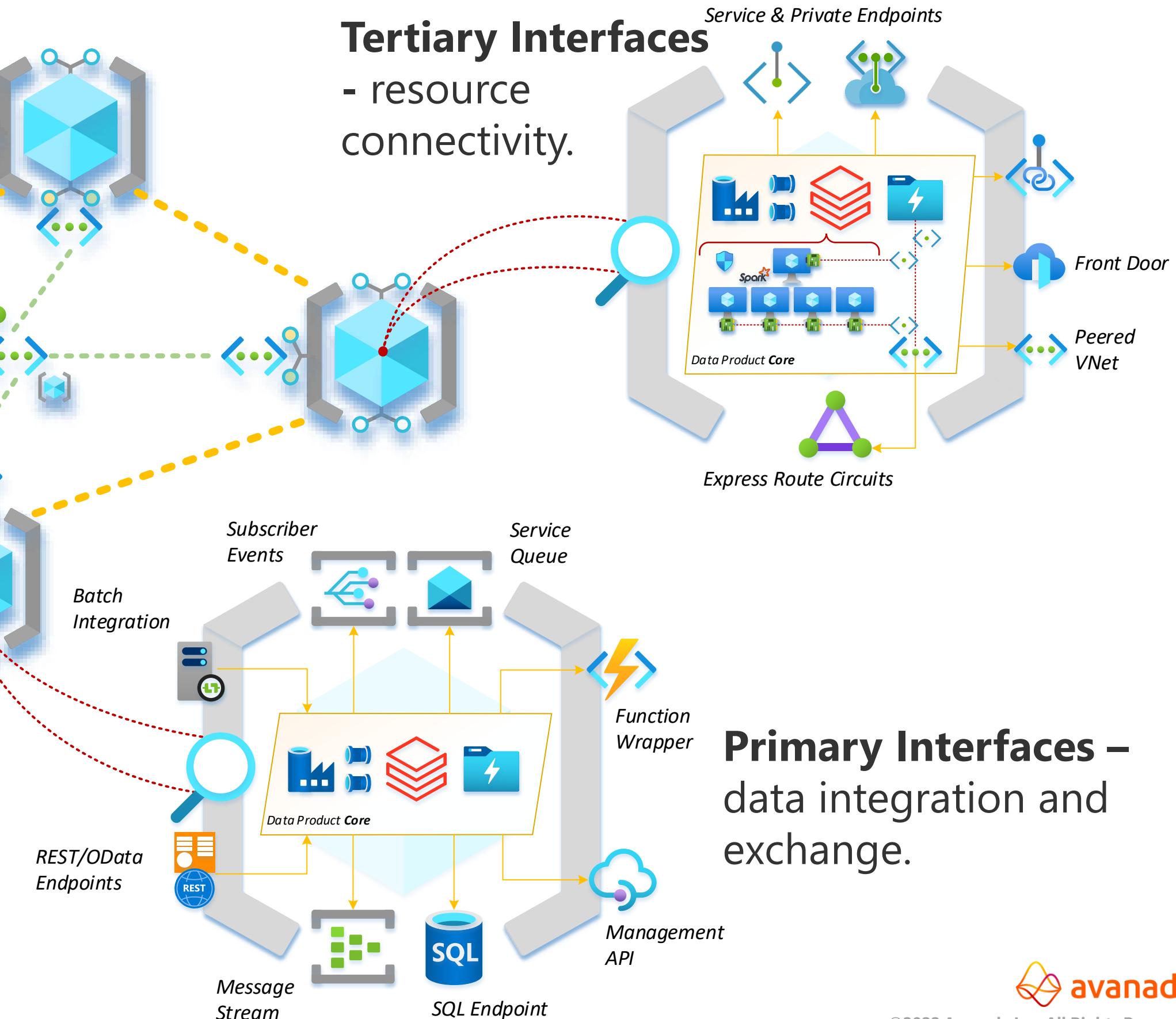
Primary Interfaces –
data integration and
exchange.

Data Products - Azure Interfaces

Secondary Interfaces - operational reporting and logging.

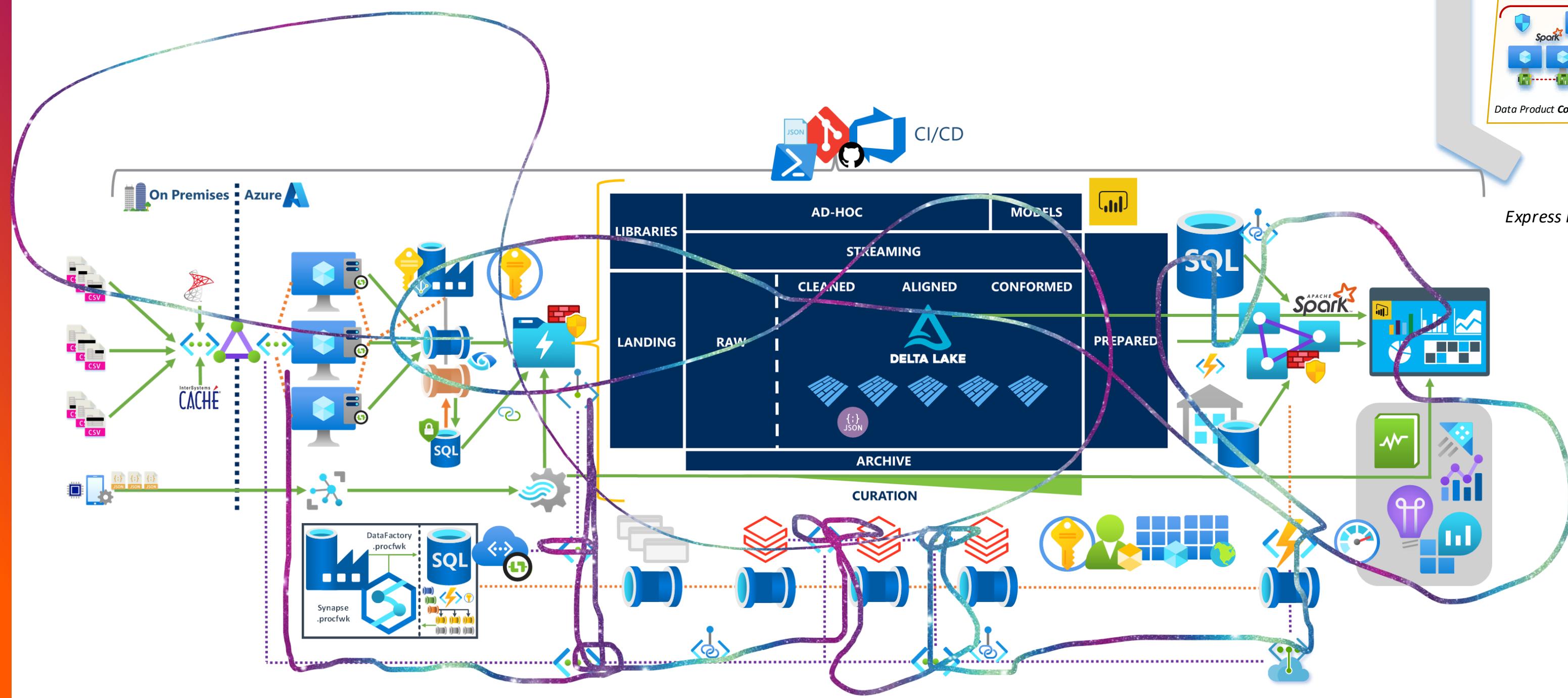


Tertiary Interfaces - resource connectivity.

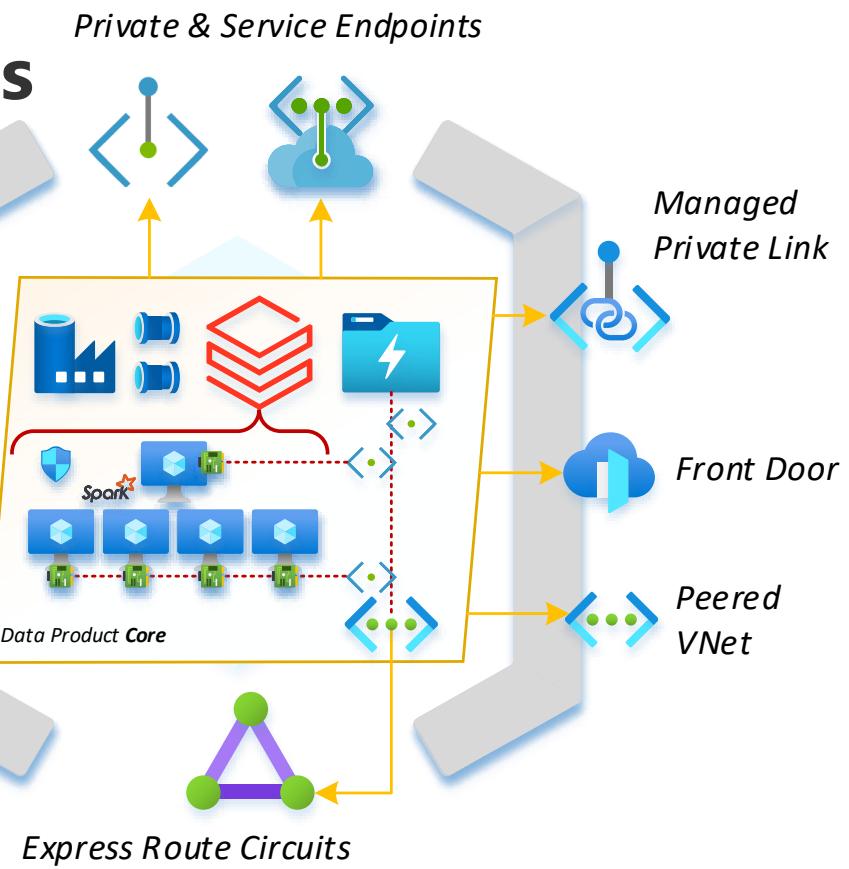


Primary Interfaces – data integration and exchange.

Data Products - Azure Interfaces

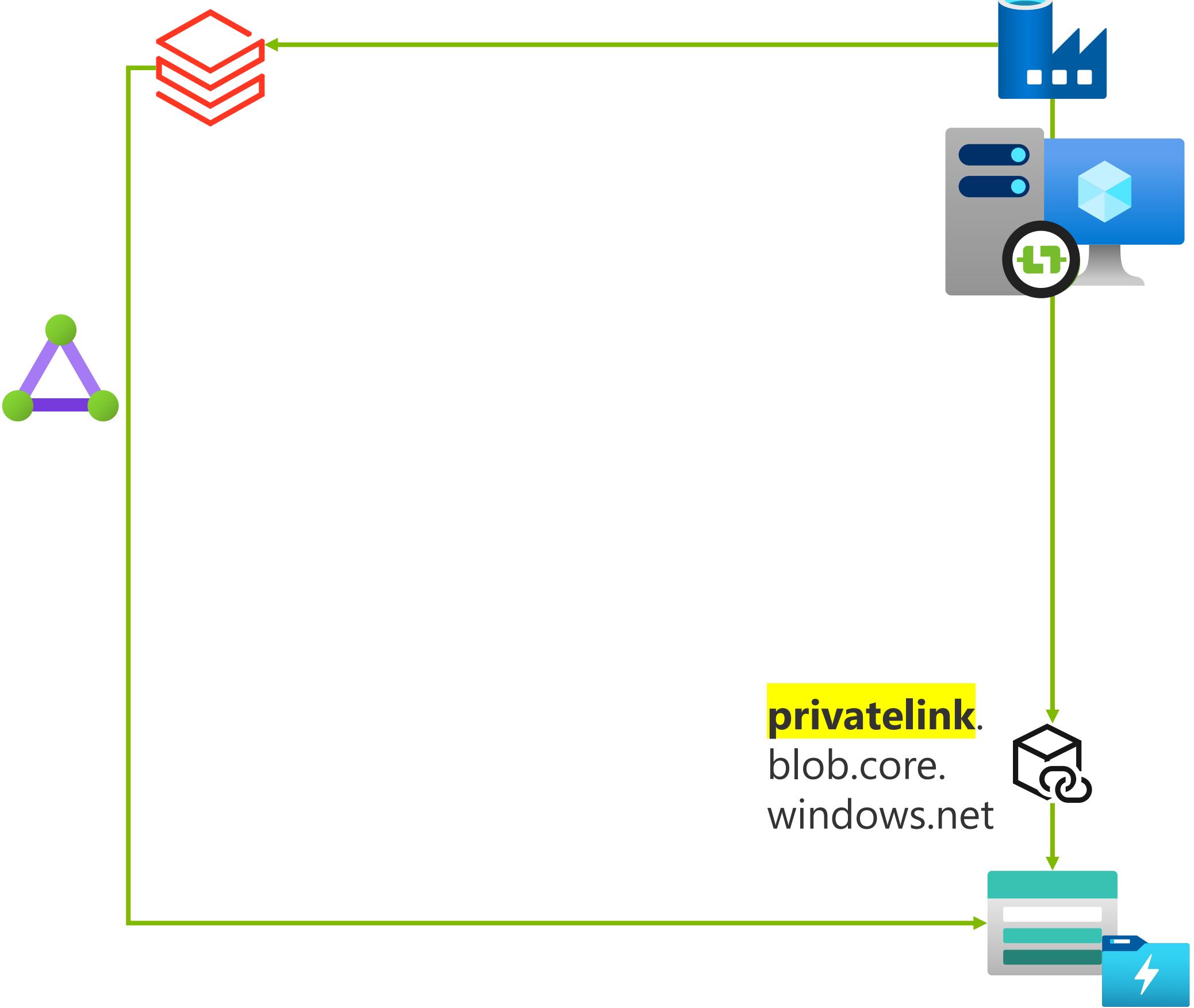


Tertiary Interfaces
- resource connectivity.

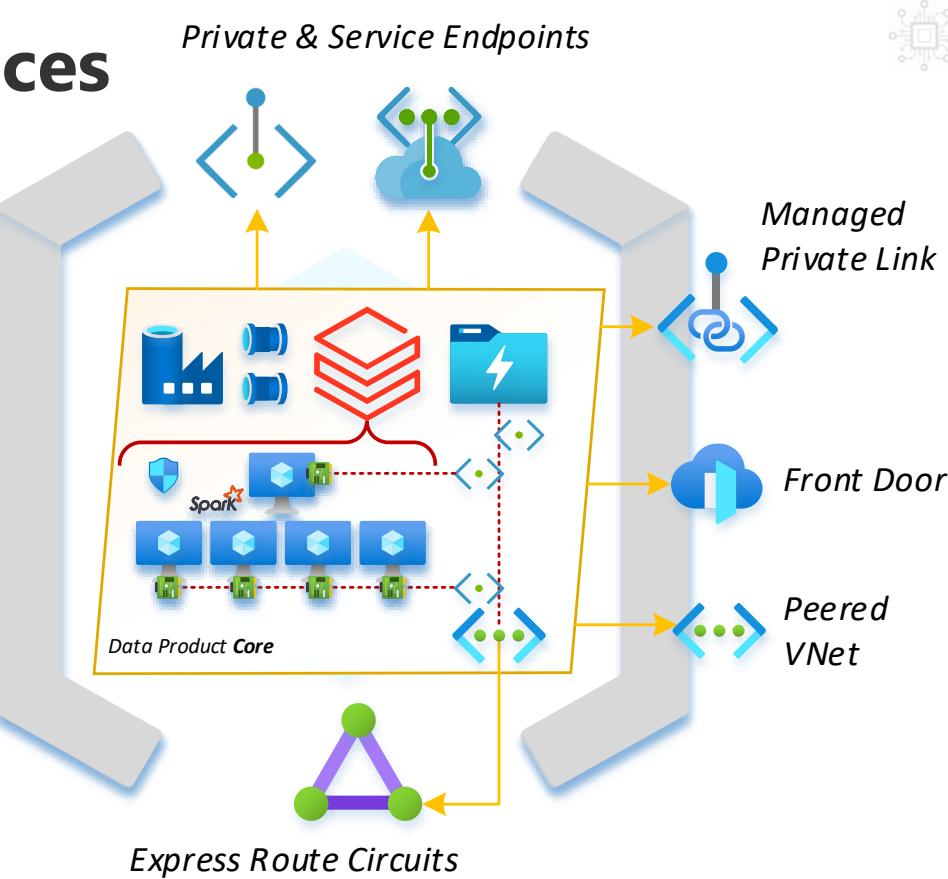


Data Products - Azure Interfaces

VNets



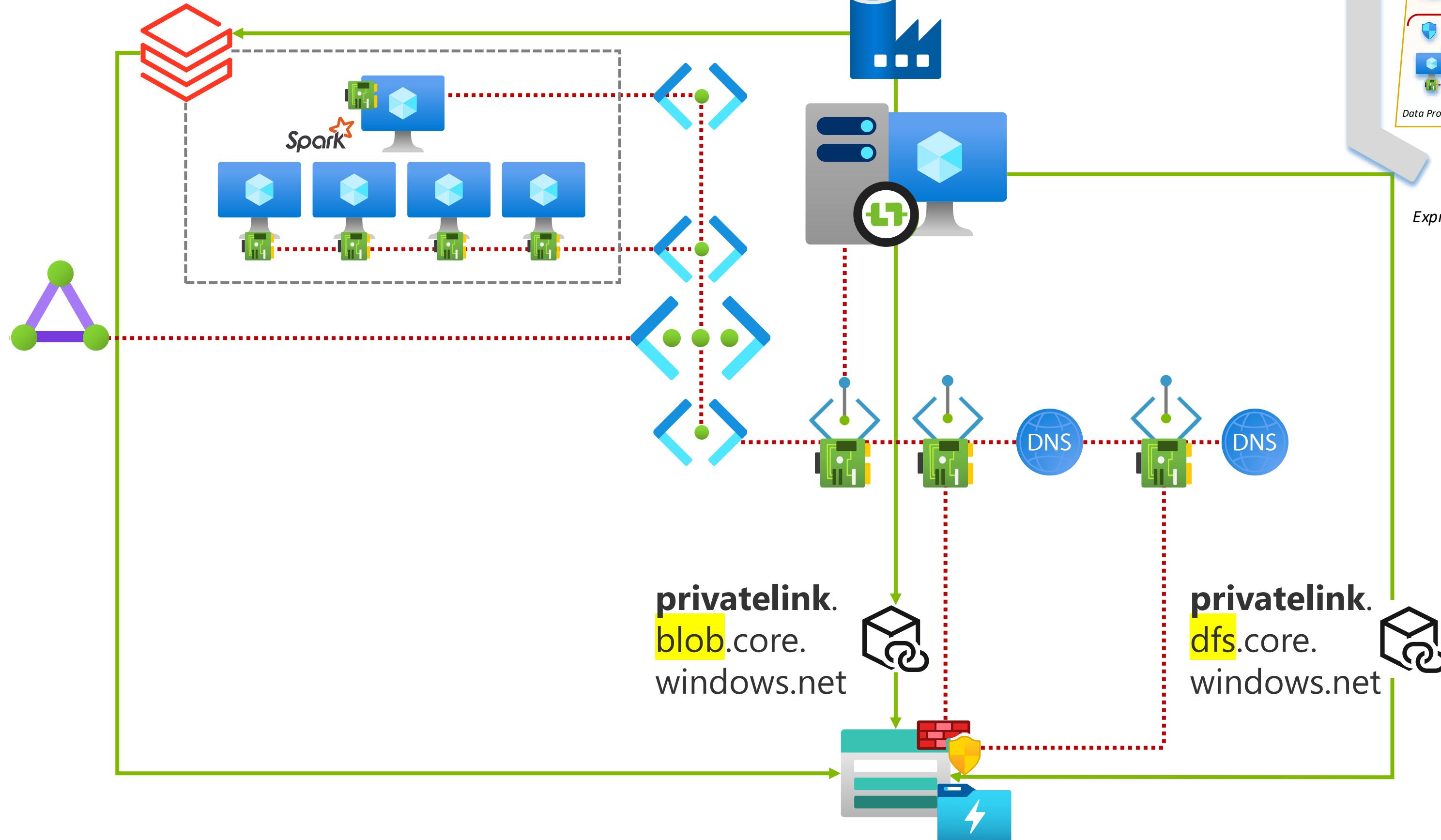
Tertiary Interfaces
- resource connectivity.





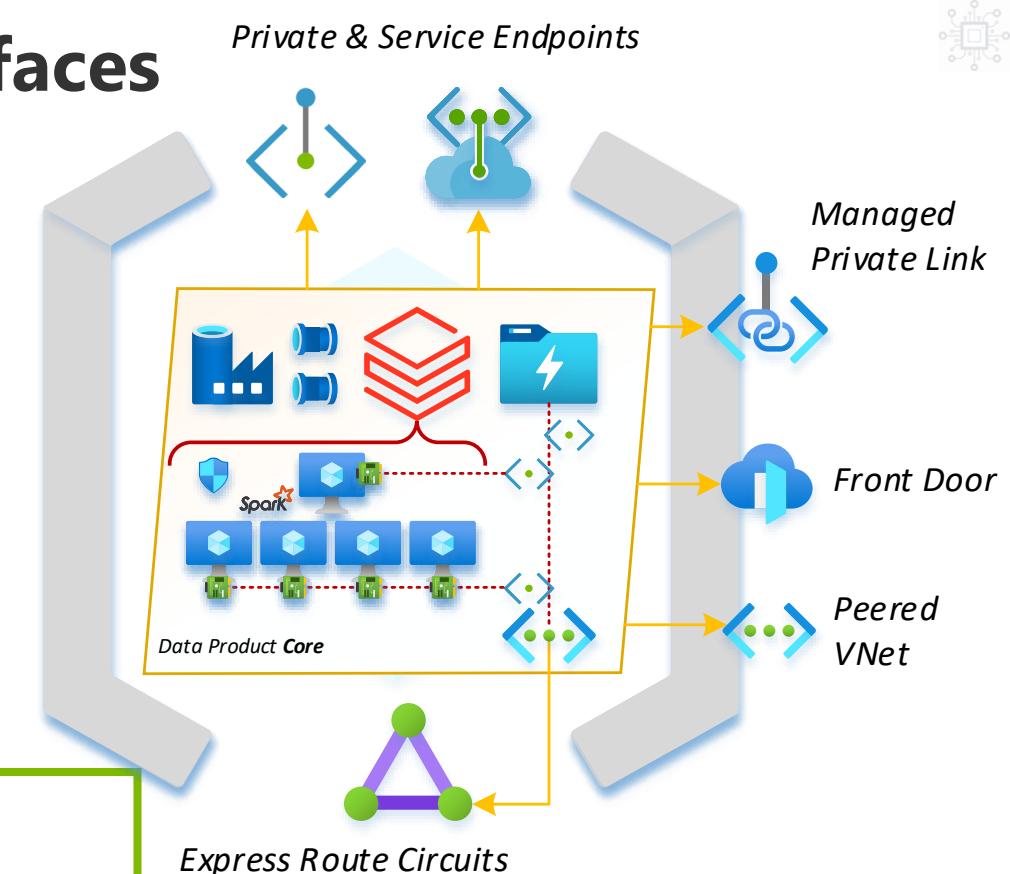
Data Products - Azure Interfaces

VNets

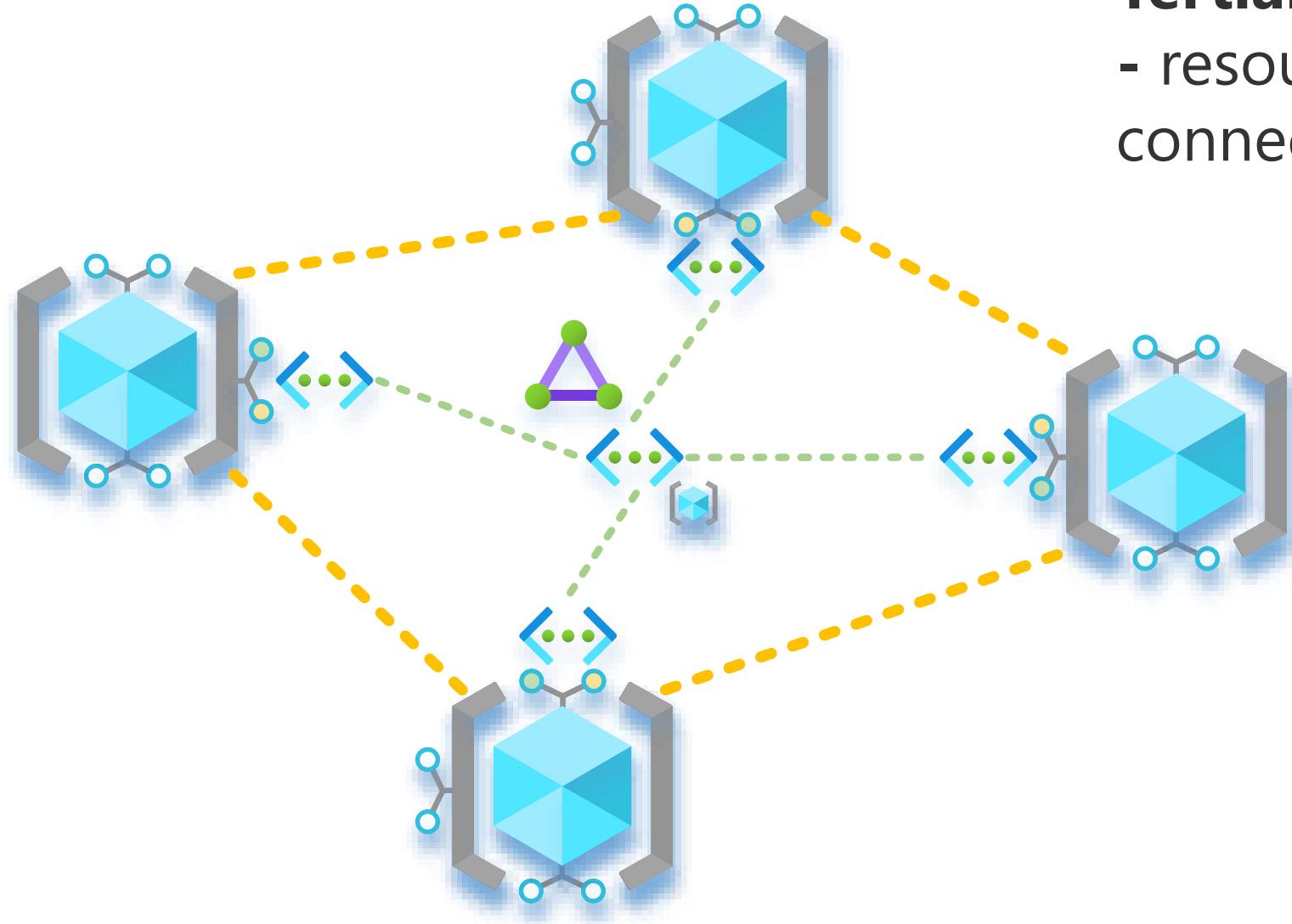


Tertiary Interfaces

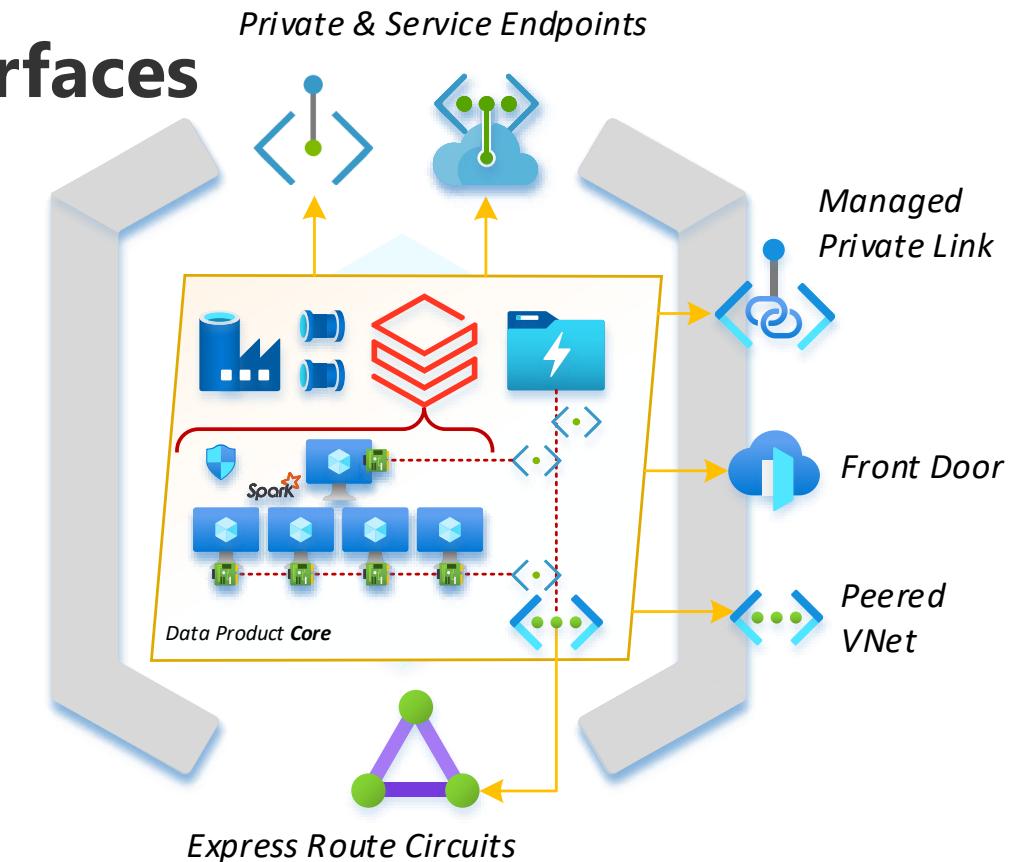
- resource connectivity.



Data Products - Azure Interfaces



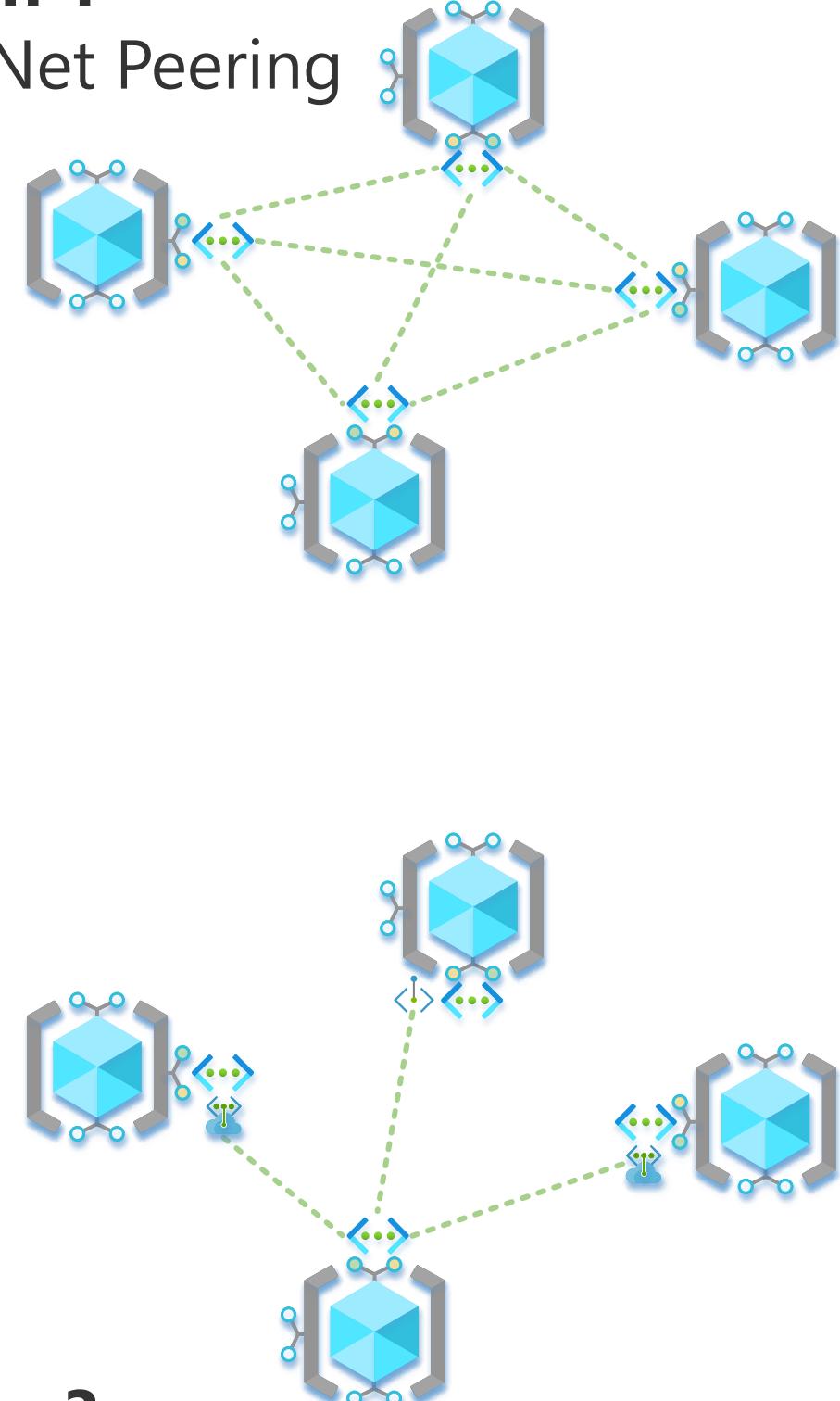
Tertiary Interfaces
- resource connectivity.



Data Products - Azure Interfaces

Option 1

Full VNet Peering

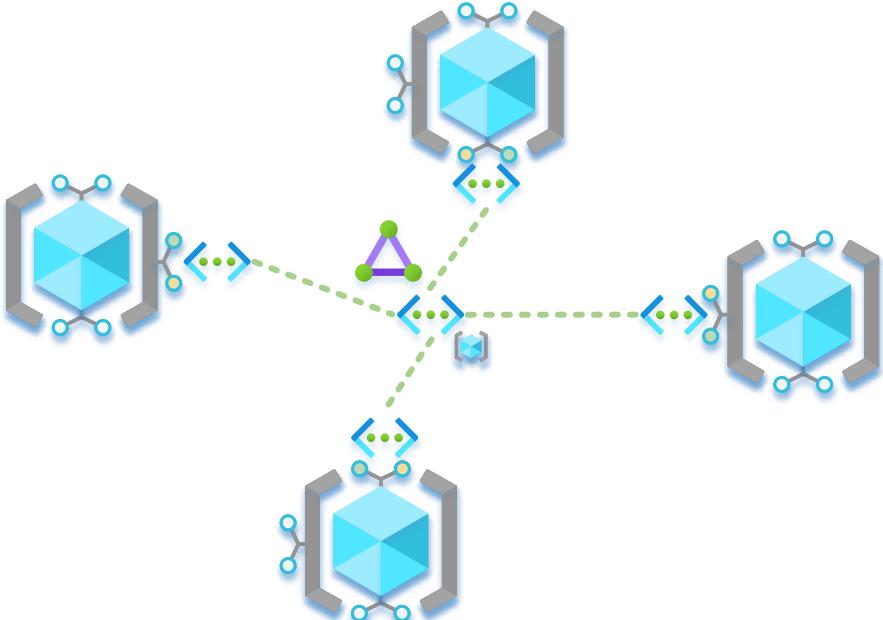


Option 3

Targeted Service/Private Endpoints

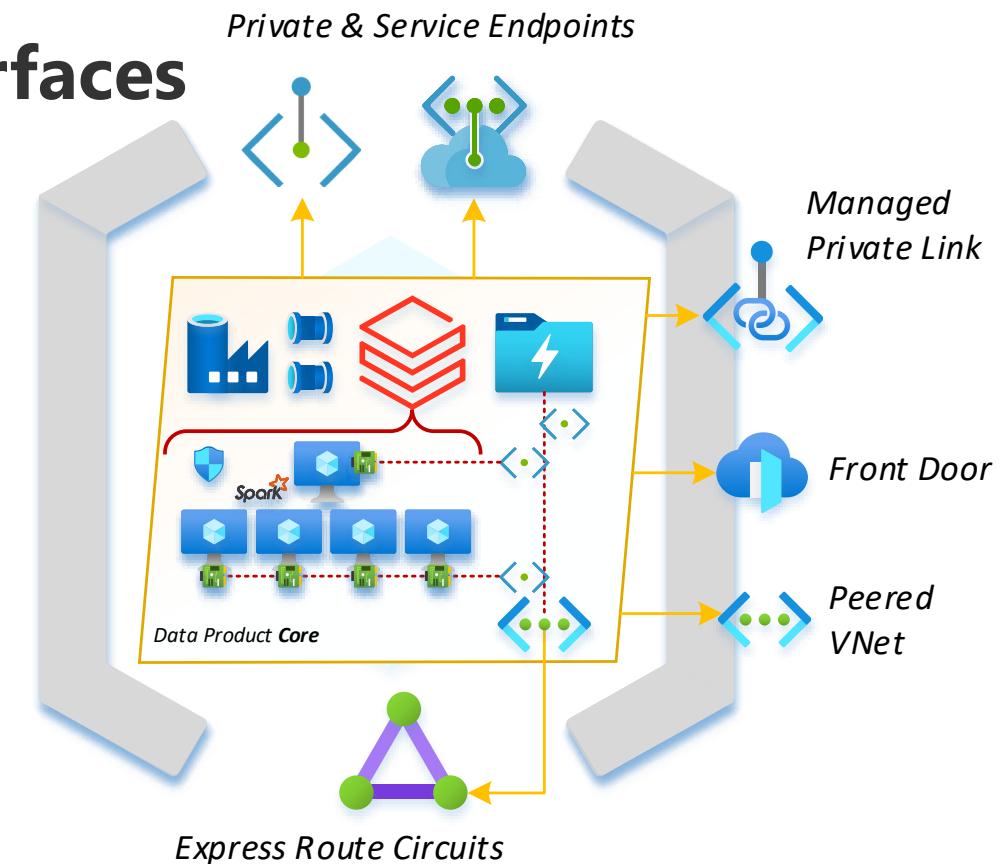
Option 2

Hub and Spoke VNet Peering



Tertiary Interfaces

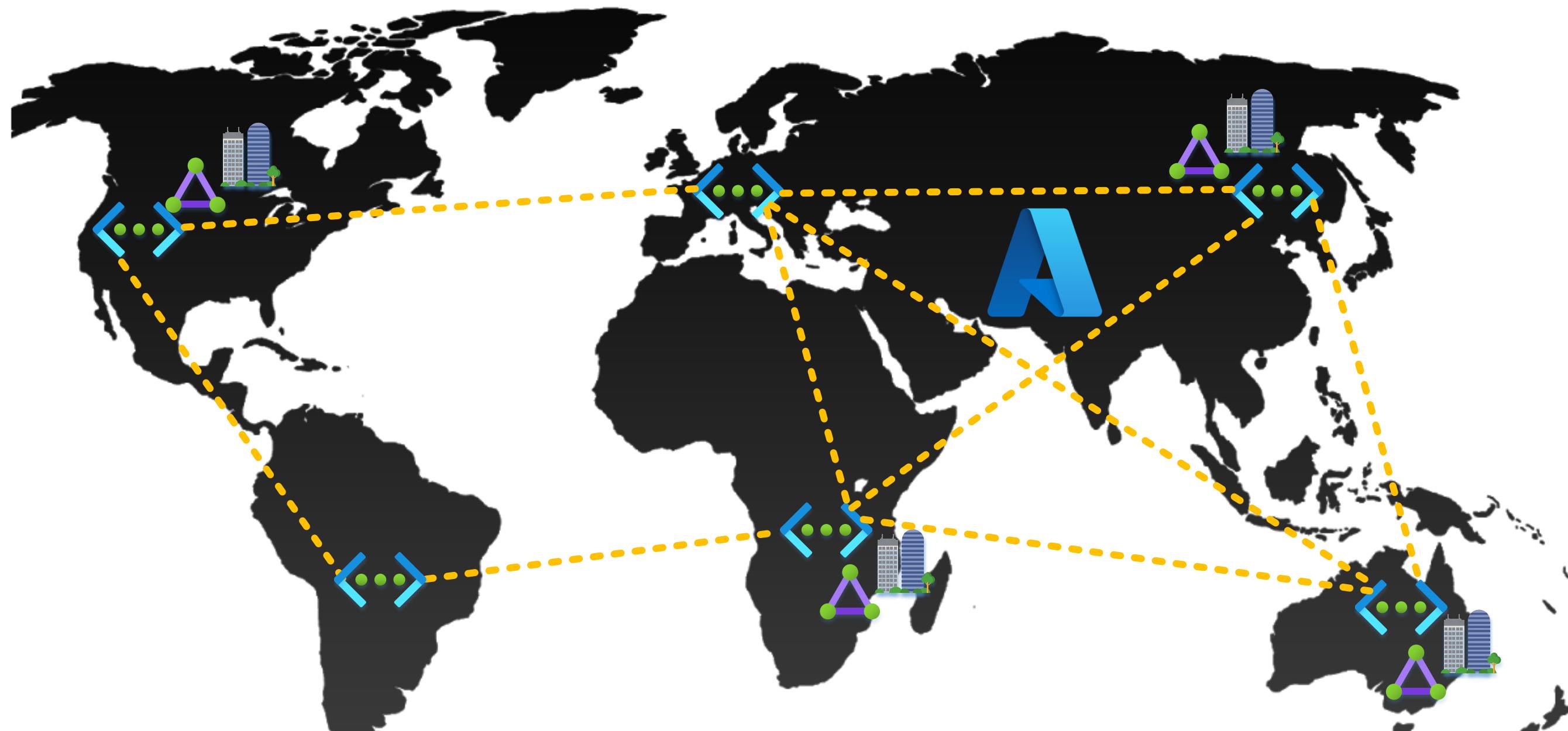
- resource connectivity.



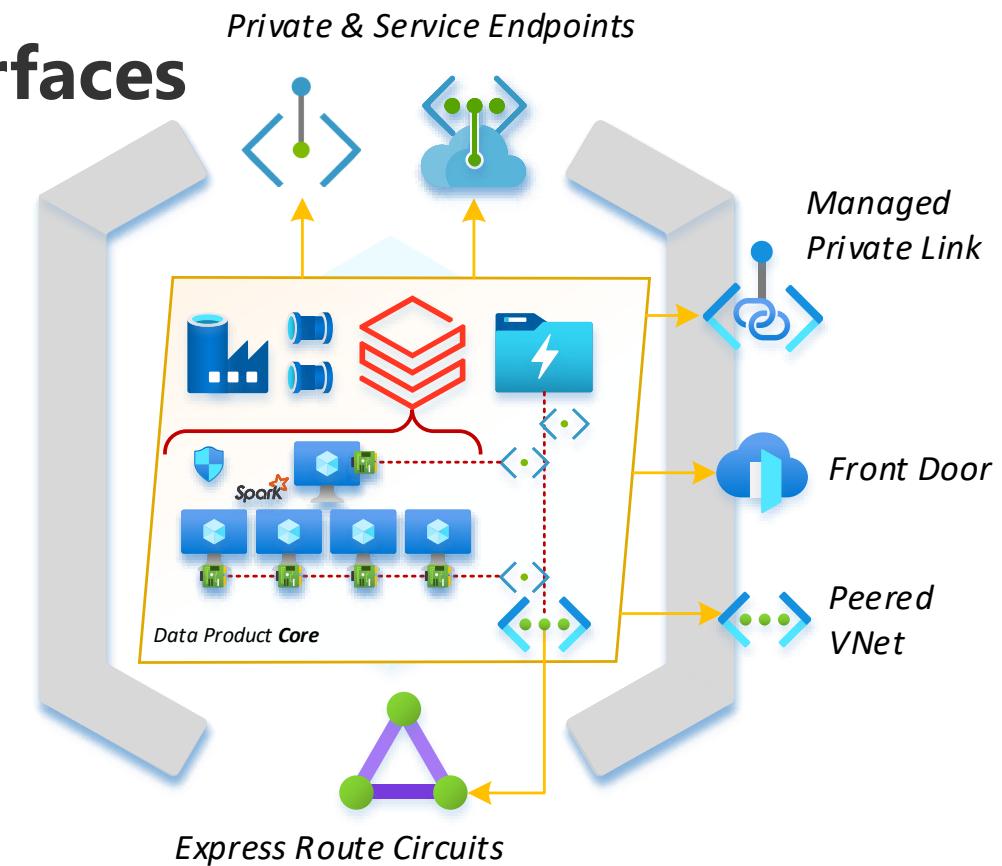
Other Options

- Use public endpoints.
- Use local resource firewalls.
- Use Managed Private Links

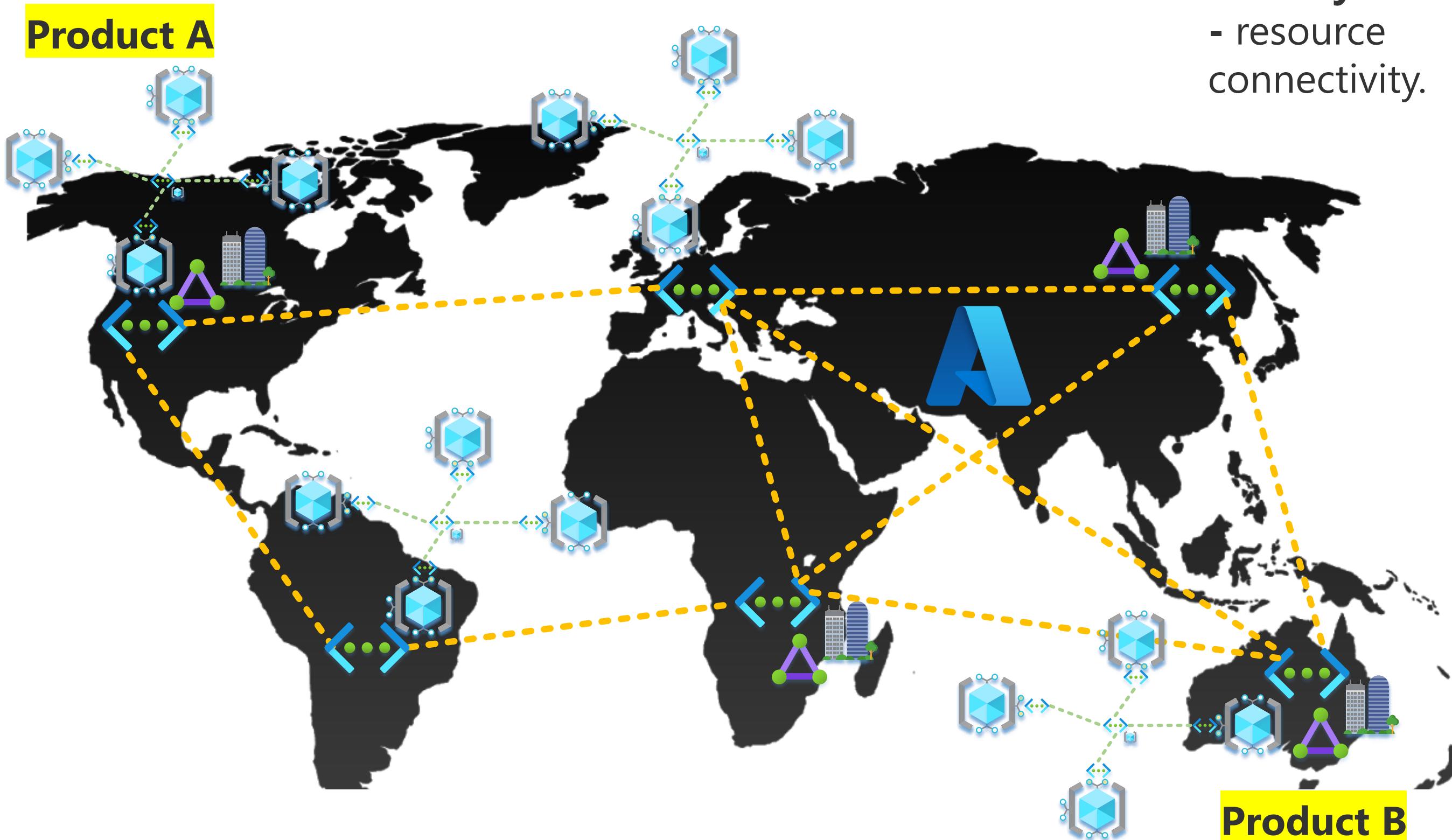
Data Products - Azure Interfaces



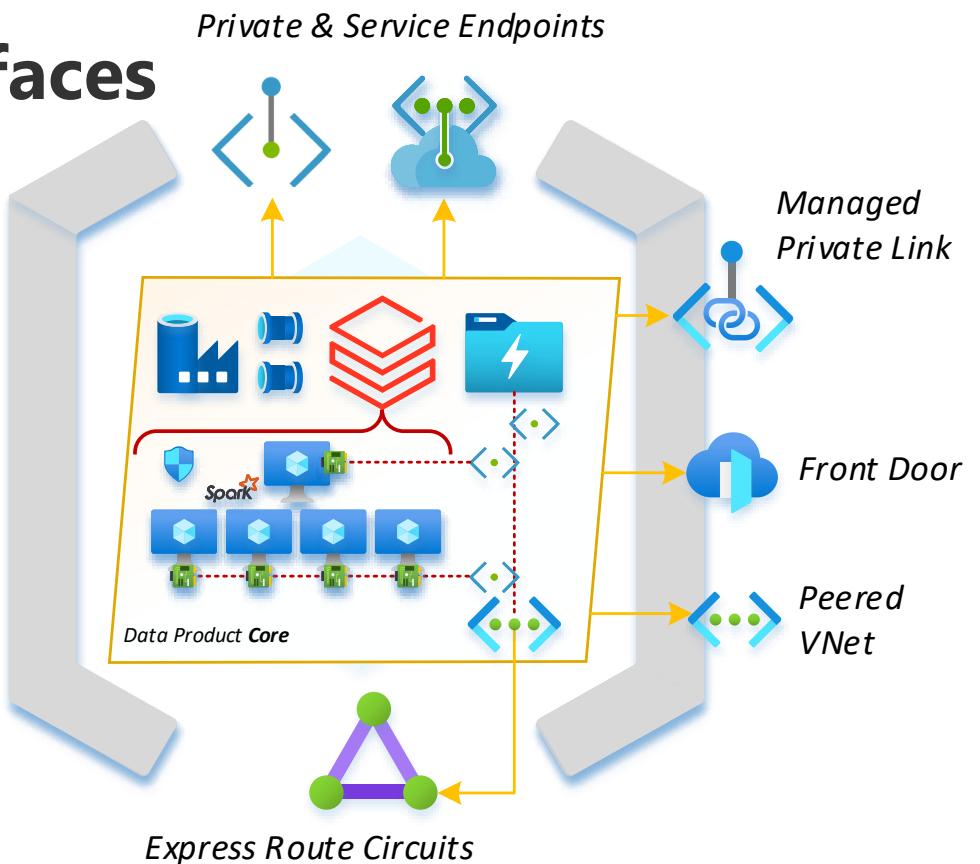
Tertiary Interfaces
- resource connectivity.



Data Products - Azure Interfaces

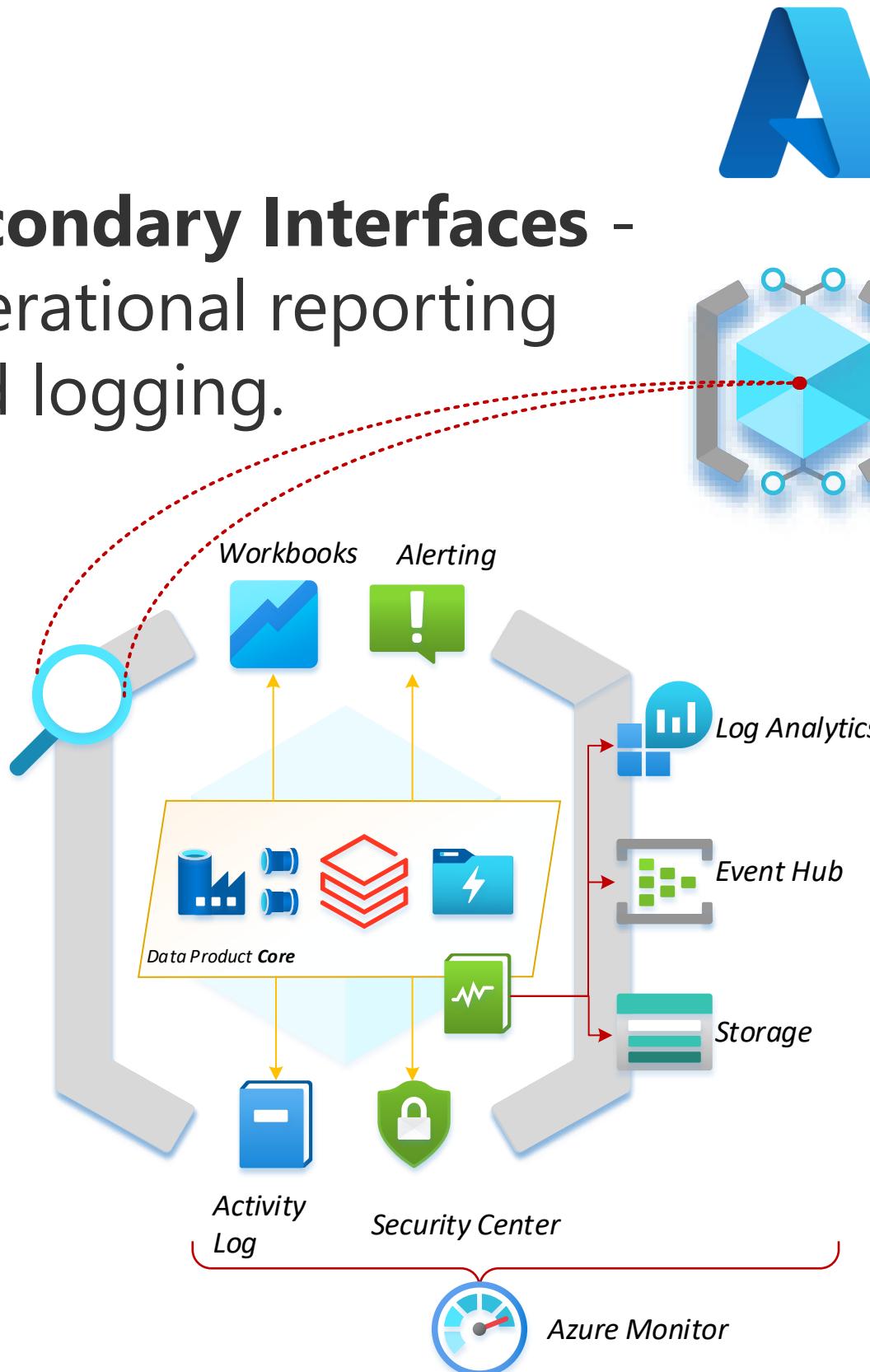


Tertiary Interfaces
- resource connectivity.

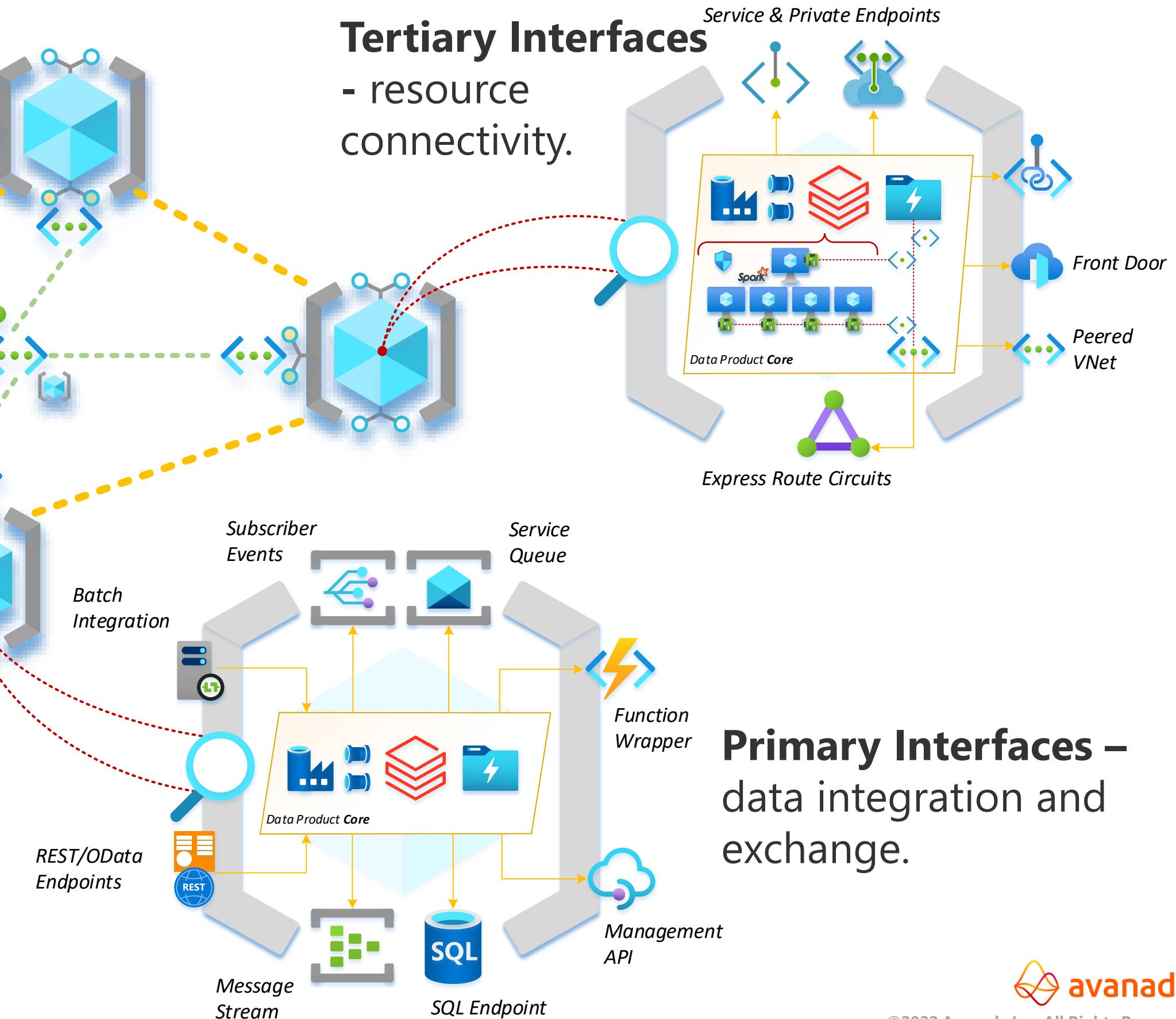


Data Products - Azure Interfaces

Secondary Interfaces - operational reporting and logging.



Tertiary Interfaces - resource connectivity.

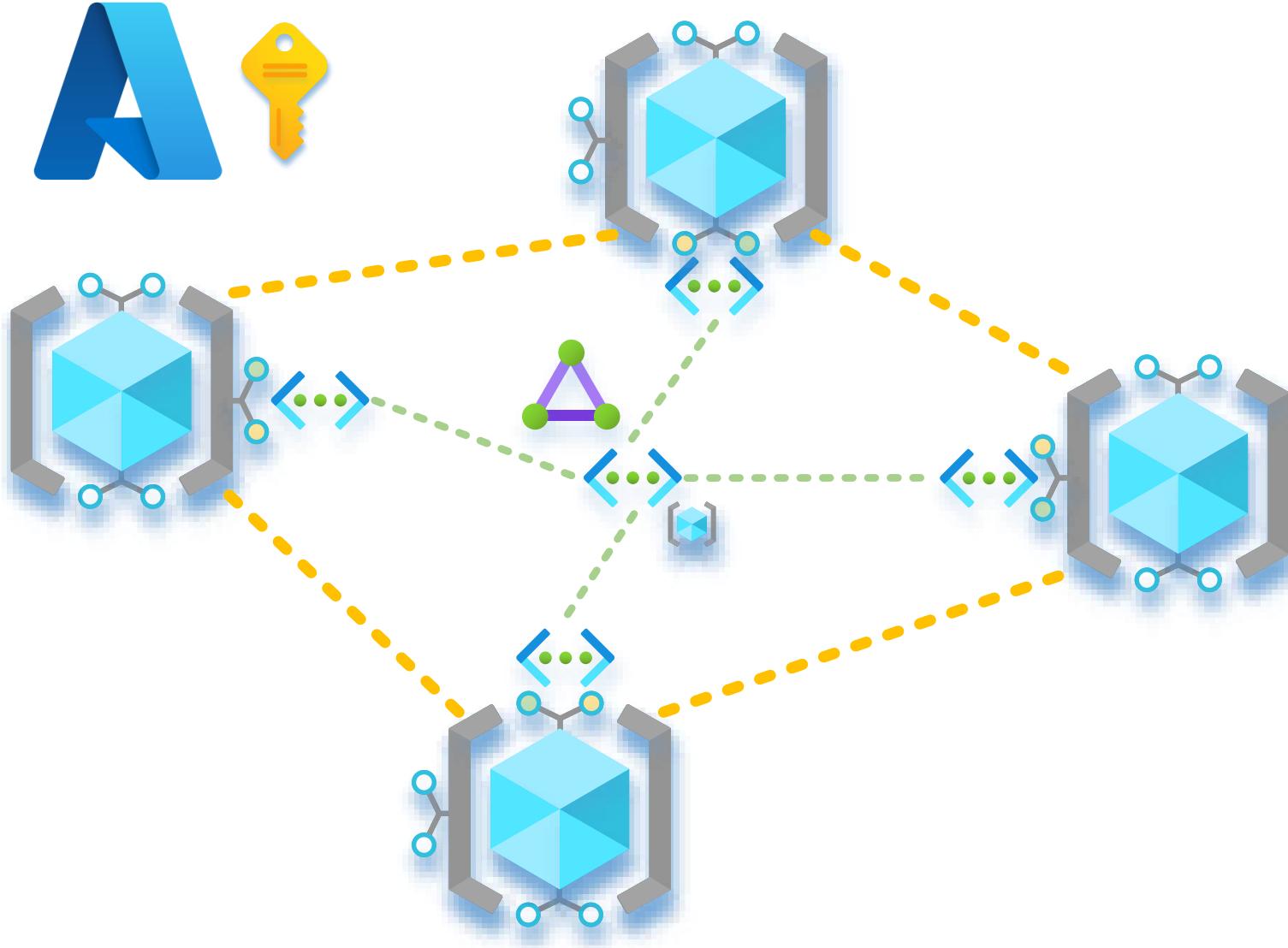


Primary Interfaces – data integration and exchange.



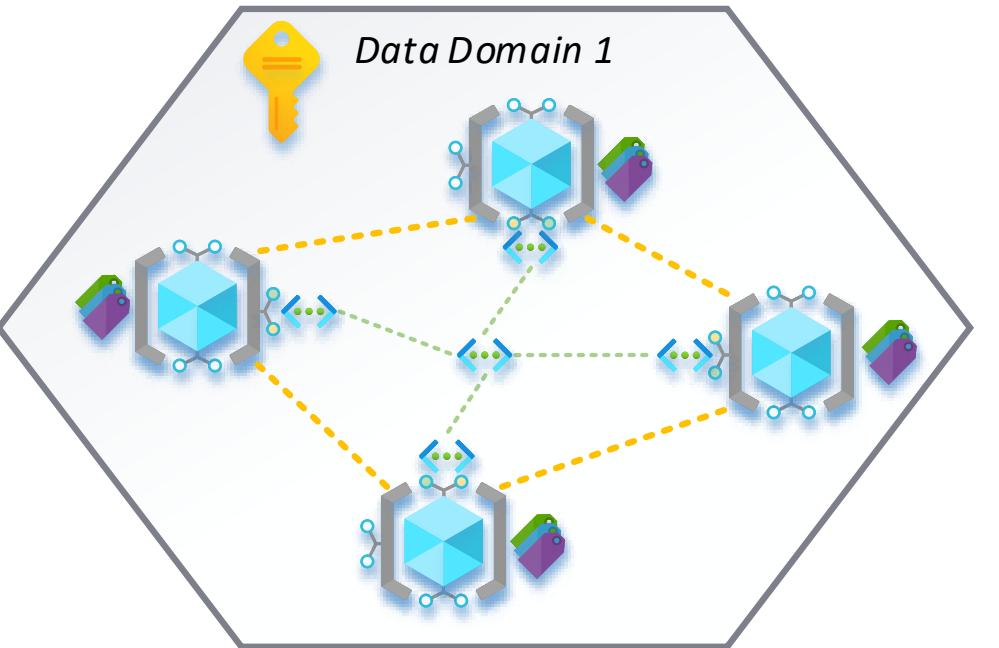
Data Domains in Azure

Domain-oriented
decentralised
data ownership
and architecture.



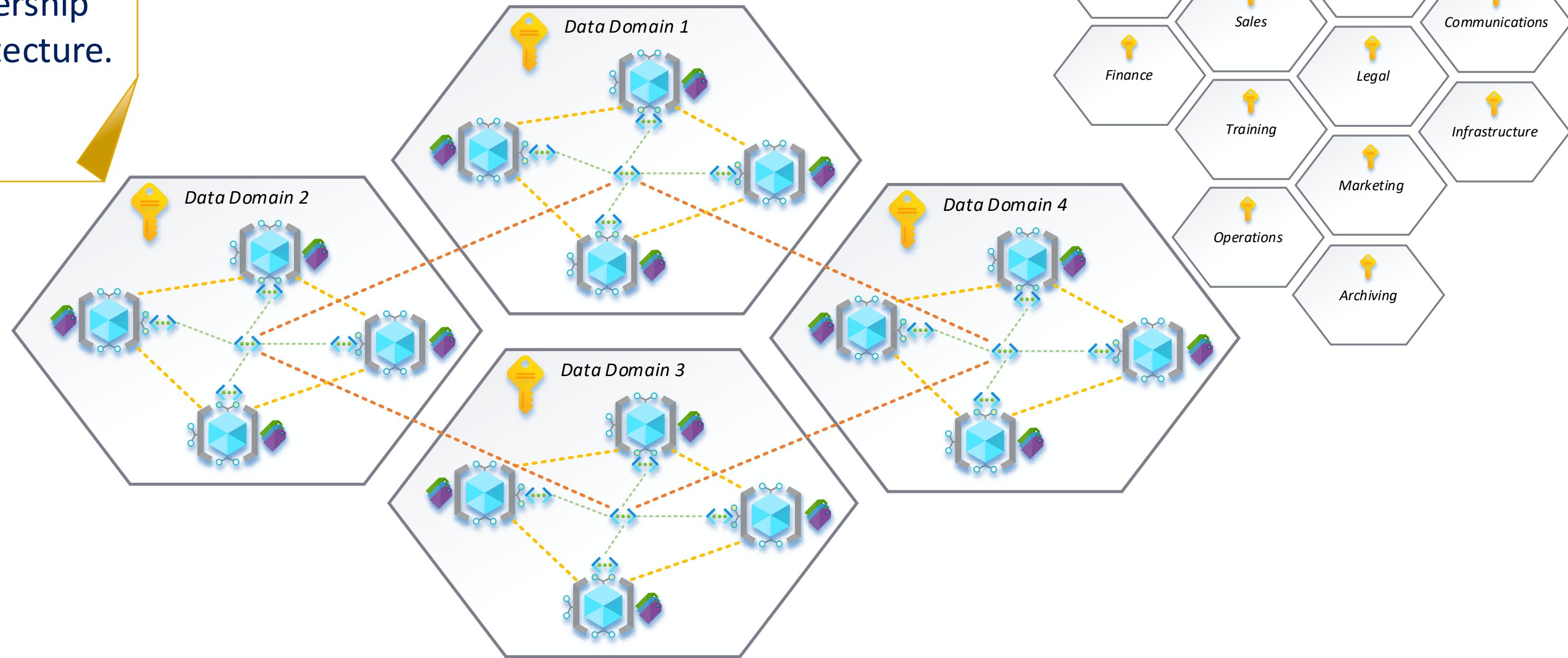
Data Domains in Azure

Domain-oriented
decentralised
data ownership
and architecture.



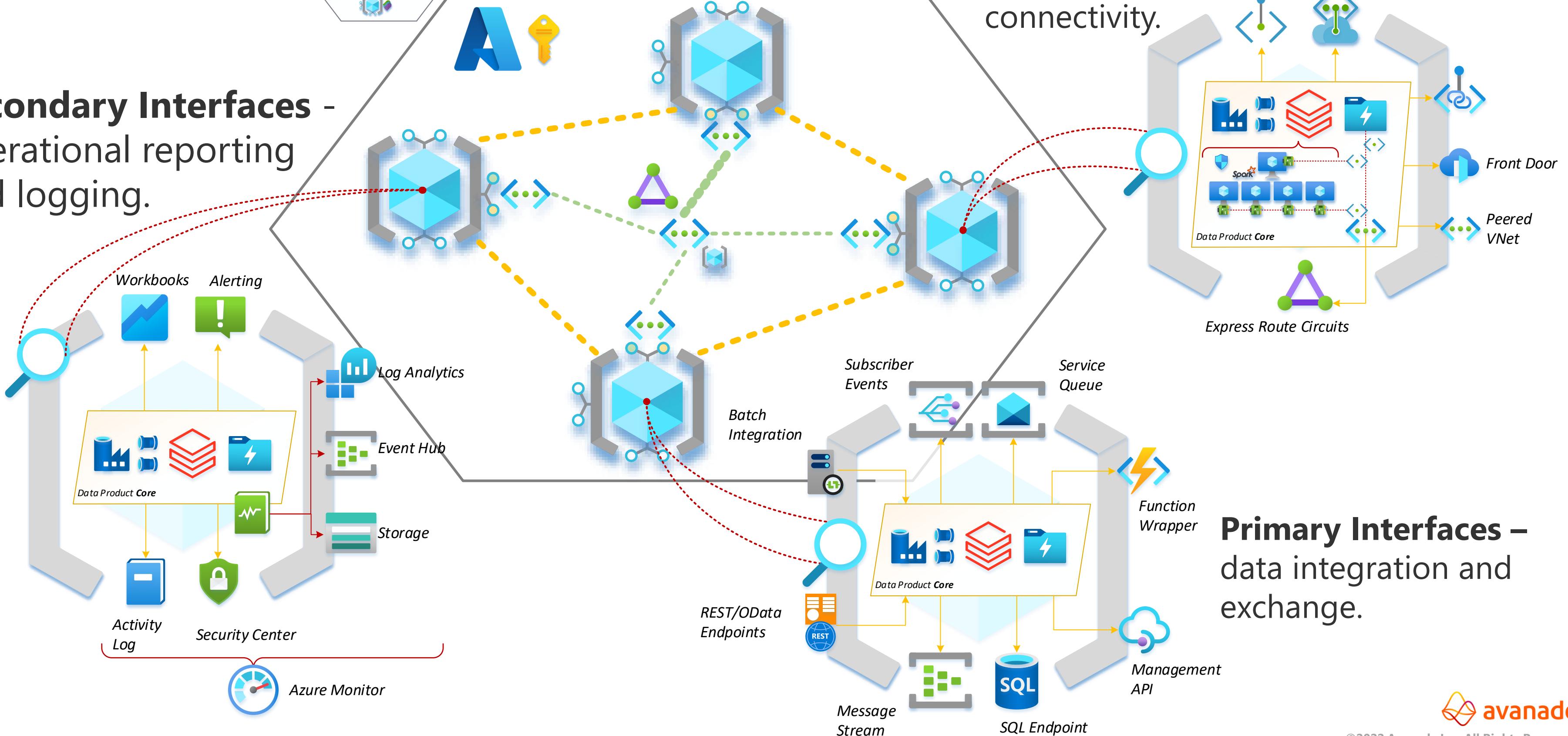
Data Domains in Azure

Domain-oriented decentralised data ownership and architecture.



Data Mesh - Product Interfacing

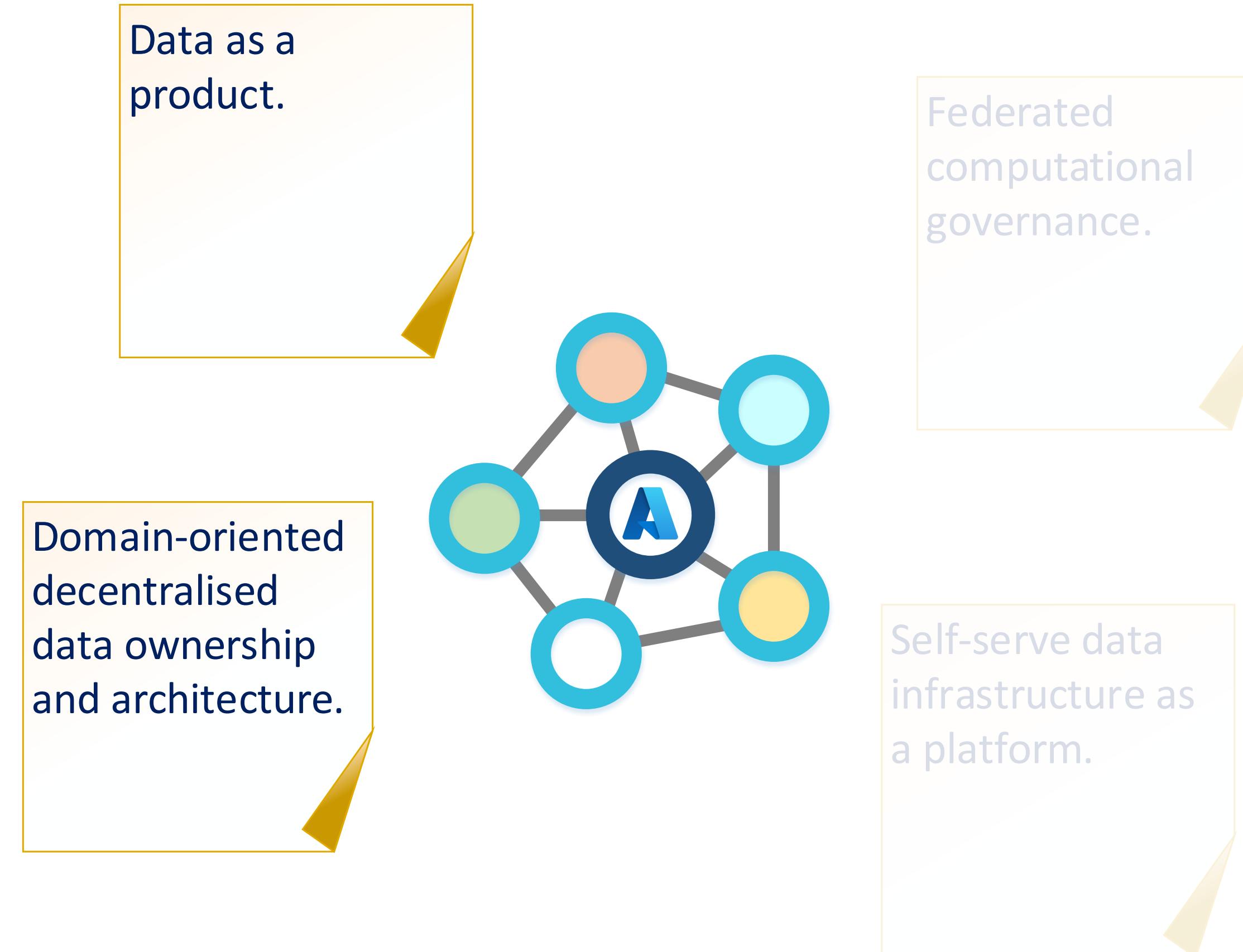
Secondary Interfaces - operational reporting and logging.



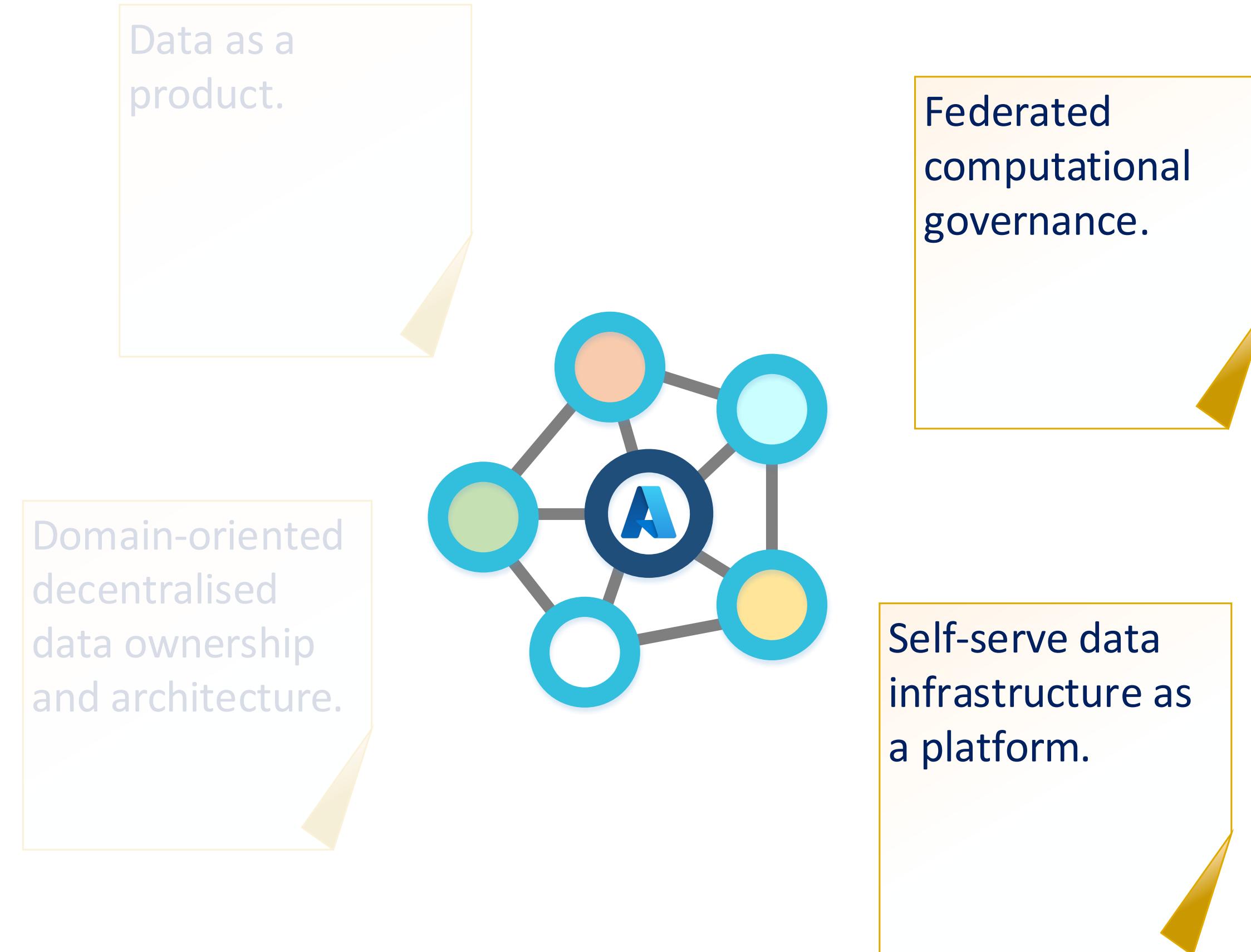
Primary Interfaces –
data integration and
exchange.

Tertiary Interfaces
- resource
connectivity.

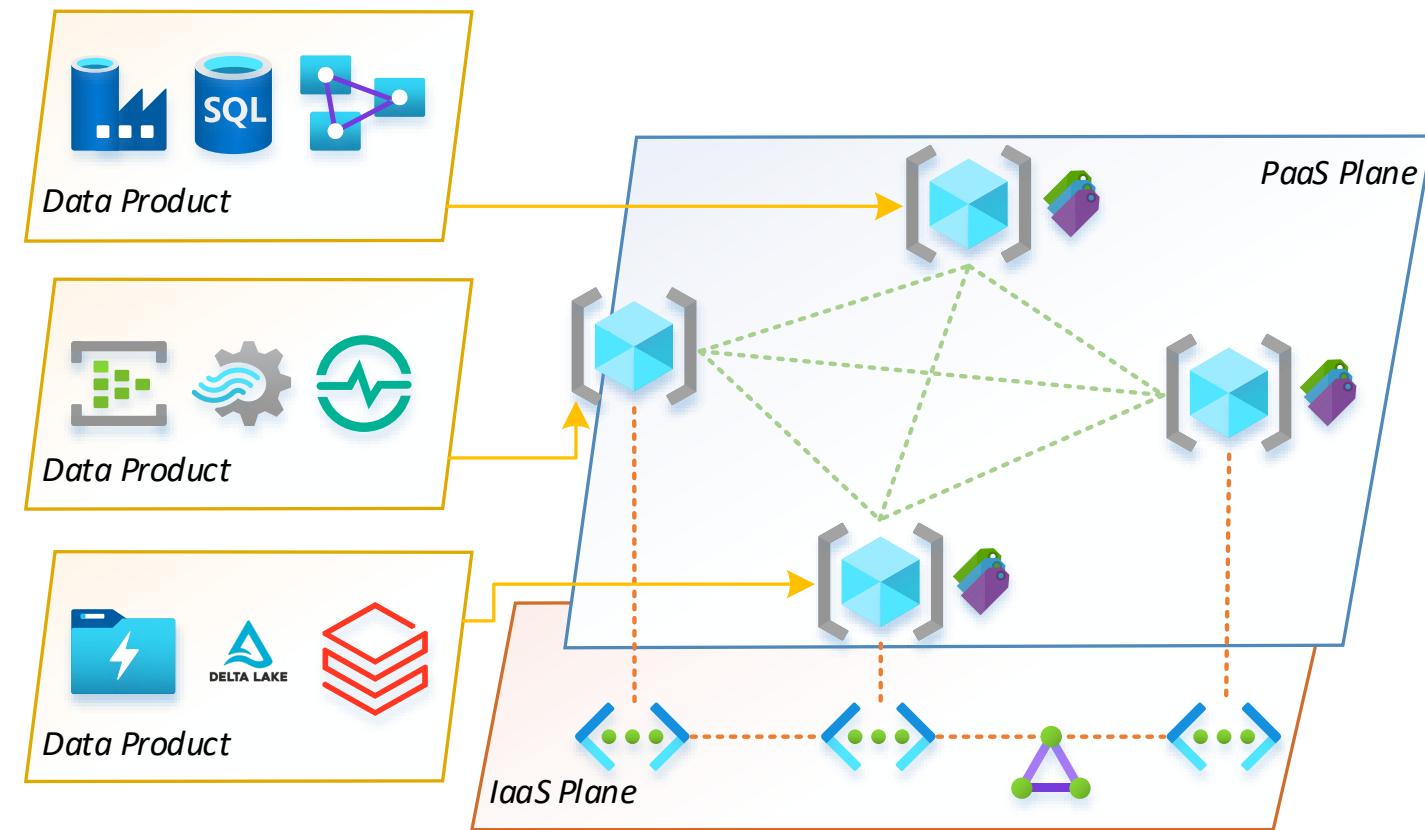
Data Mesh Principals - Theory vs Practice

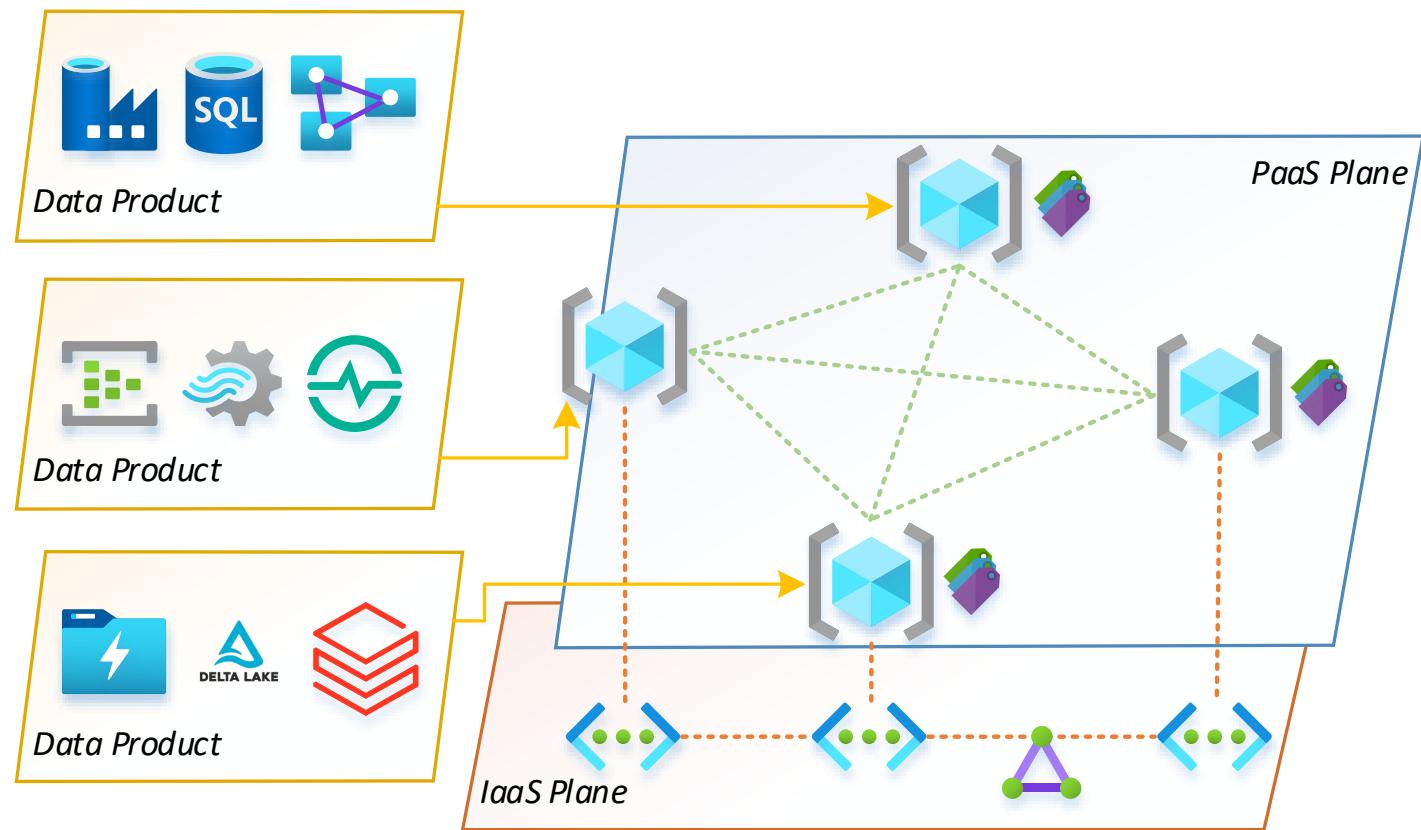
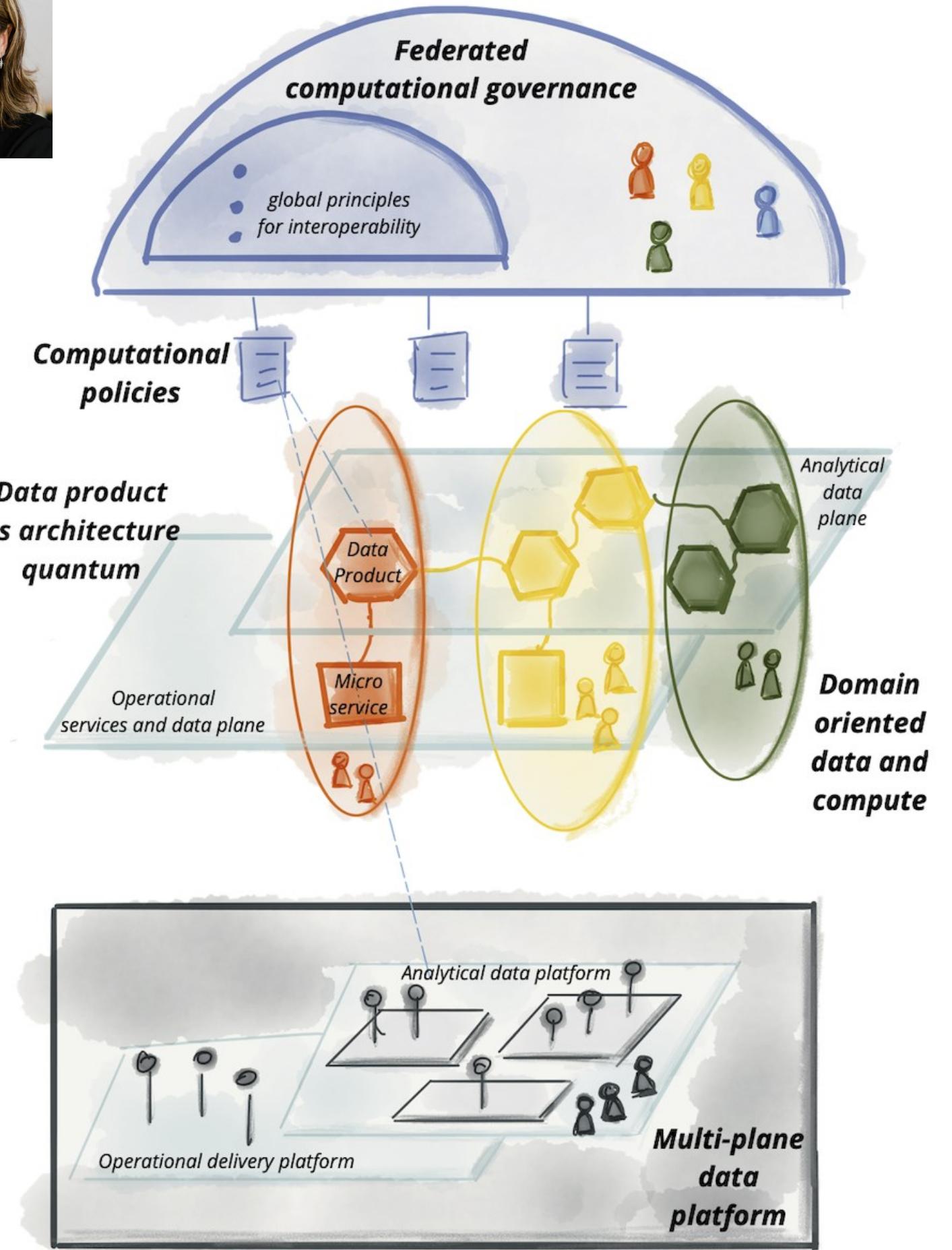


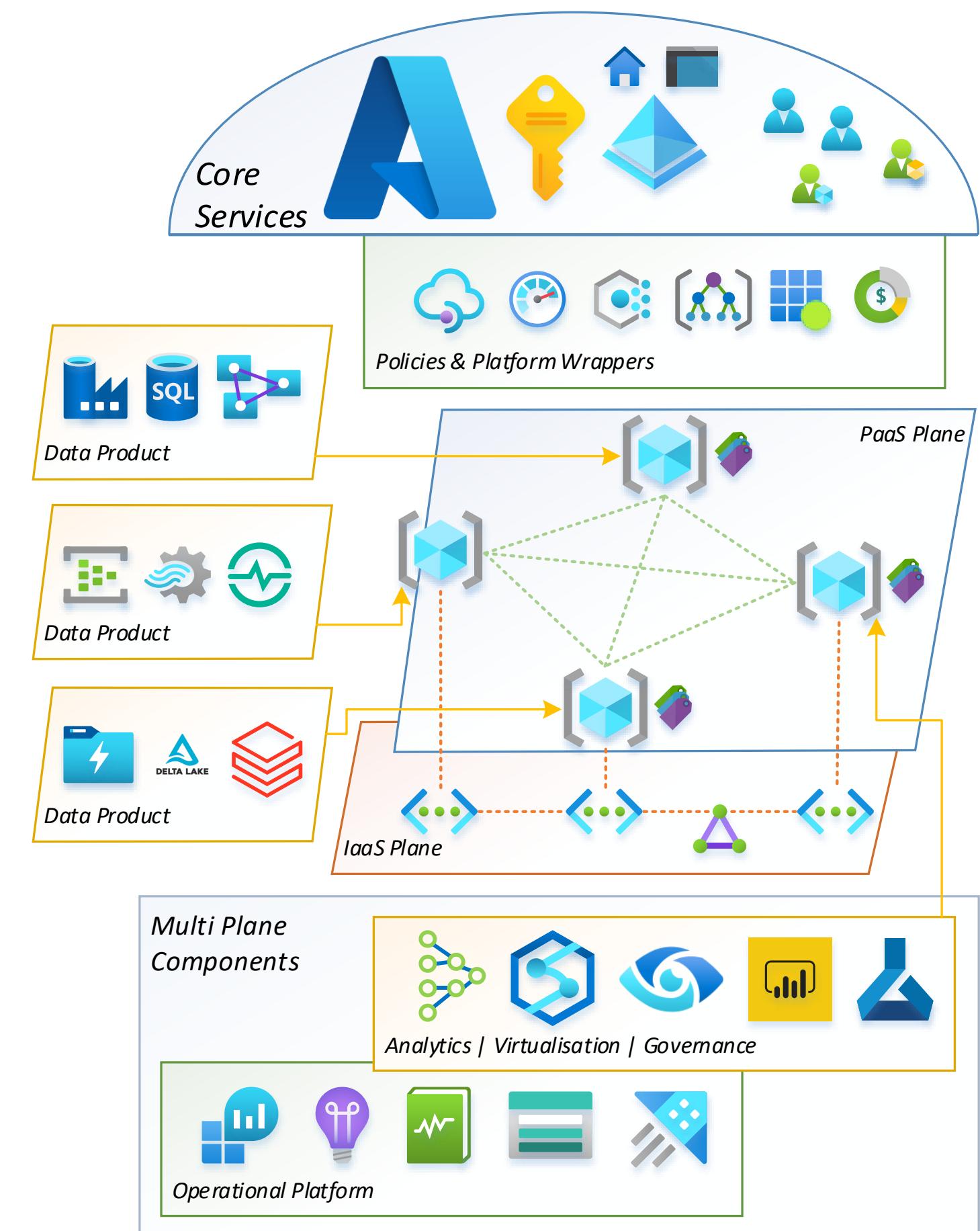
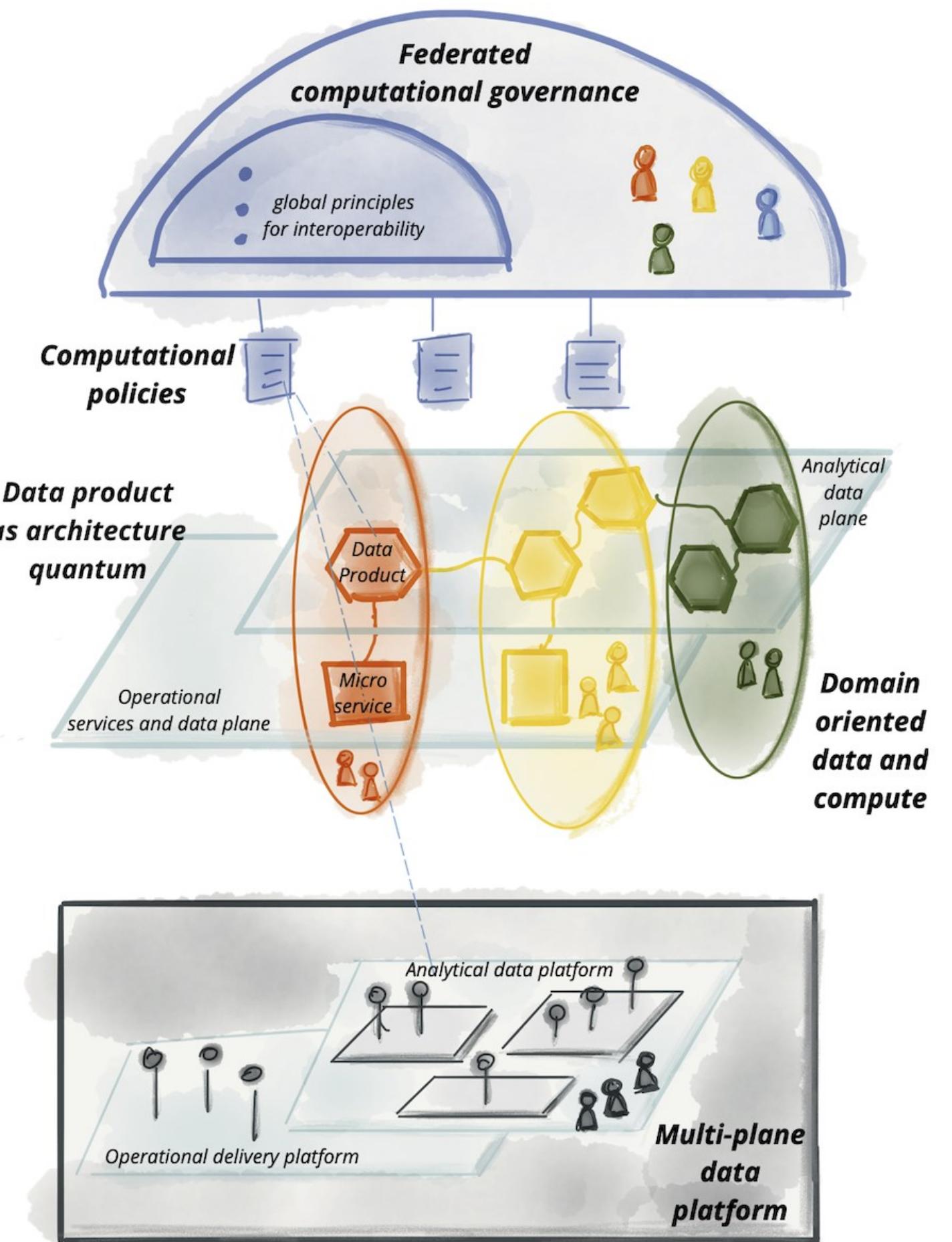
Data Mesh Principals - Theory vs Practice

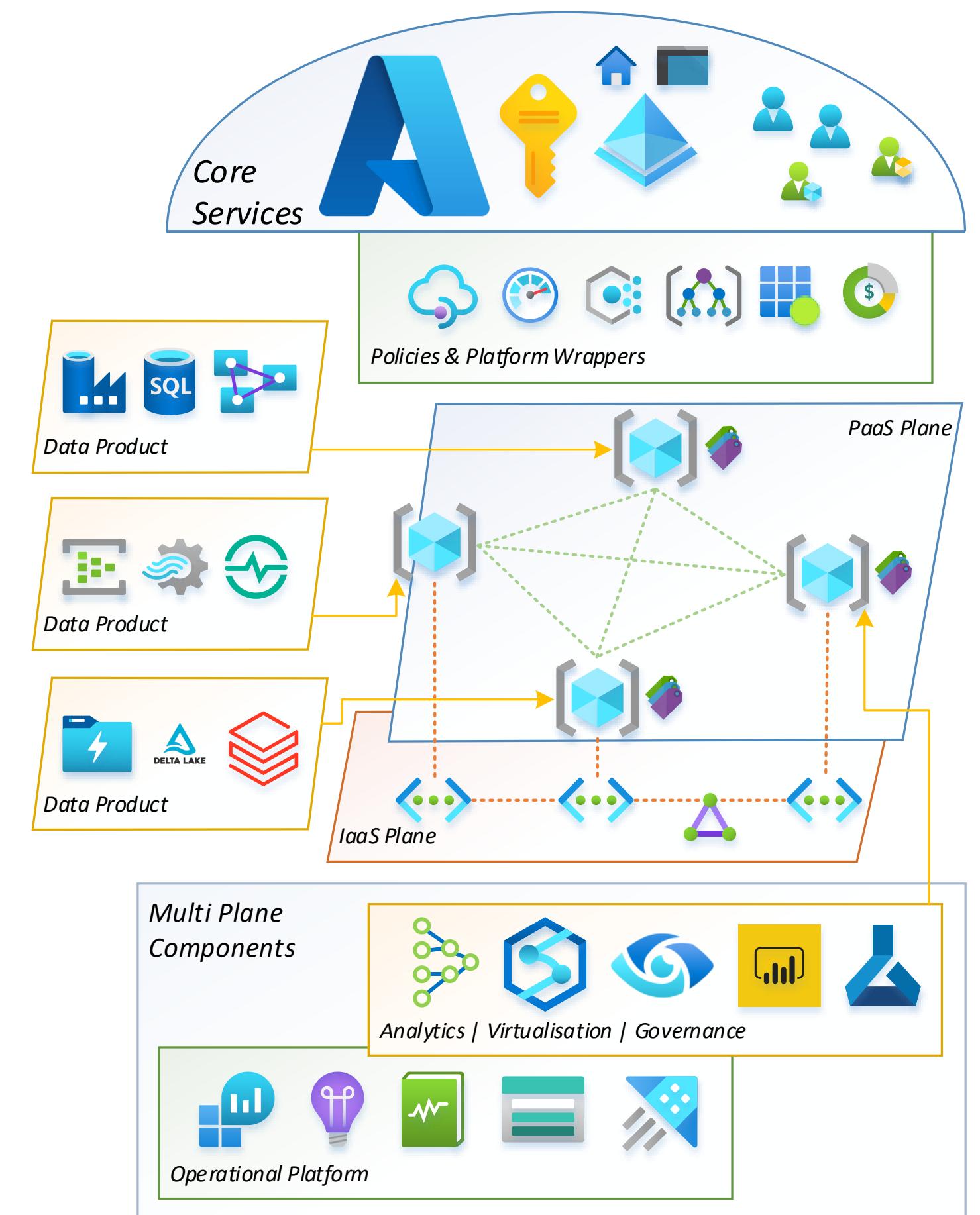


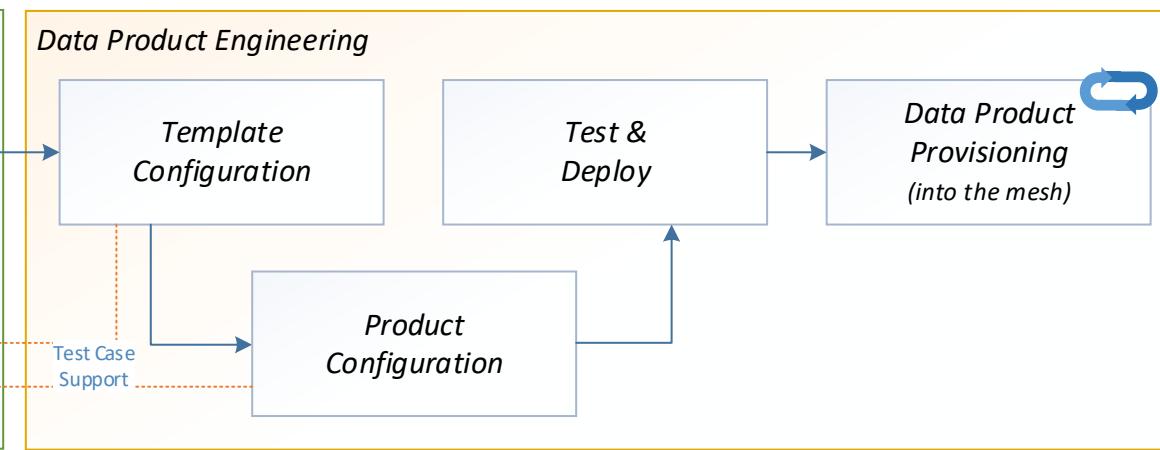
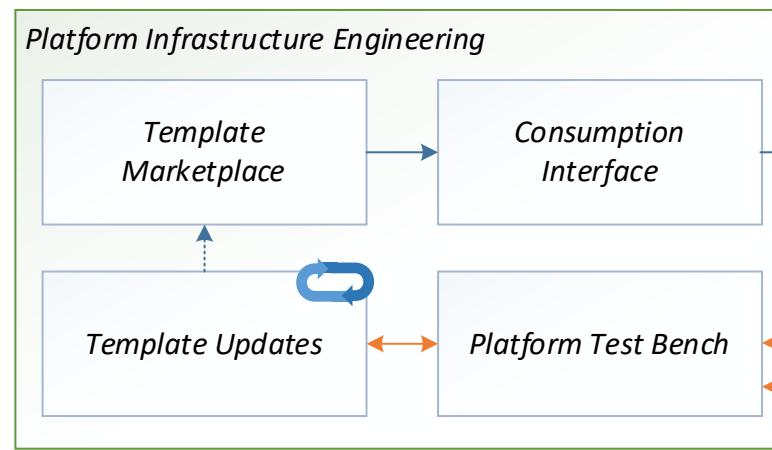
Data Mesh in Azure



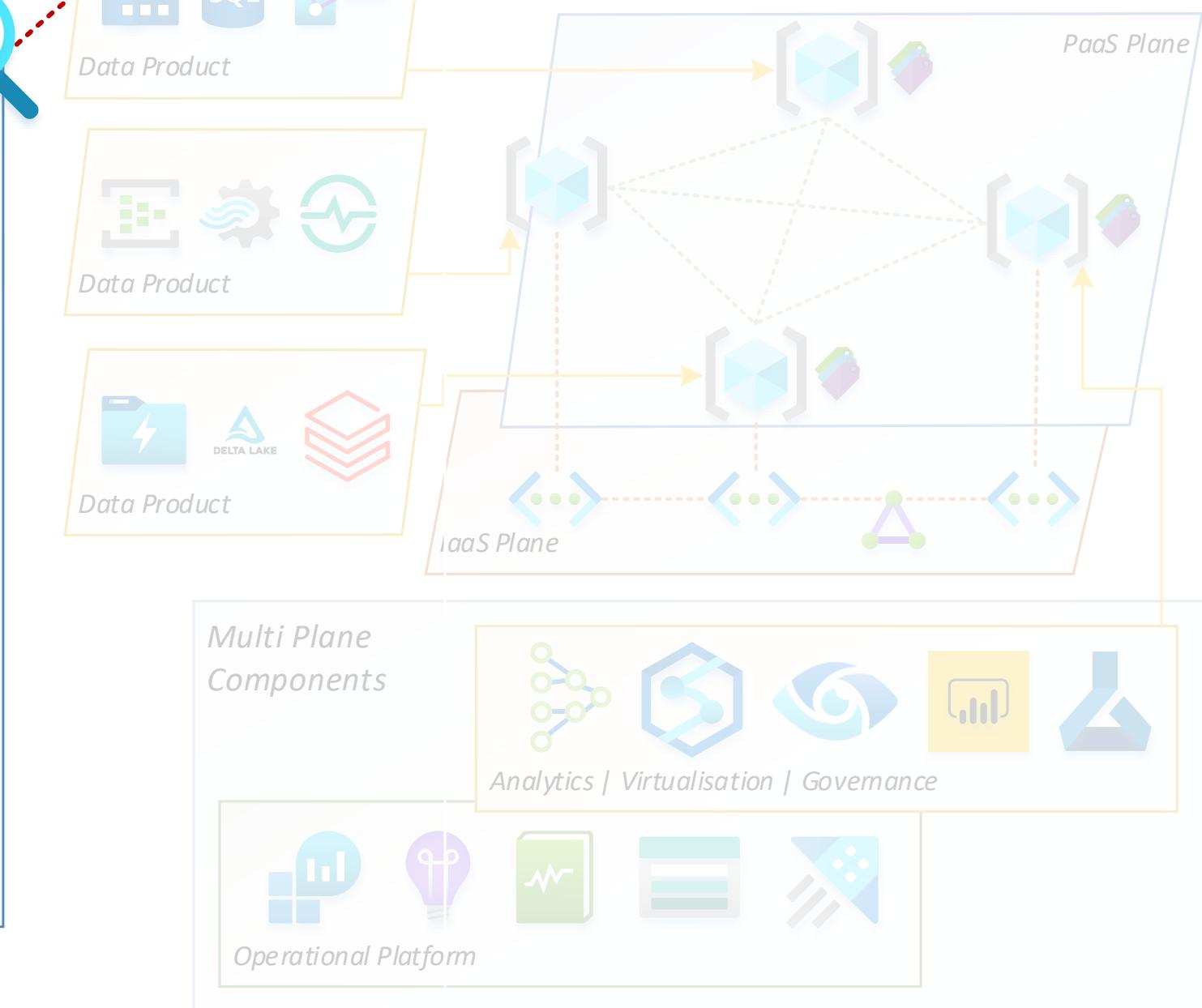
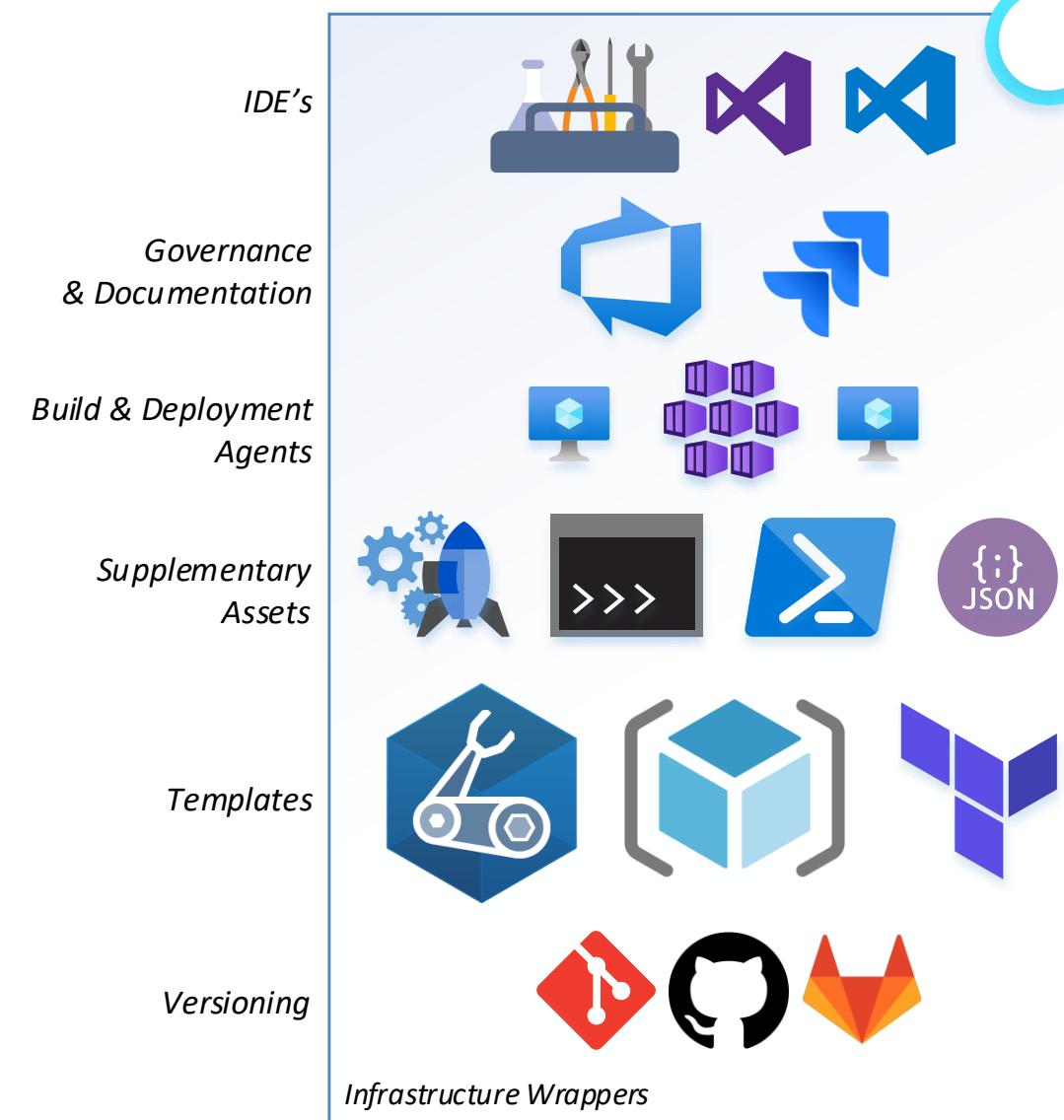


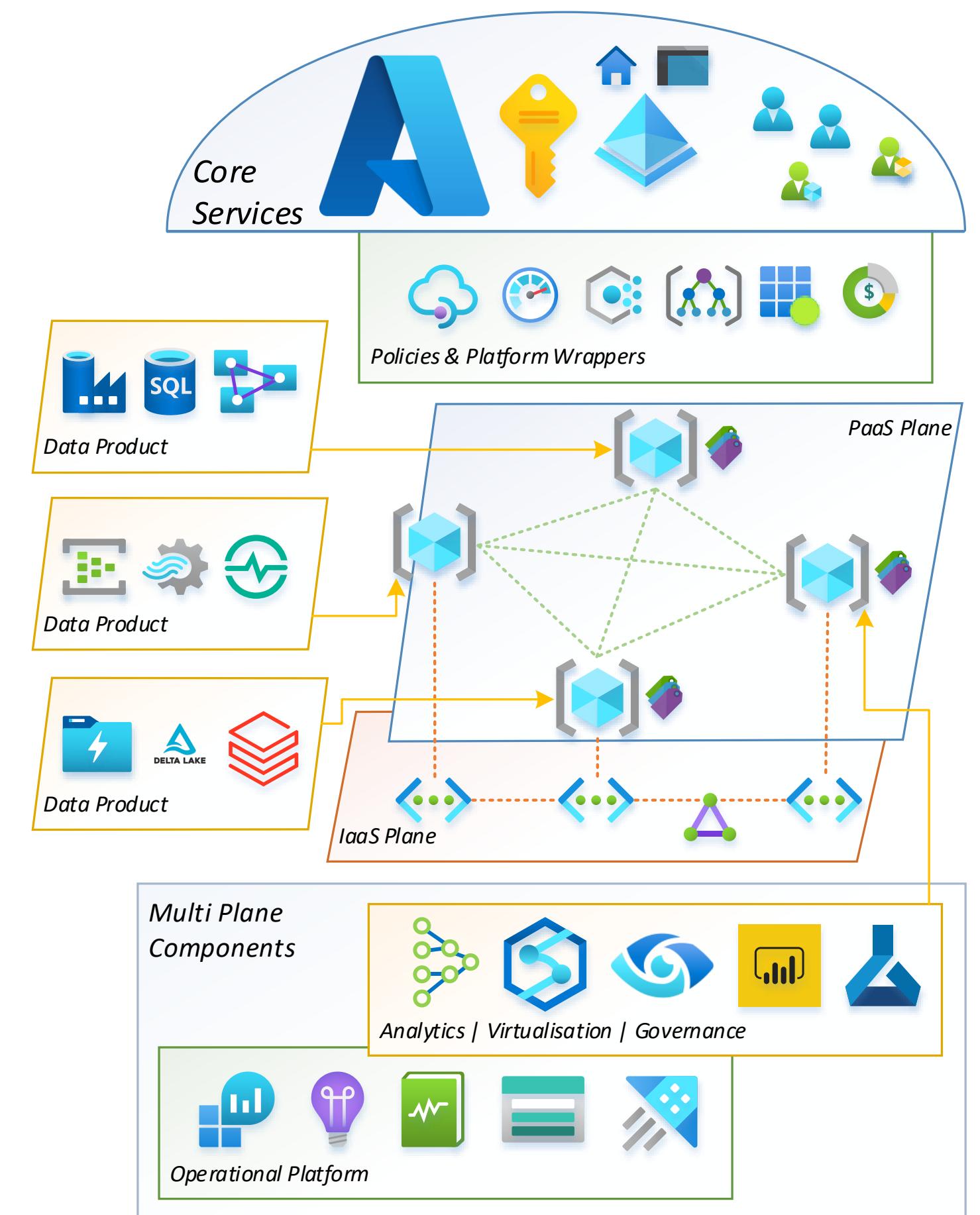






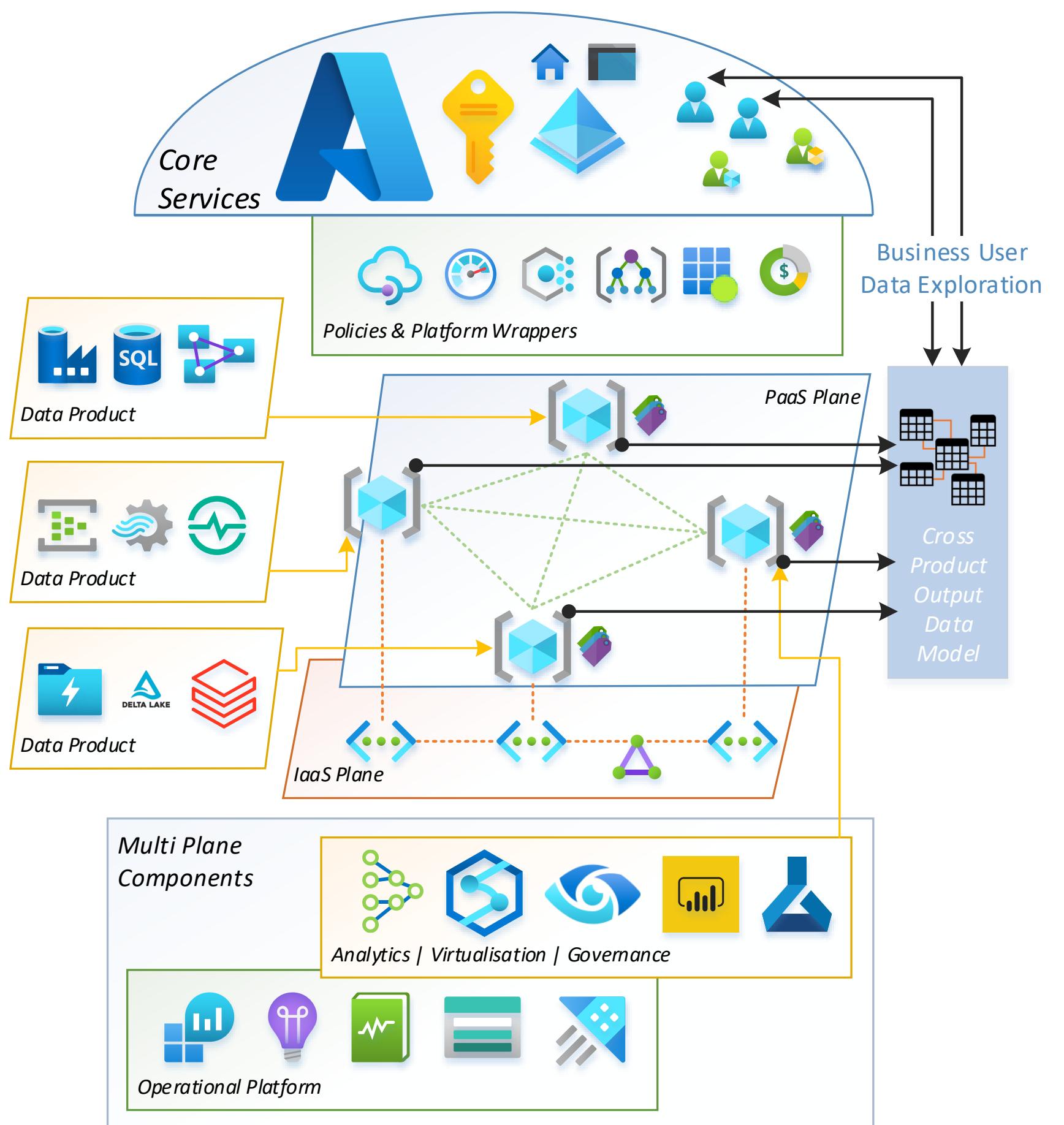
Self-serve data infrastructure as a platform.

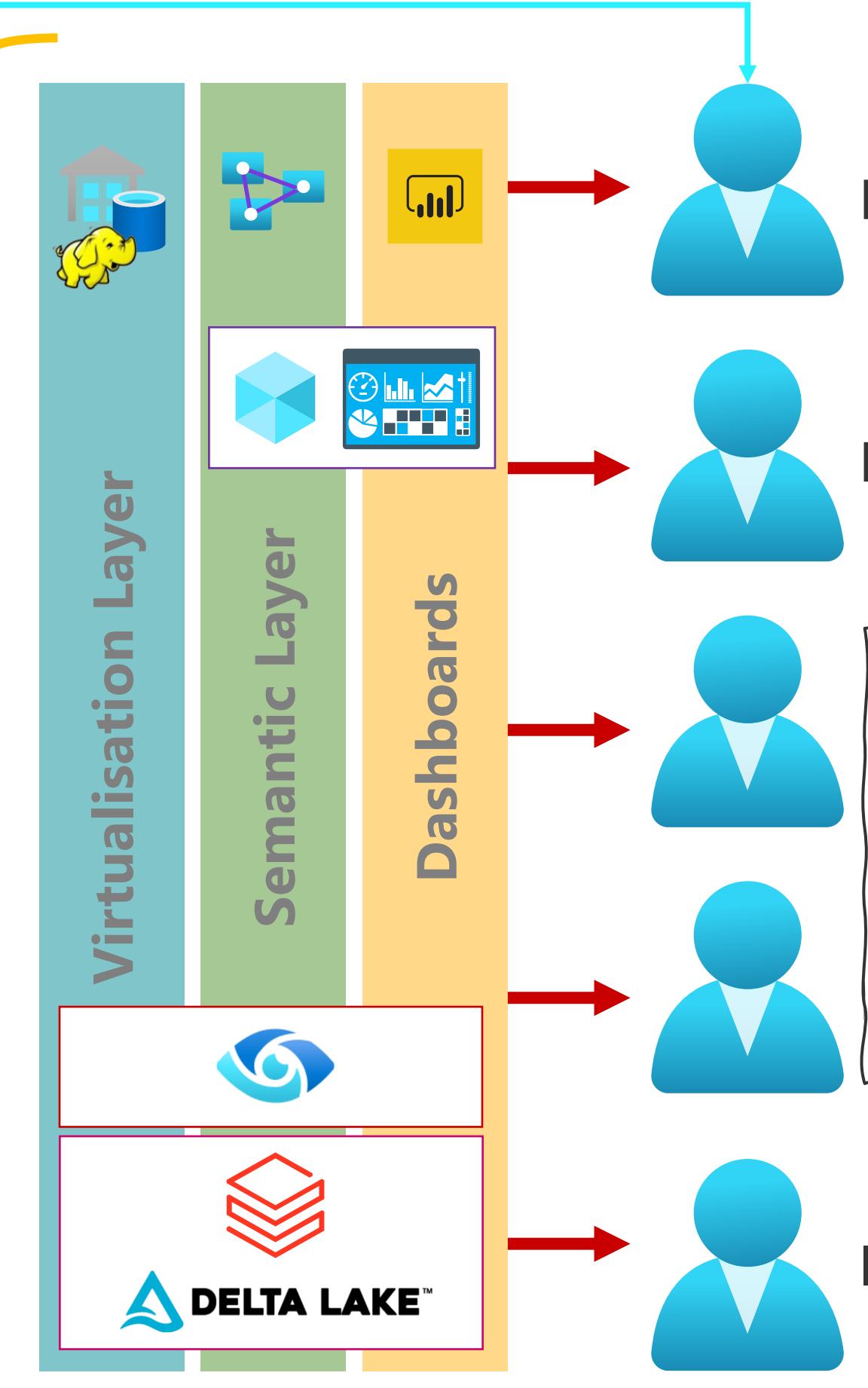
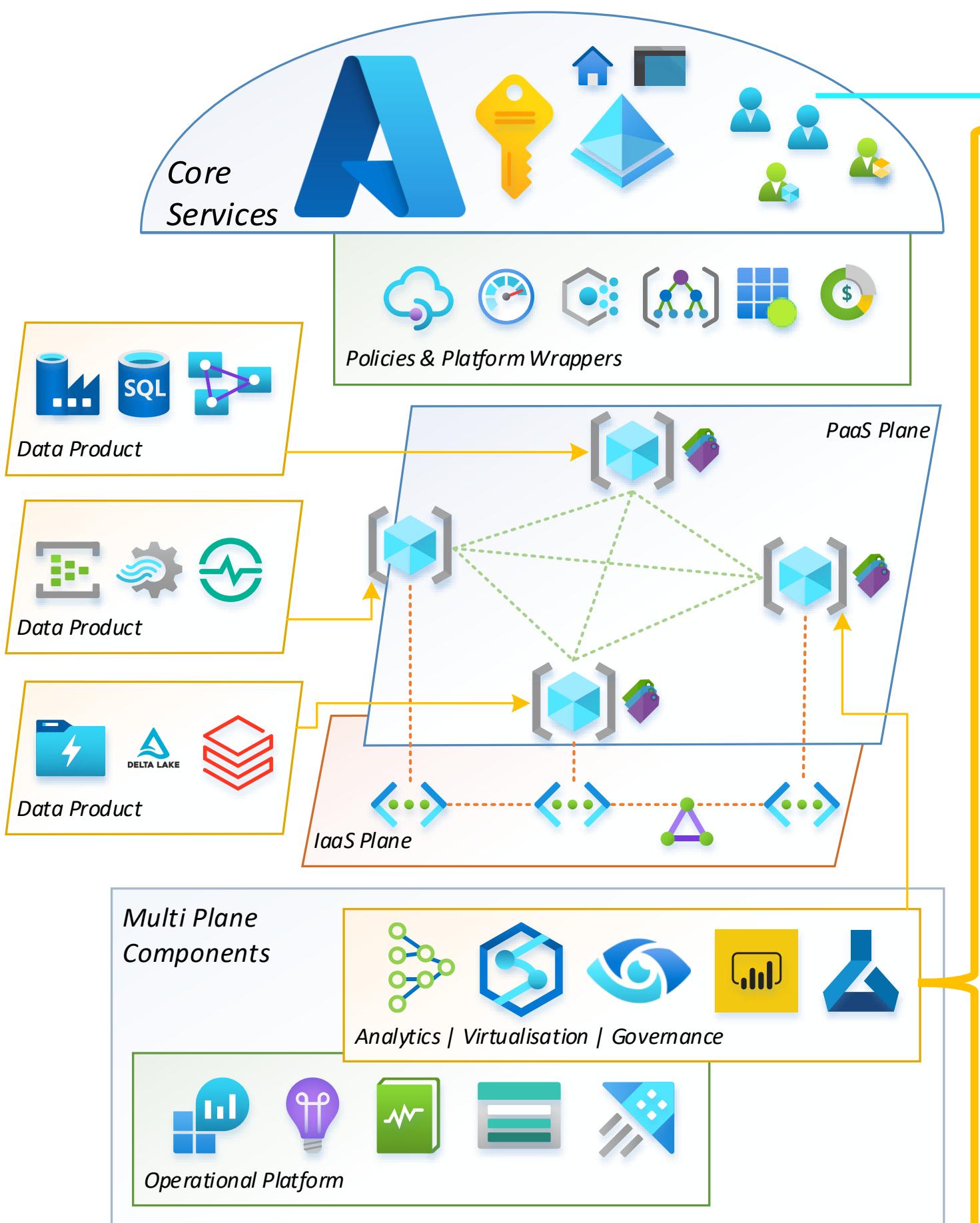






Federated computational governance.





Federated computational governance.

Business User

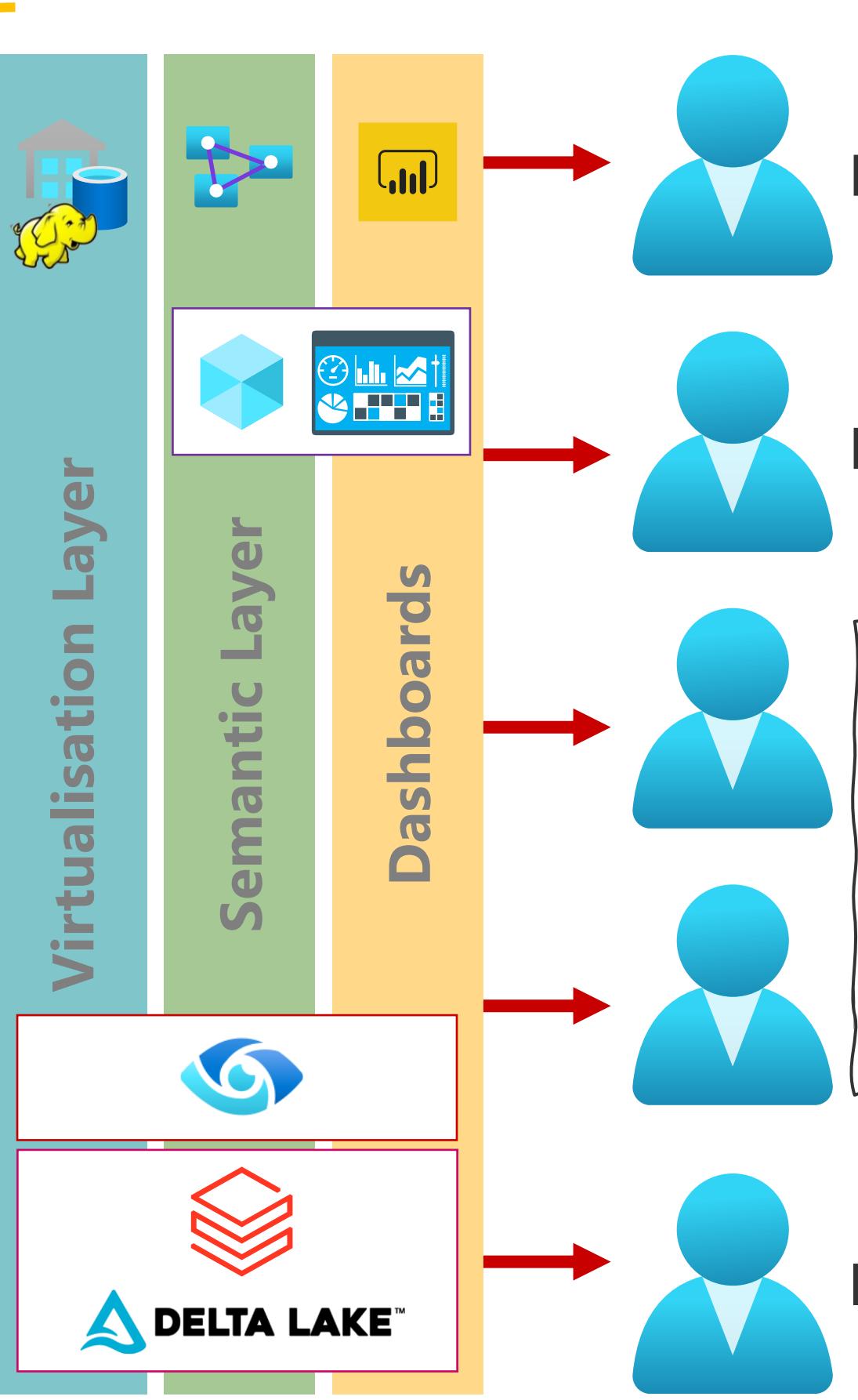
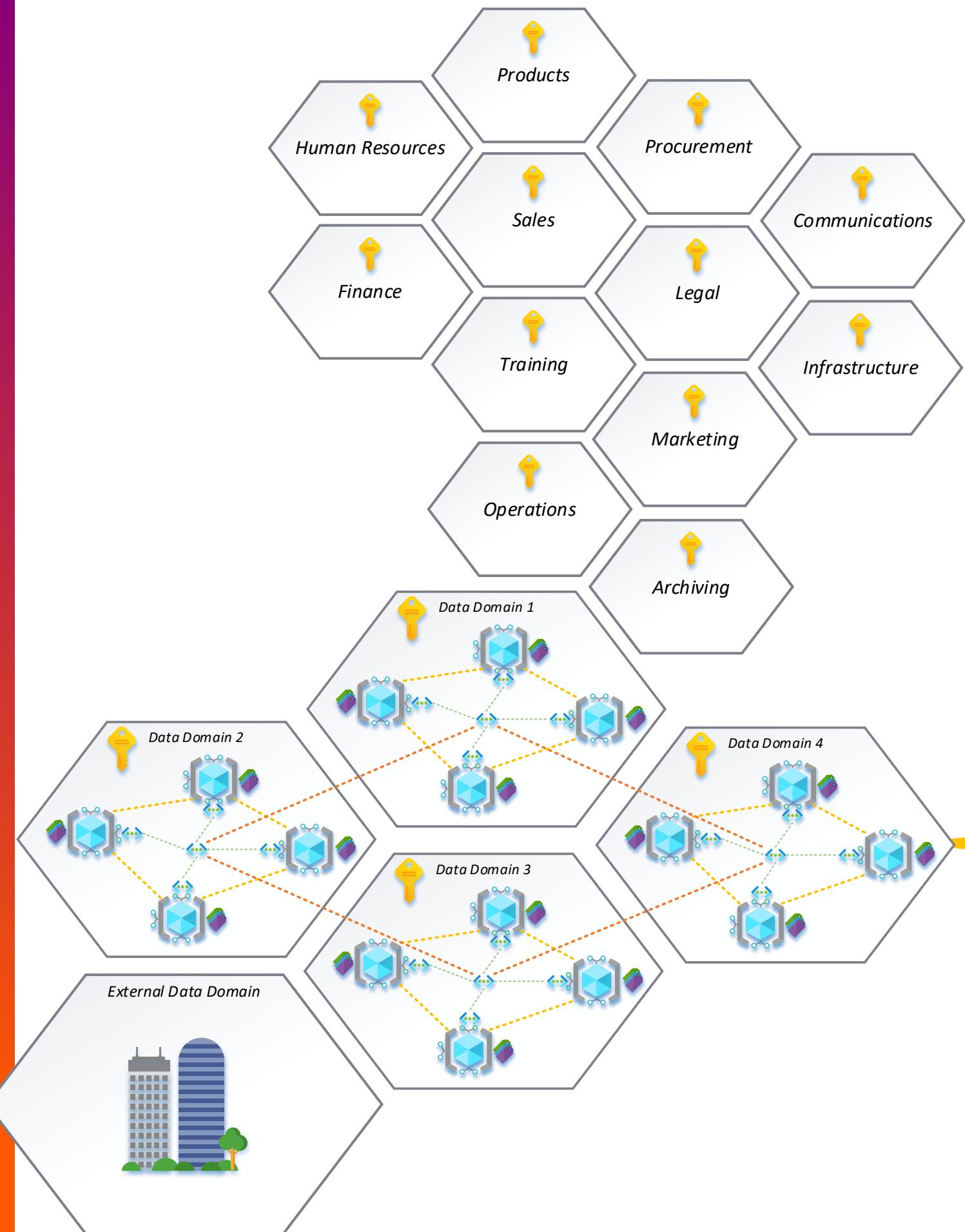
Data Scientist

Information Officer

Q5: What tech could/should be used to deliver insight across the Data Mesh?

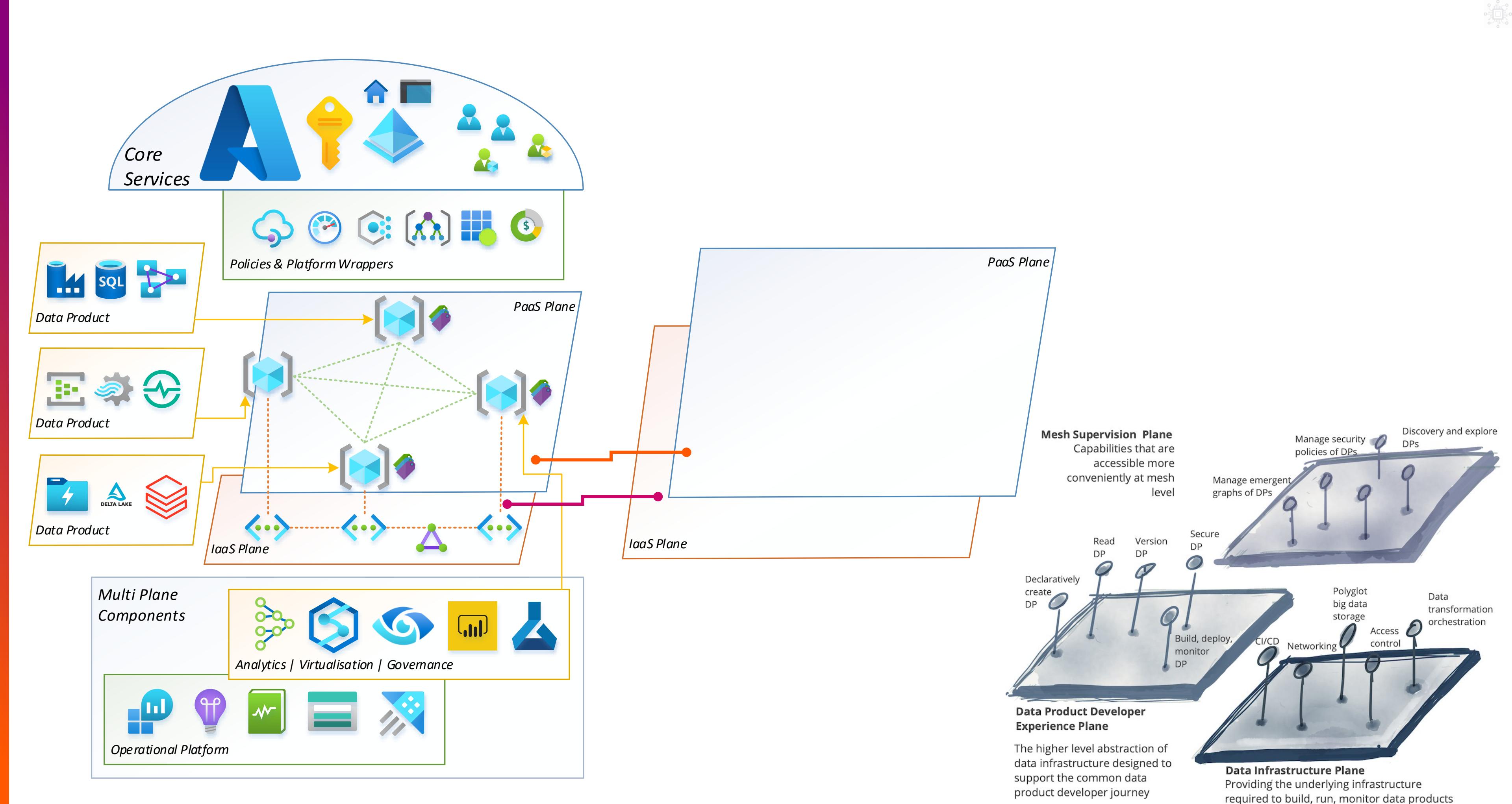


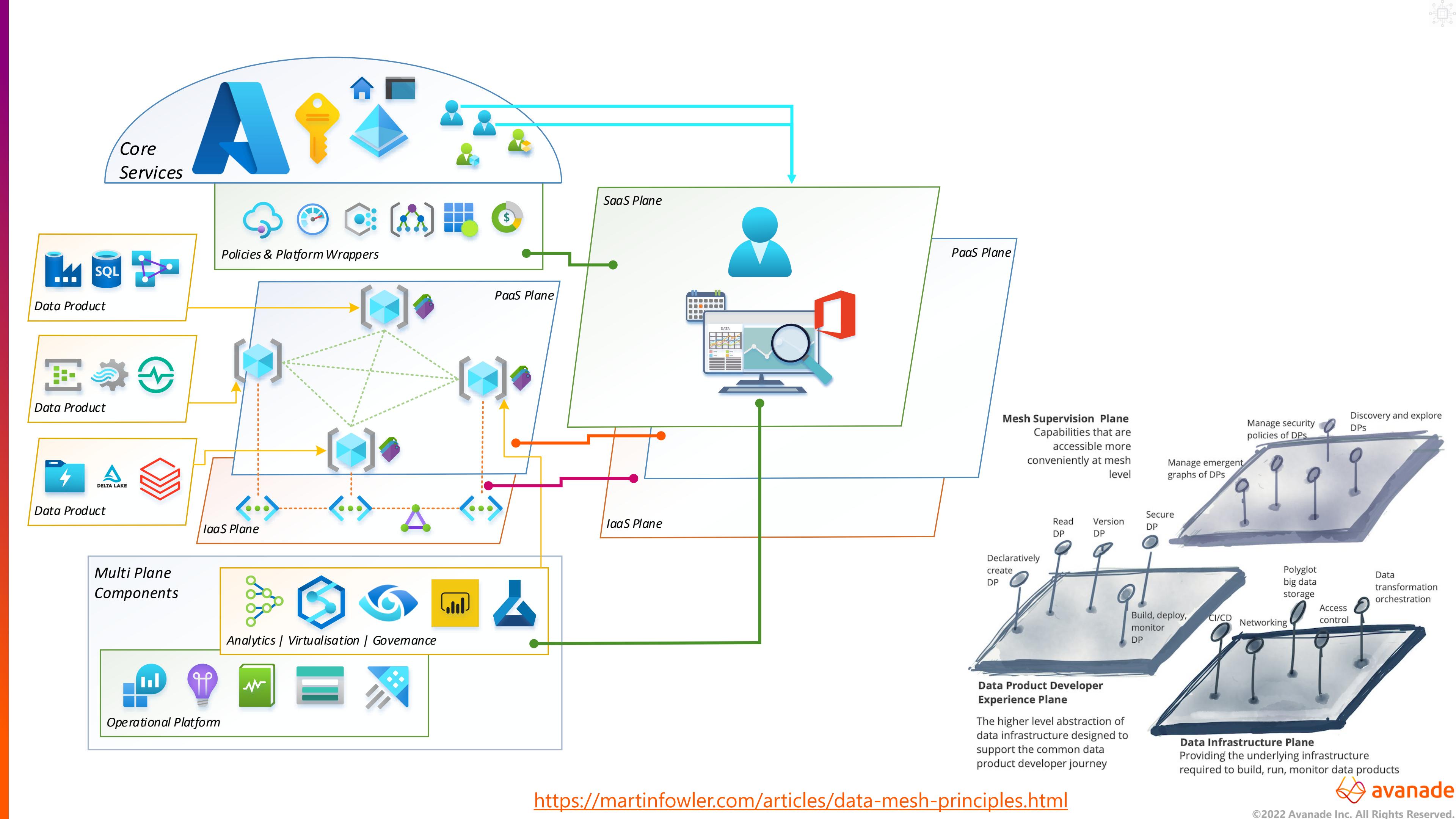
Federated computational governance.

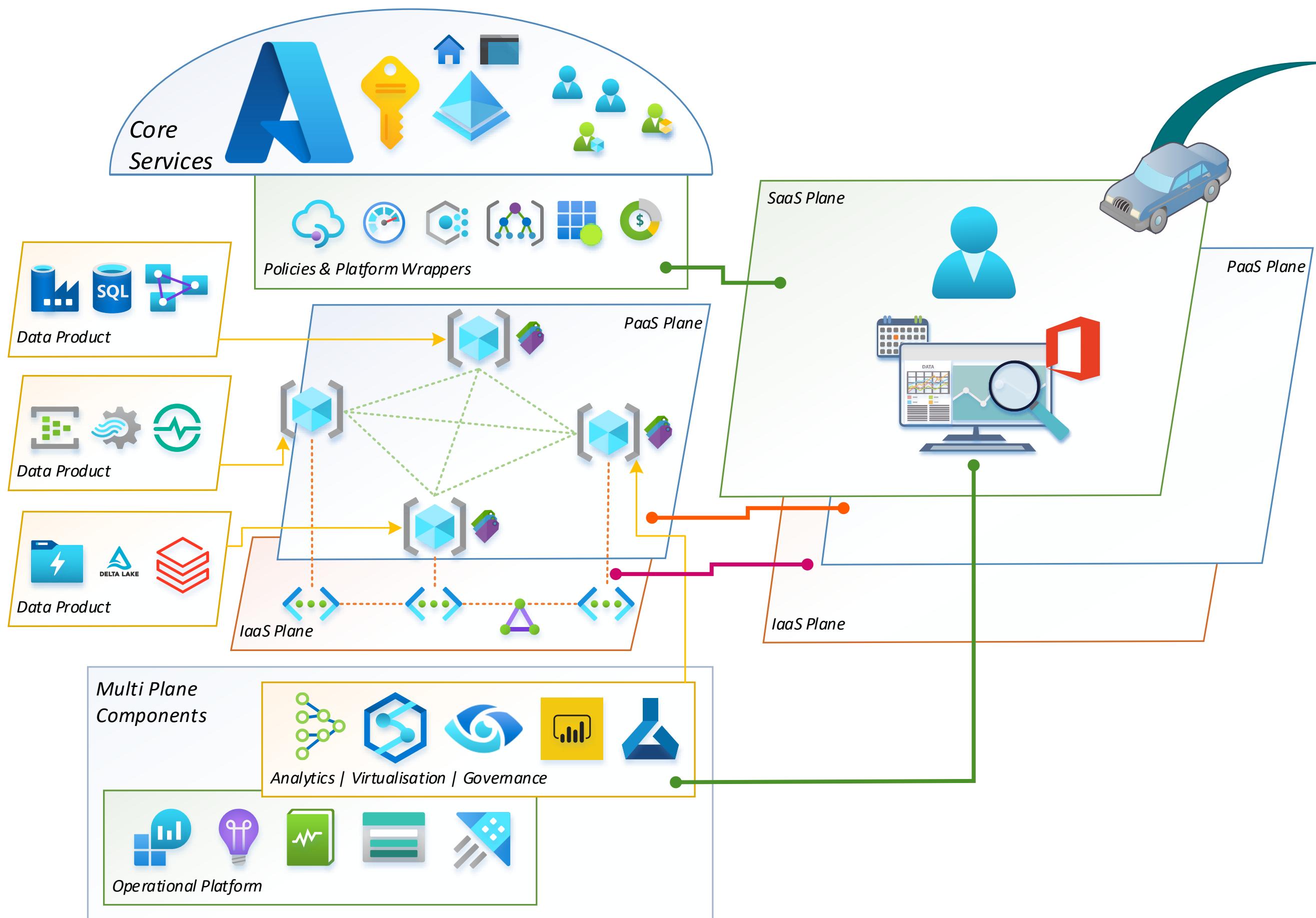


Q5: What tech could/should be used to deliver insight across the Data Mesh?

Information Officer



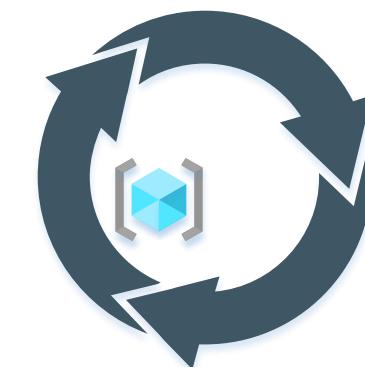




A Mesh Asset Marketplace



A Self-Service Analytics Canvas



Data Product Onboarding Framework



Conclusions & Next Steps

Data Mesh Principals - Theory vs Practice

Conclusions & Next Steps

Q1: Should a data product handle both transactional/operational and analytical data?

Data as a product.

Q2: When does a data platform become a Data Mesh?

Domain-oriented decentralised data ownership and architecture.

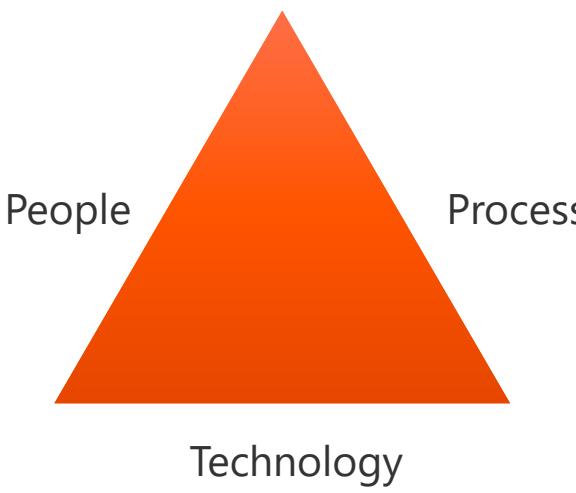
Q6: Is every Data Mesh implementation the same?

Self-serve data infrastructure as a platform.

Q5: What tech could/should be used to deliver insight across the Data Mesh?

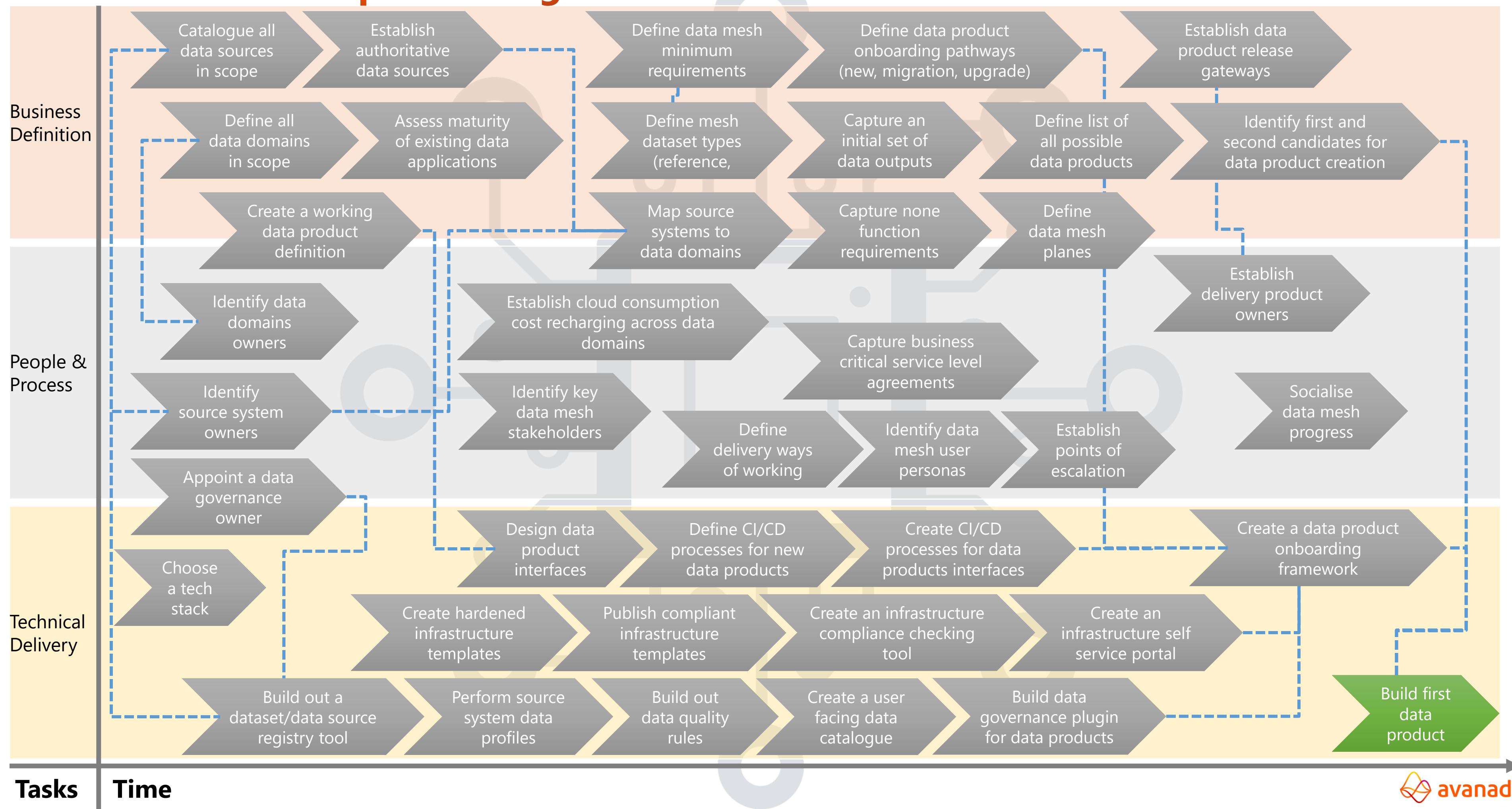
Federated computational governance.

Q: What next?....



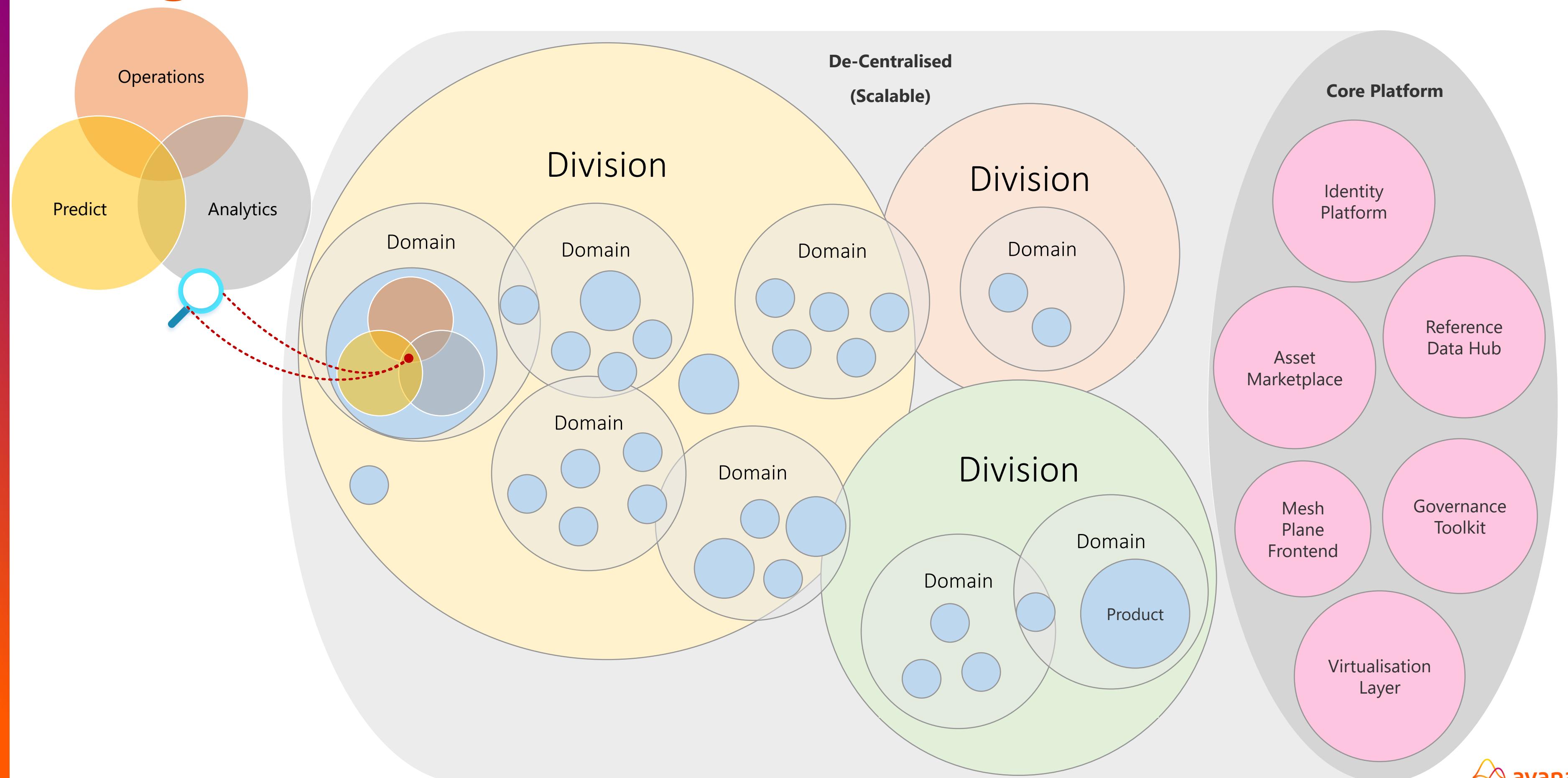
Data Mesh Roadmap - Starting Point

<https://mrpaulandrew.com/tag/data-mesh-vs-azure/>

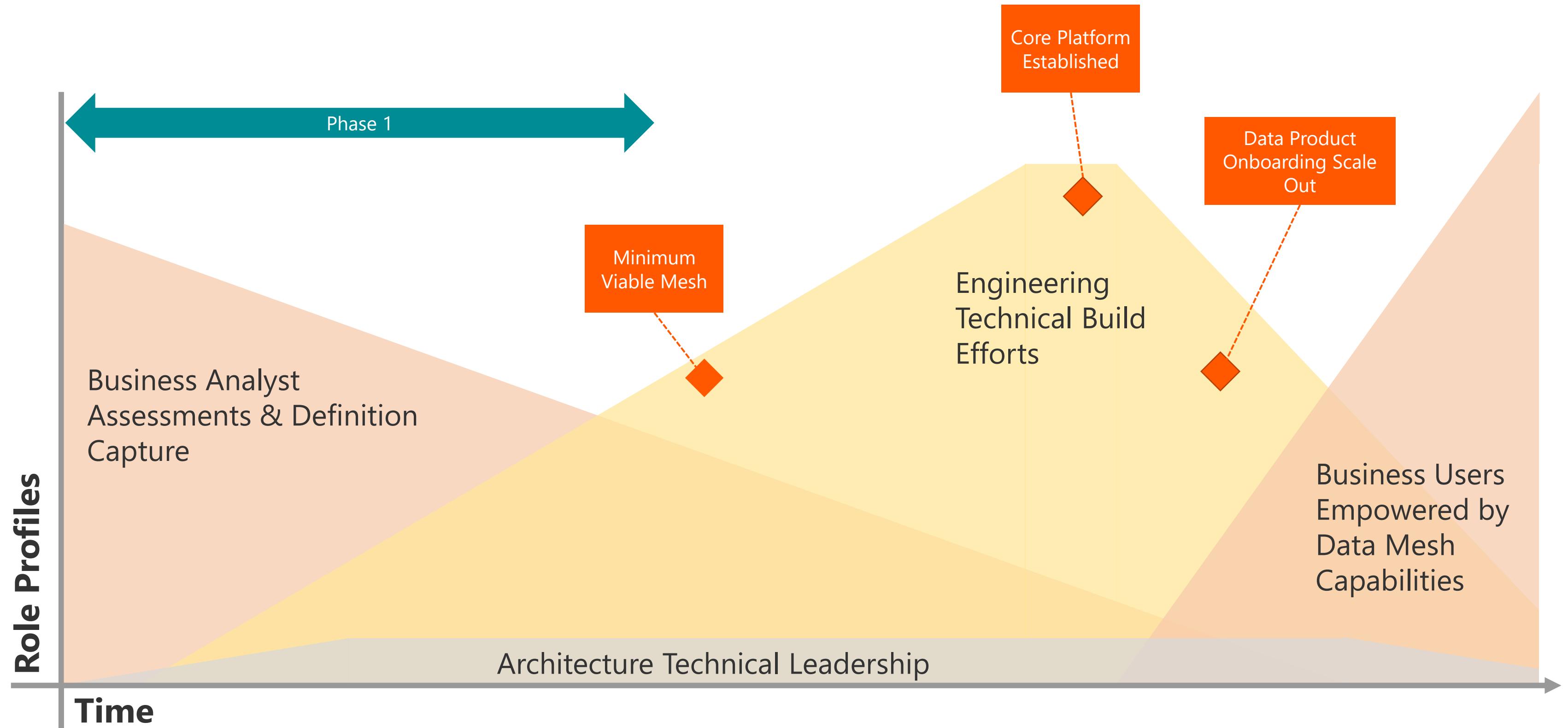




A Logical Data Mesh Architecture



Mesh Build Team Profile View



Thank you for listening.

