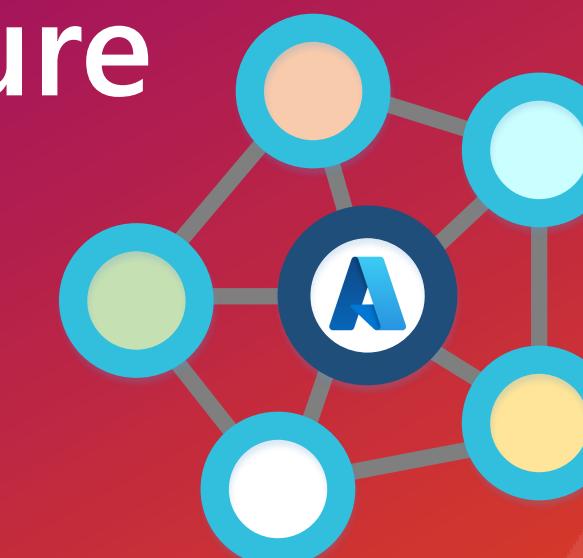




Theory vs Practice

Implementing a Data Mesh Architecture in Azure

with Paul Andrew





15 edycja konferencji SQLDay

8-10 maja 2023, WROCŁAW + ONLINE



partner złoty



partner srebrny



partner brązowy



About Me



@MrPaulAndrew



In/MrPaulAndrew



c/MrPaulAndrew



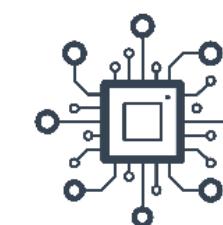
MrPaulAndrew.com



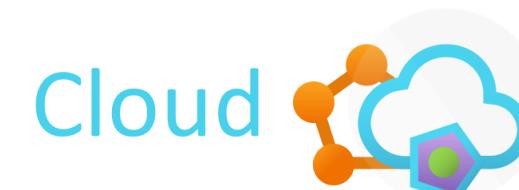
/MrPaulAndrew



avanade



Mr Paul Andrew
Consulting Ltd



Formations

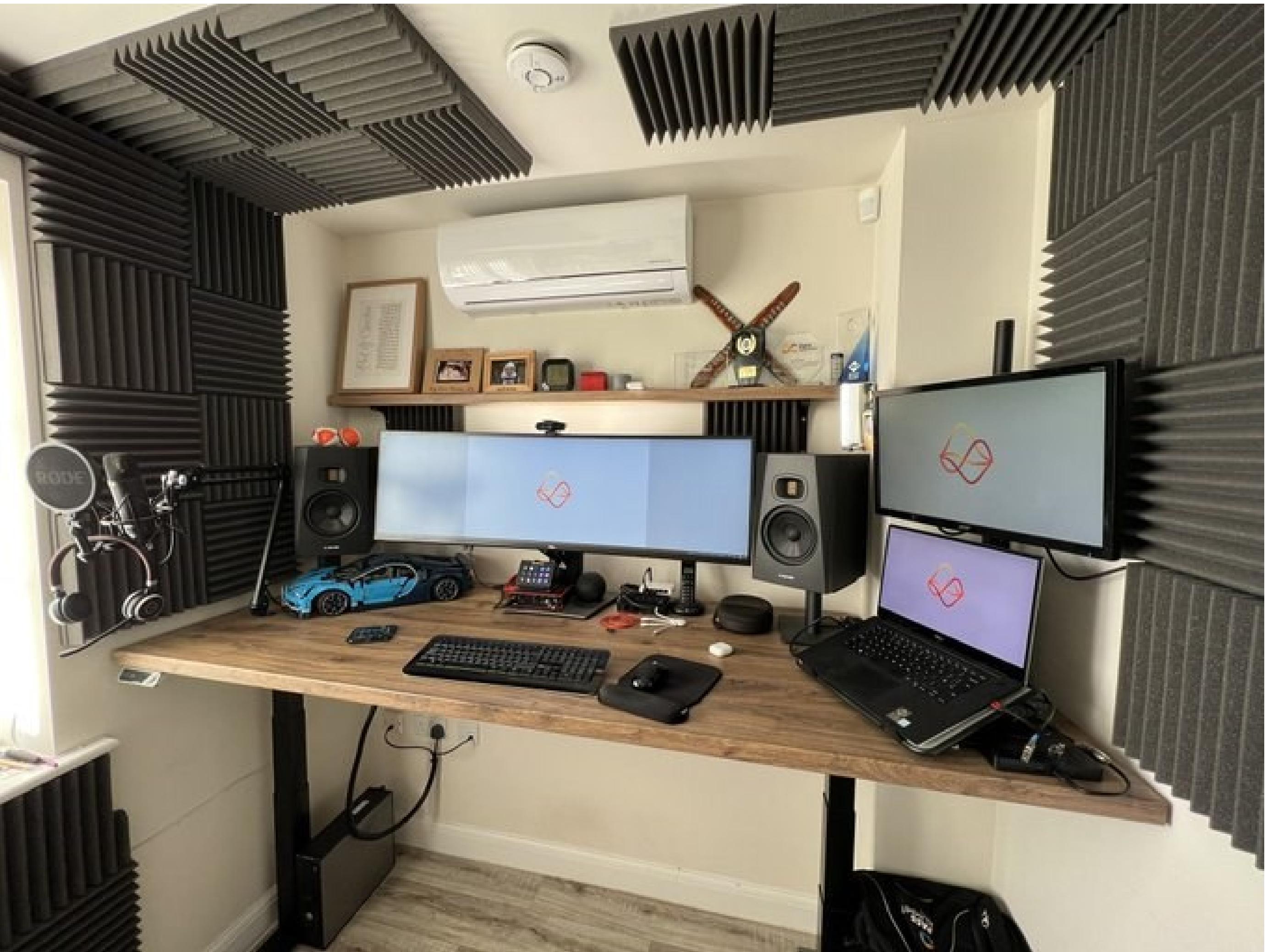
CommunityEvents

Demo code, content and slides from various community events.

● C++

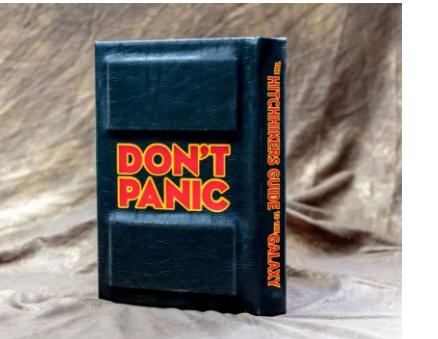


About Me



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

Answer:
42



Answer:
It depends! ✓

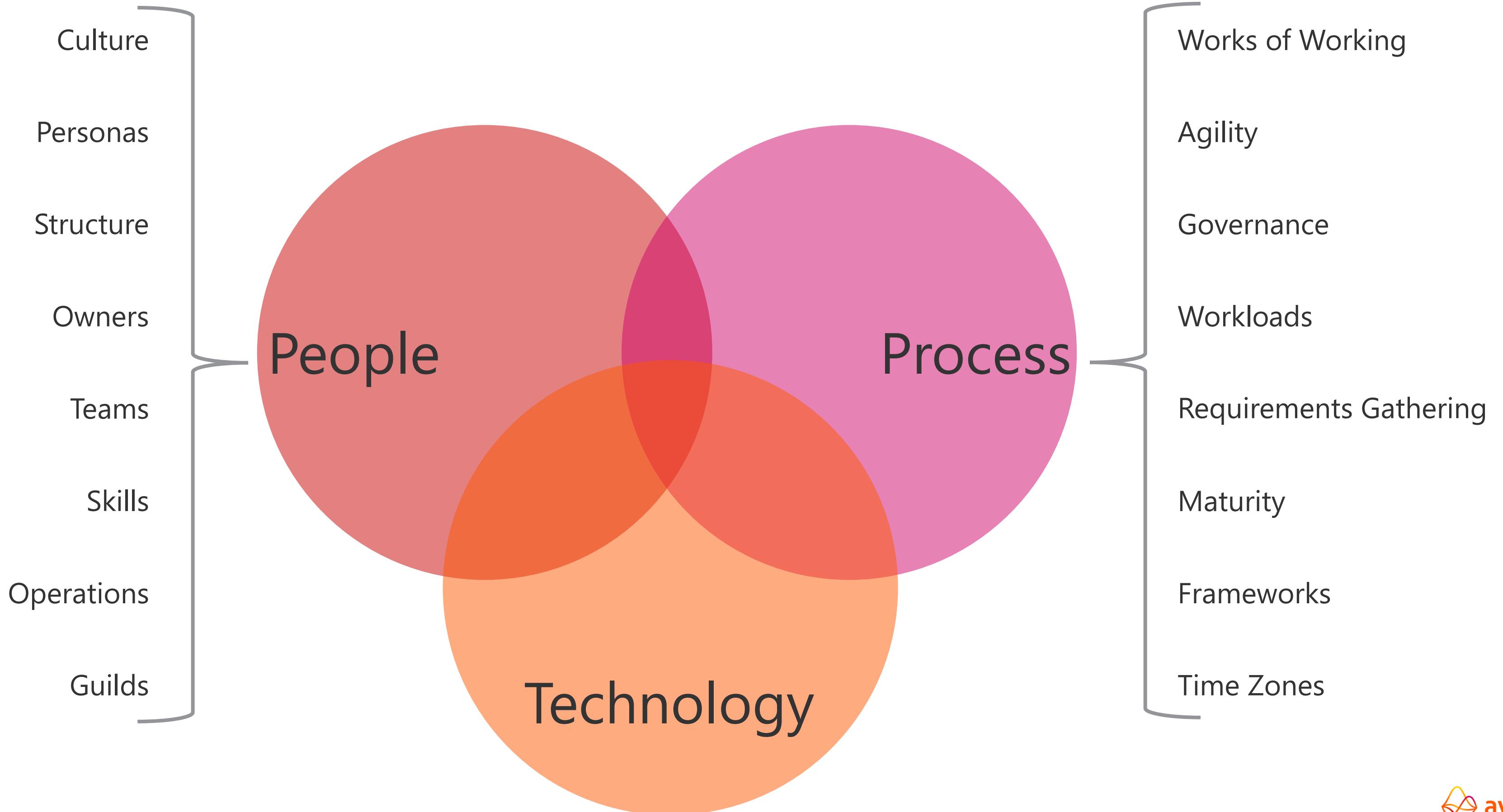


Data Mesh:

What is it about?

Why should we build it?

Data Mesh – What is it about?



Data Mesh – What is it about?



Technology

Data Mesh – What is it about?

- *Zhamak Dehghani*

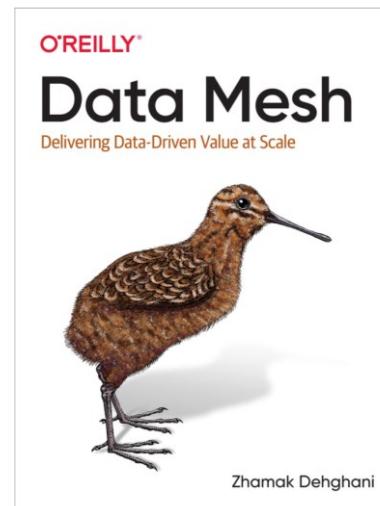
@zhamakd



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

ISBN-10
1492092398

ISBN-13
978-1492092391

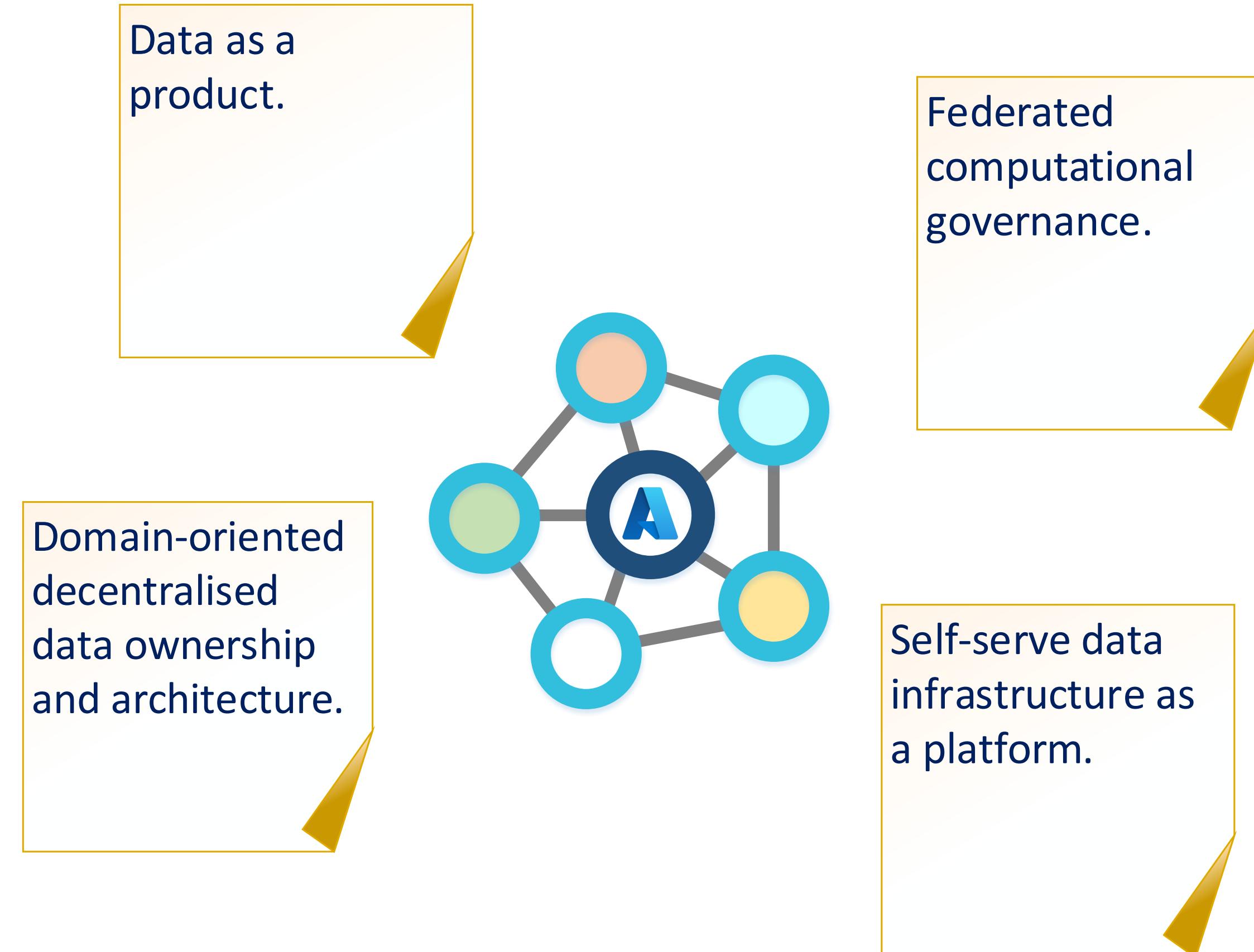


- 1. Domain-oriented decentralised data ownership and architecture.
- 2. Data as a product.
- 3. Self-serve data infrastructure as a platform.
- 4. Federated computational governance.

Data Mesh Principals

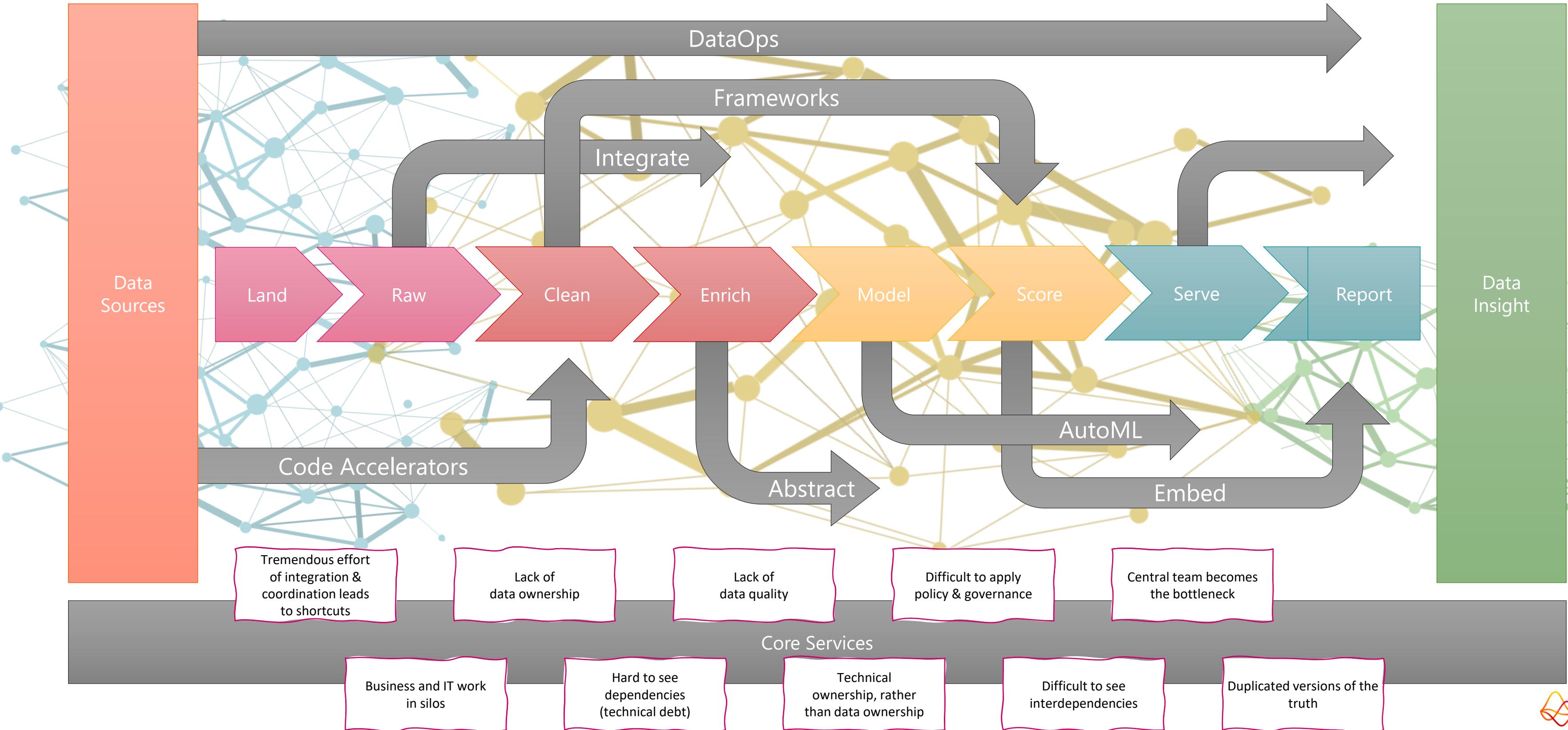
1. Domain-oriented decentralised data ownership and architecture.
2. Data as a product.
3. Self-serve data infrastructure as a platform.
4. Federated computational governance.

Data Mesh Principals



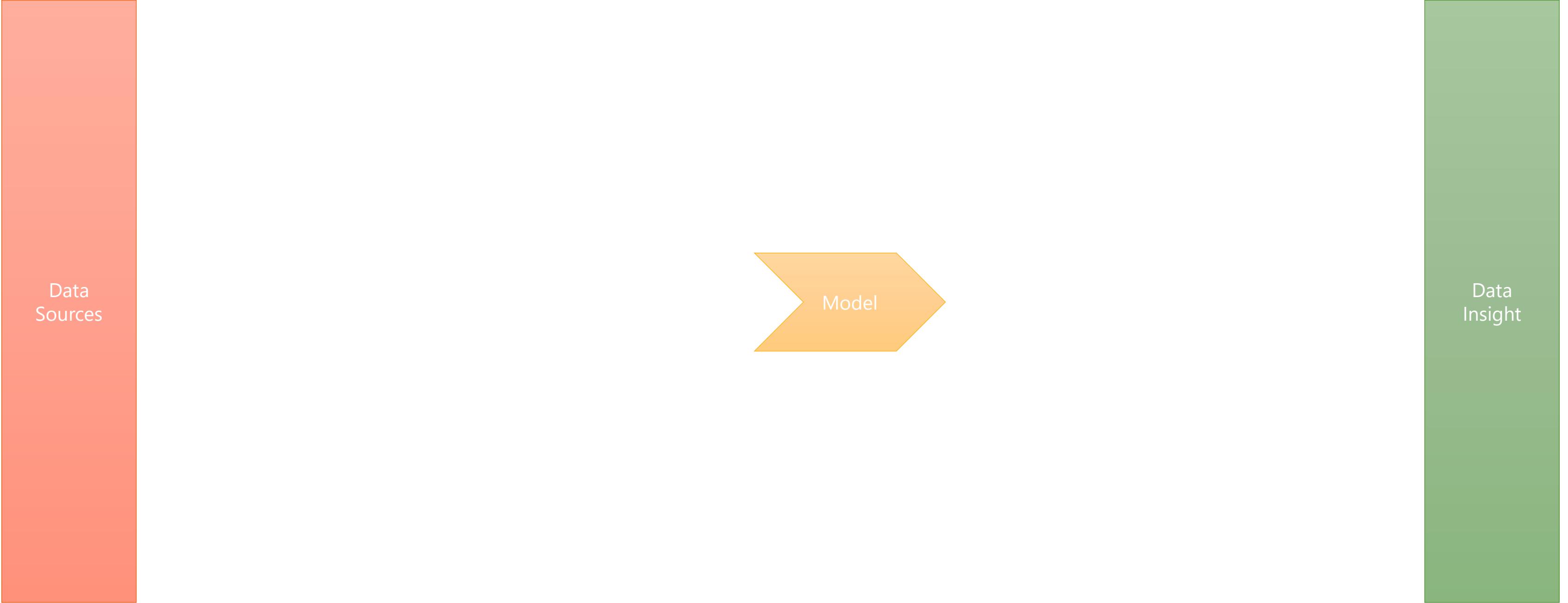
Data Mesh – Why should we build it?

Using a **traditional centralised approach**, enhanced with cloud scale technologies to create a modern data analytics platform.



Data Mesh – *Why should we build it?*

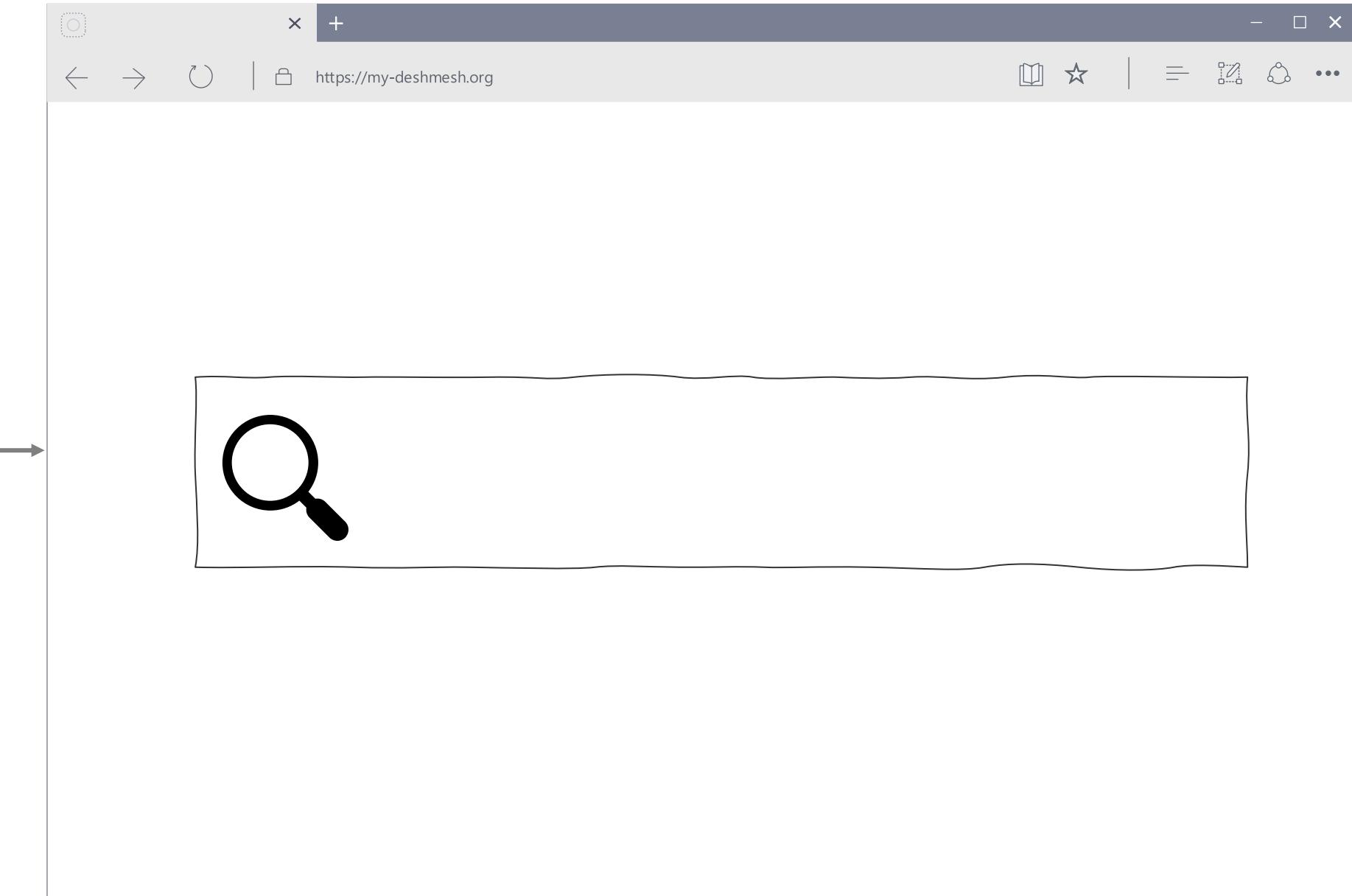
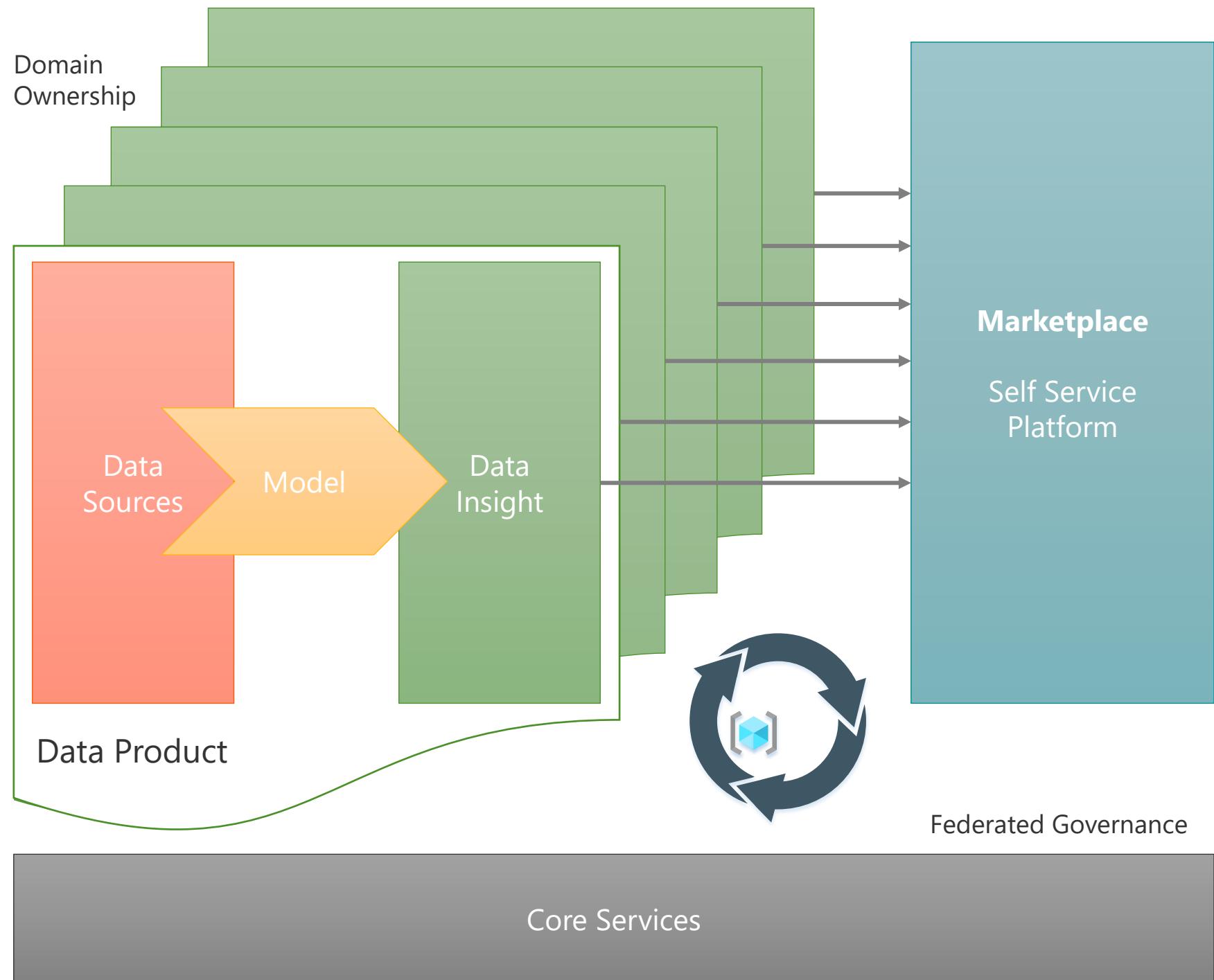
Using a **traditional centralised** approach, enhanced with cloud scale technologies to create a modern data analytics platform.





Data Mesh – *Why should we build it?*

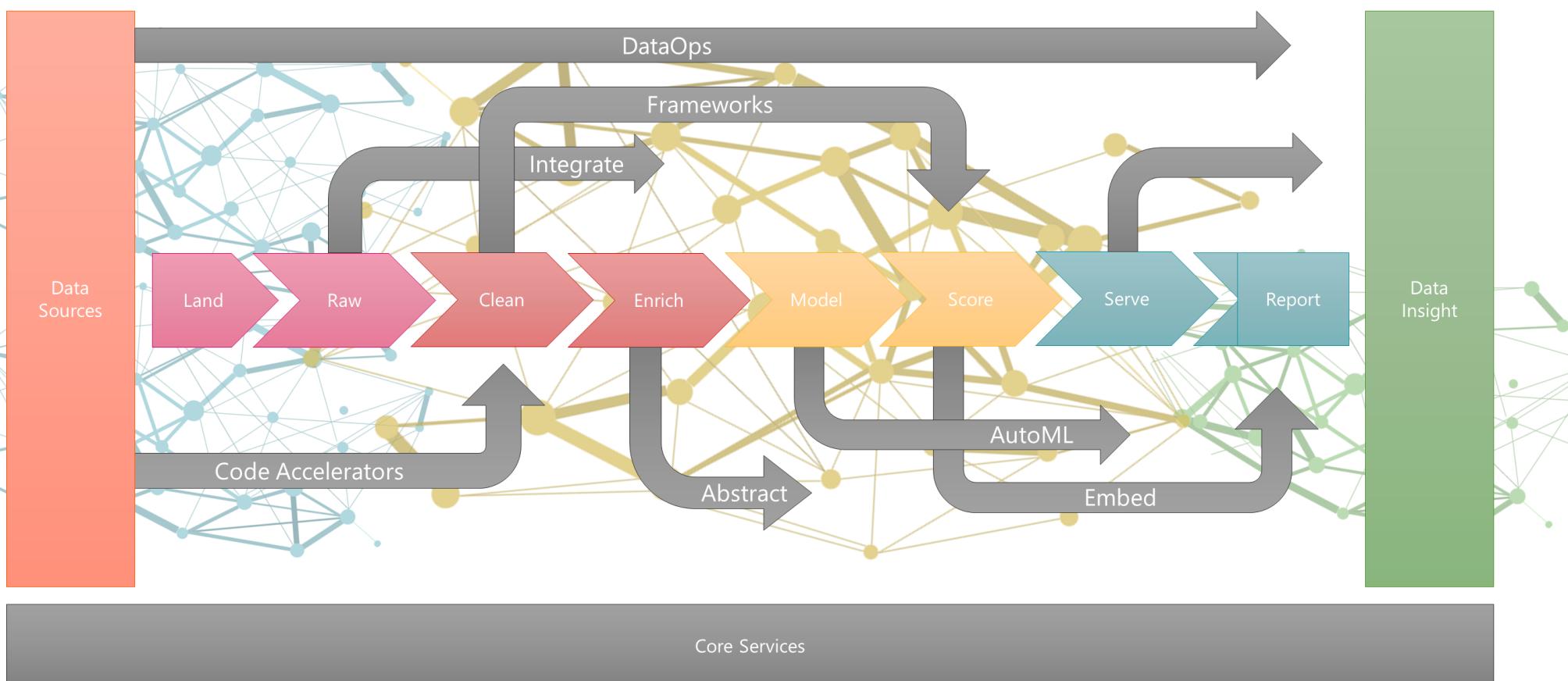
Using a **de-centralised** approach to cloud scale analytics, empowering users to rapidly gain insights to make strategic business decisions.





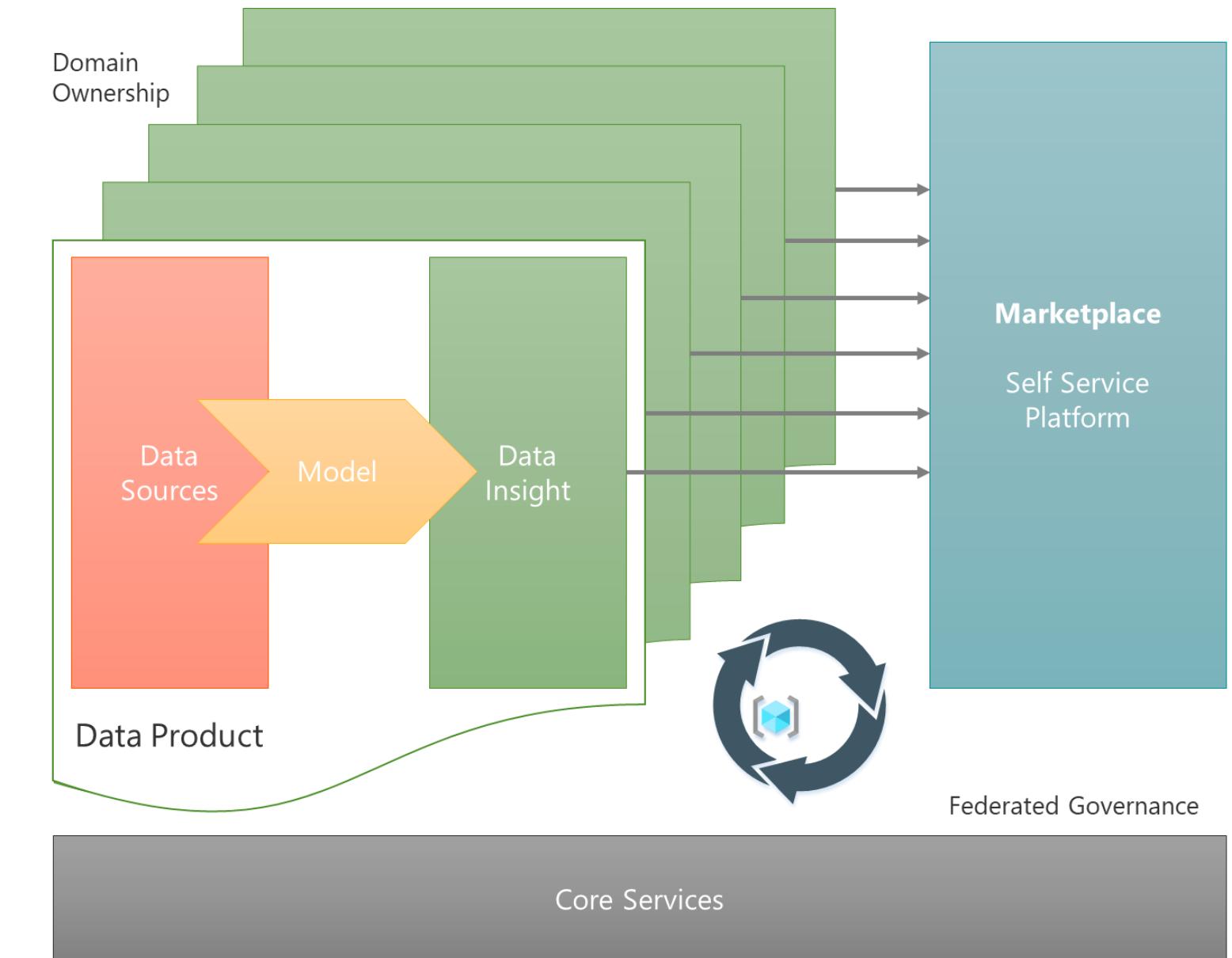
Time to Insight

Using a **traditional centralised approach**, enhanced with cloud scale technologies to create a modern data analytics platform.



... Weeks/Months

Using a **de-centralised approach** to cloud scale analytics, empowering users to rapidly gain insights to make strategic business decisions.

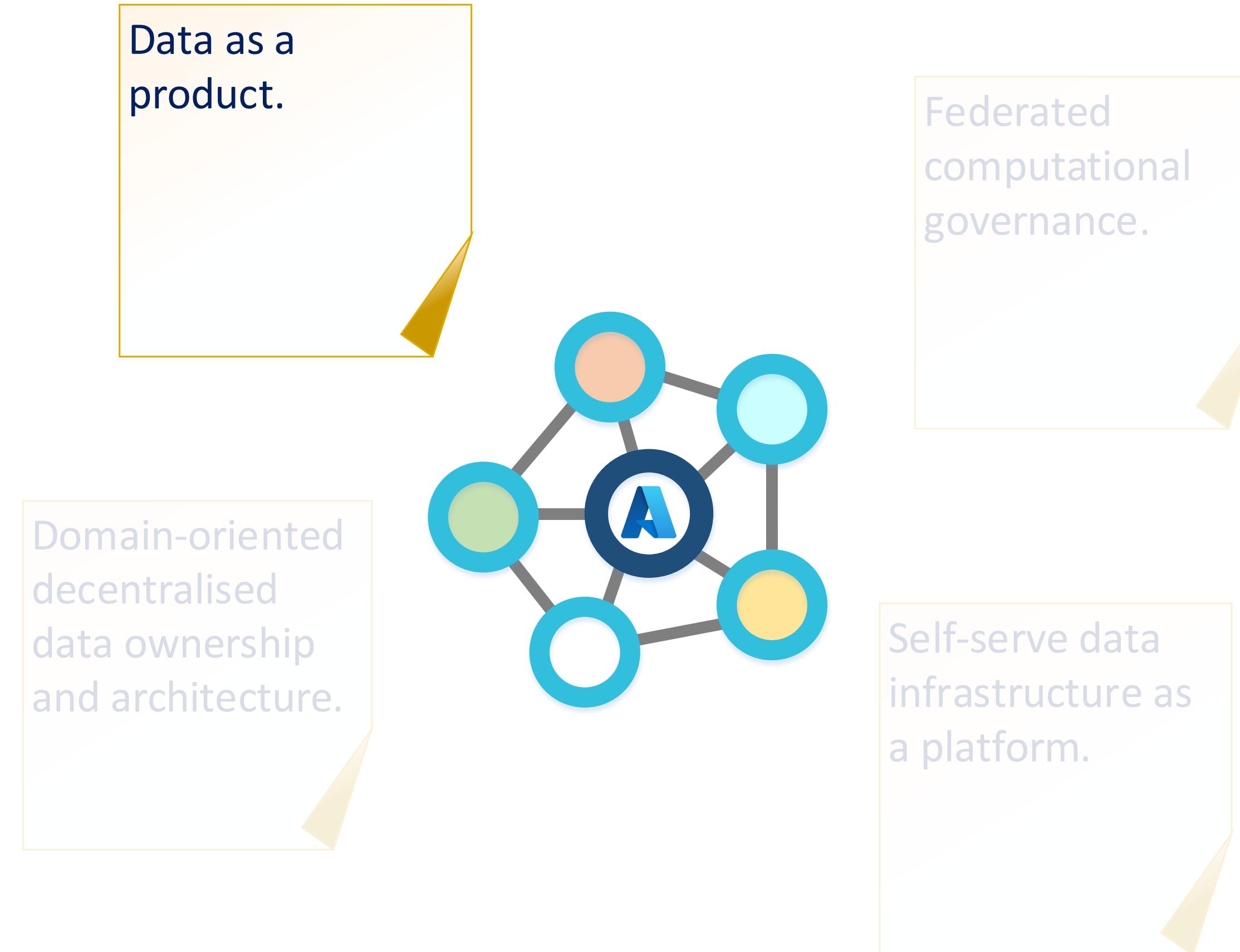


... Hours/Days

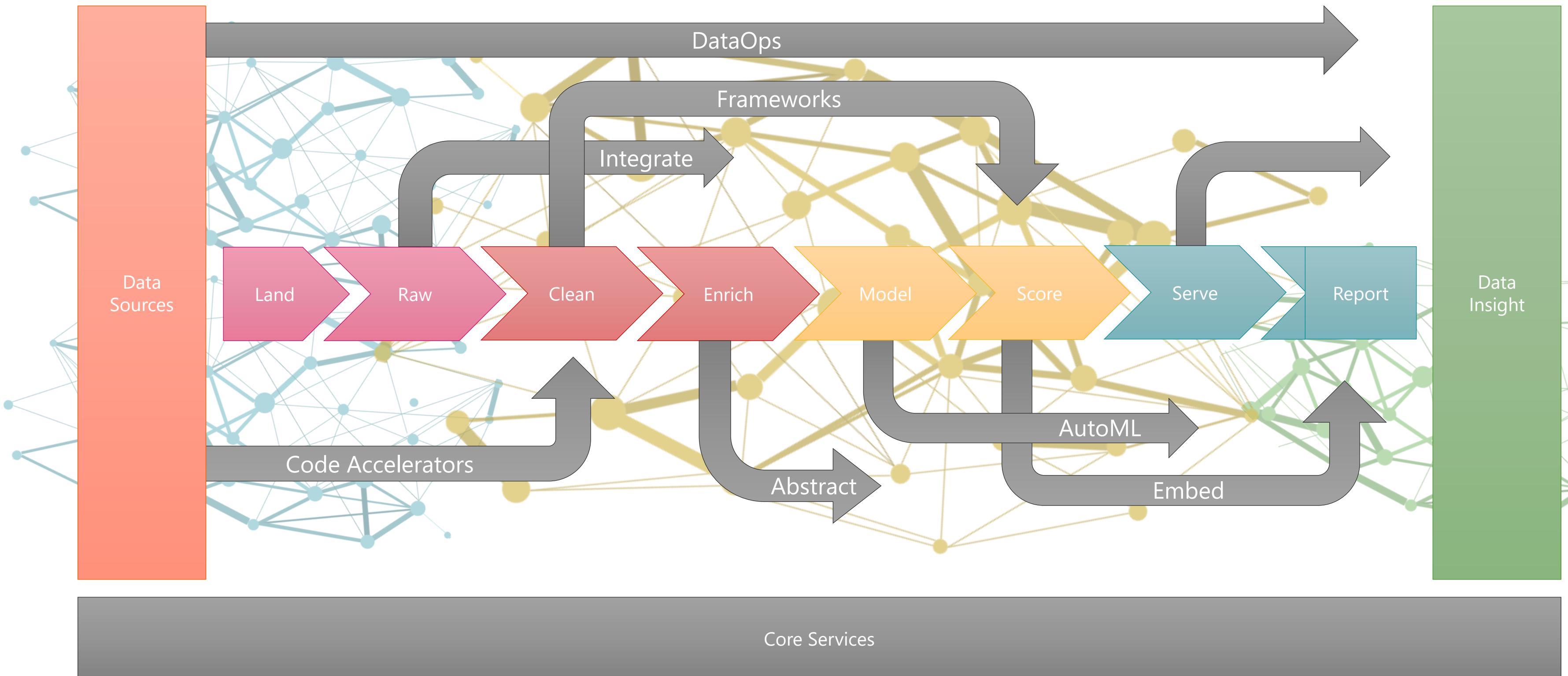


Data Mesh: *How...* *Products*

Data Mesh Principals - Theory vs Practice



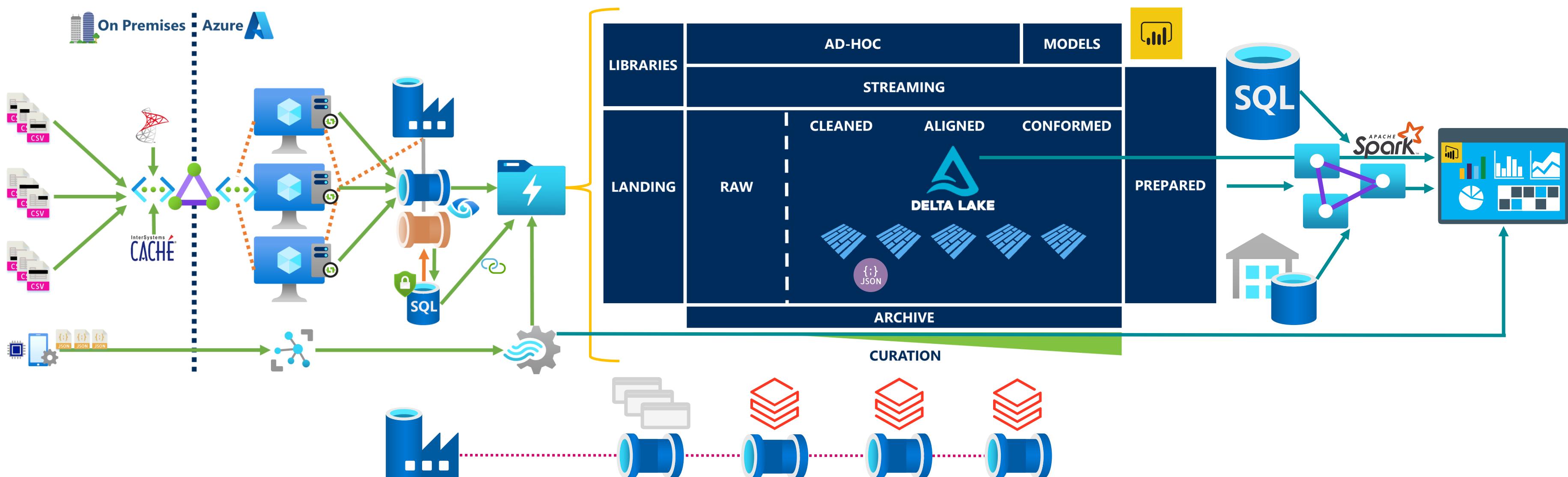
Extract | Transform | Load



Extract

Transform

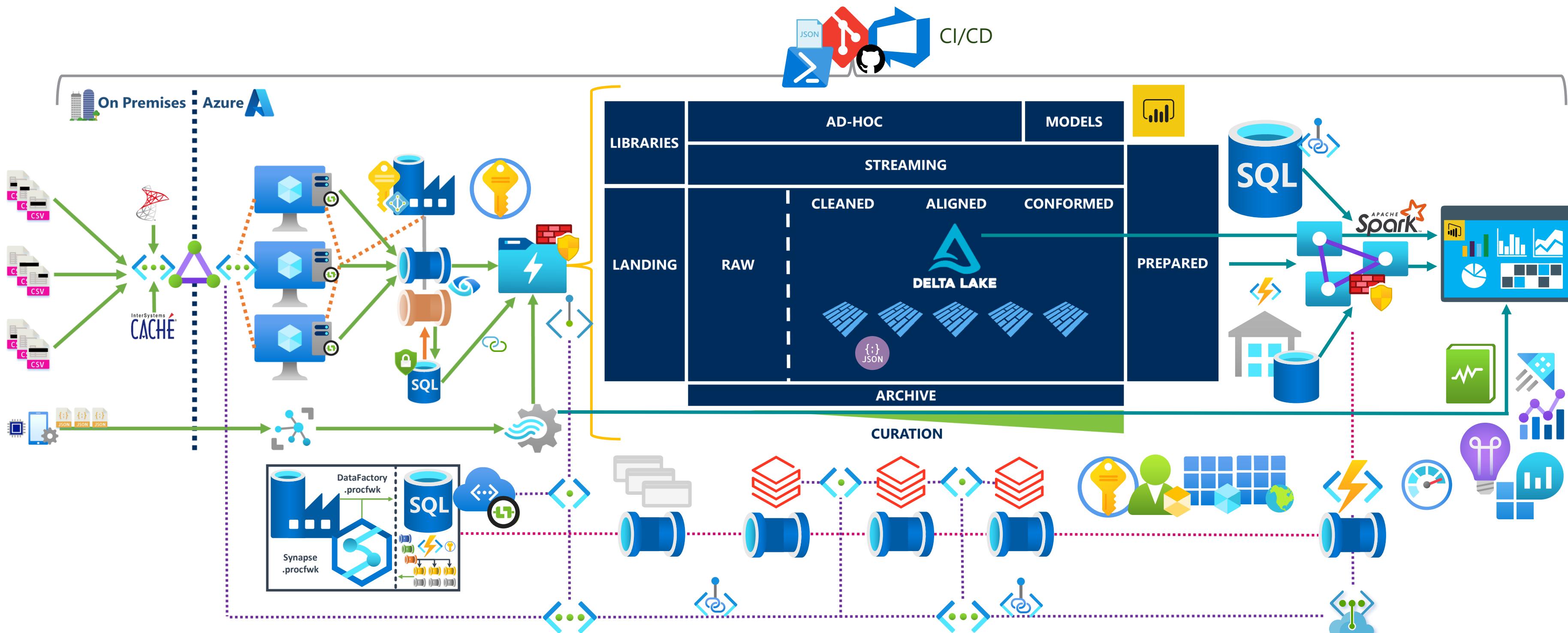
Load

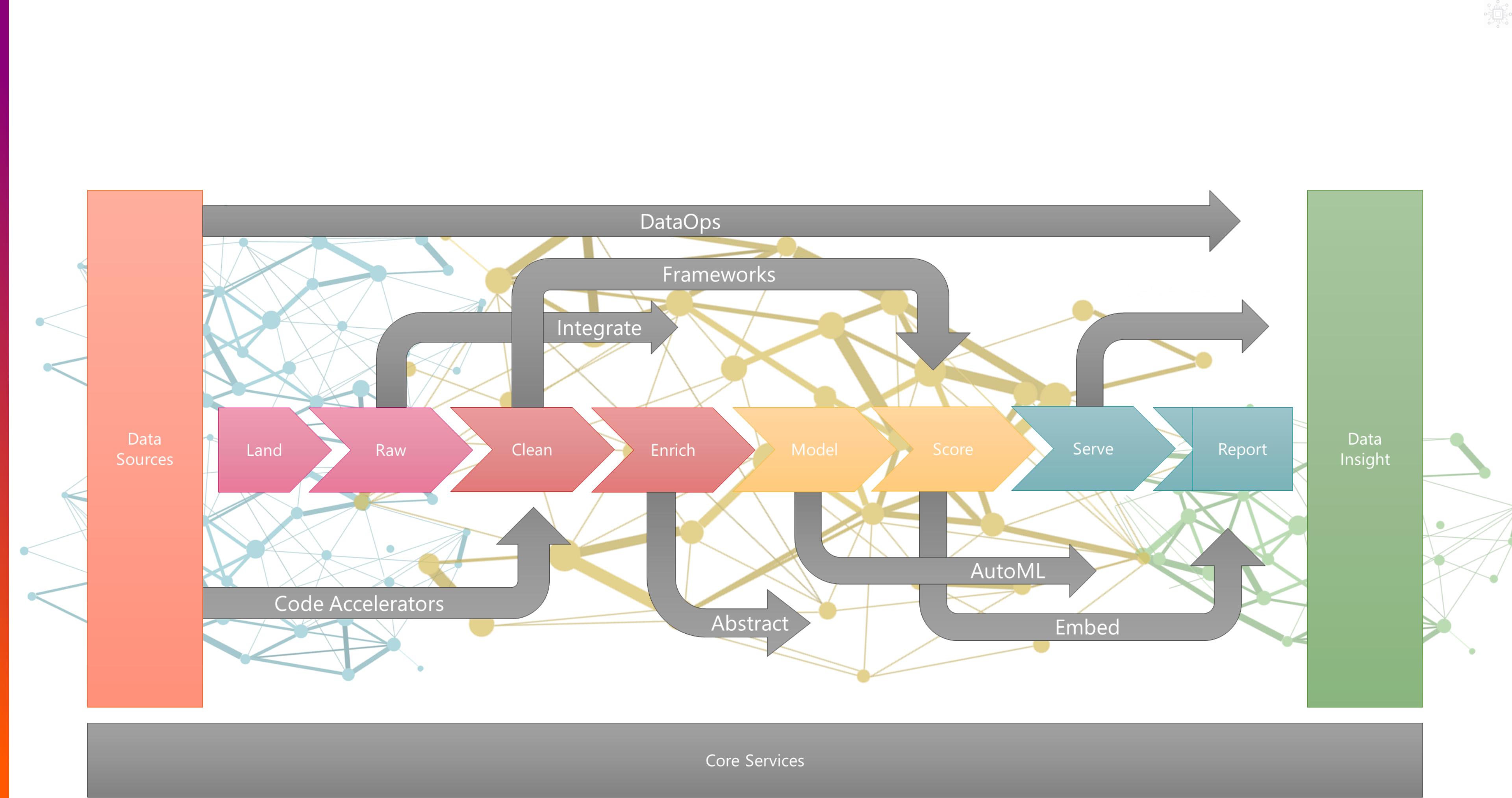


Extract

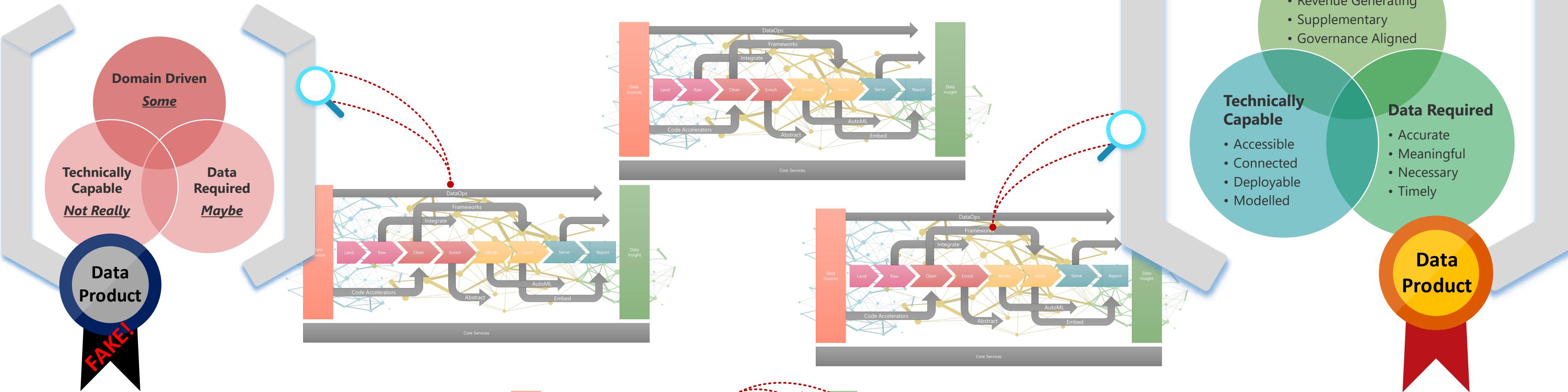
Transform

Load

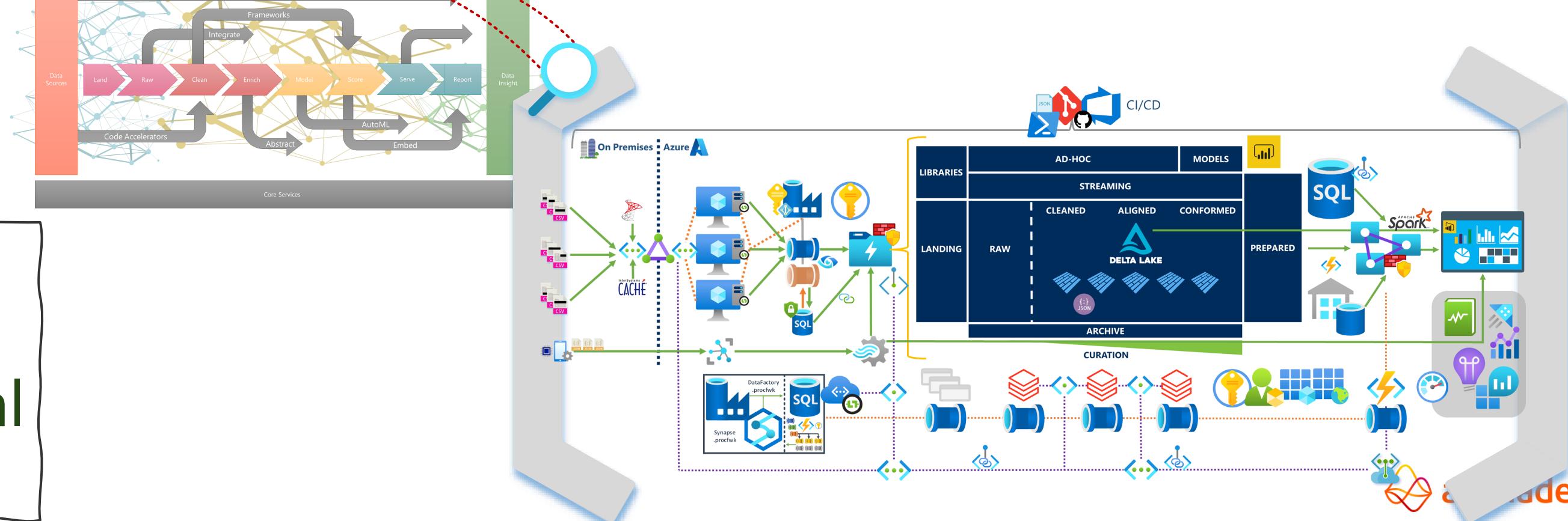




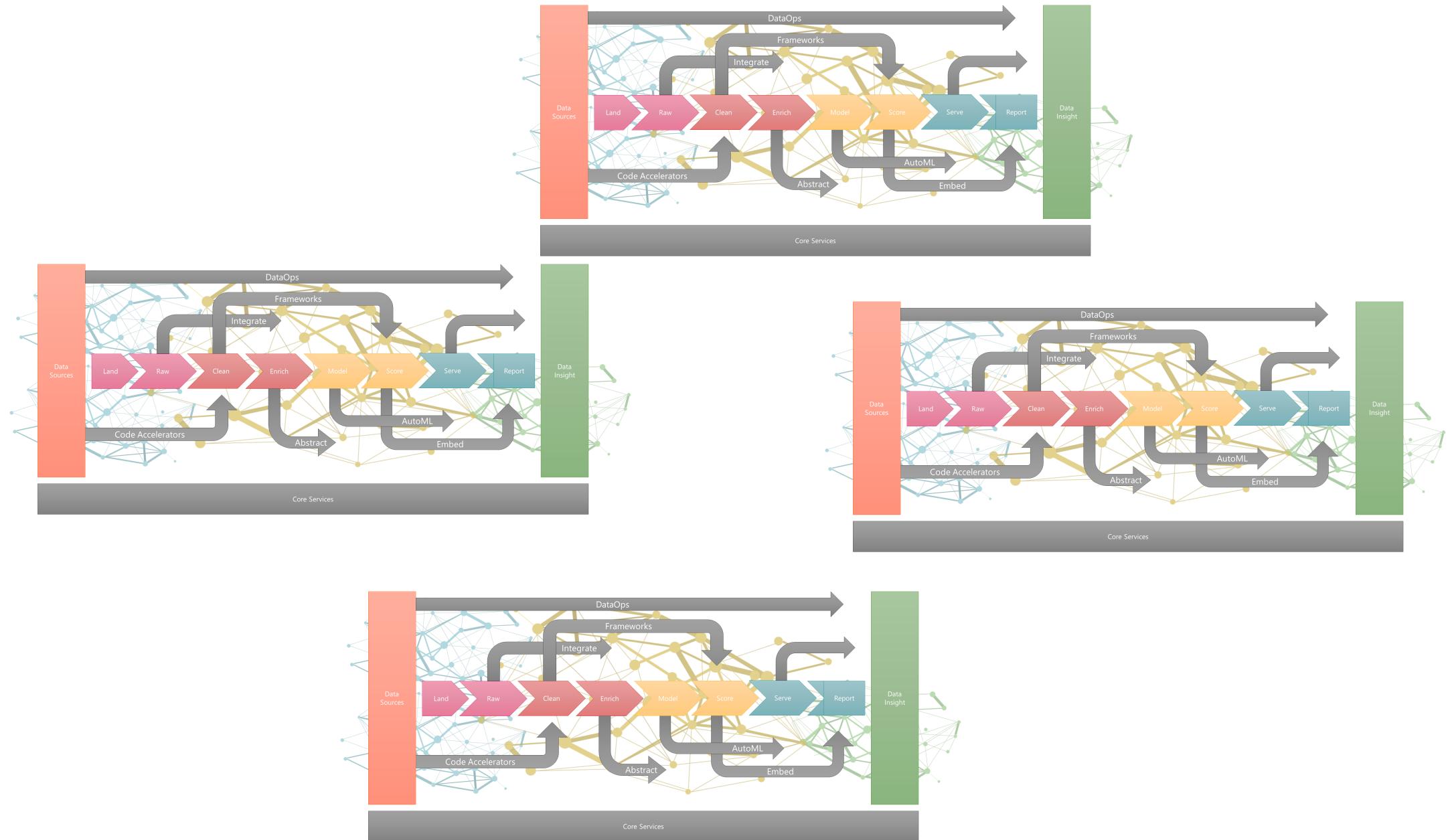
Data Products



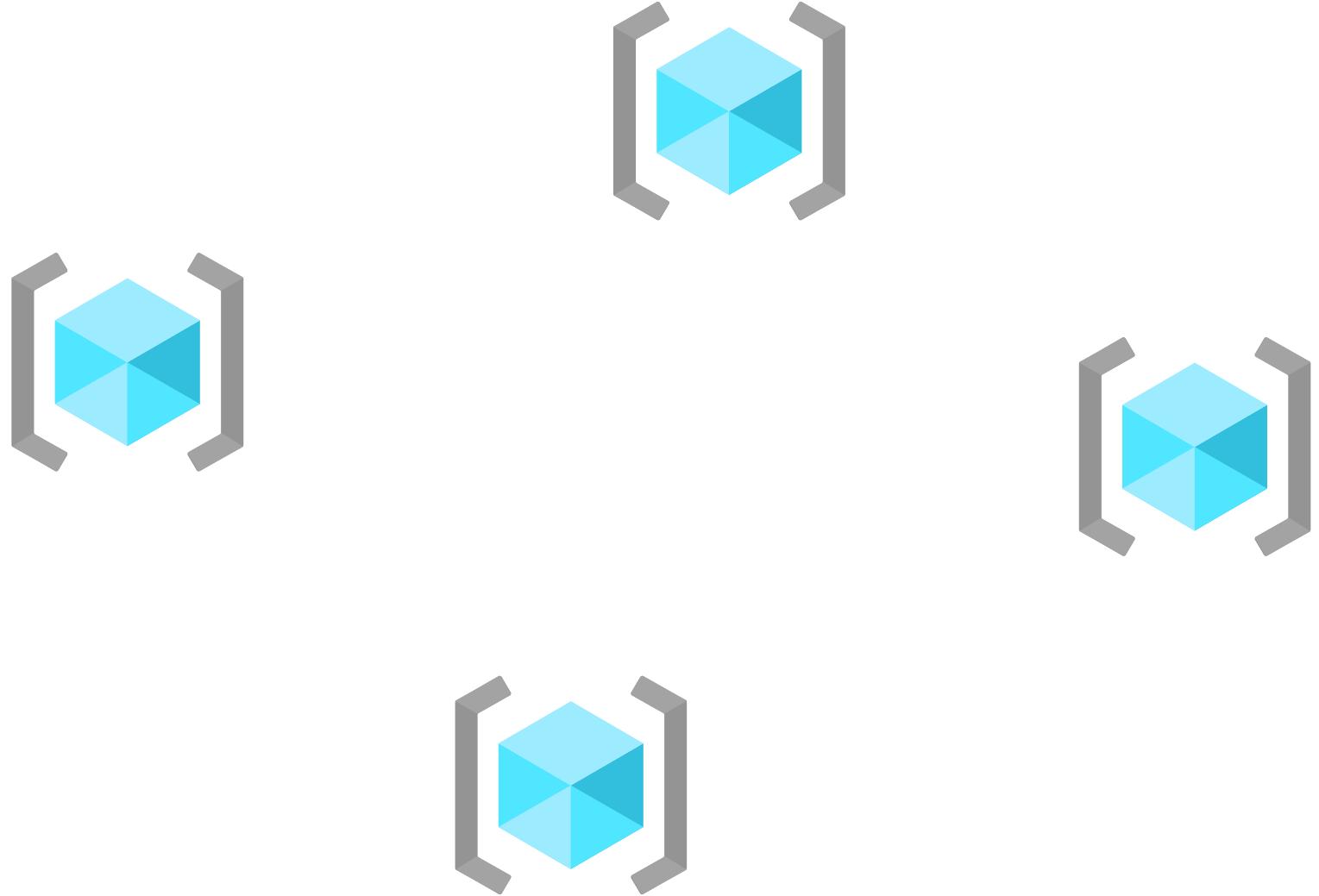
Q1: Should a data product handle both transactional/operational and analytical data?



Data Products in Azure

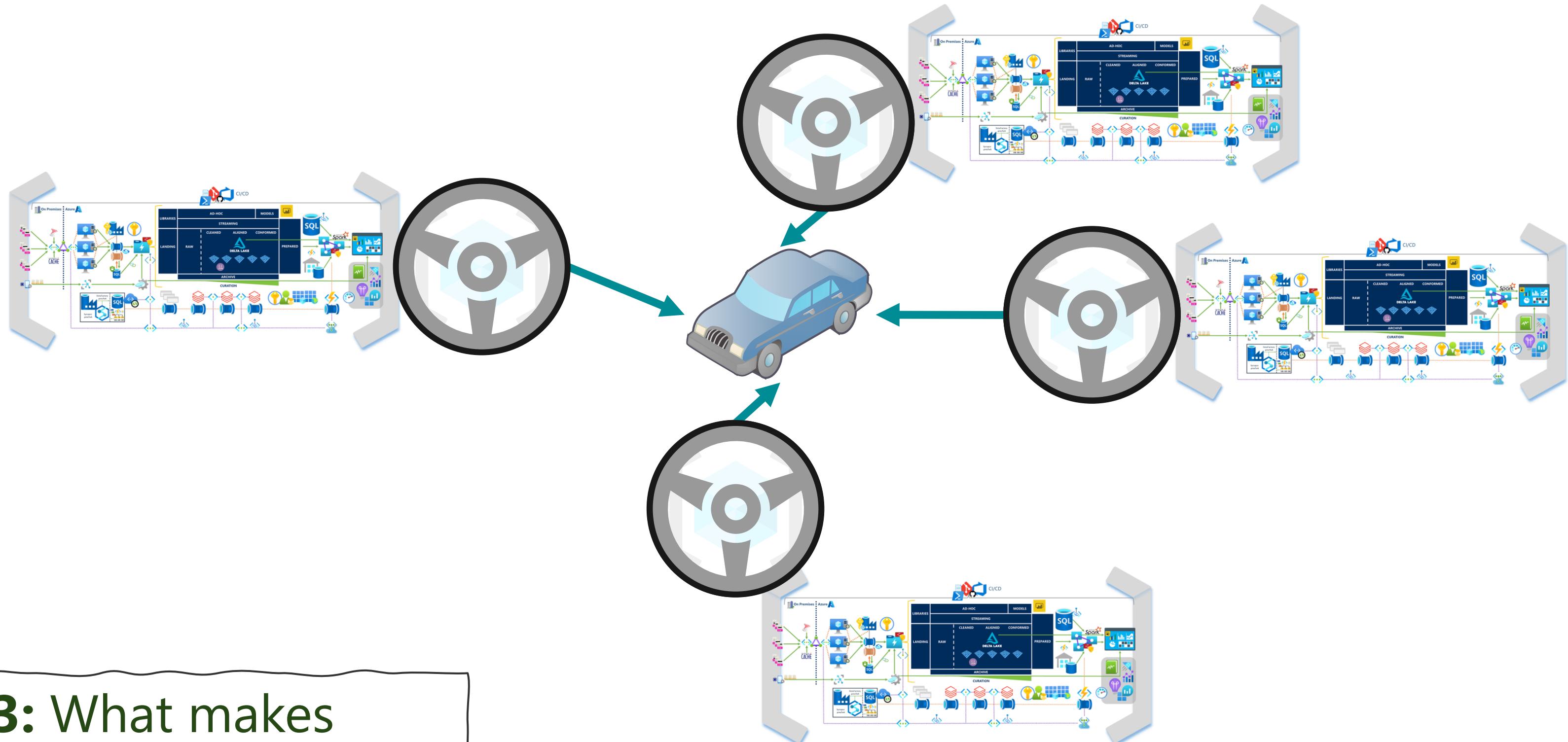


Data Products in Azure



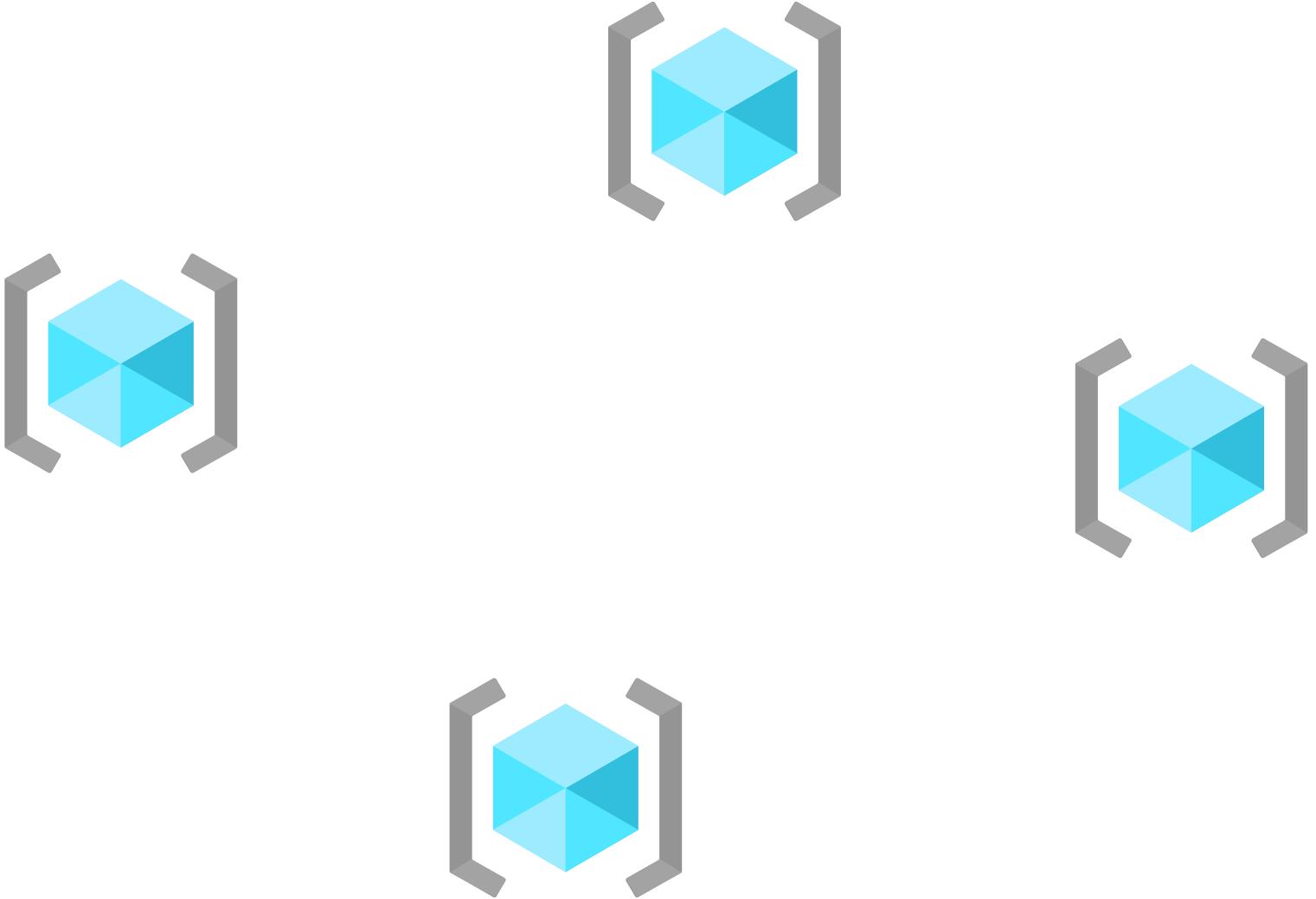
Q2: When does a data solution become a Data Mesh?

Data Products in Azure



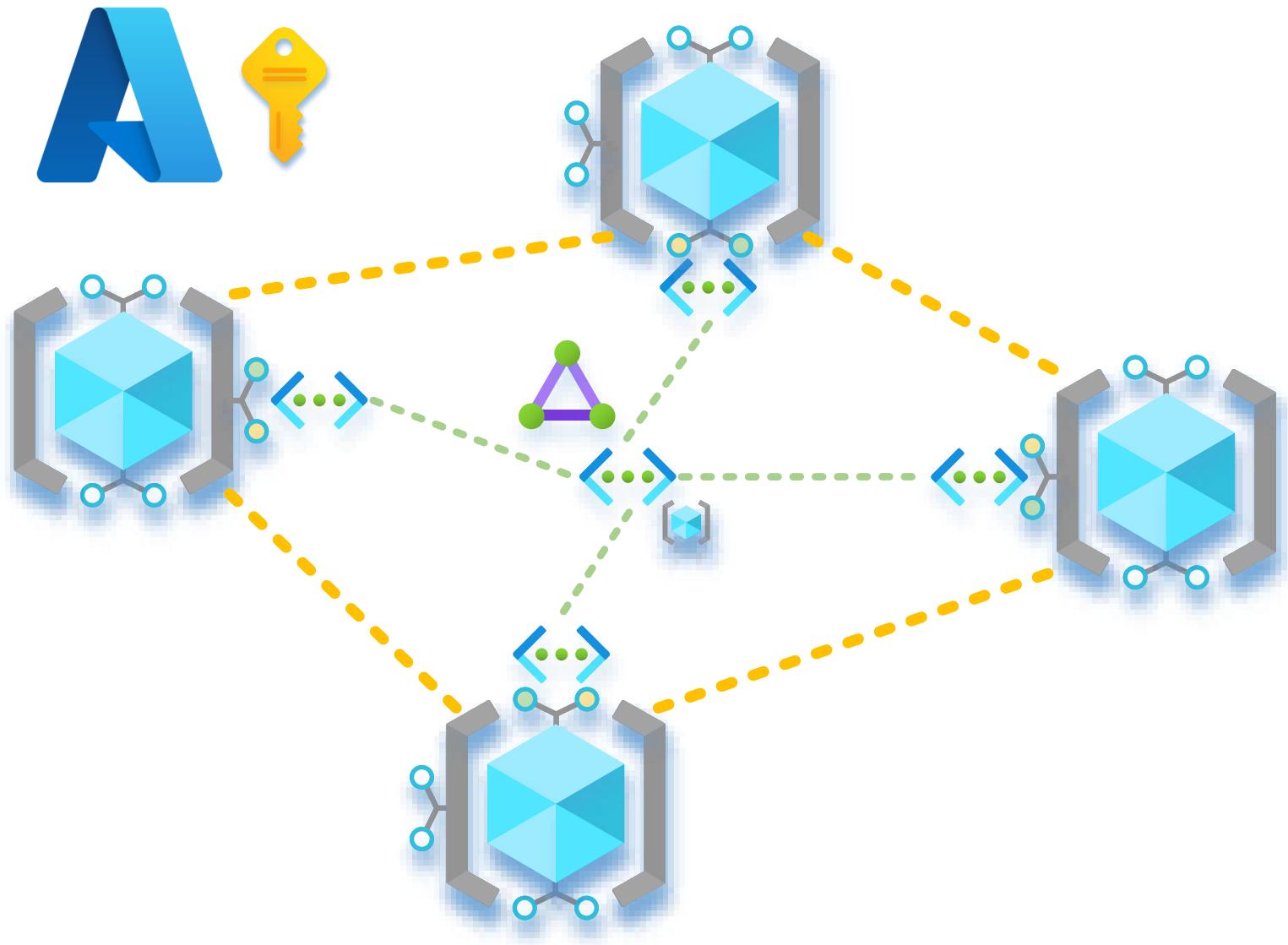
Q3: What makes minimum viable Data Mesh contain?

Data Products in Azure

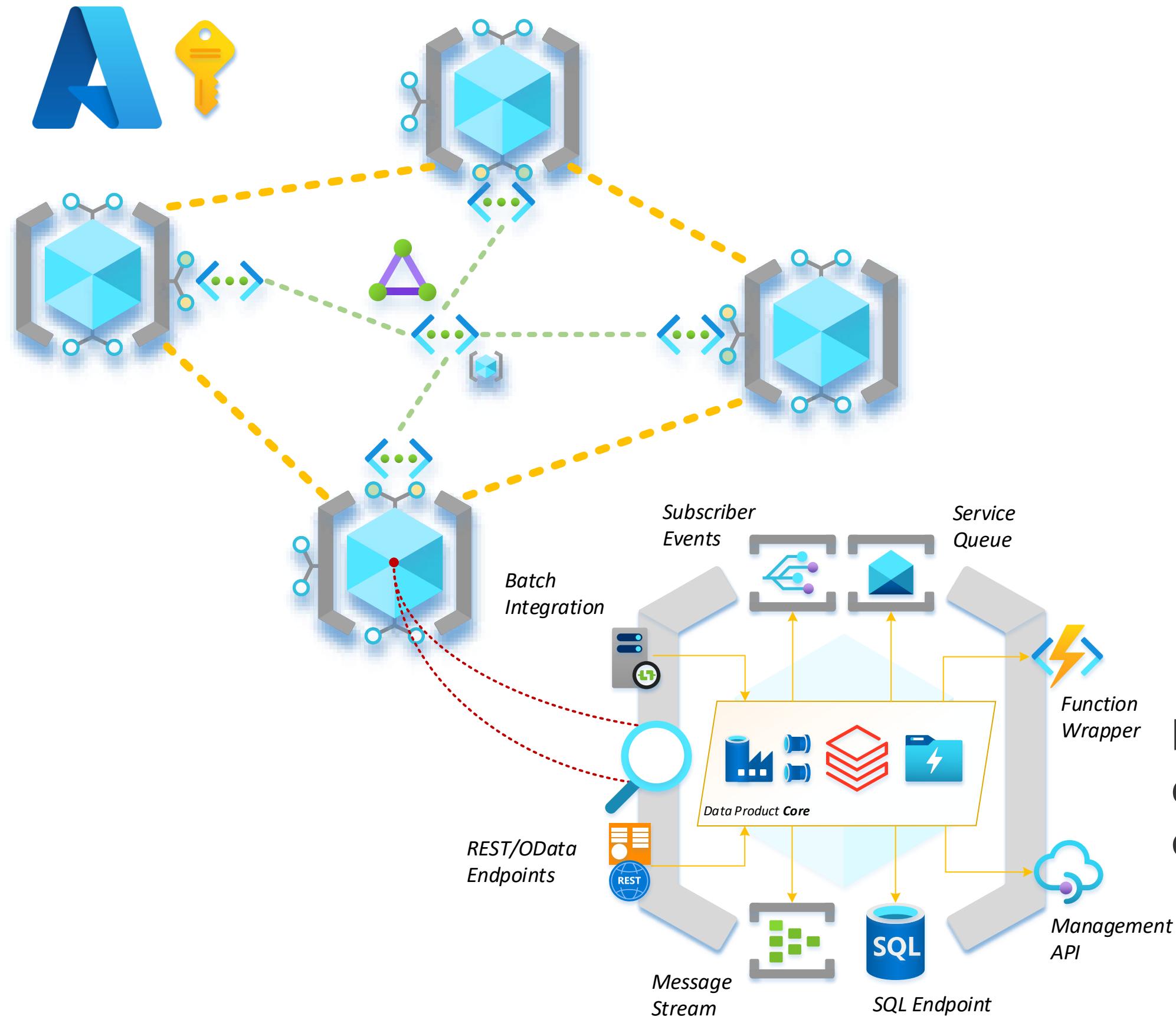




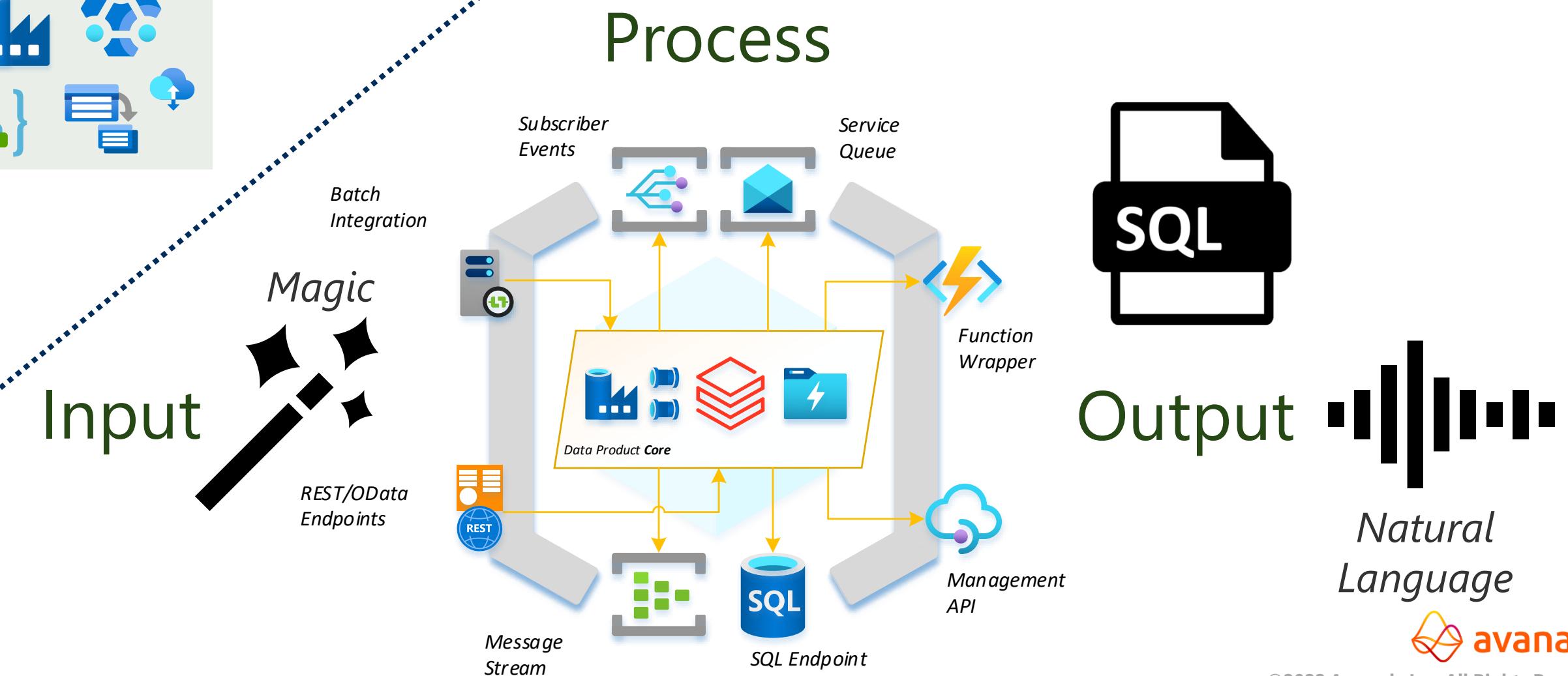
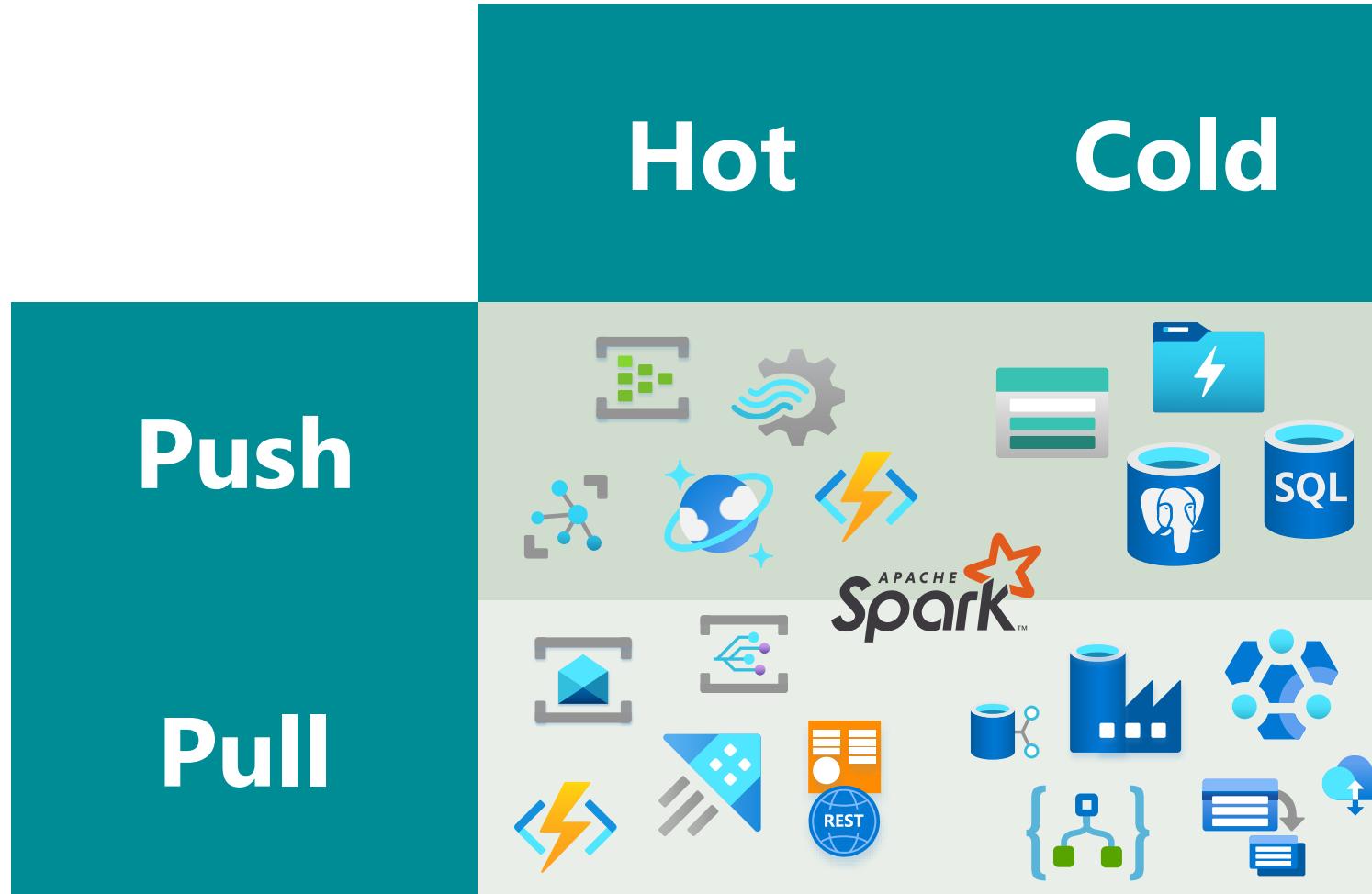
Data Products - Azure Interfaces



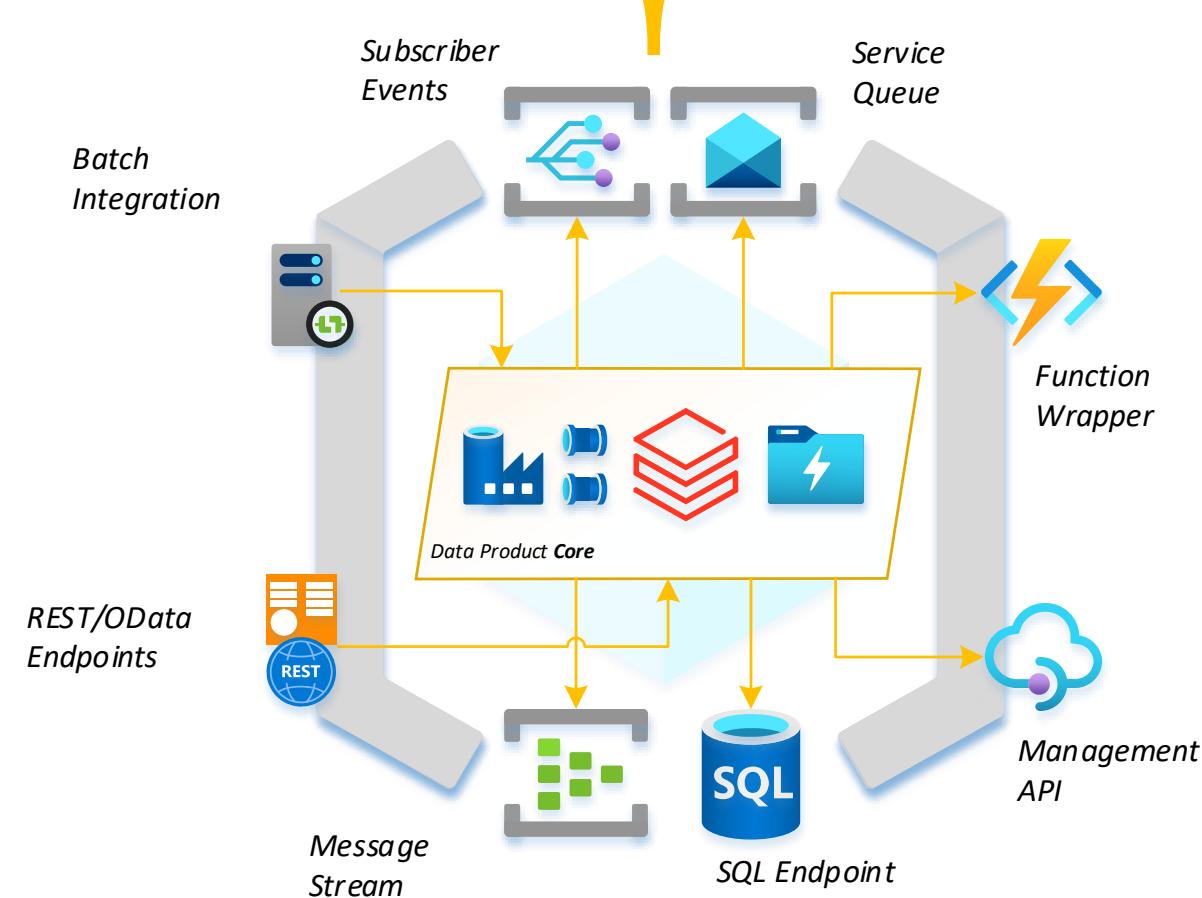
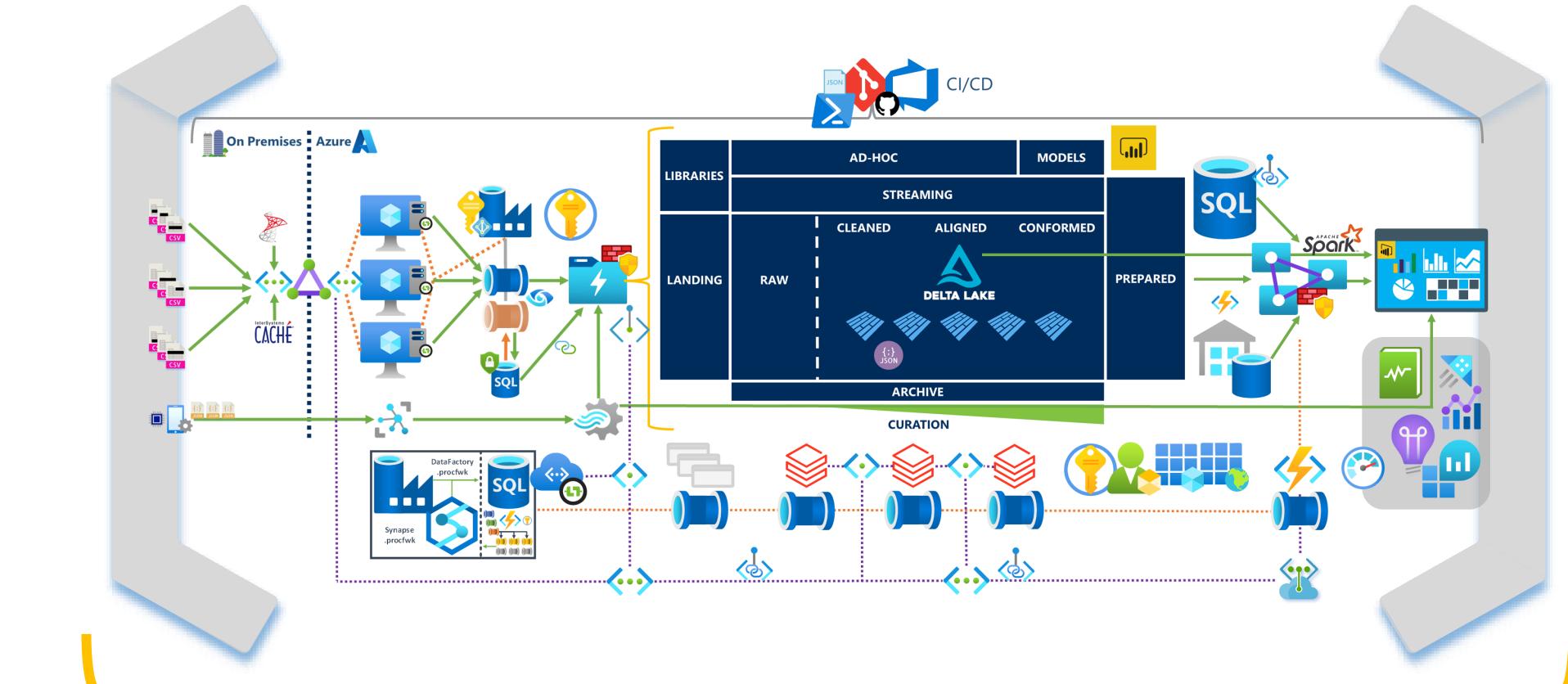
Data Products - Azure Primary Interfaces



Data Products - Azure Primary Interfaces

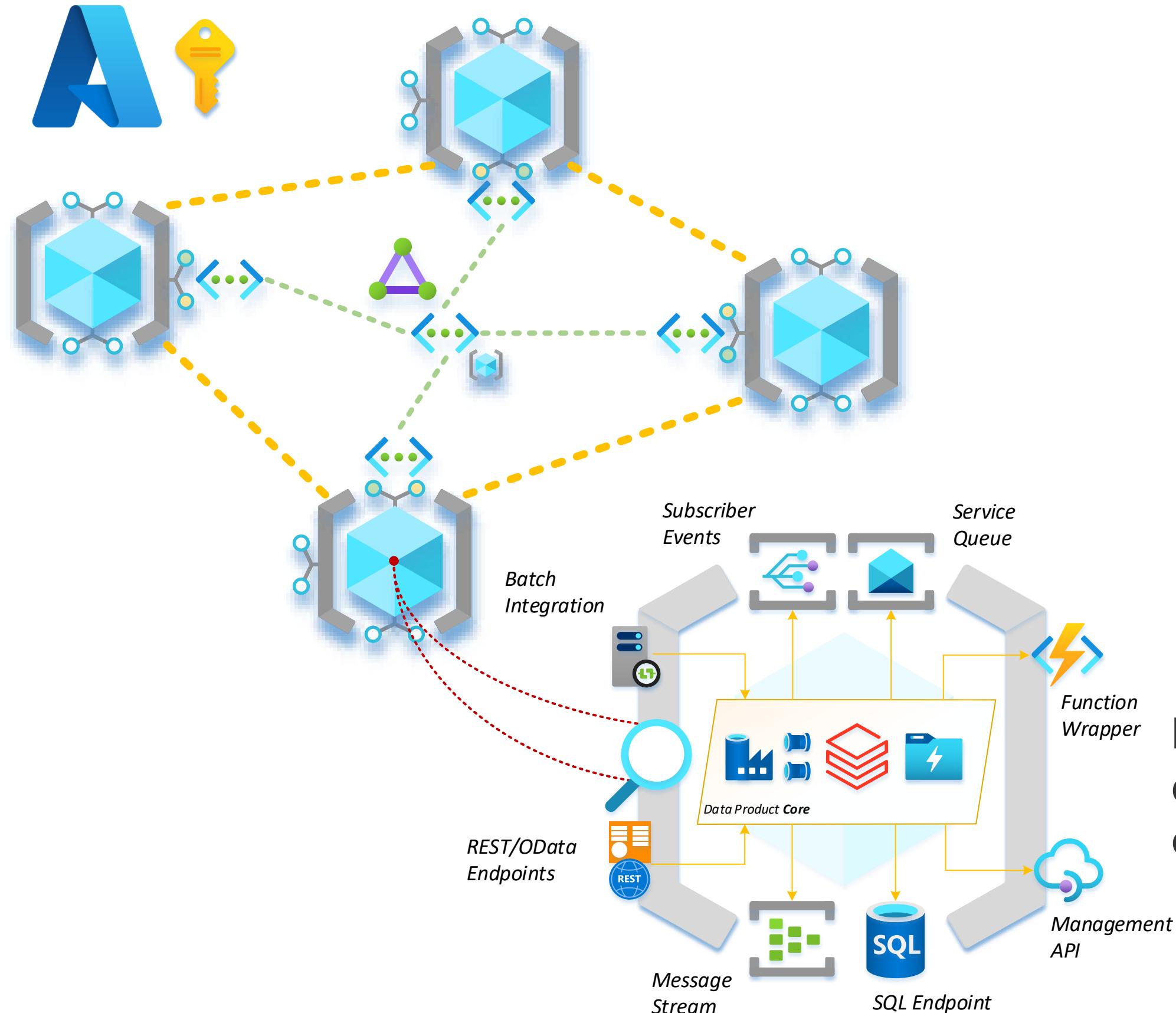


Data Products - Azure Primary Interfaces



Primary Interfaces –
data integration and
exchange.

Data Products - Azure Primary Interfaces

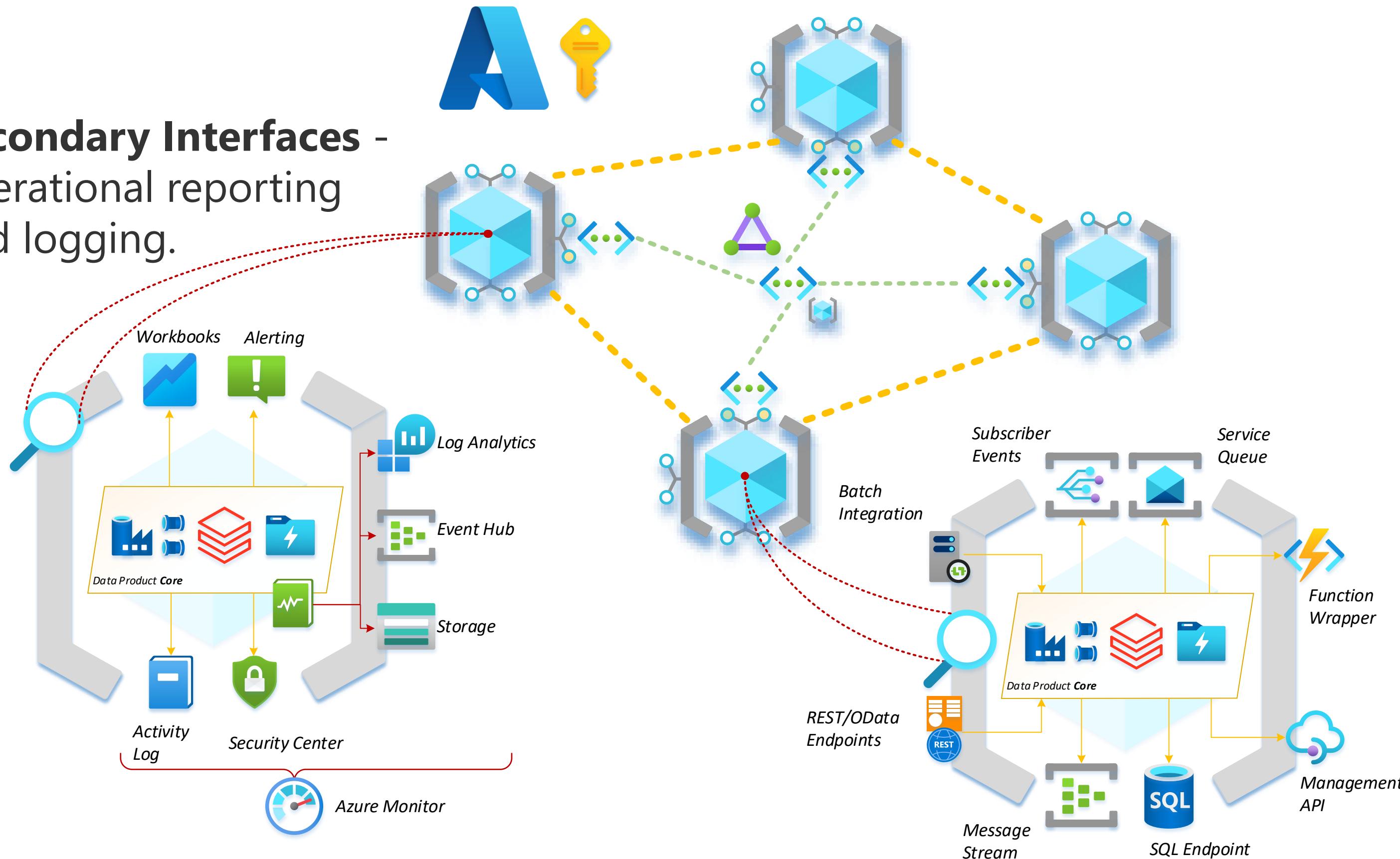


Primary Interfaces –
data integration and
exchange.



Data Products - Azure Secondary Interfaces

Secondary Interfaces -
operational reporting
and logging.

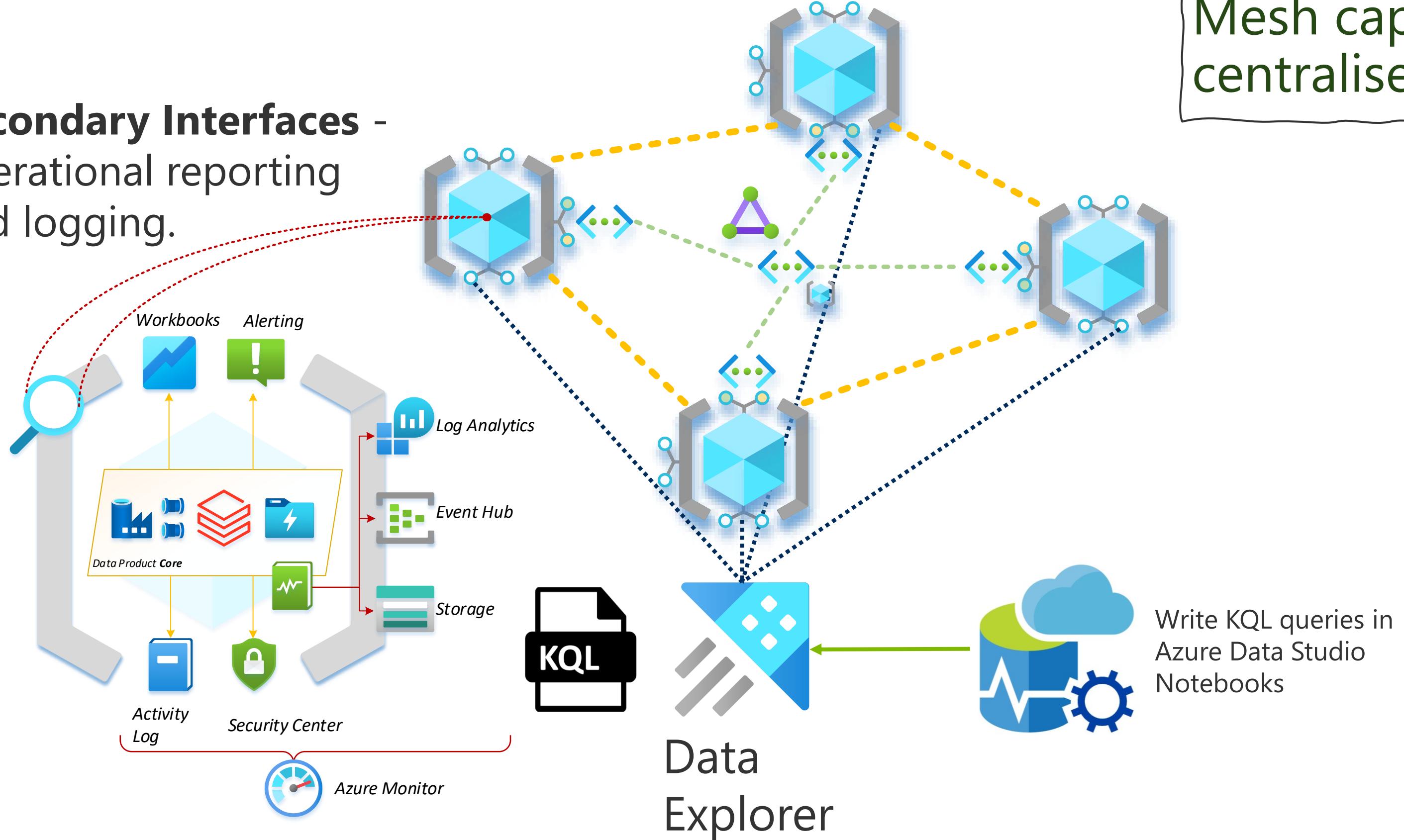


Primary Interfaces –
data integration and
exchange.



Data Products - Azure Secondary Interfaces

Secondary Interfaces - operational reporting and logging.

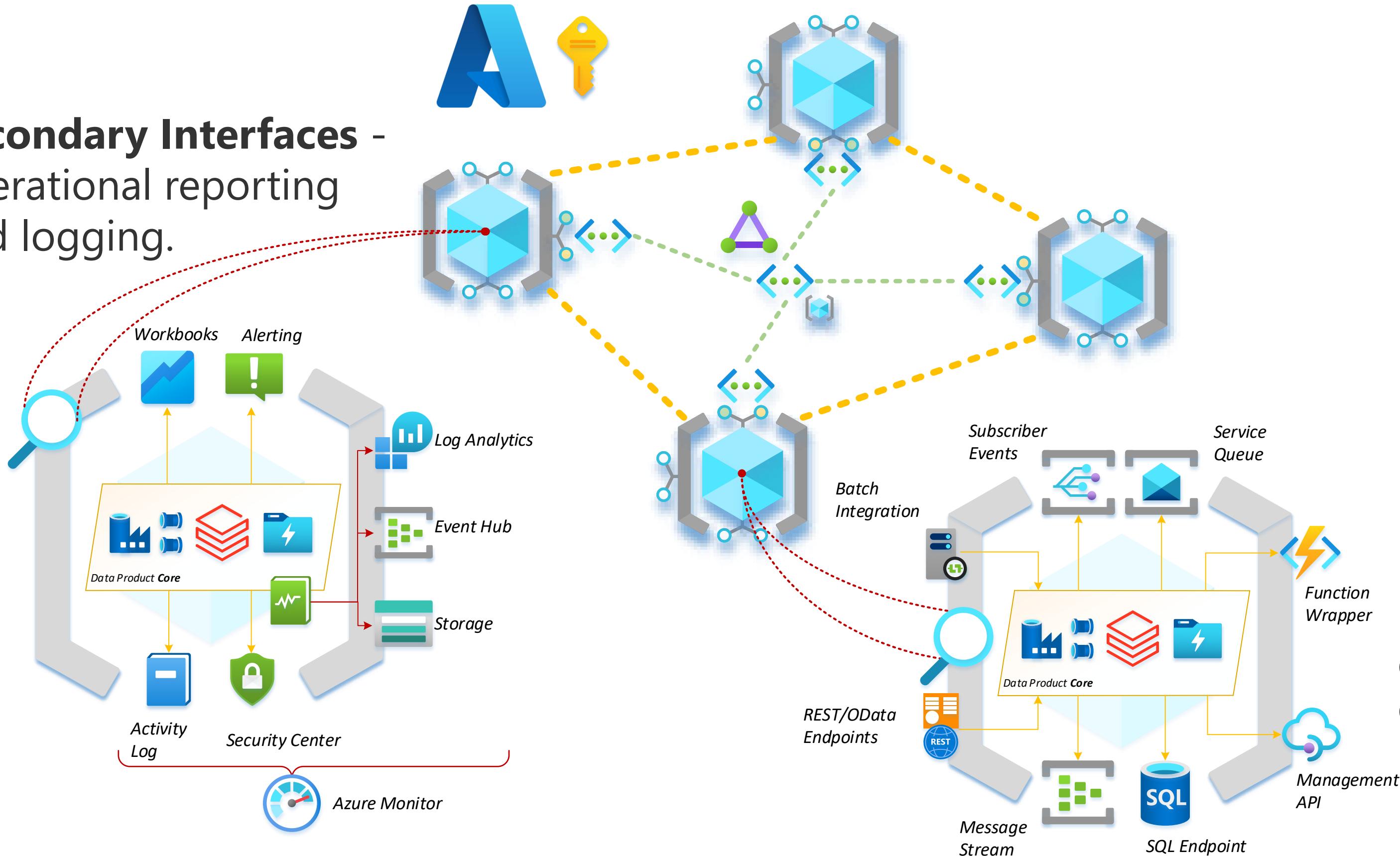


Q4: Should all Data Mesh capabilities be decentralised?

Data Products - Azure Secondary Interfaces



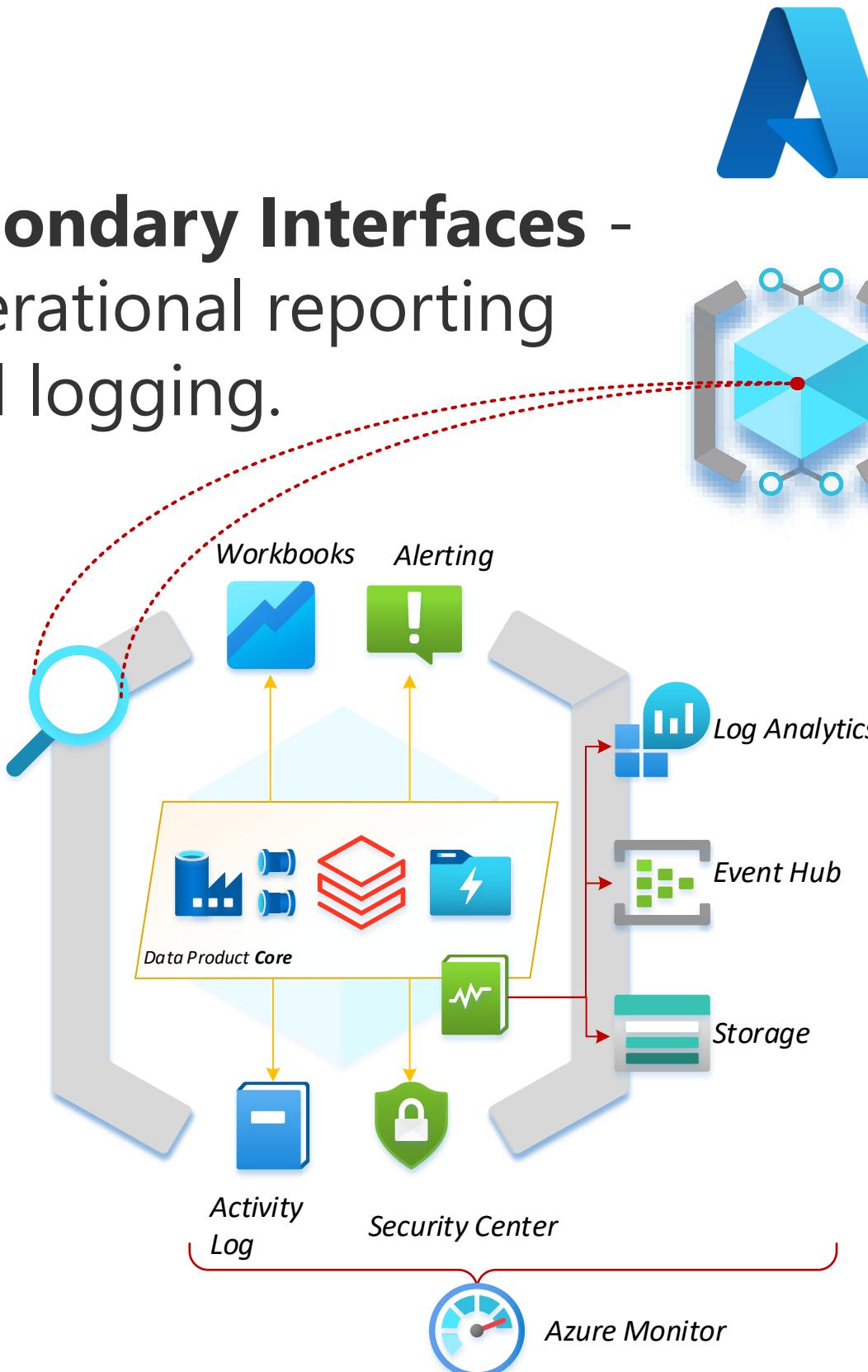
Secondary Interfaces -
operational reporting
and logging.



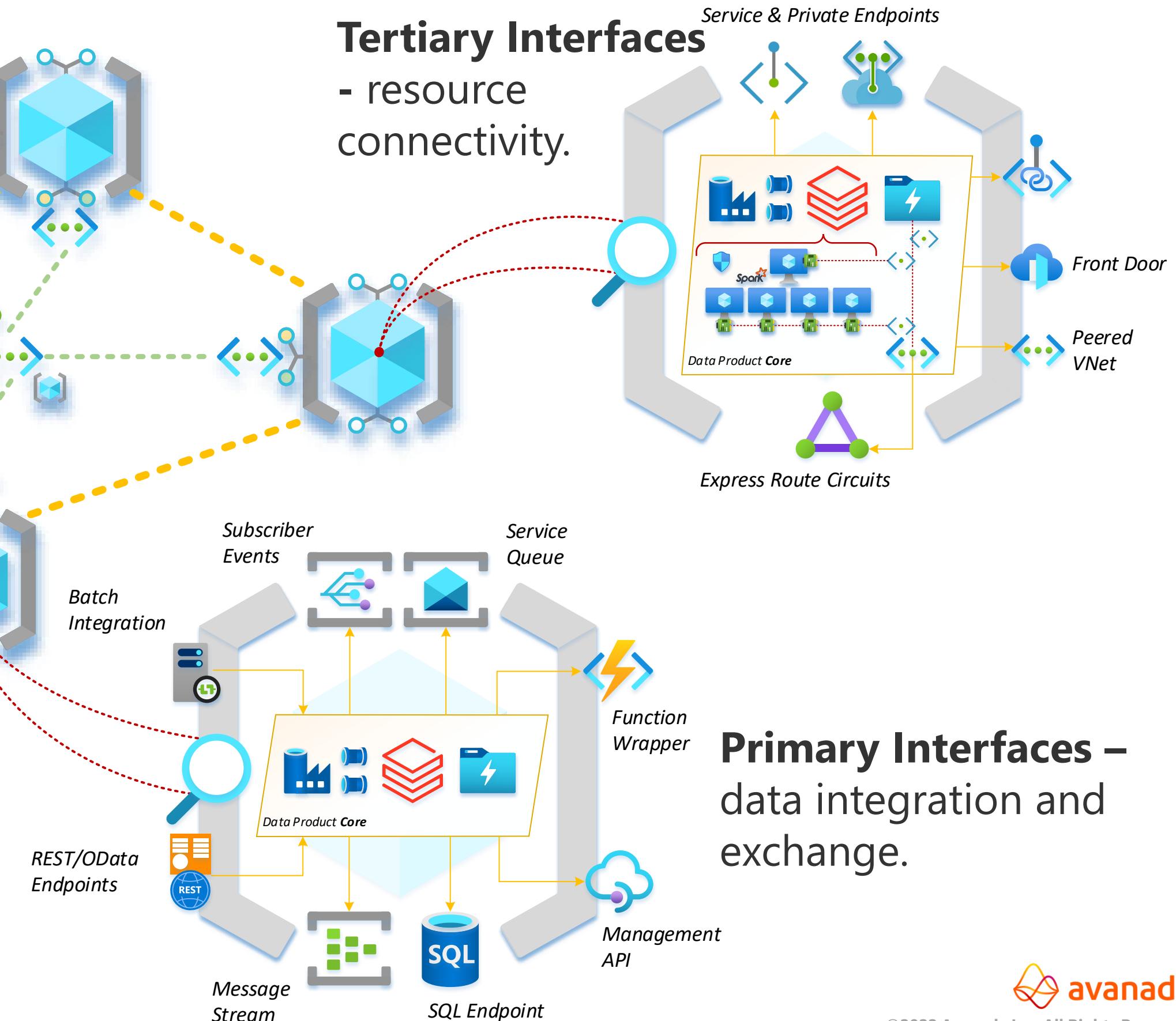
Primary Interfaces –
data integration and
exchange.

Data Products - Azure Tertiary Interfaces

Secondary Interfaces - operational reporting and logging.

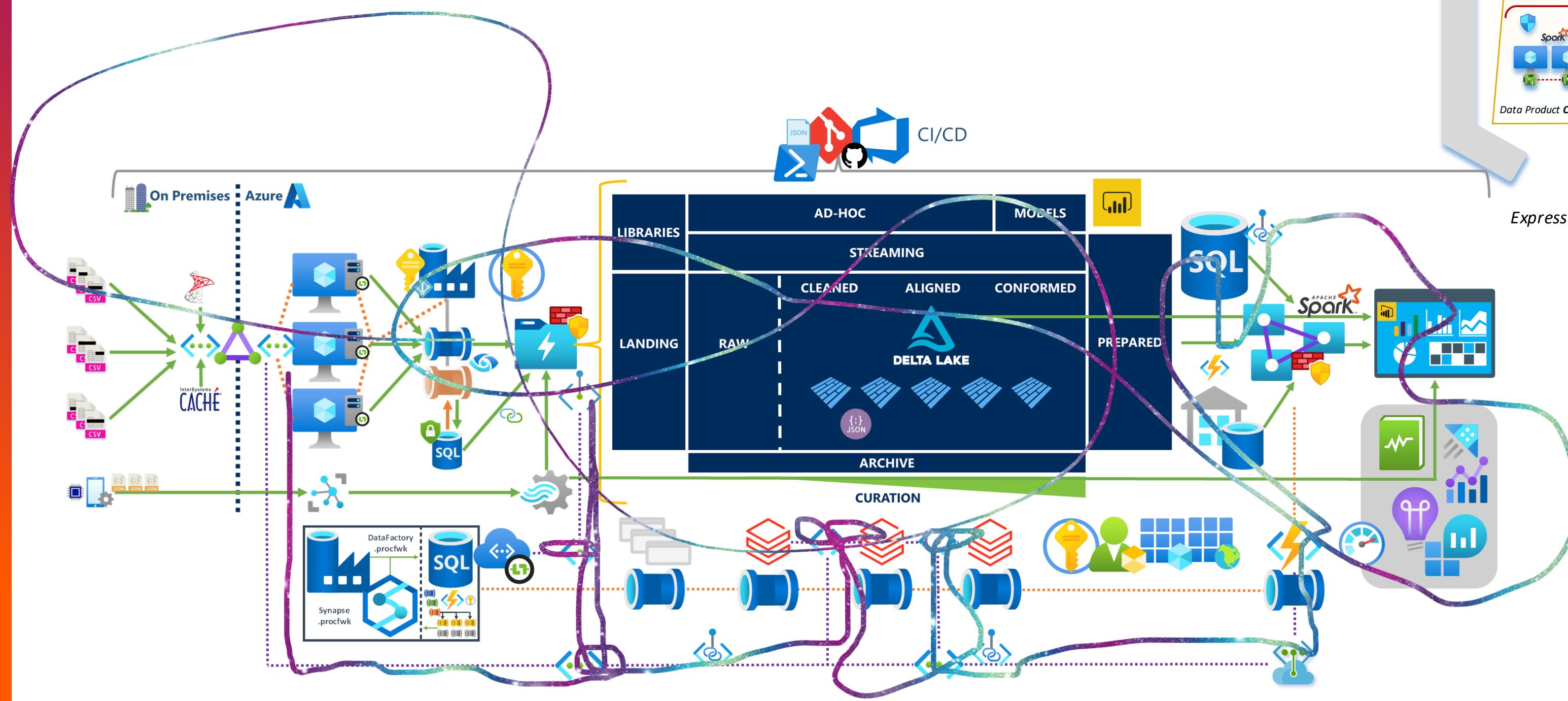


Tertiary Interfaces - resource connectivity.

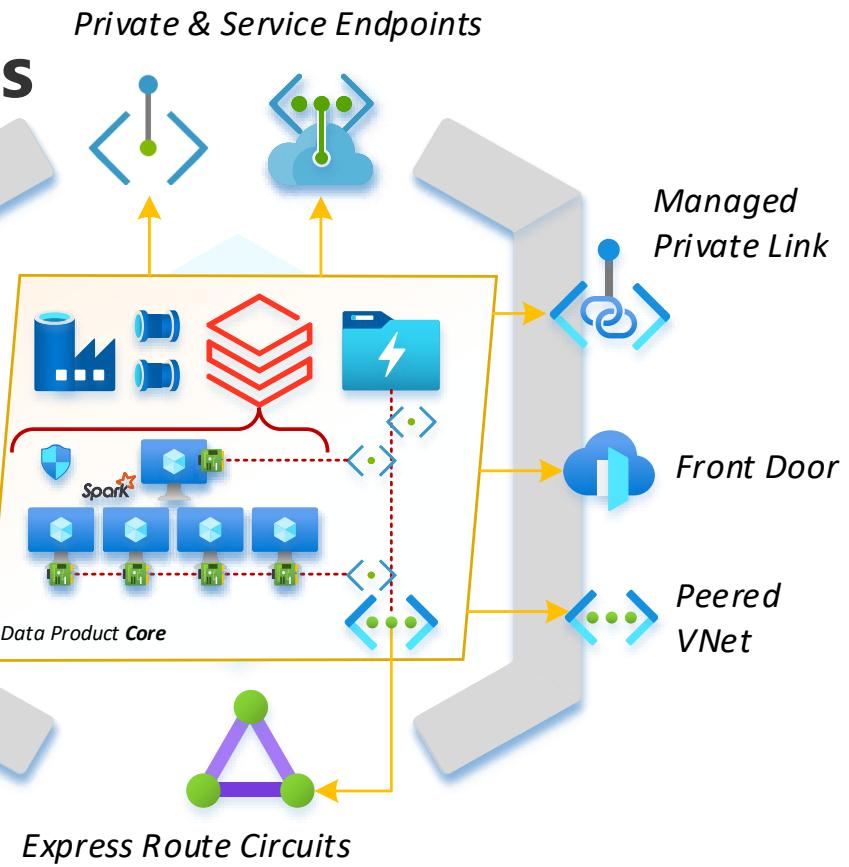


Primary Interfaces – data integration and exchange.

Data Products - Azure Tertiary Interfaces

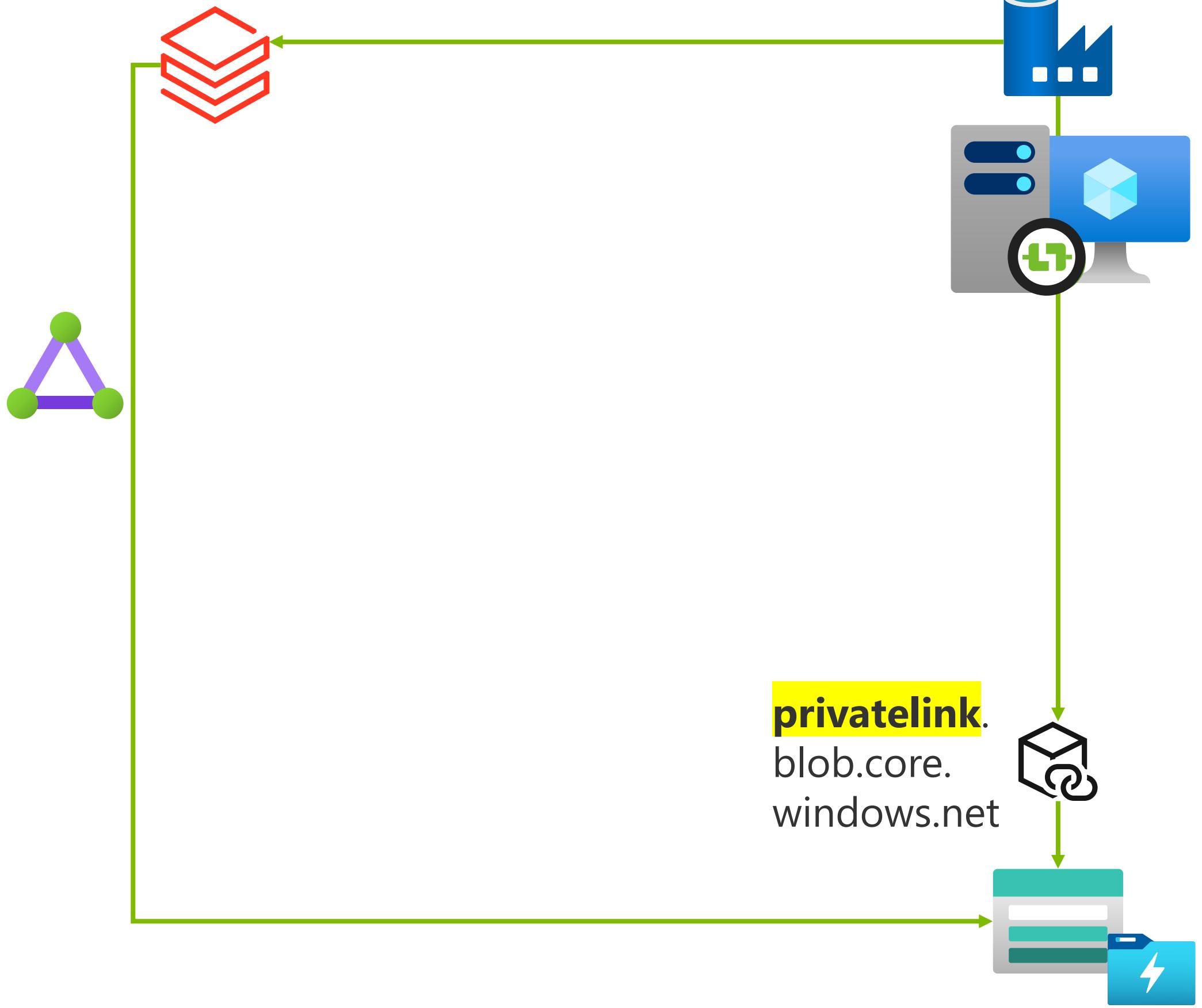


Tertiary Interfaces
- resource connectivity.



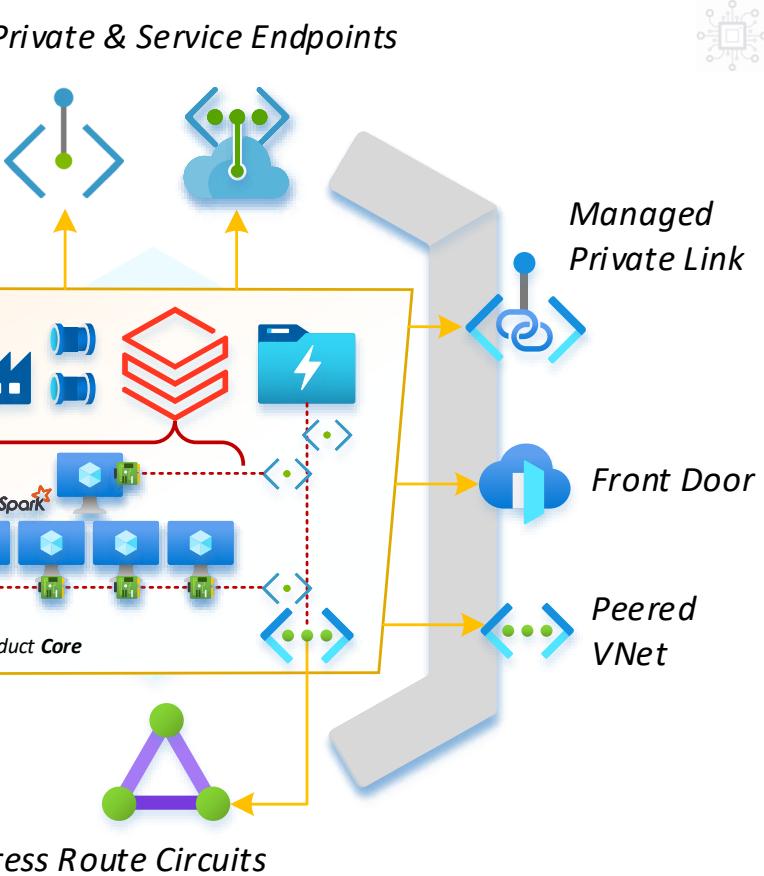
Data Products - Azure Interfaces

VNets



Tertiary Interfaces

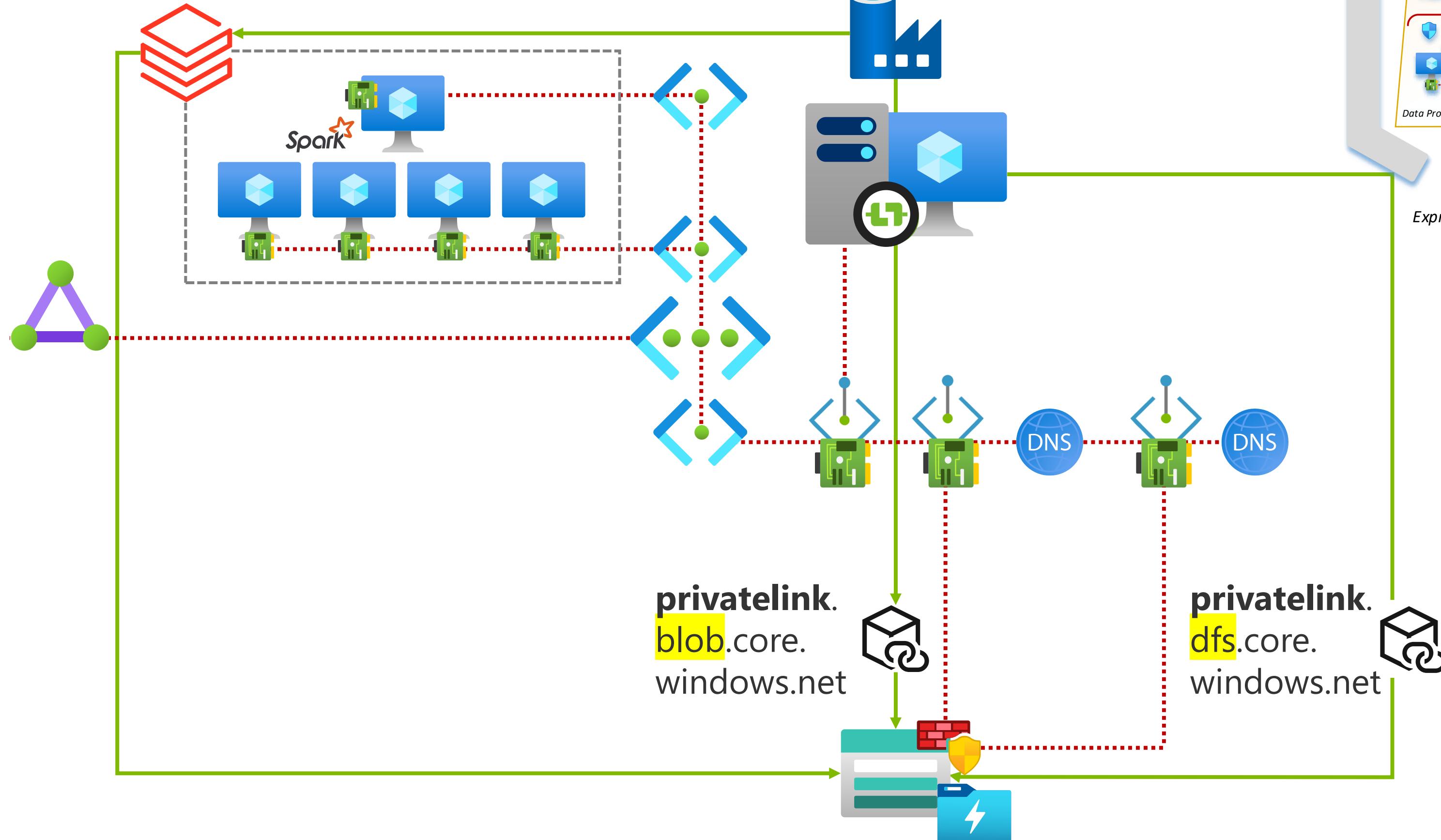
- resource connectivity.



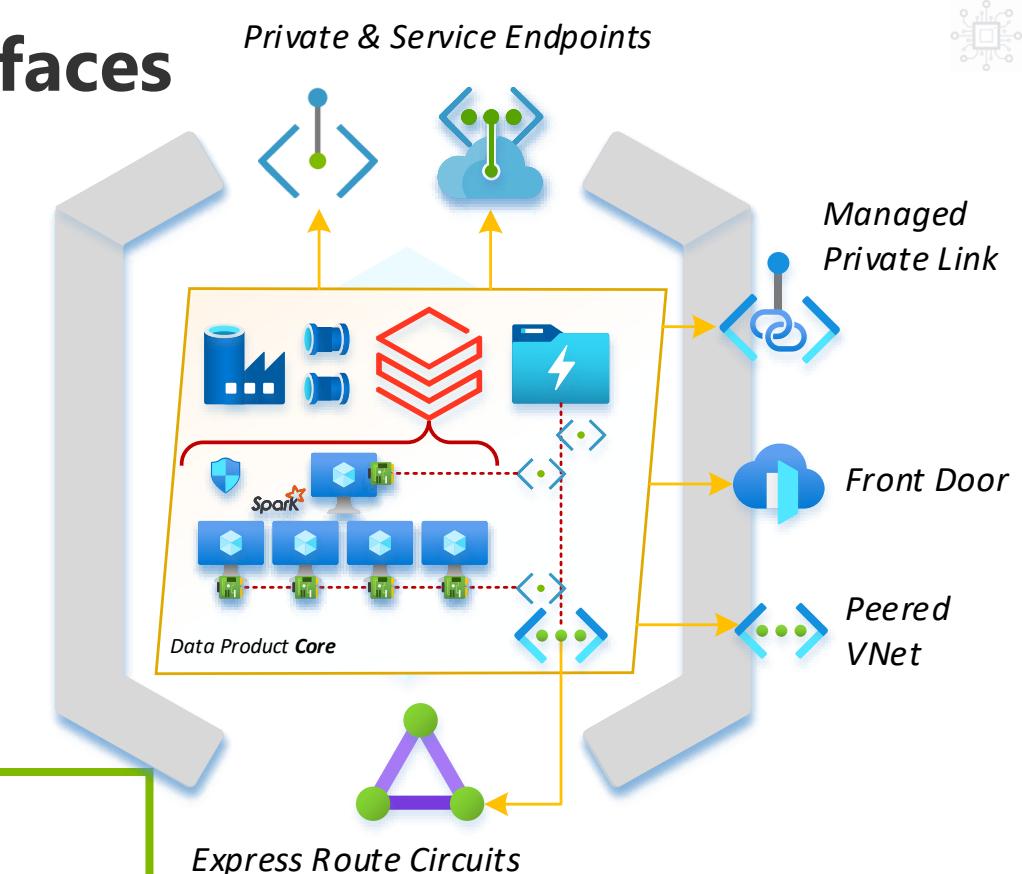


Data Products - Azure Interfaces

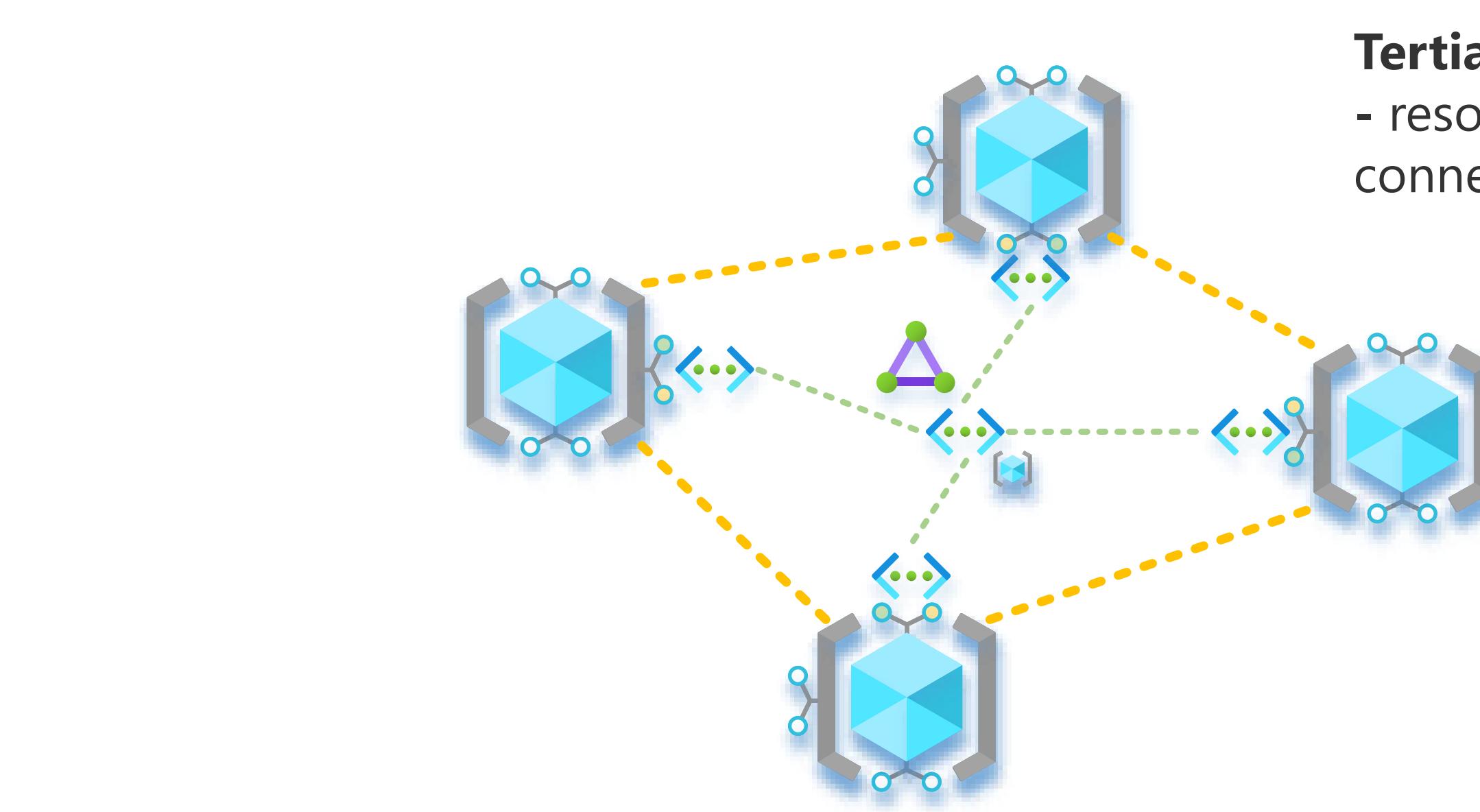
VNets



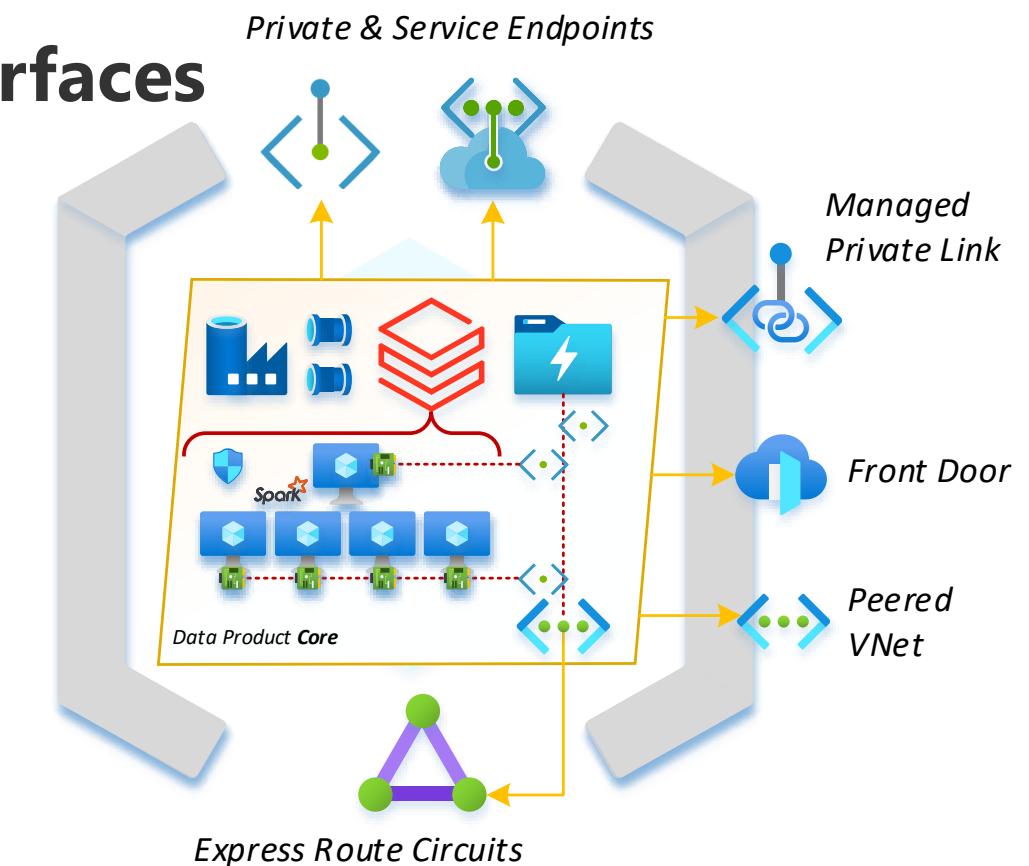
Tertiary Interfaces
- resource connectivity.



Data Products - Azure Tertiary Interfaces



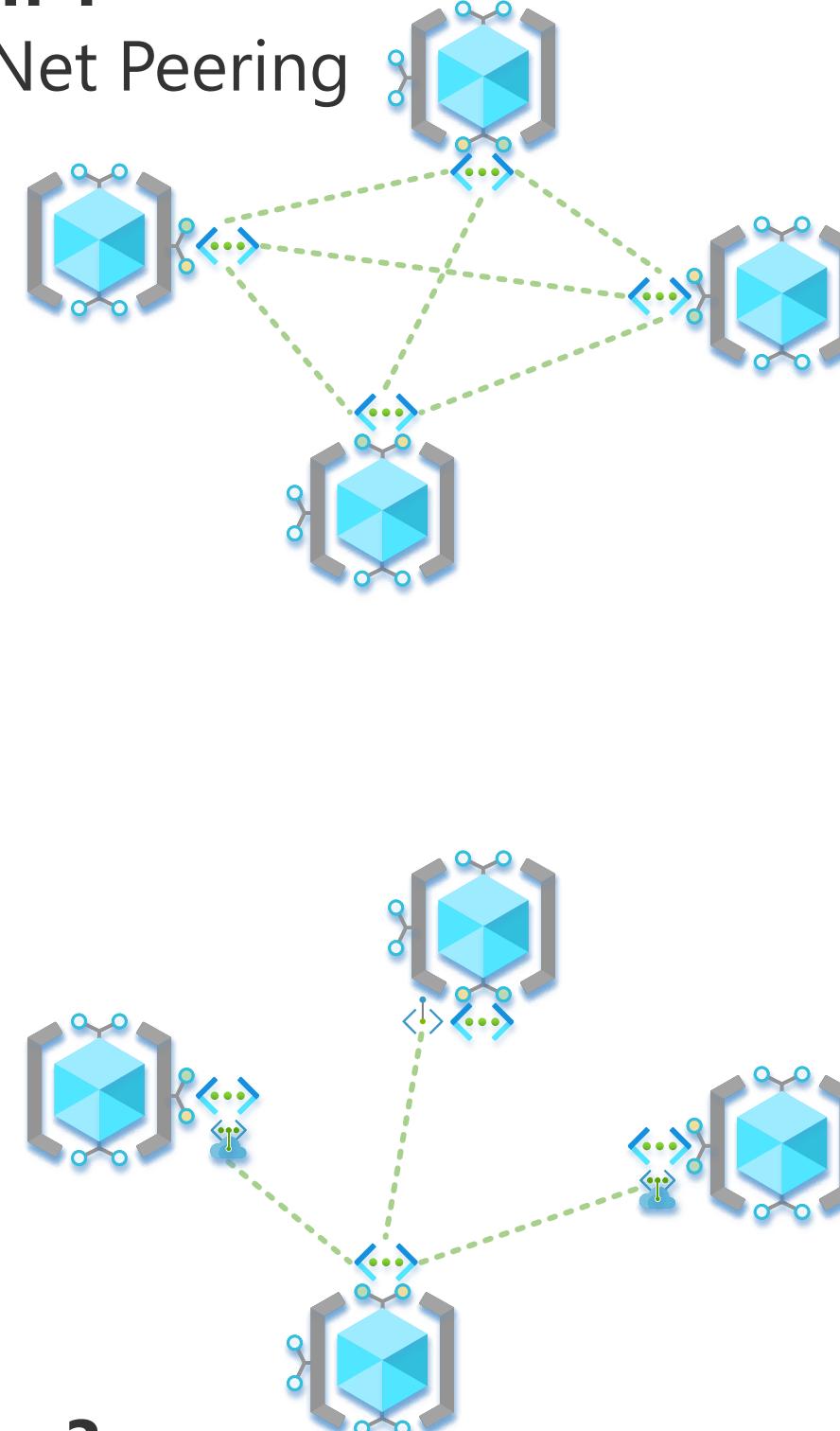
Tertiary Interfaces
- resource
connectivity.



Data Products - Azure Tertiary Interfaces

Option 1

Full VNet Peering



Option 3

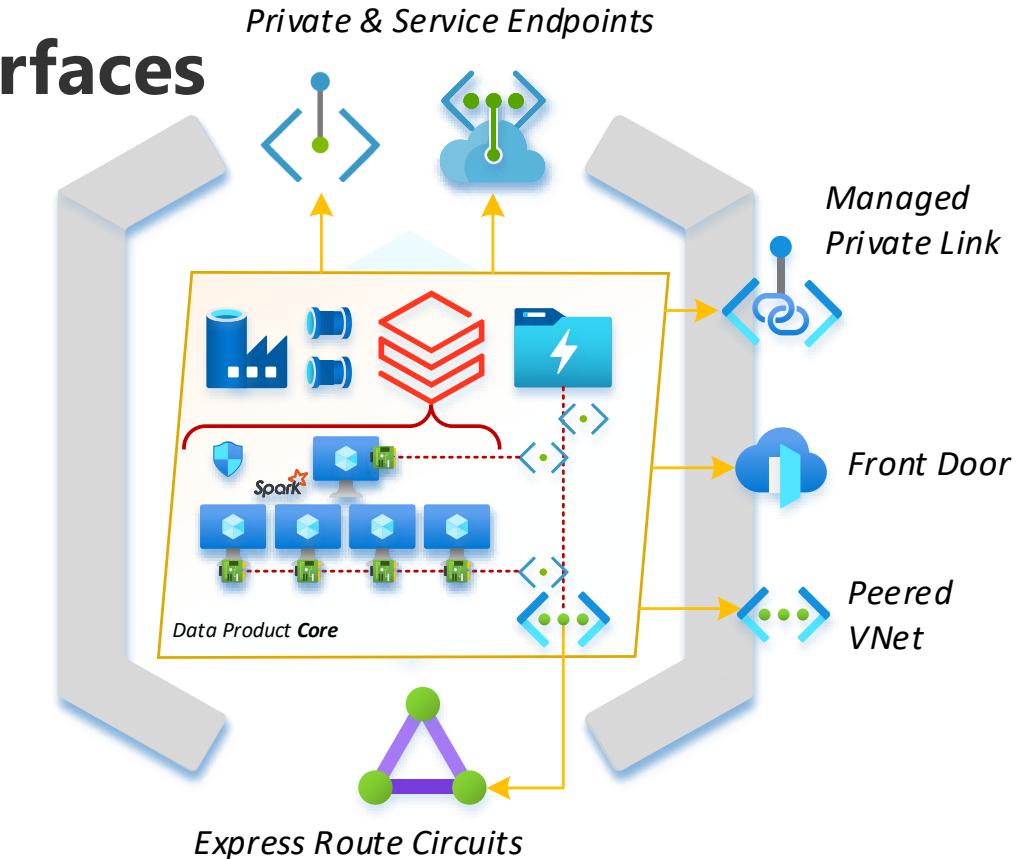
Targeted Service/Private Endpoints



Option 2

Hub and Spoke VNet Peering

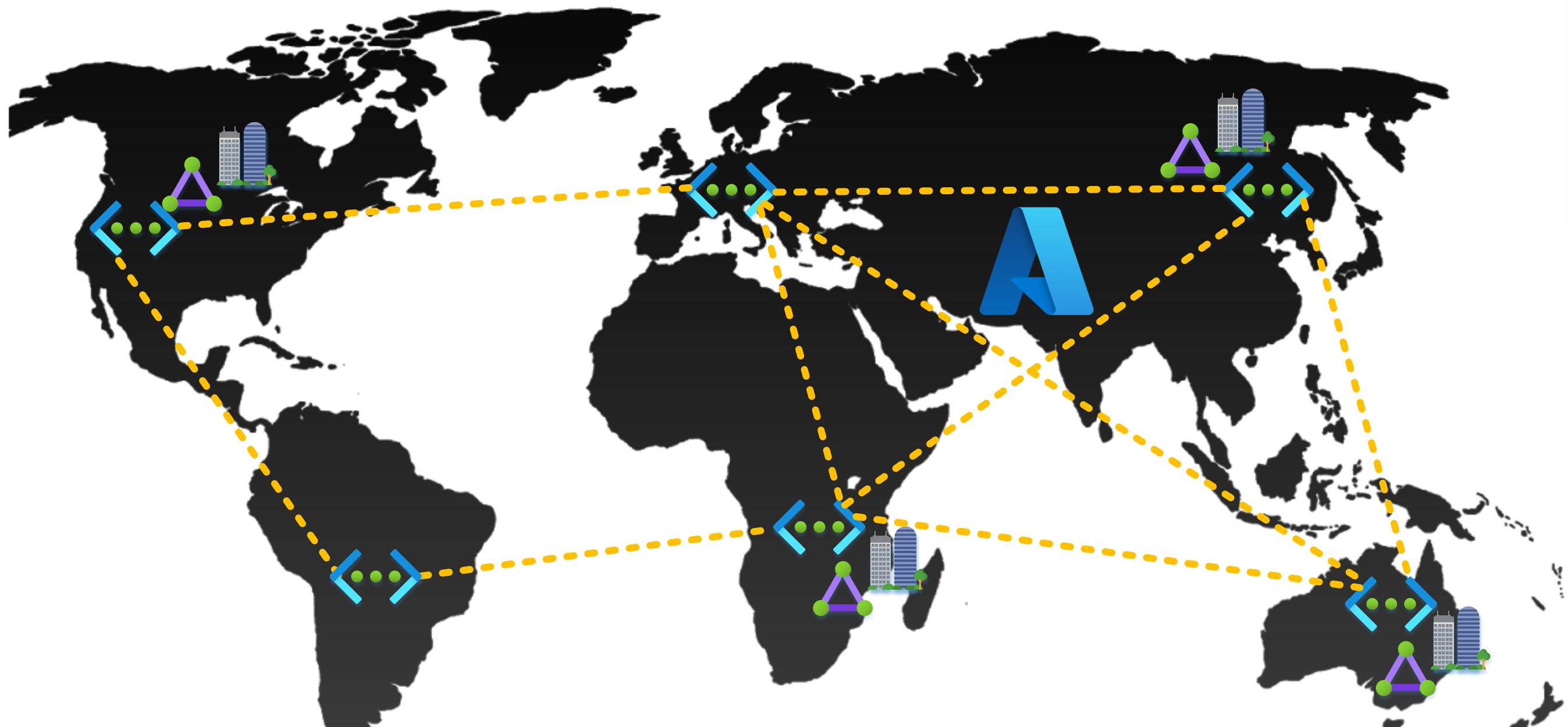
Tertiary Interfaces
- resource connectivity.



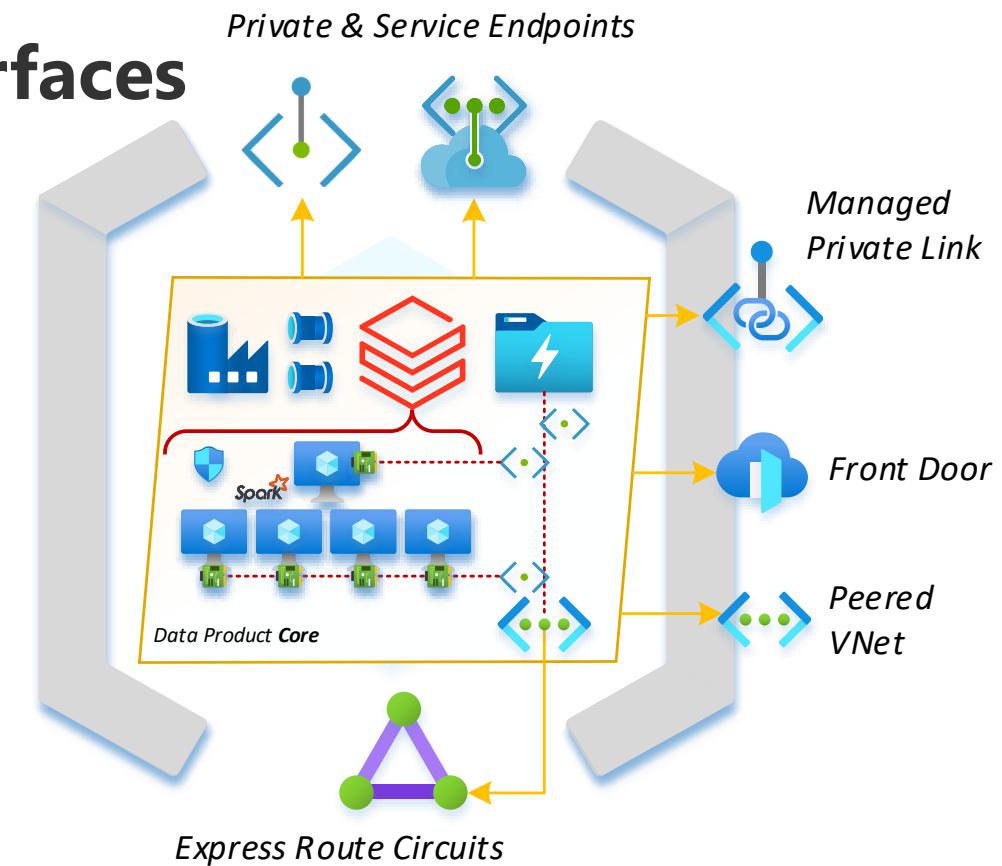
Other Options

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

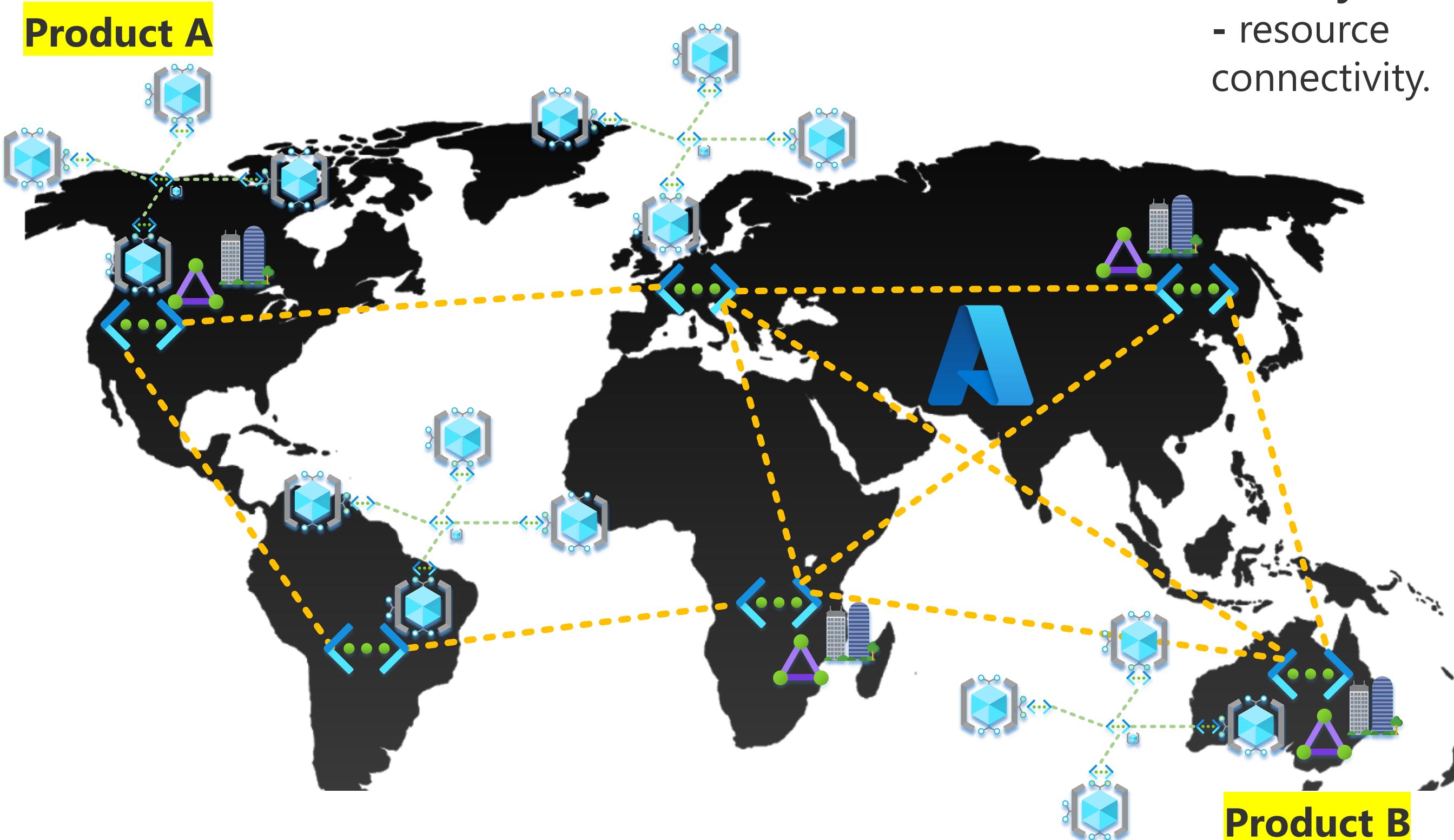
Data Products - Azure Tertiary Interfaces



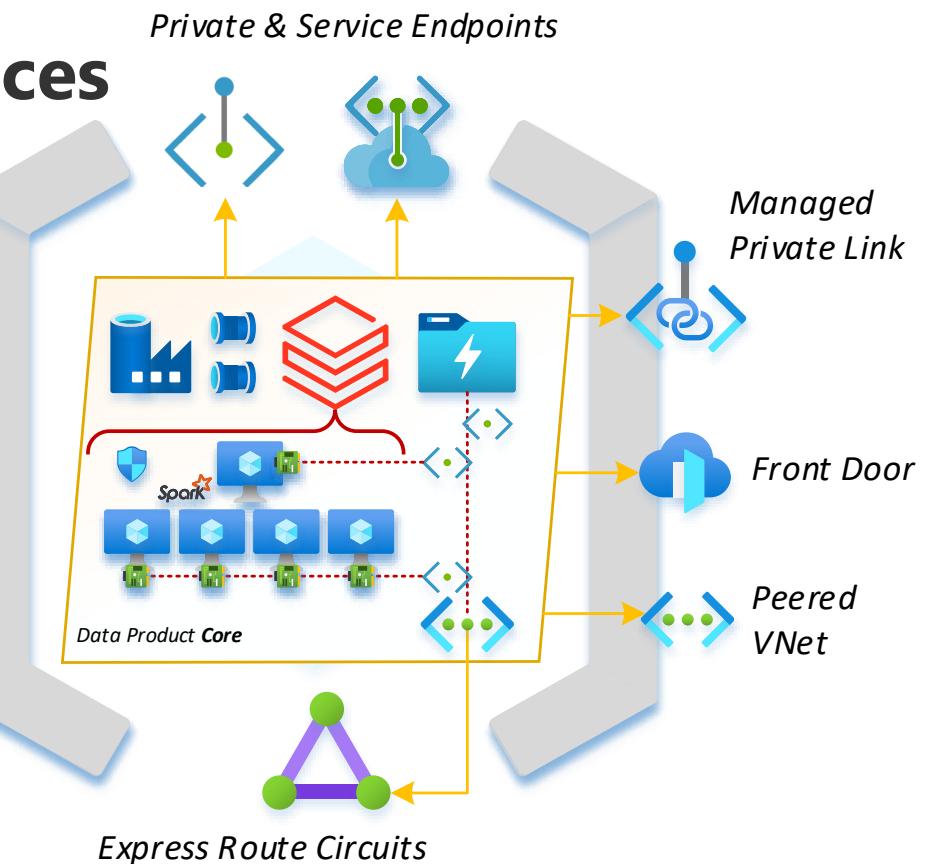
Tertiary Interfaces
- resource connectivity.



Data Products - Azure Tertiary Interfaces

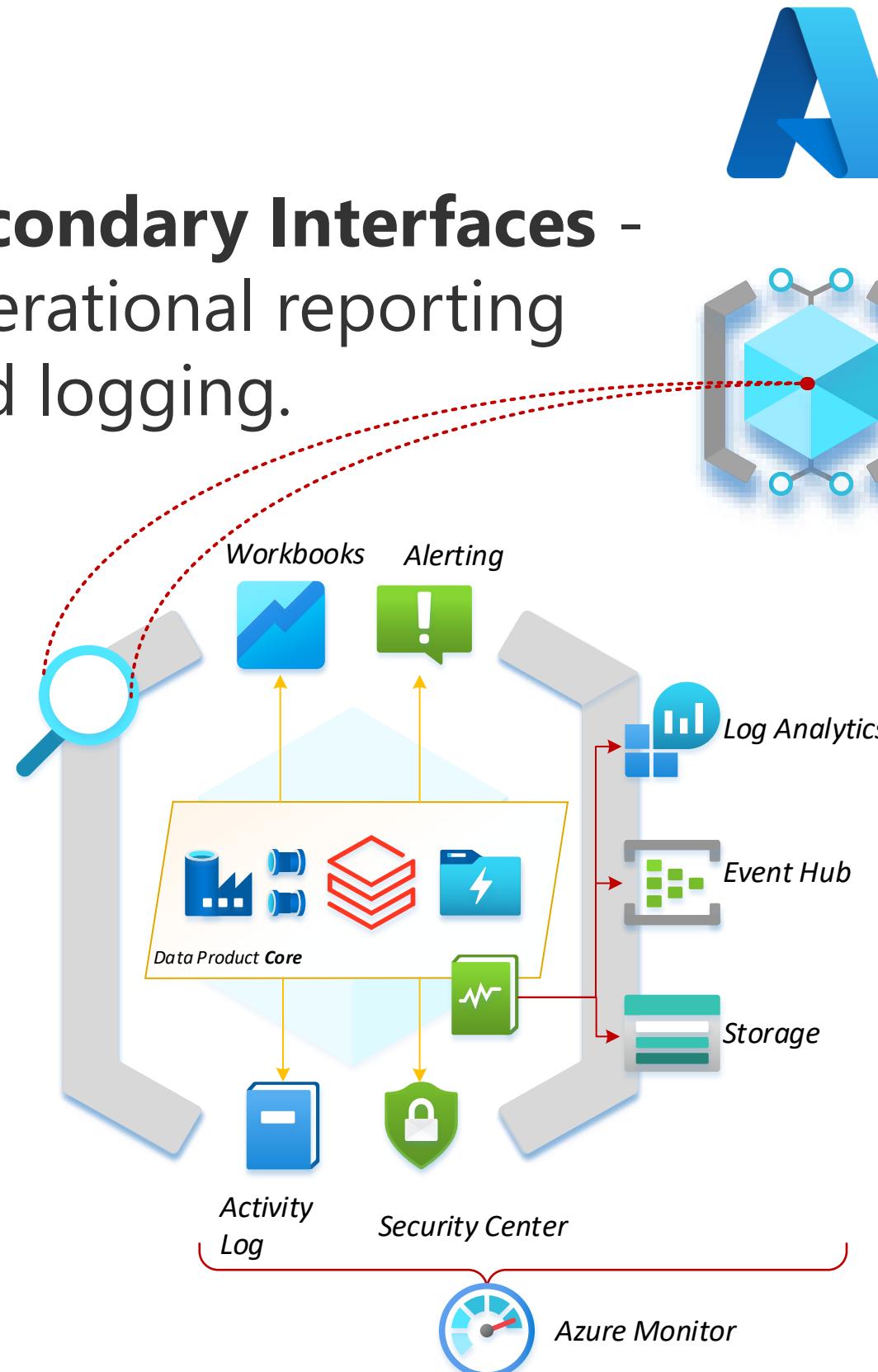


Tertiary Interfaces
- resource
connectivity.

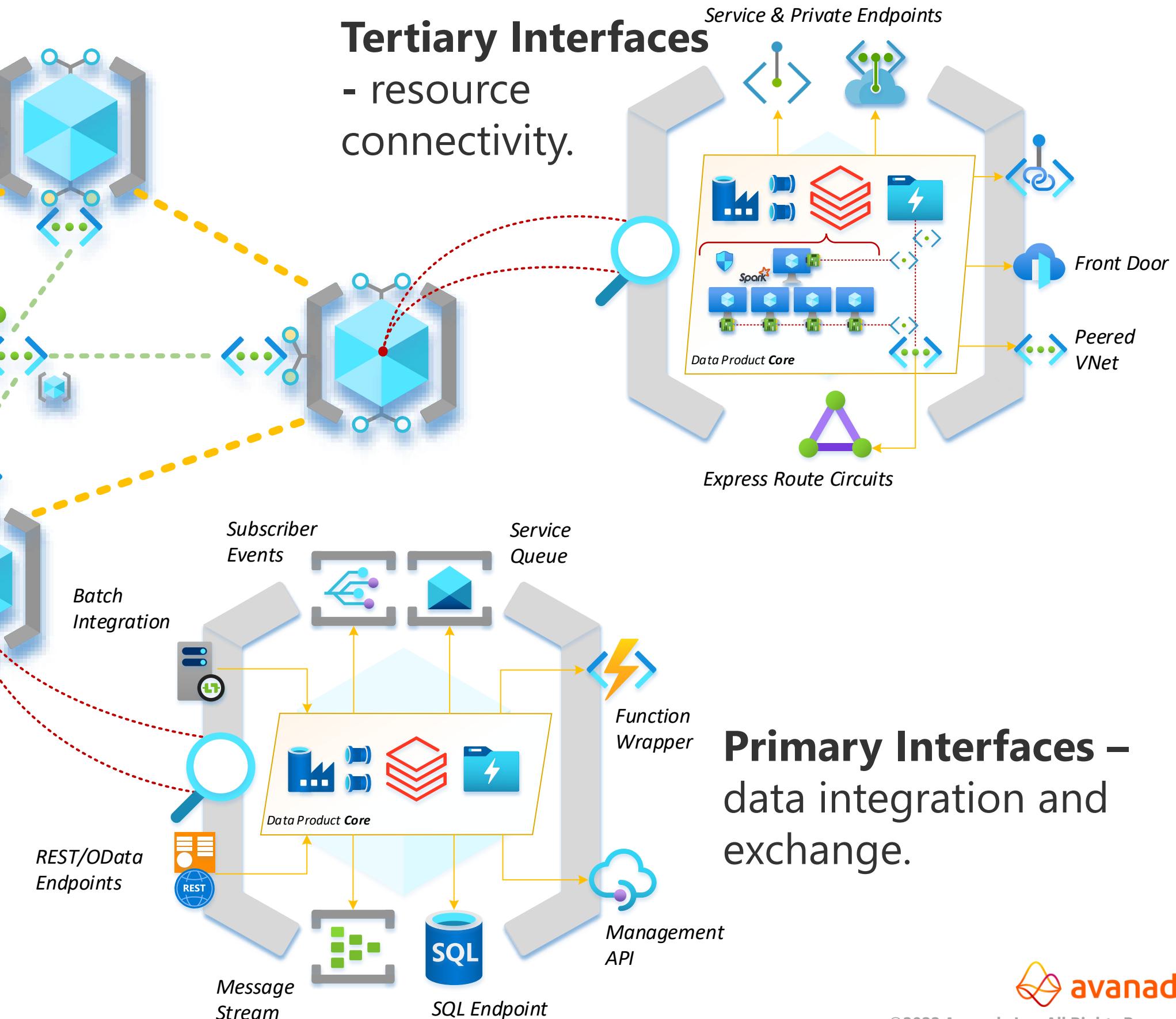


Data Products - Azure Interfaces

Secondary Interfaces - operational reporting and logging.



Tertiary Interfaces - resource connectivity.

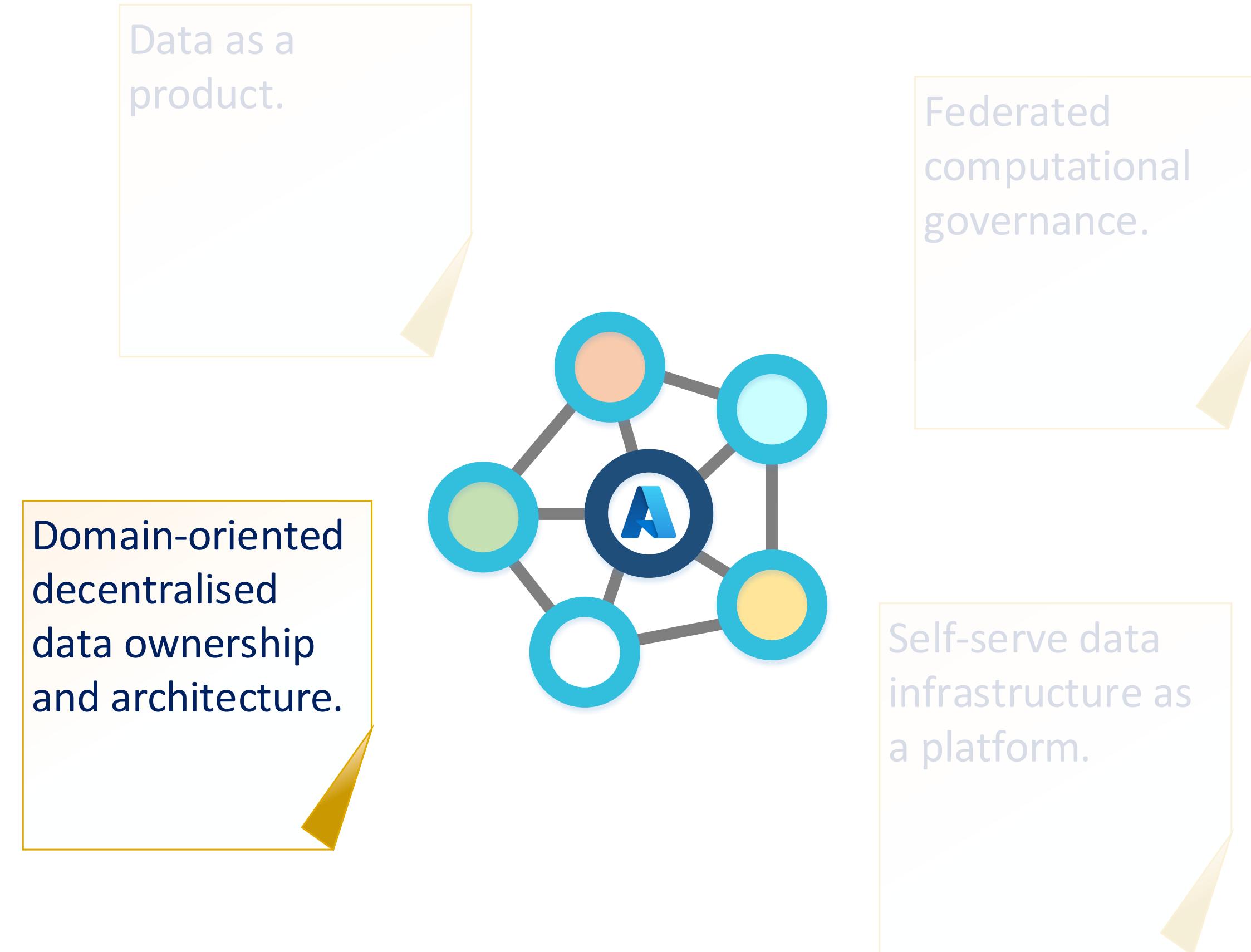


Primary Interfaces – data integration and exchange.



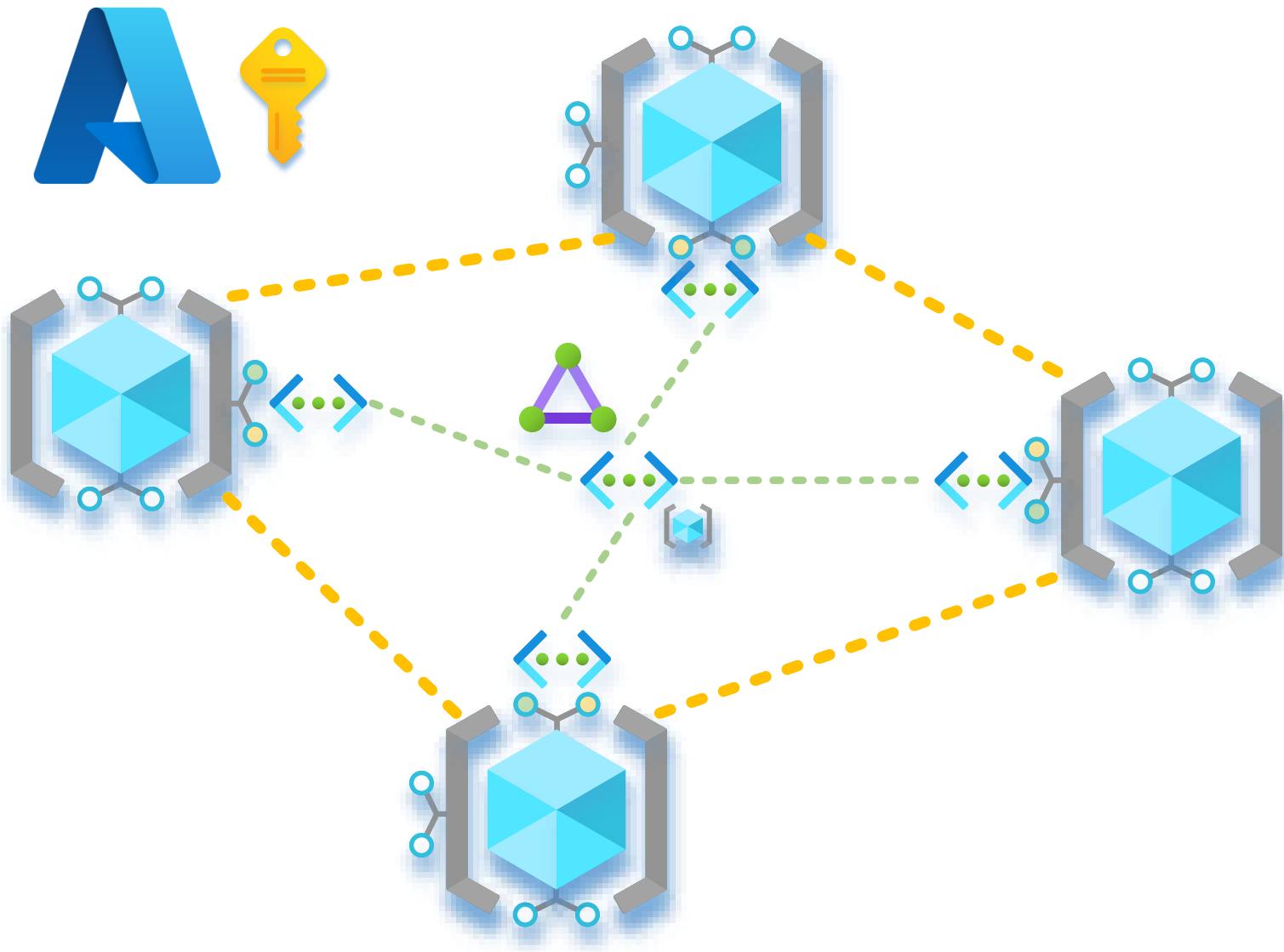
Data Mesh: *How...* *Domains*

Data Mesh Principals - Theory vs Practice



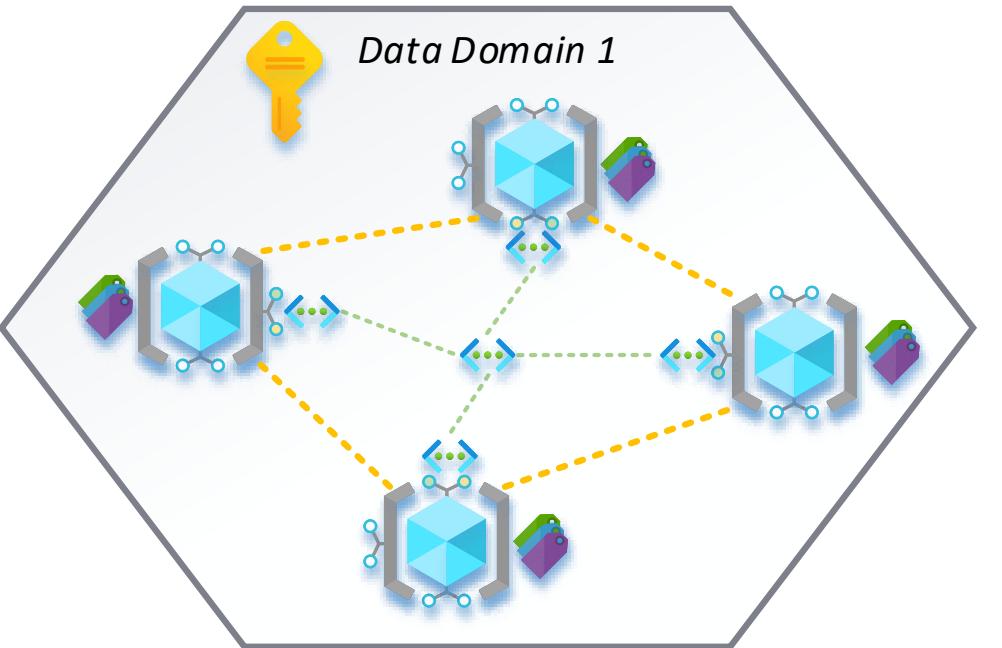


Data Domains in Azure



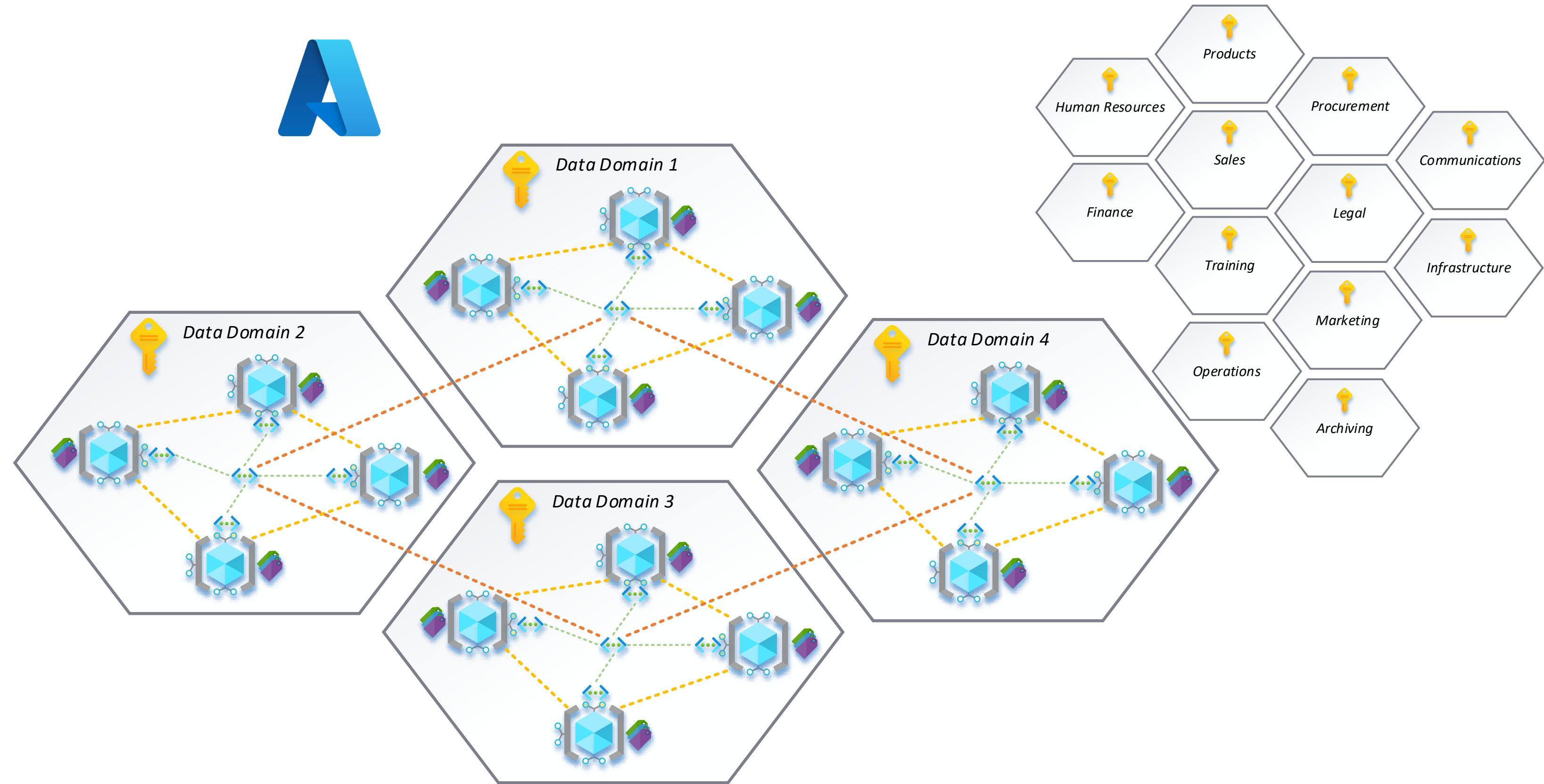


Data Domains in Azure



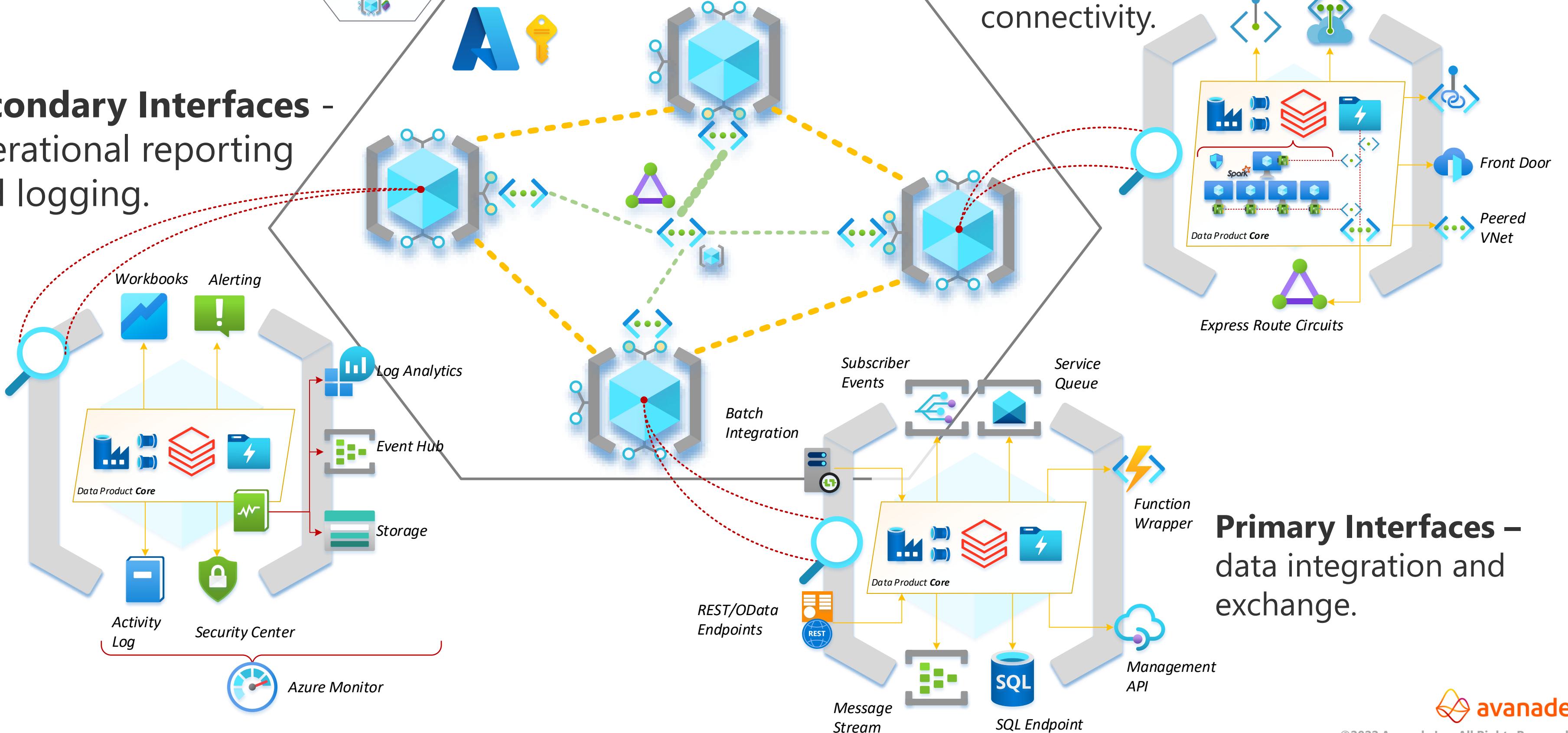


Data Domains in Azure



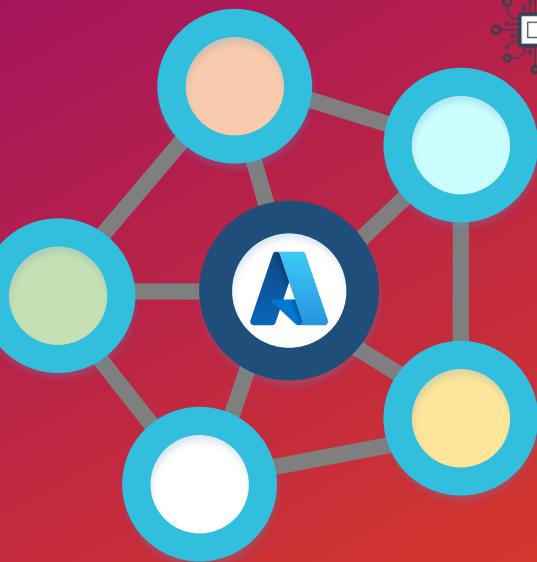
Data Mesh – Products & Domains

Secondary Interfaces – operational reporting and logging.



Tertiary Interfaces

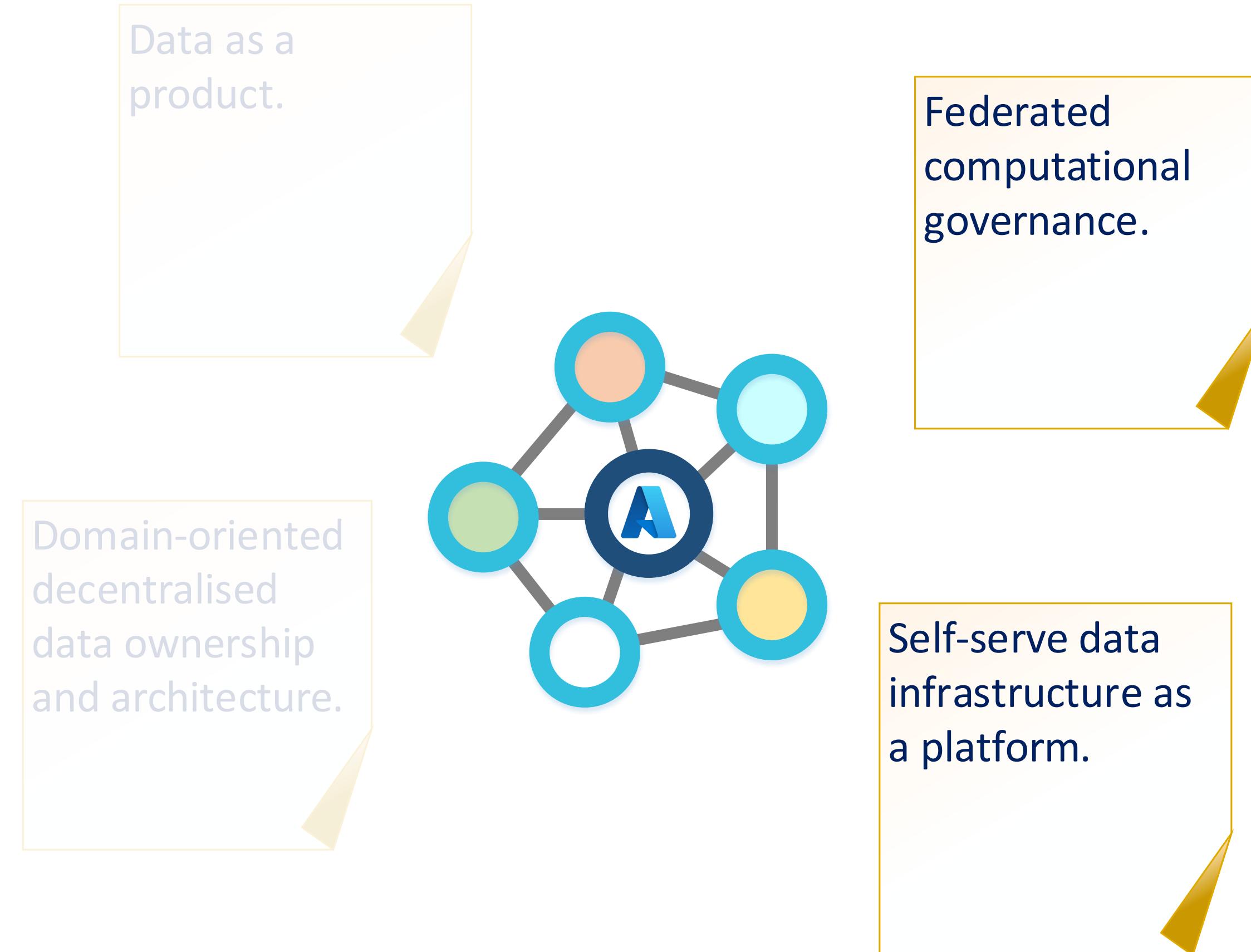
- resource connectivity.



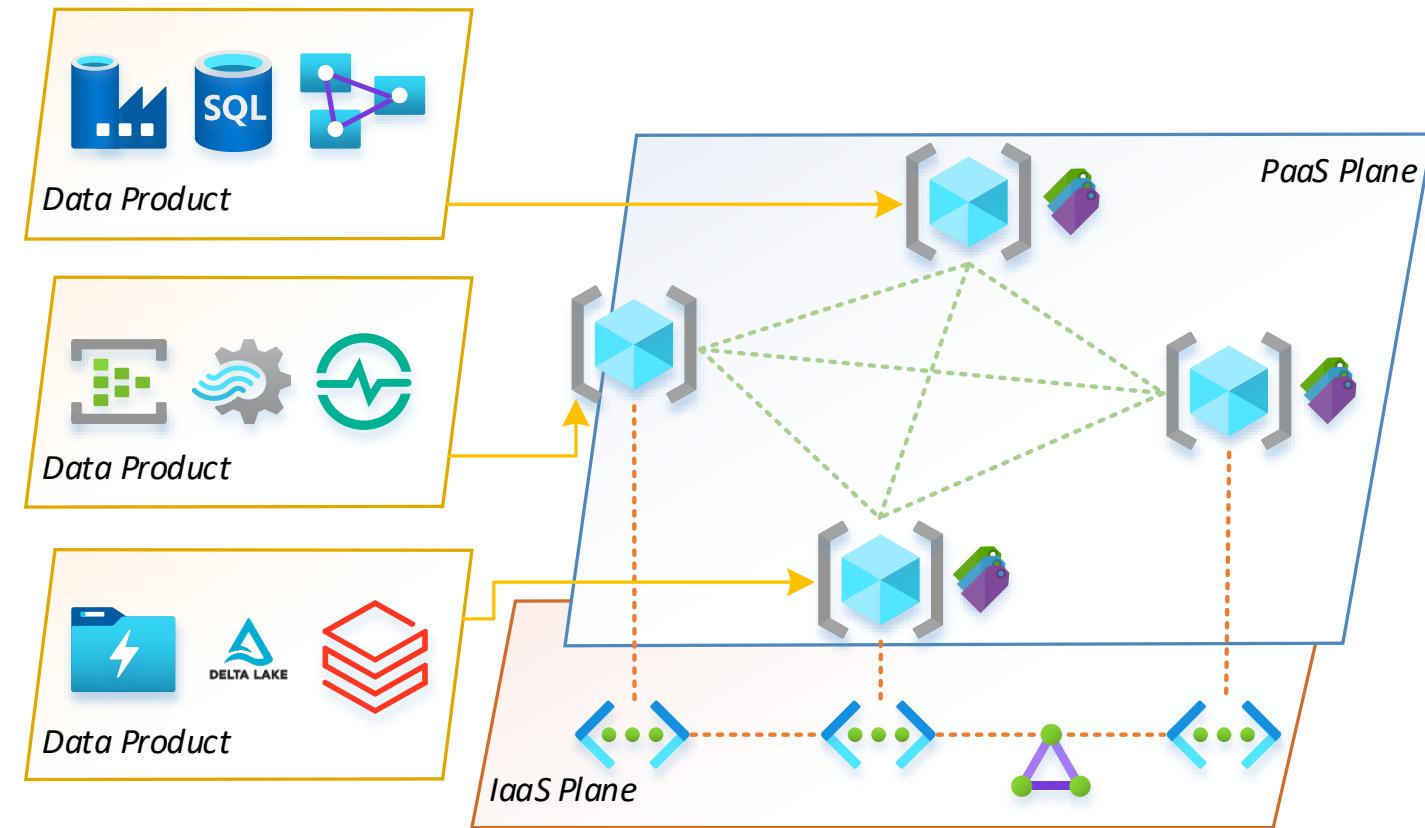
Data Mesh: *How...* *Governance & Planes*

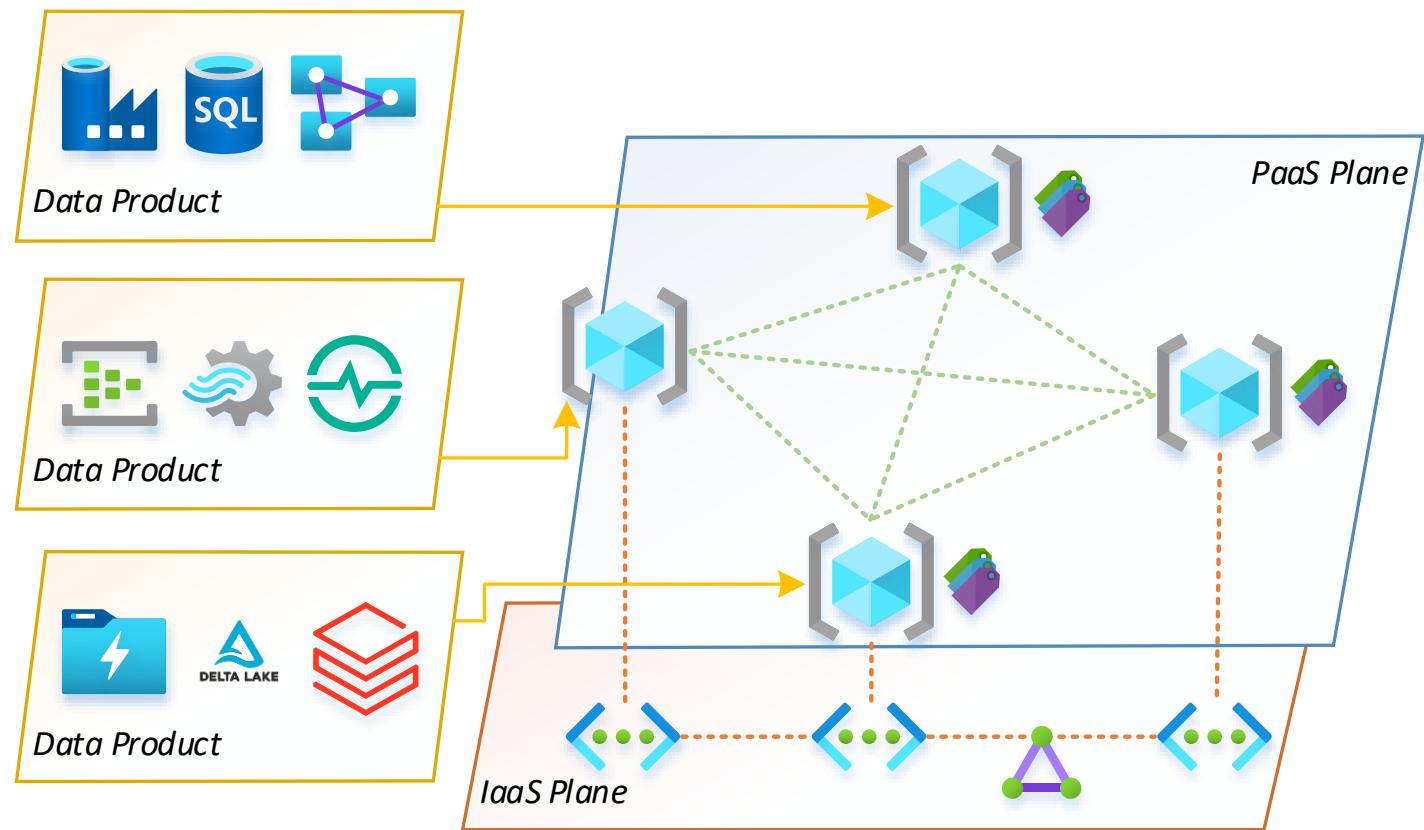
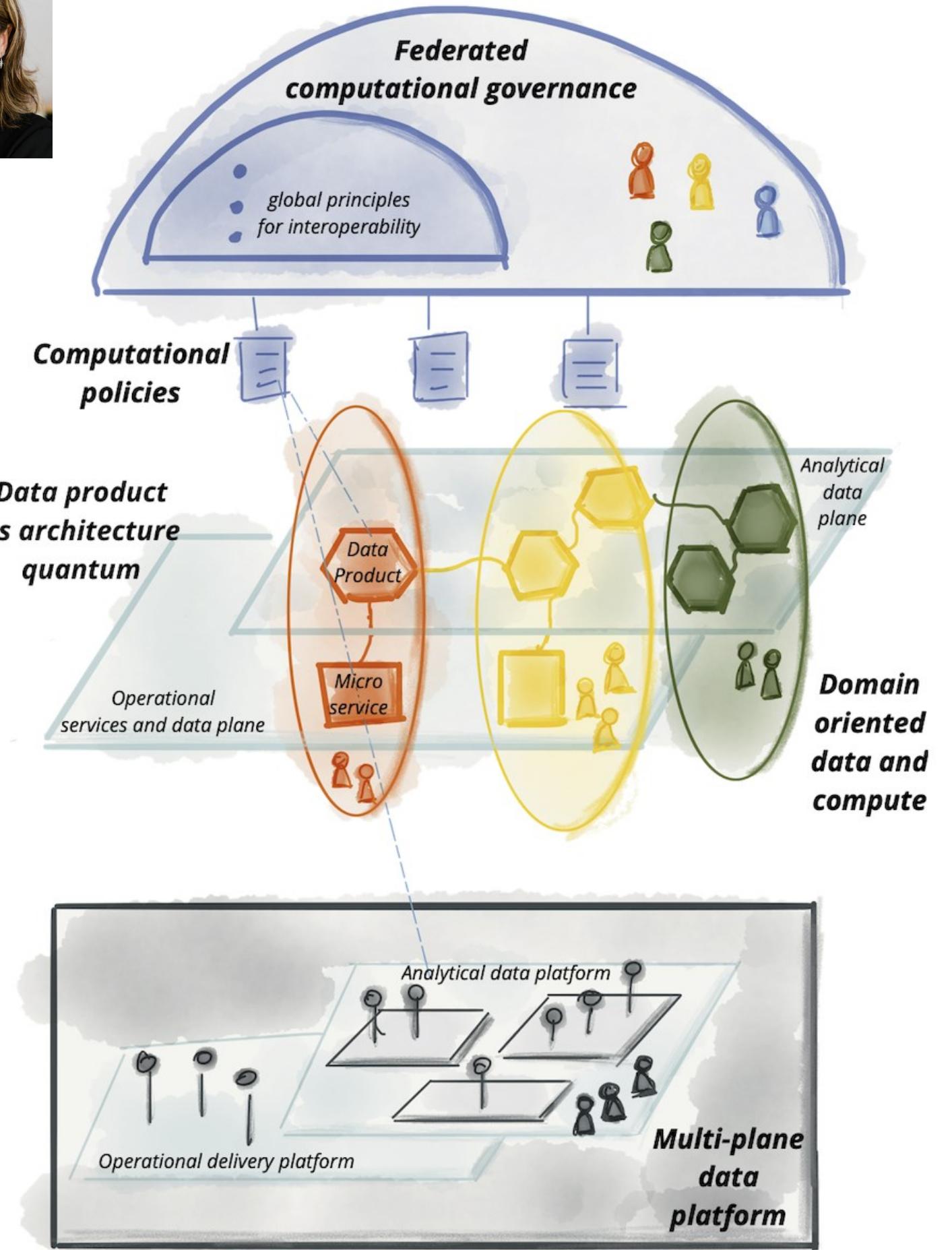


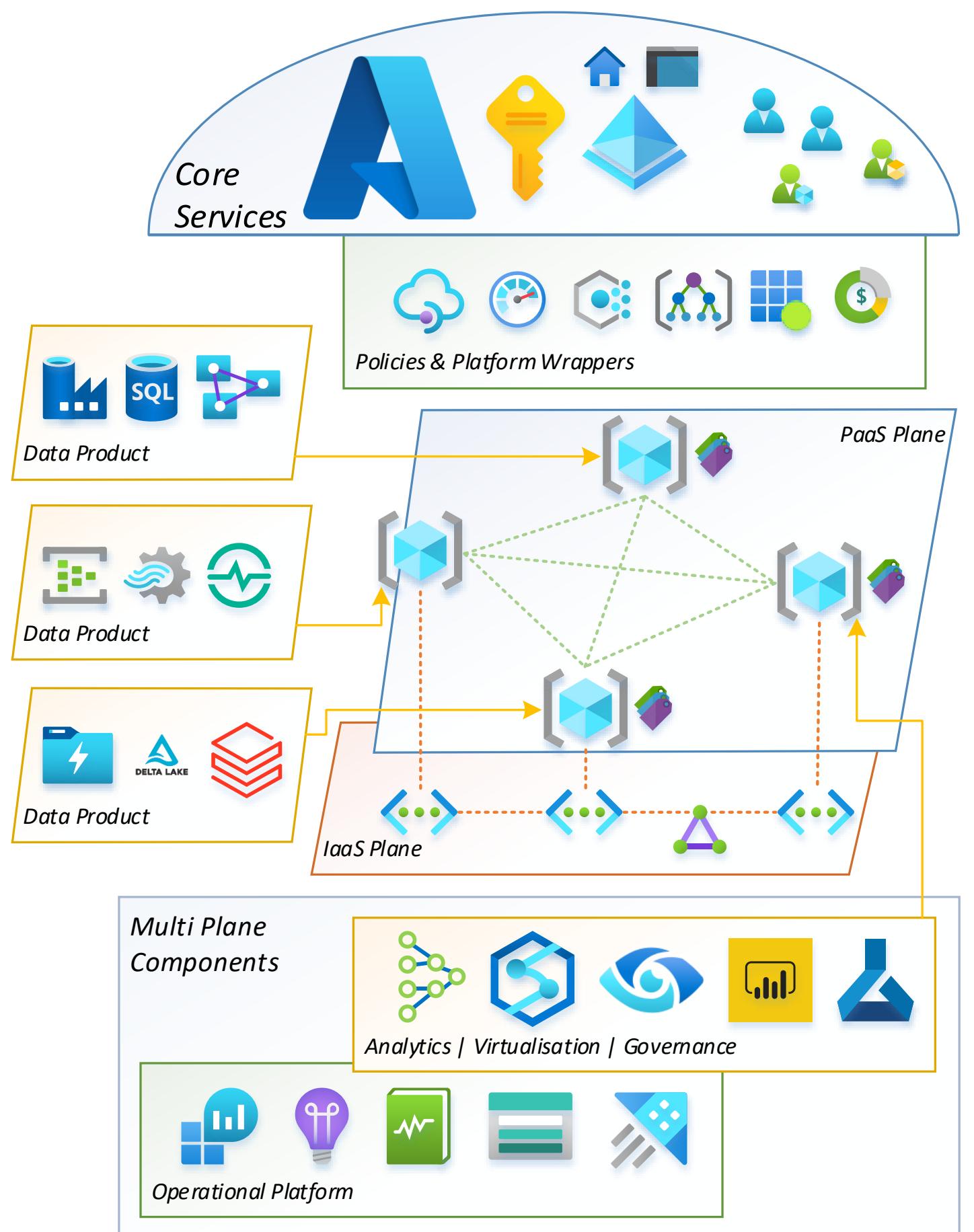
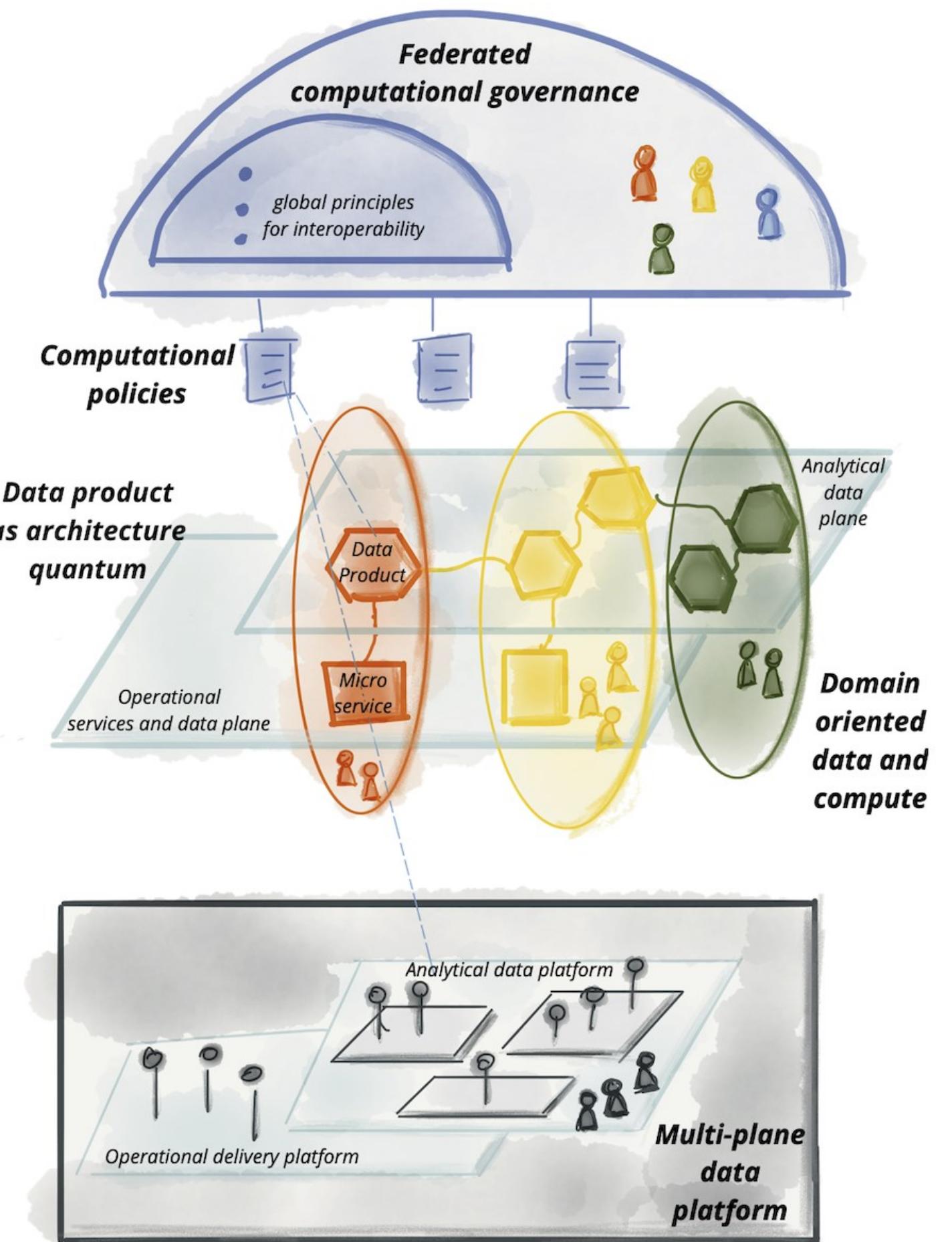
Data Mesh Principals - Theory vs Practice

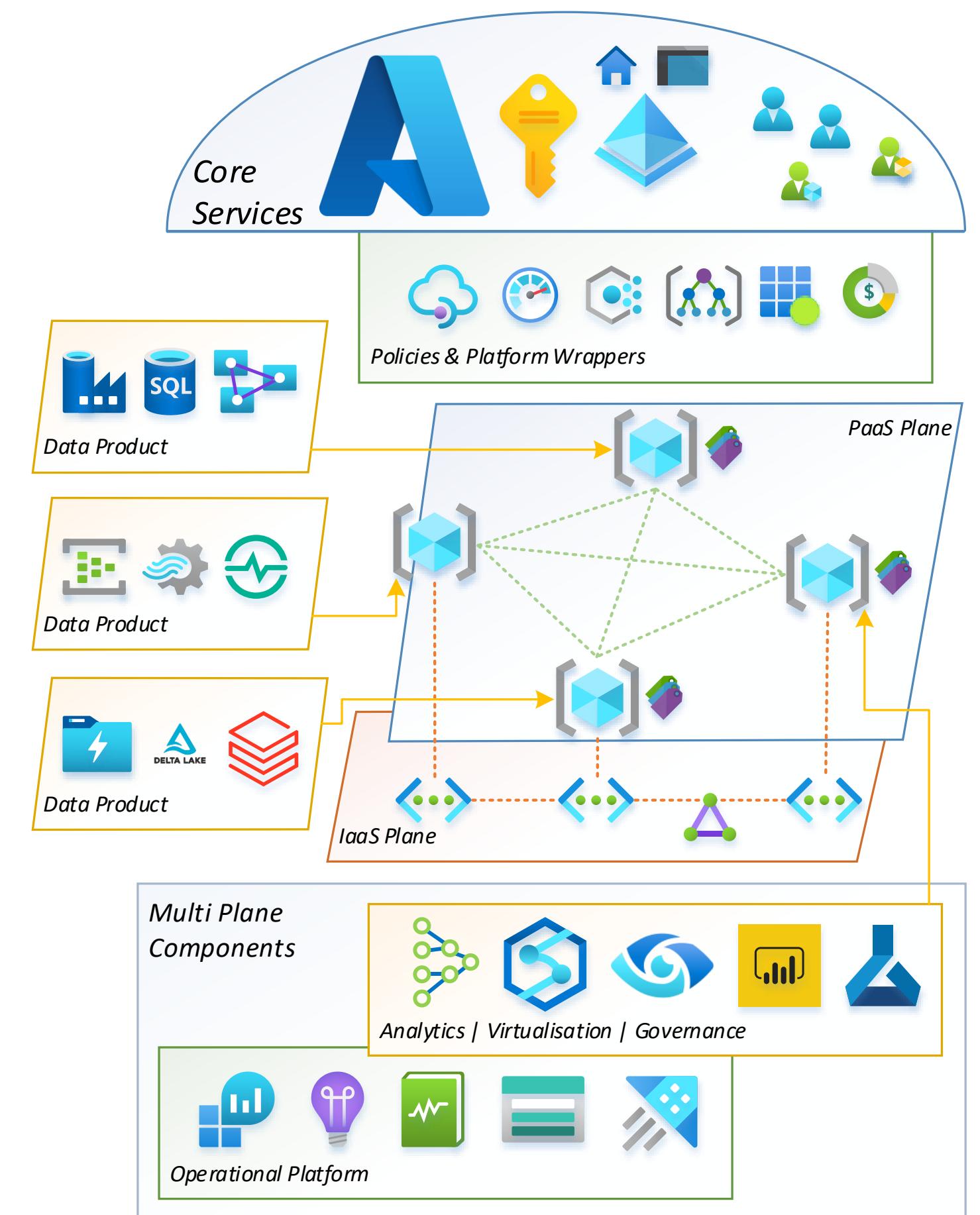


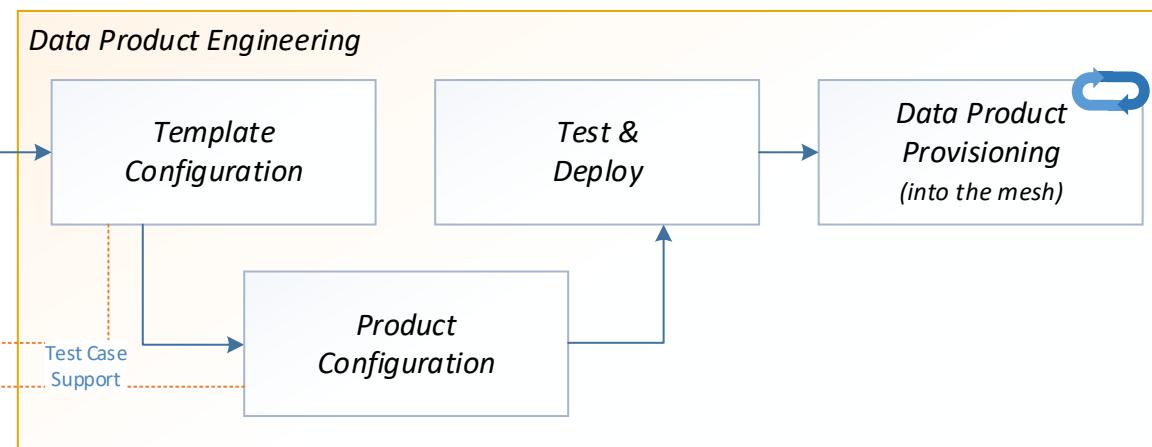
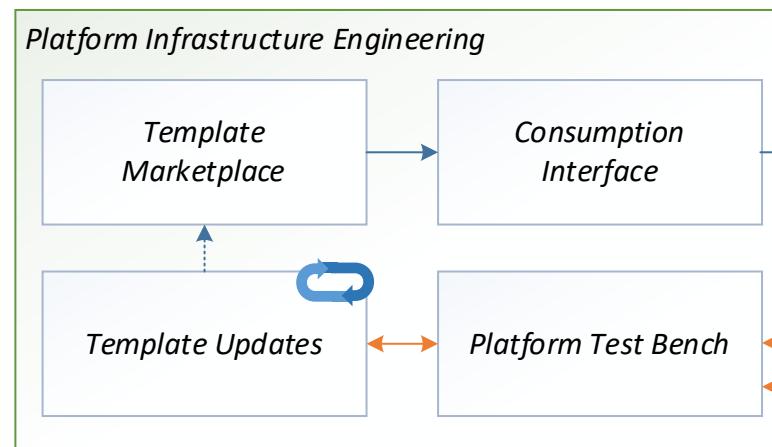
Data Mesh in Azure



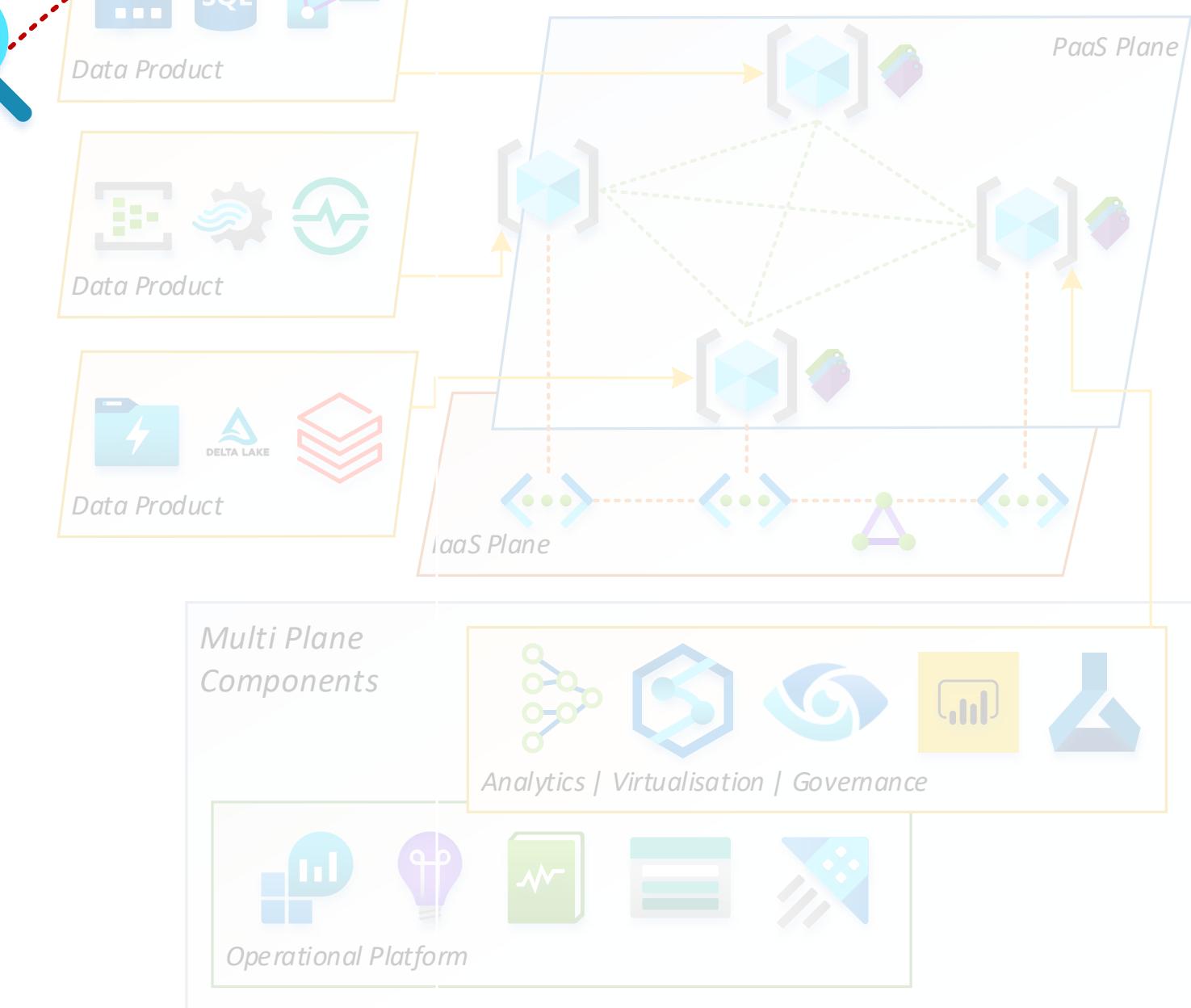
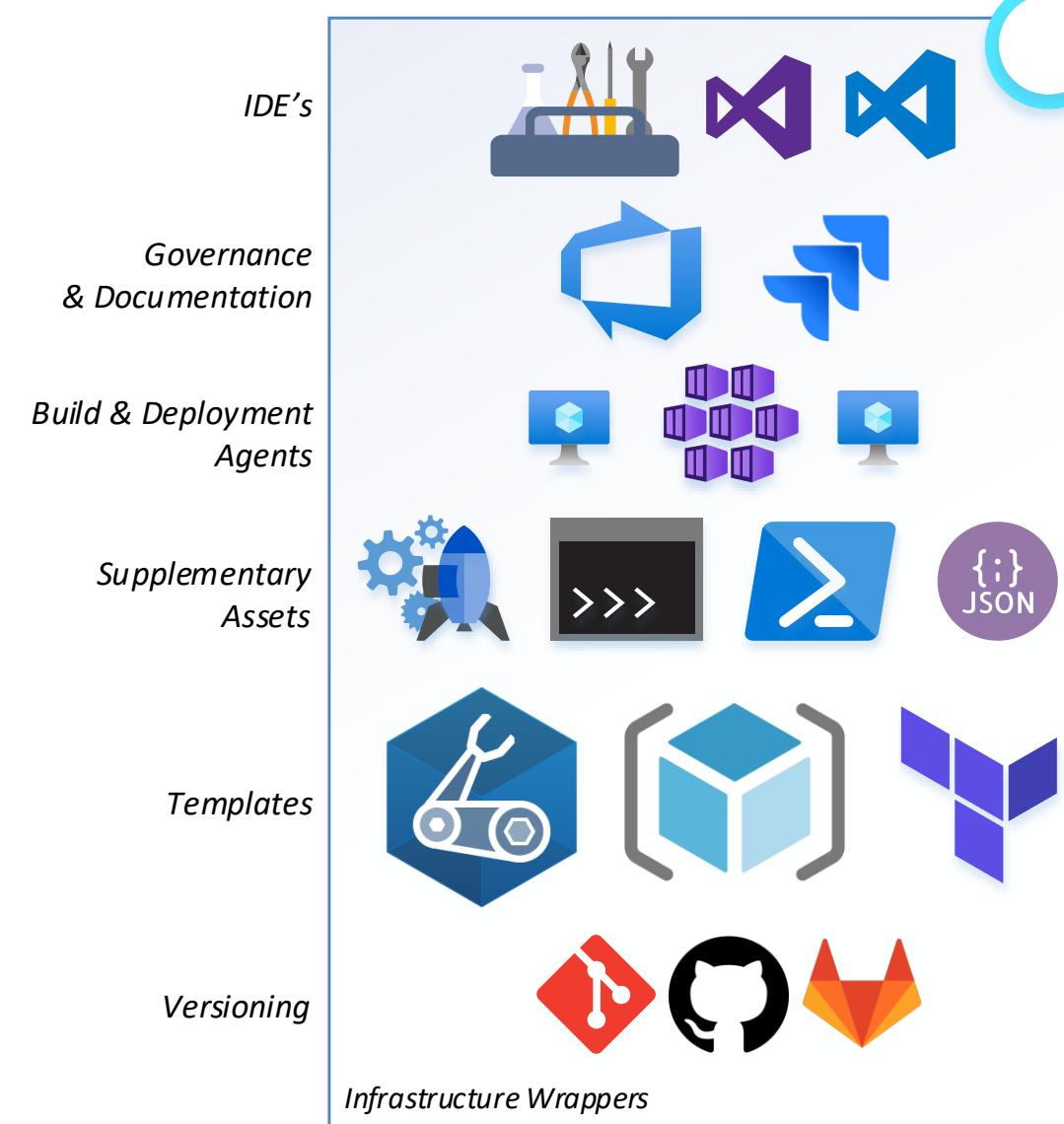


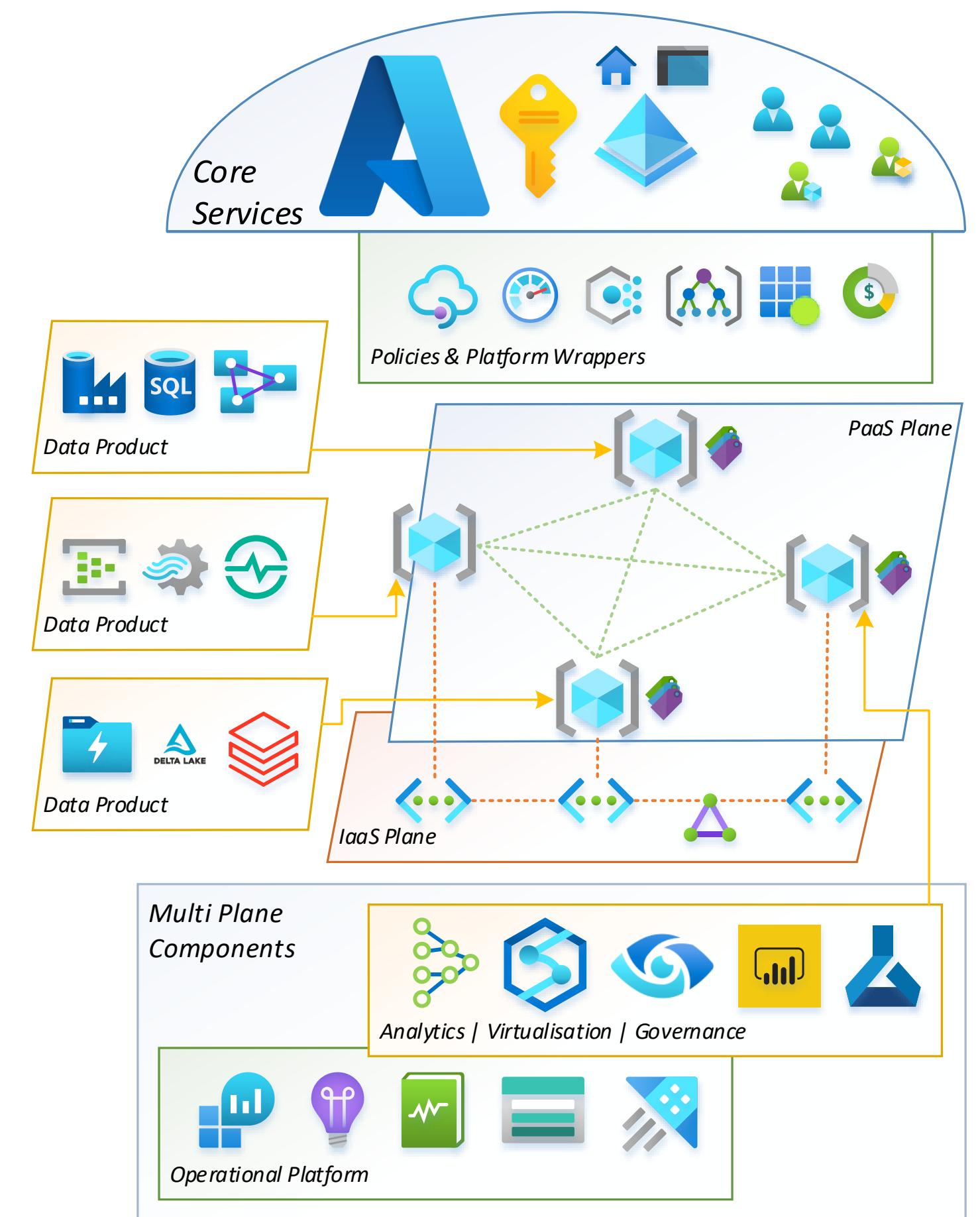






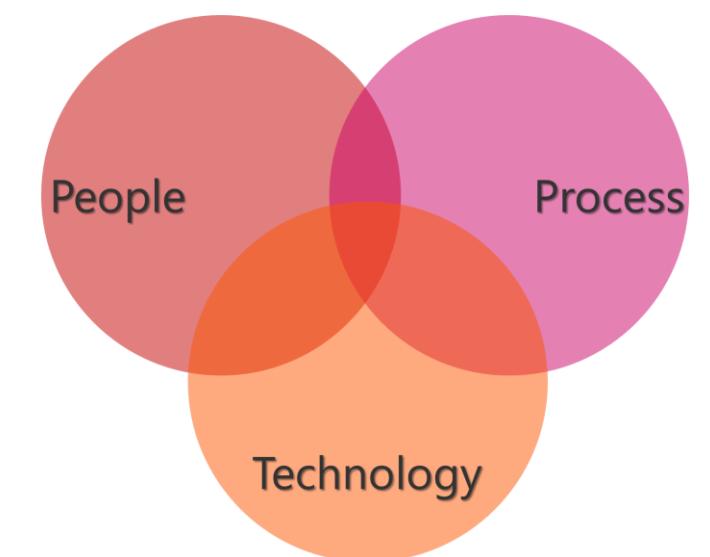
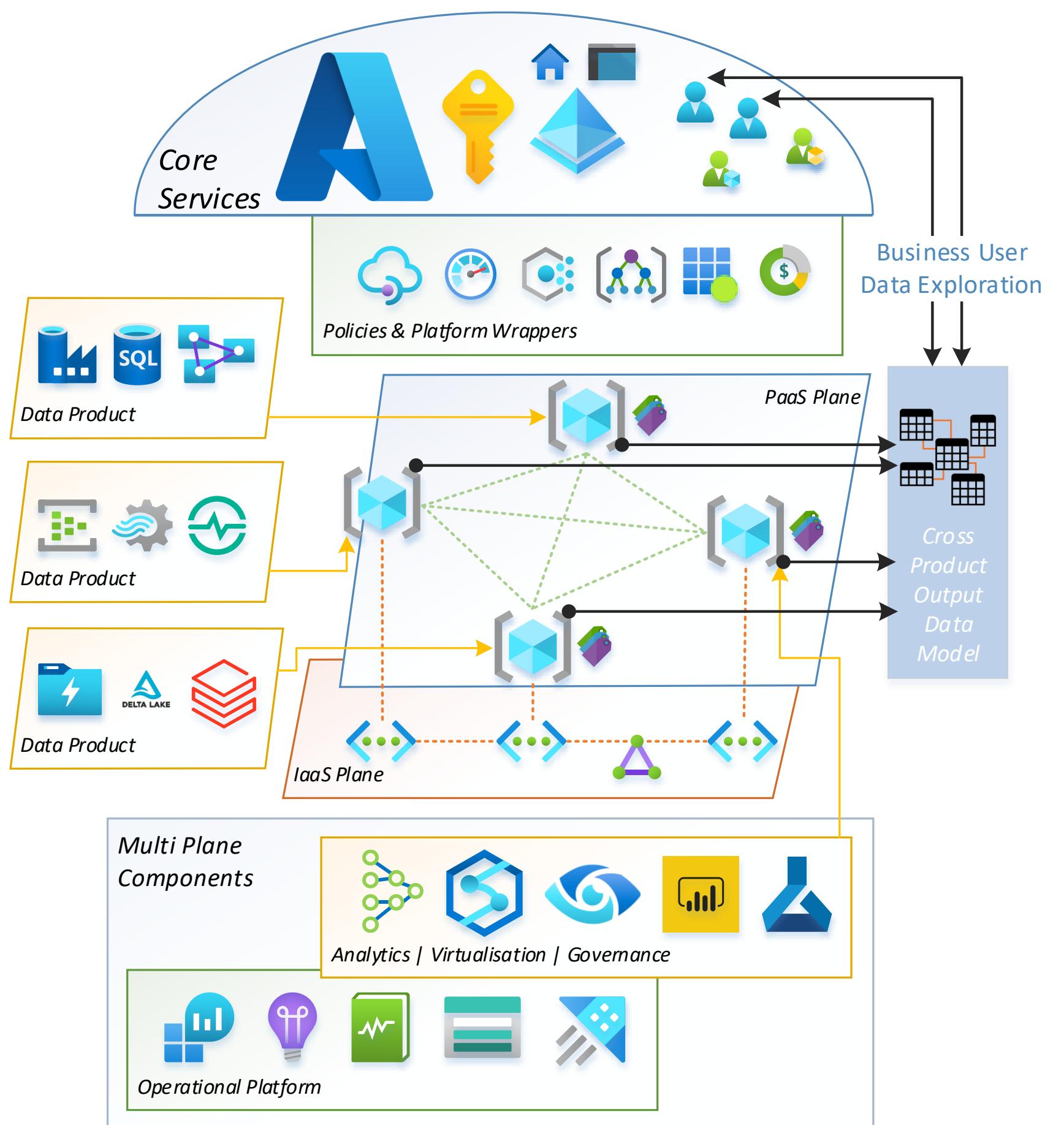
Self-serve data infrastructure as a platform.

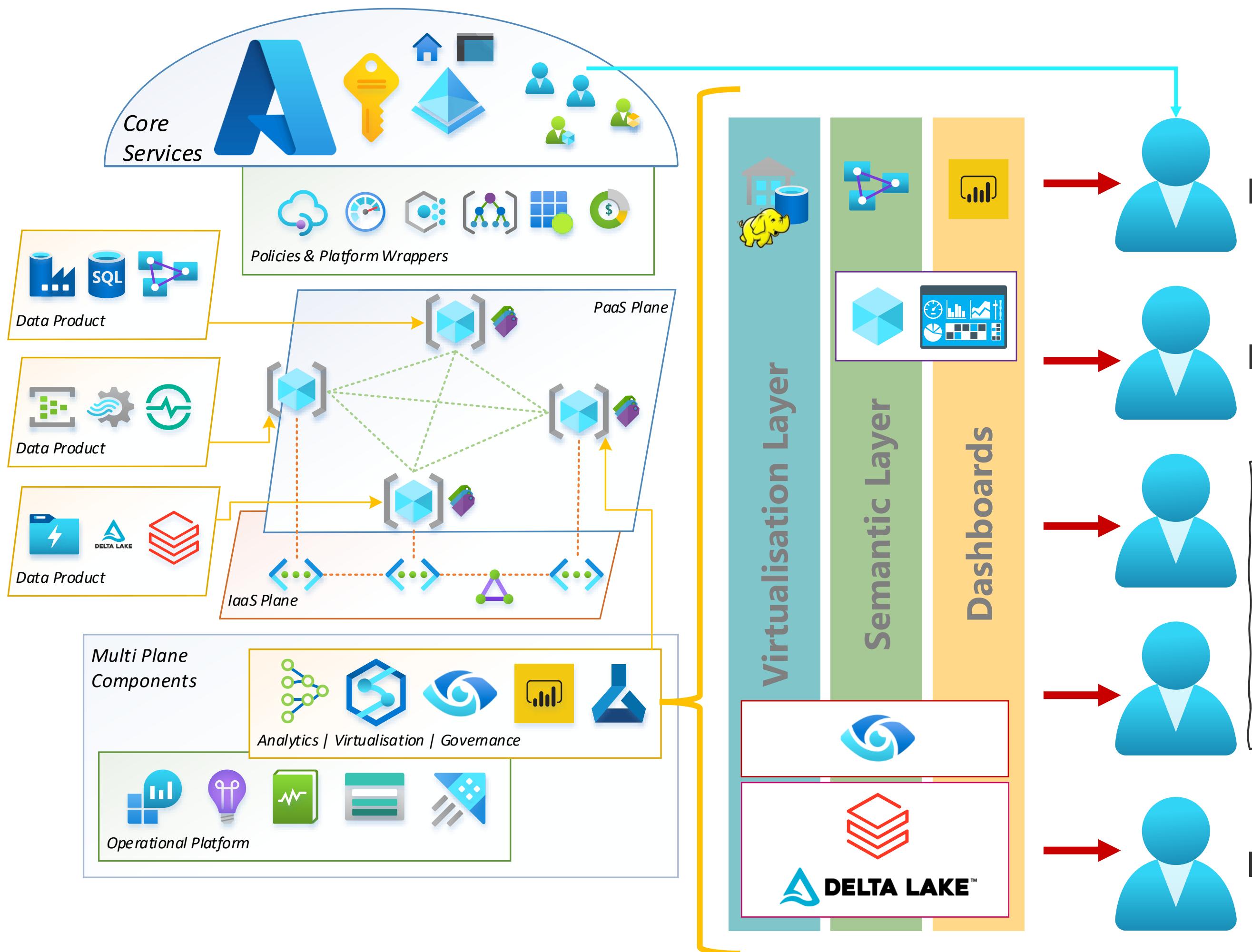






Federated computational governance.



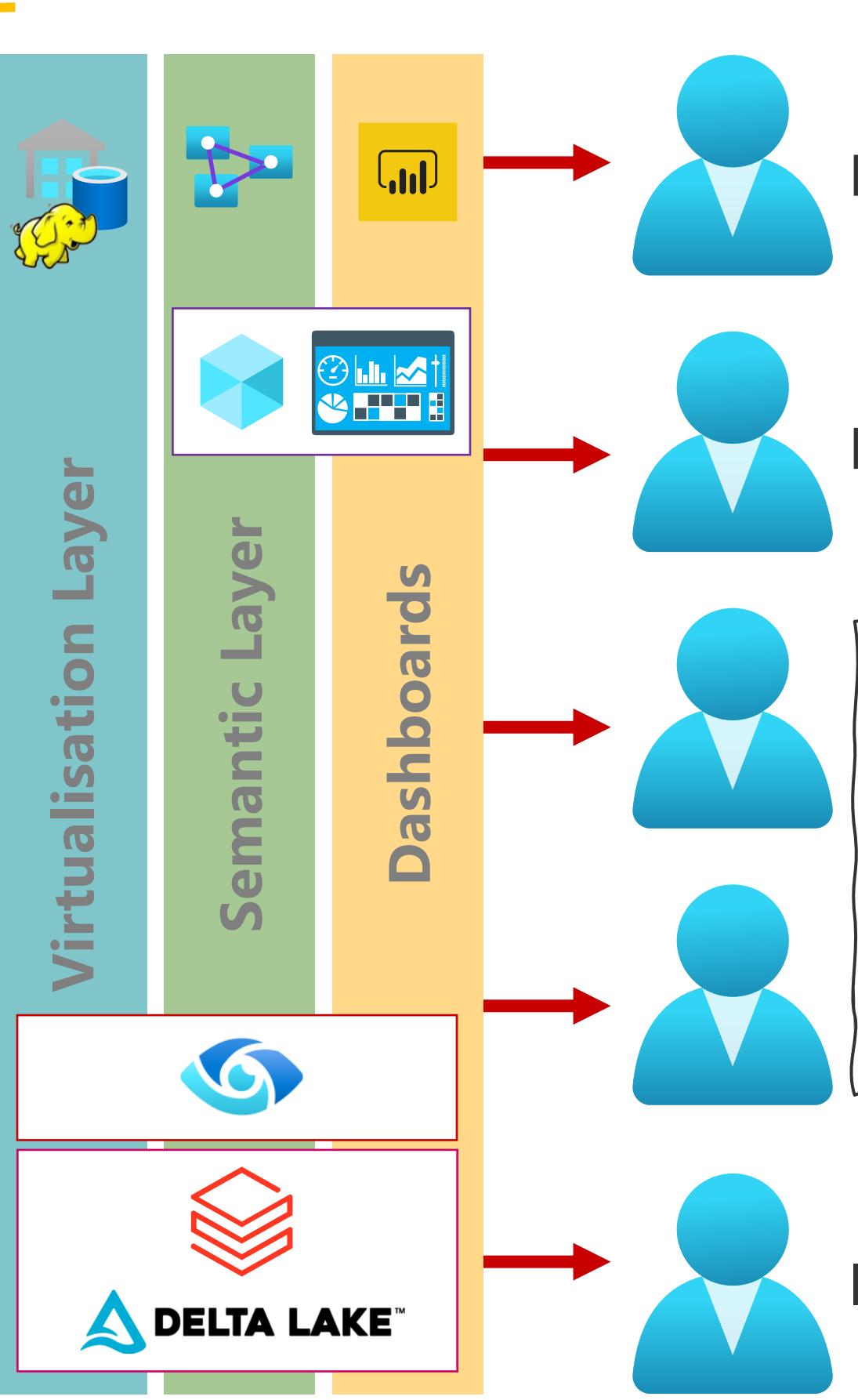
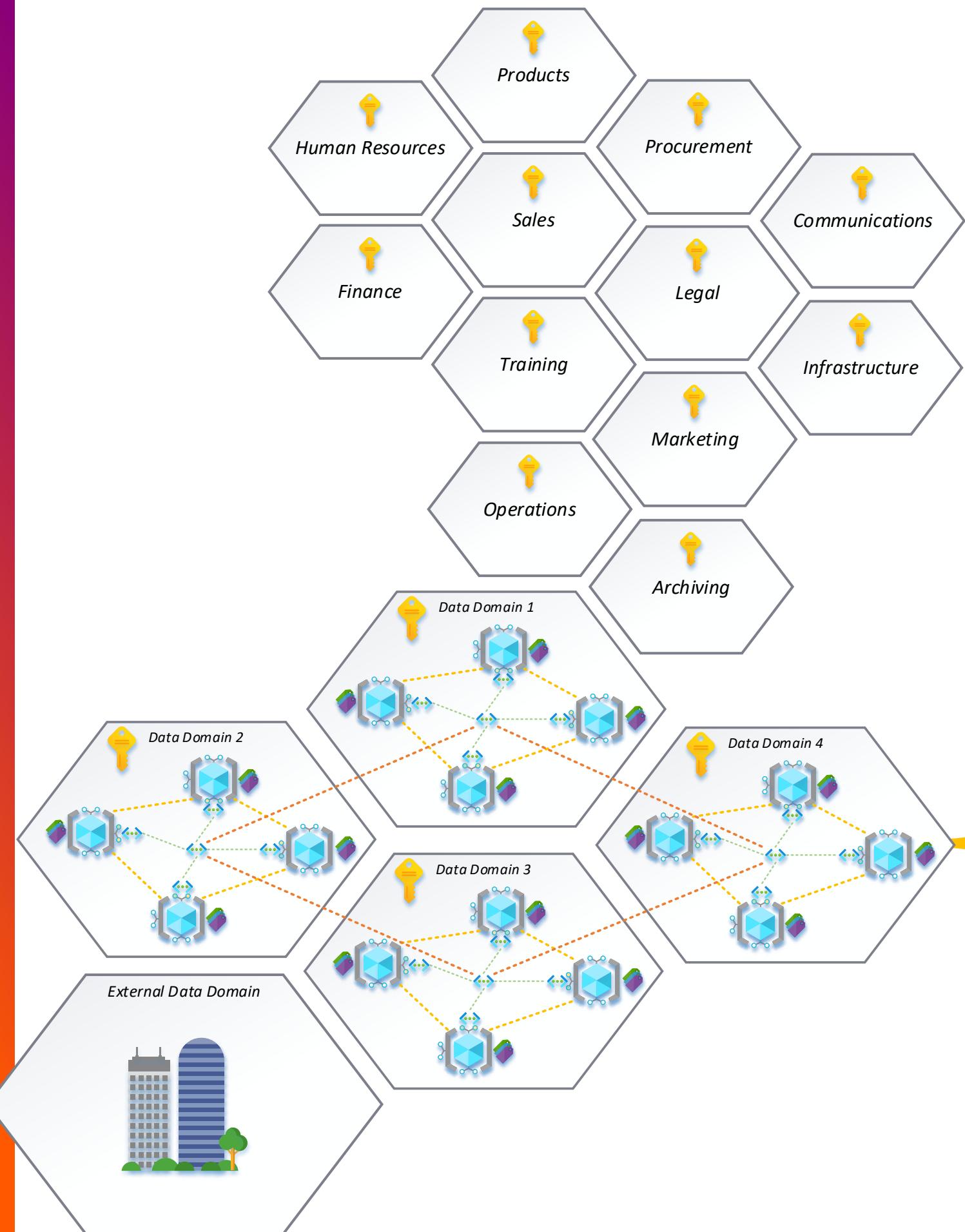


Federated computational governance.

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

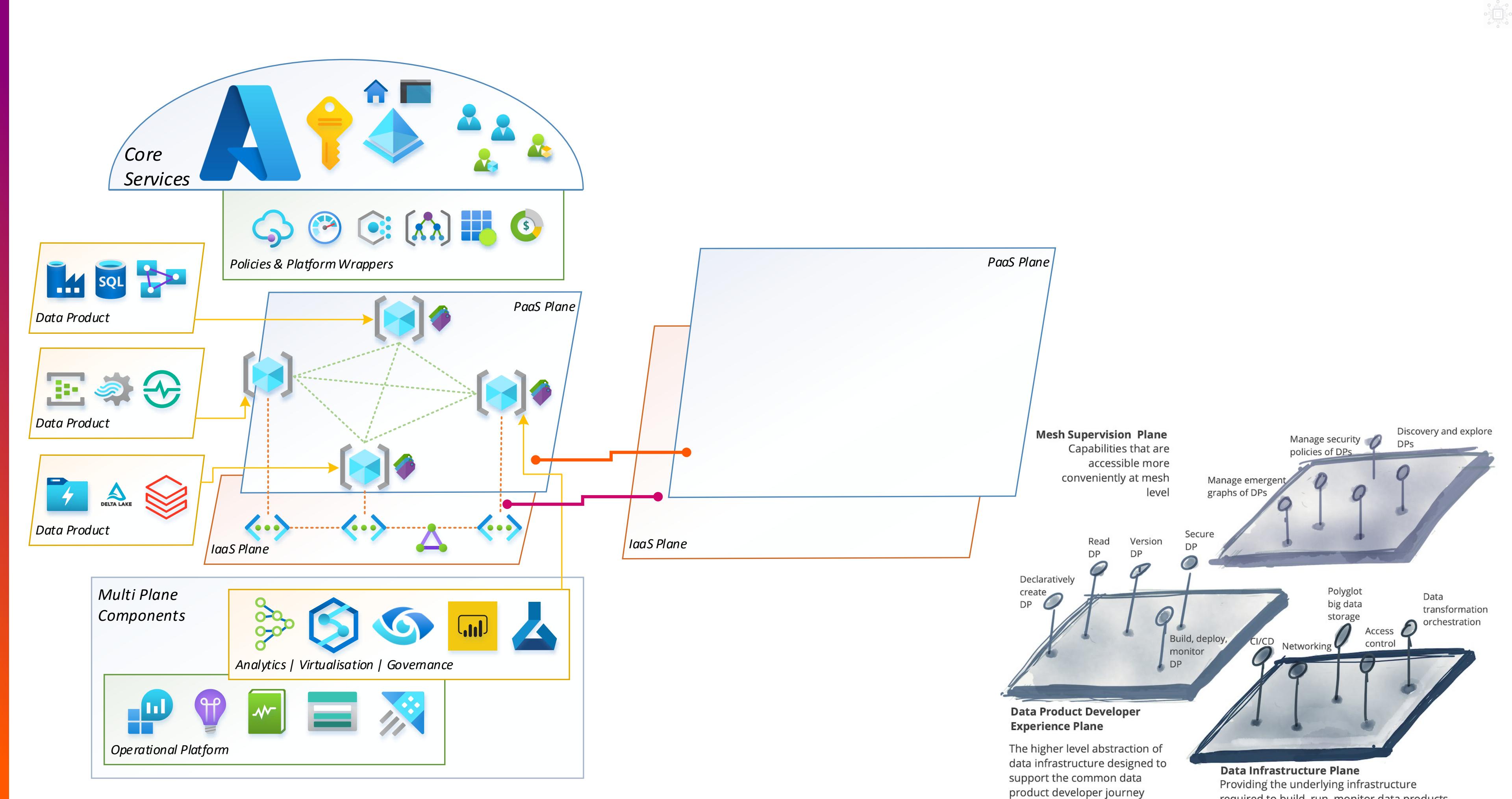


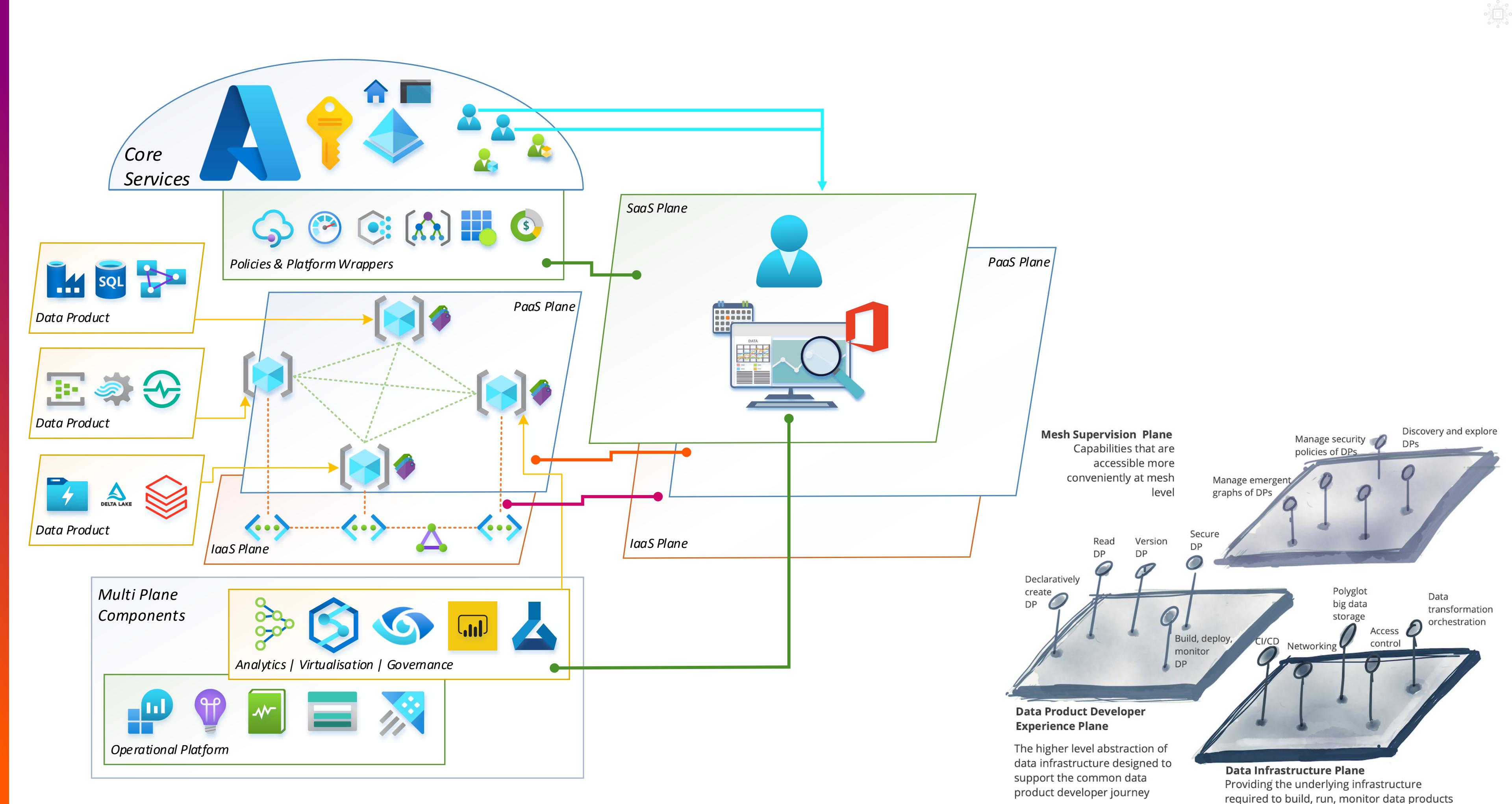
Federated computational governance.

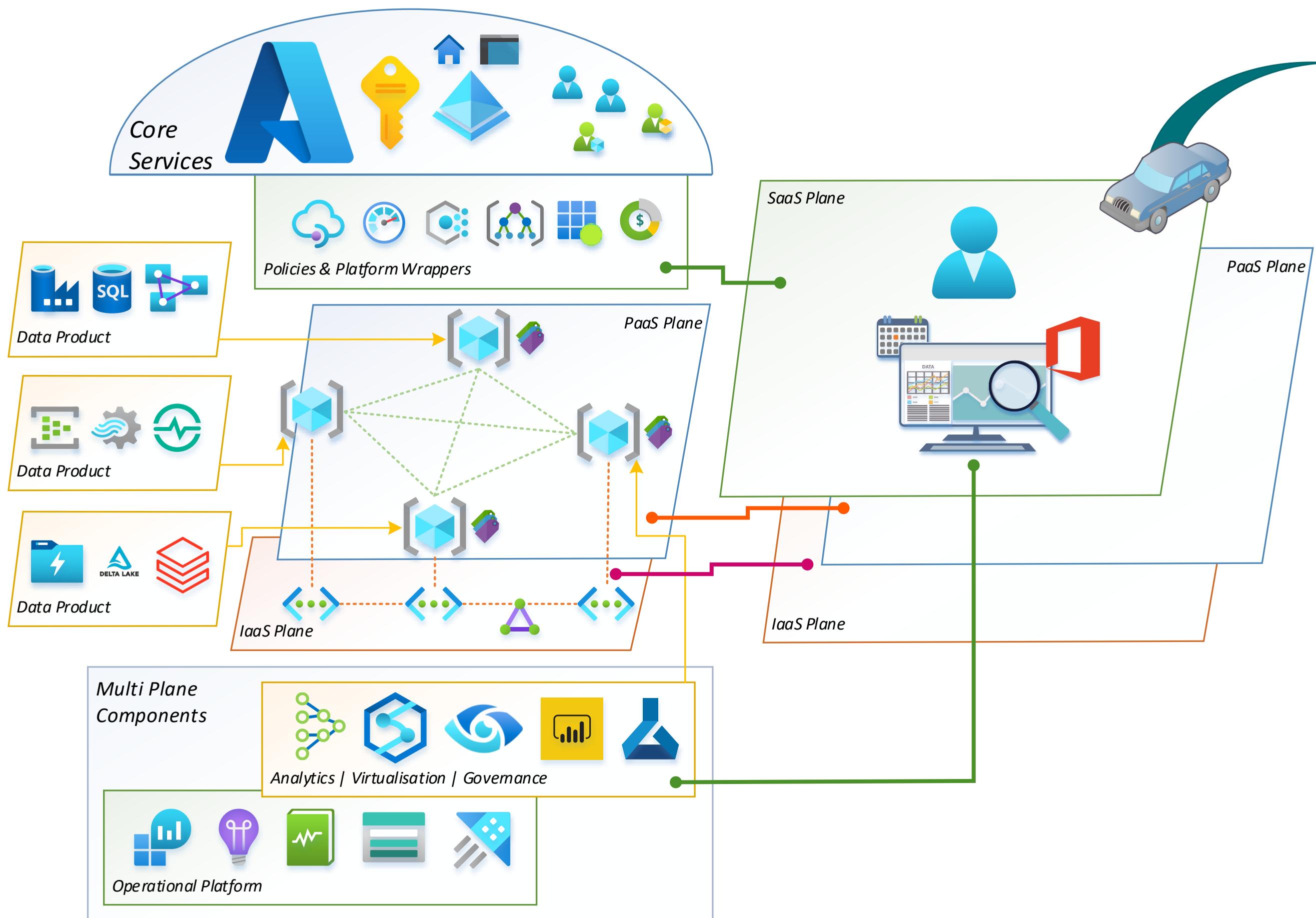


Q5: What tech could/should be used to deliver insight across the Data Mesh?

Information Officer



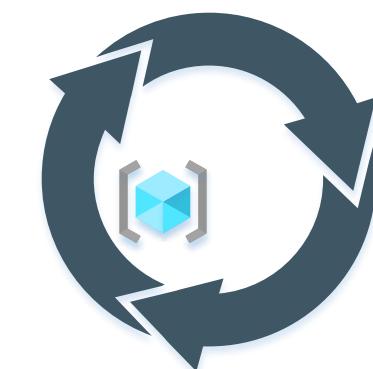




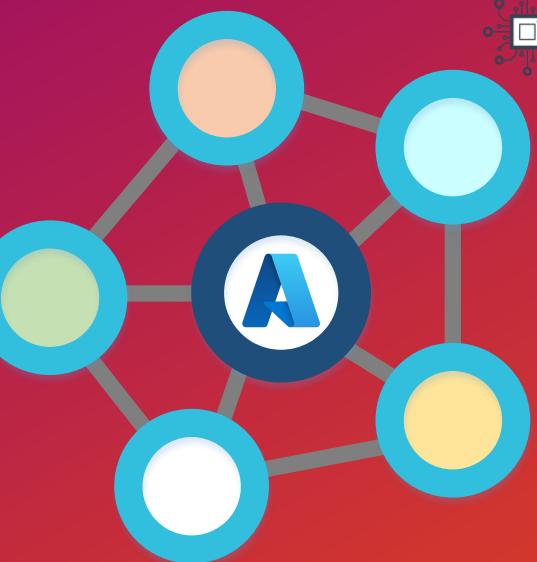
A Mesh Asset Marketplace



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?

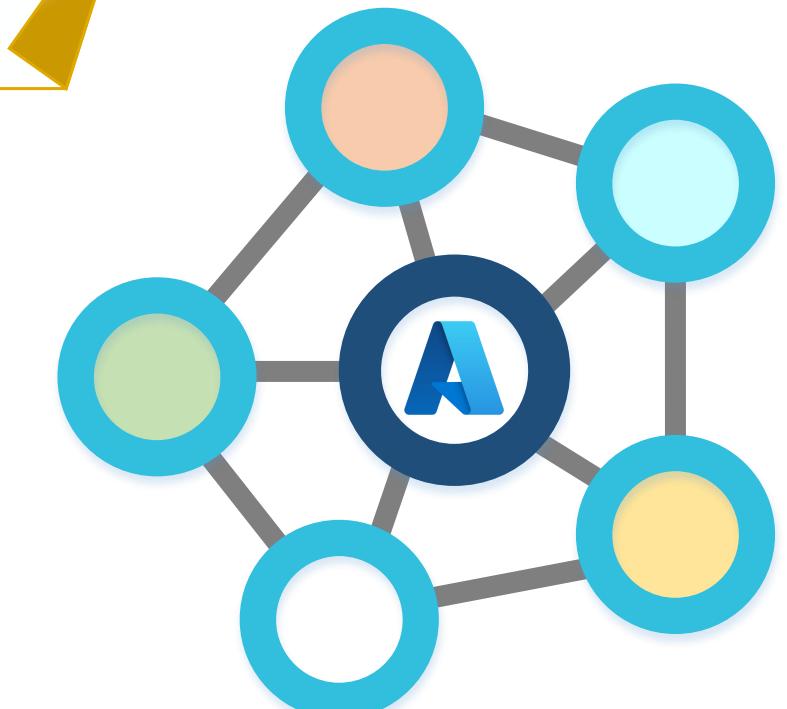
Data as a product.

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

Domain-oriented decentralised data ownership and architecture.

Q6: Is every Data Mesh implementation the same?

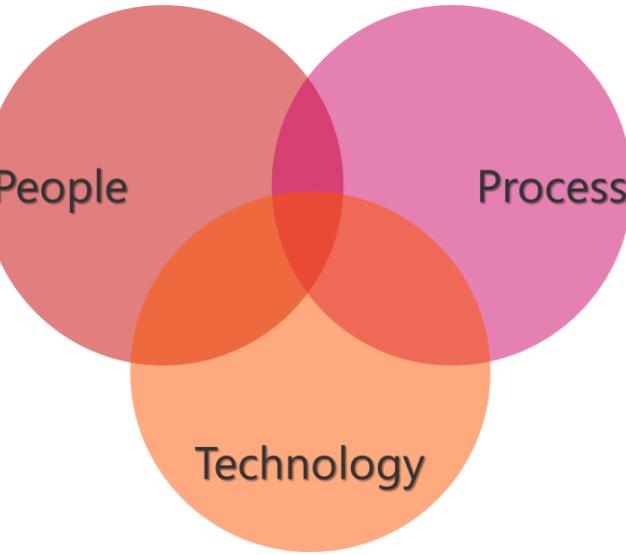
Self-serve data infrastructure as a platform.



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

Federated computational governance.

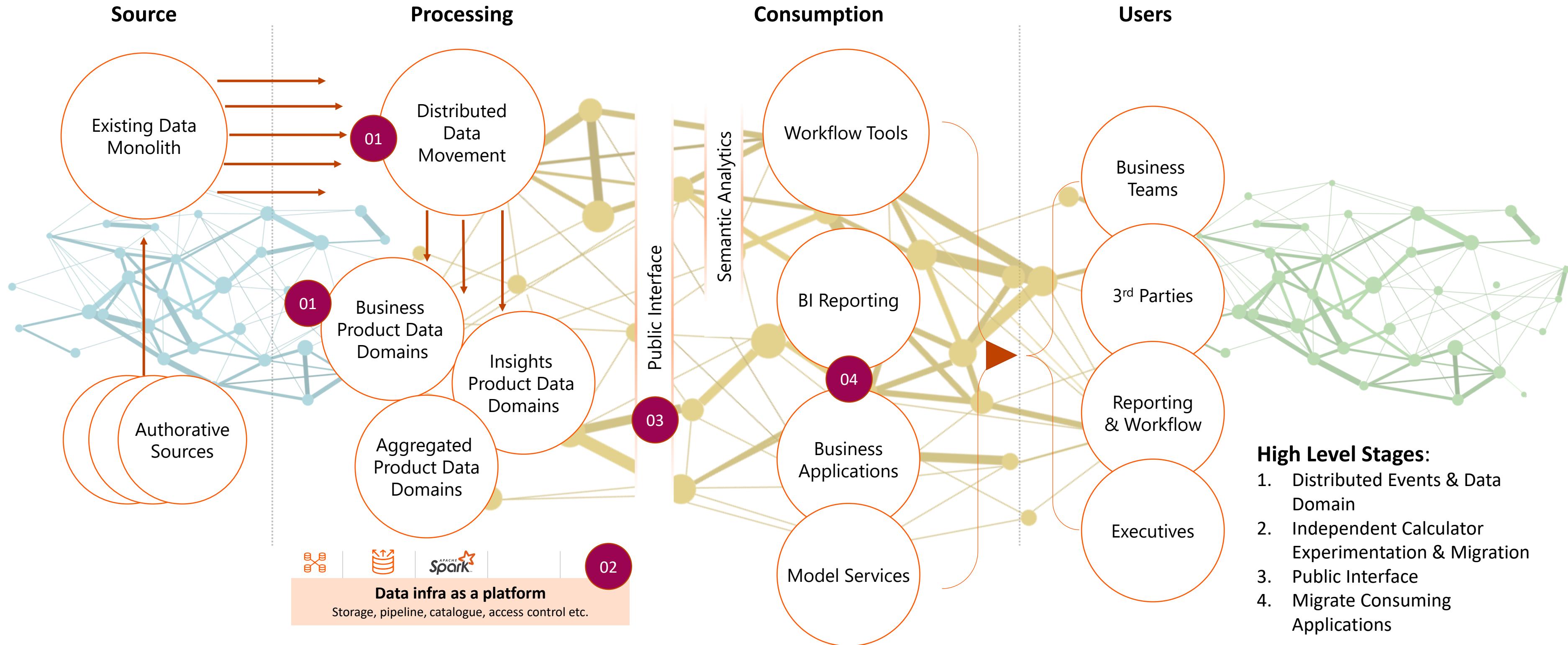
Q: What next?....



Q3: What makes minimum viable Data Mesh contain?

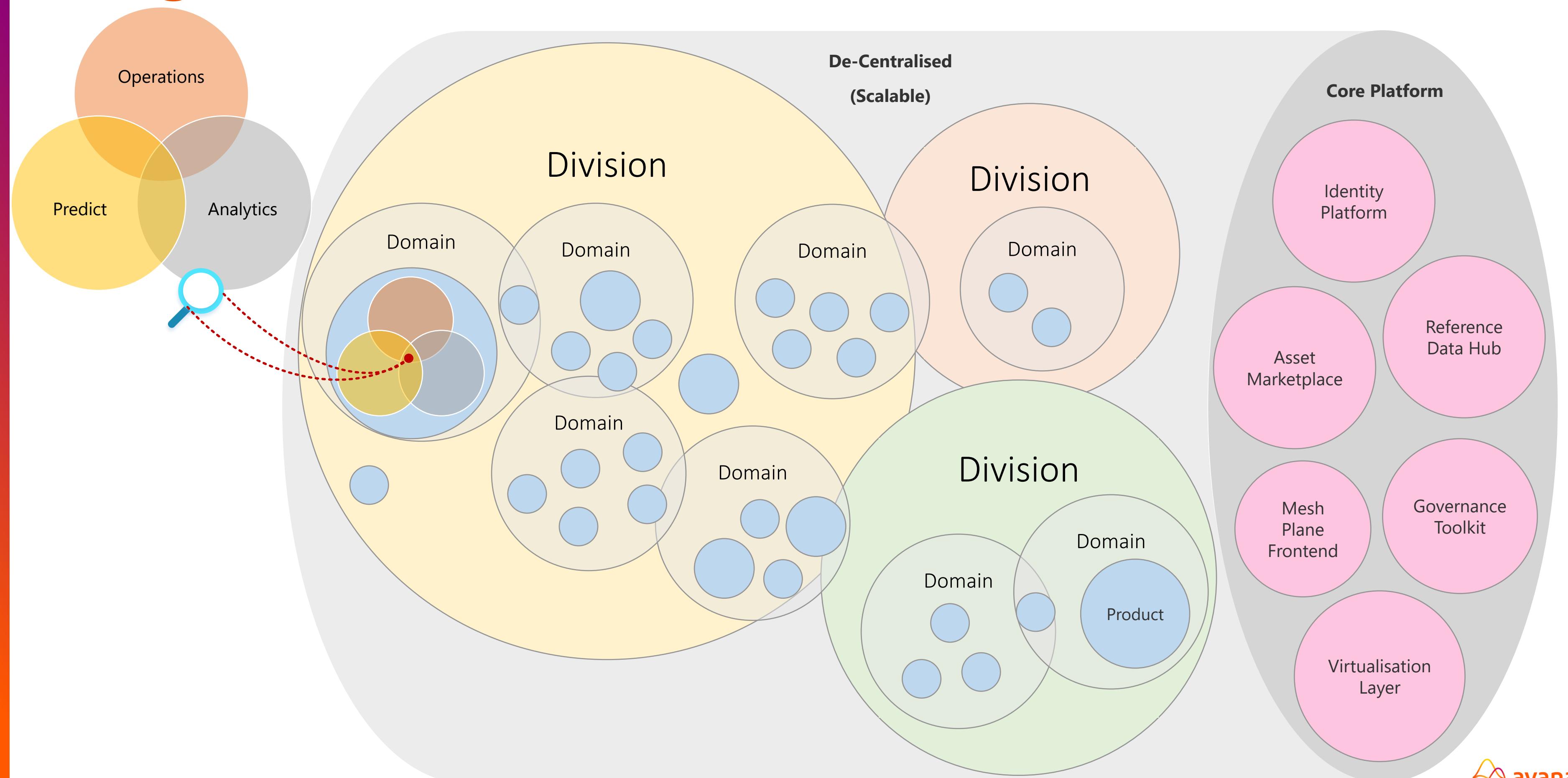


Monolith Transition to Data Mesh



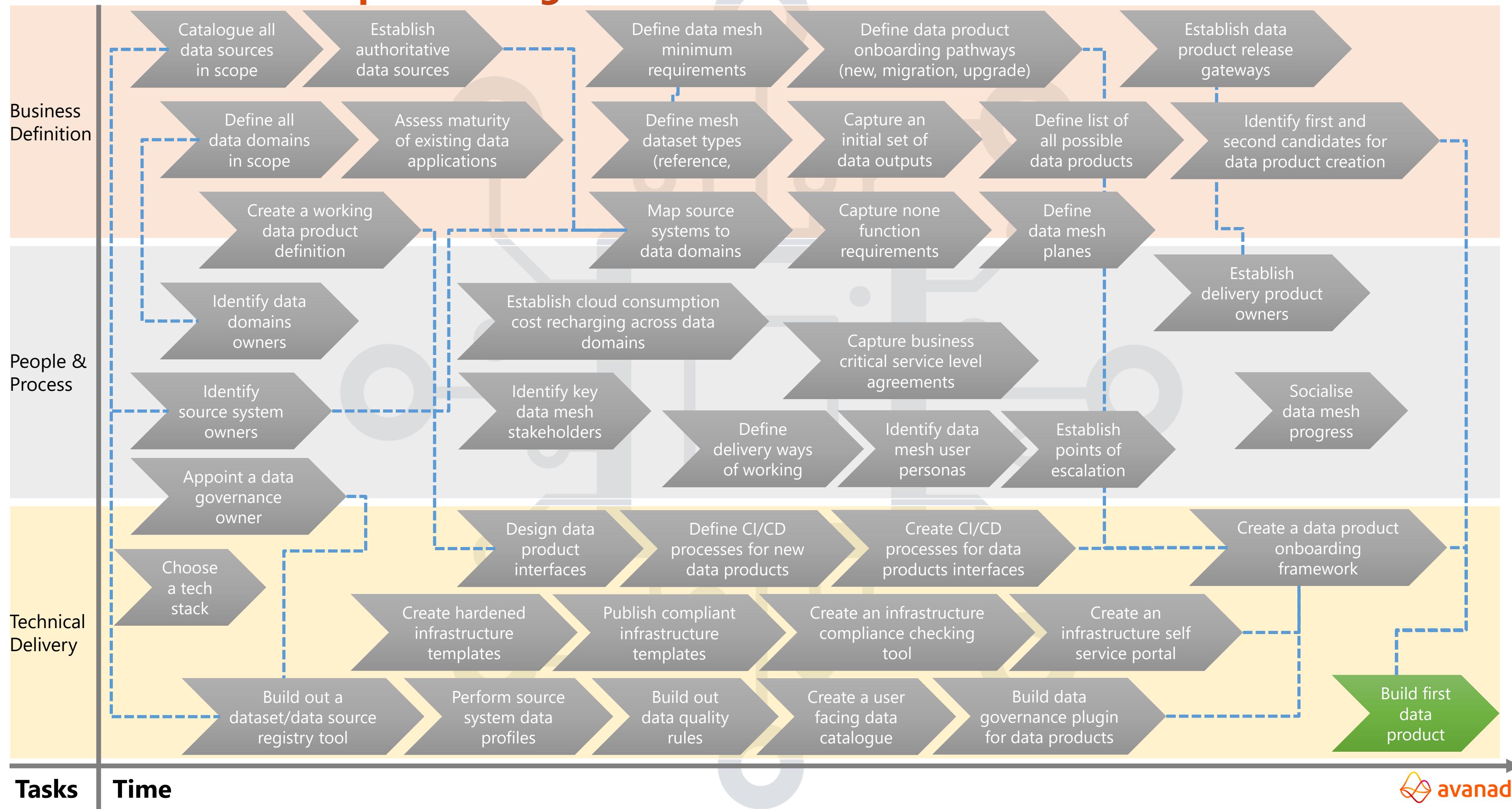


A Logical Data Mesh Architecture

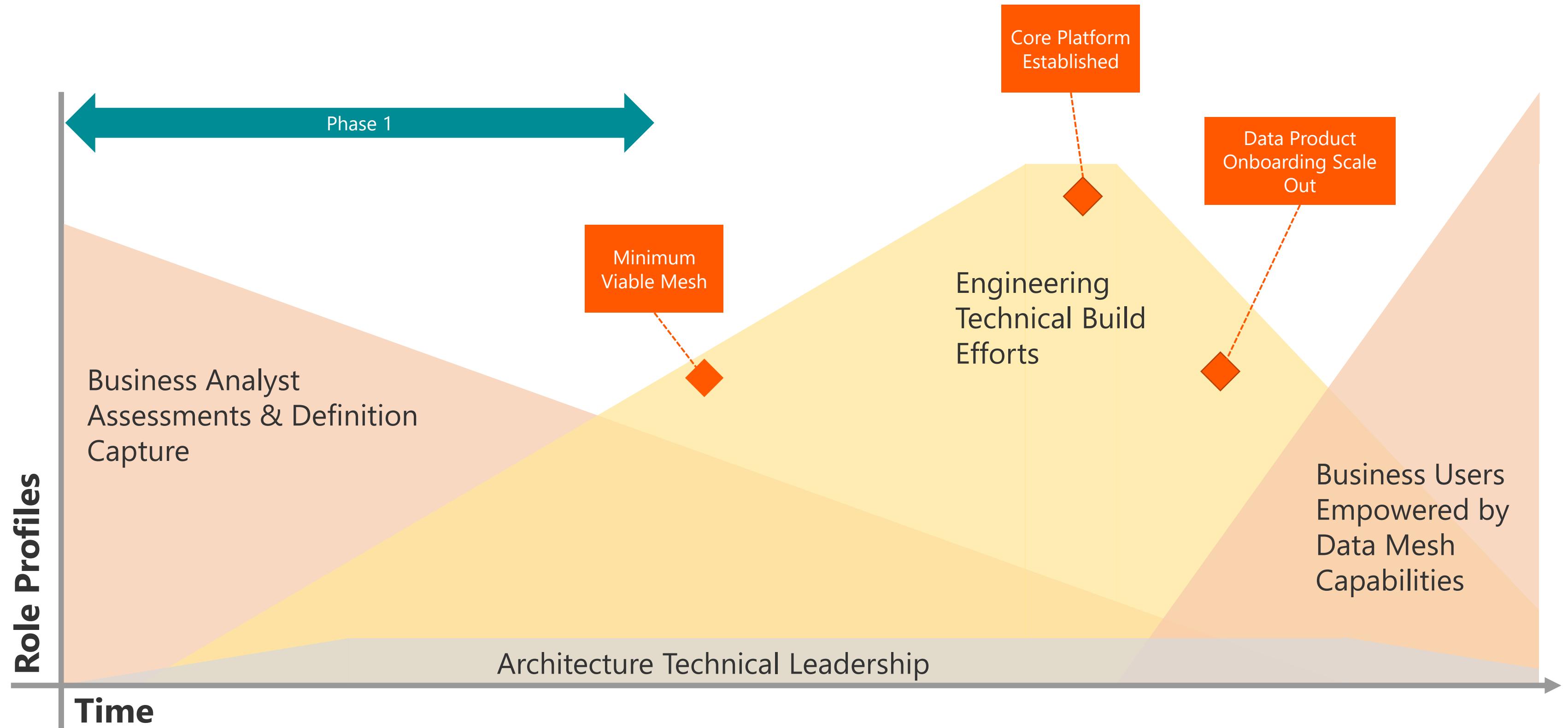


Data Mesh Roadmap - Starting Point

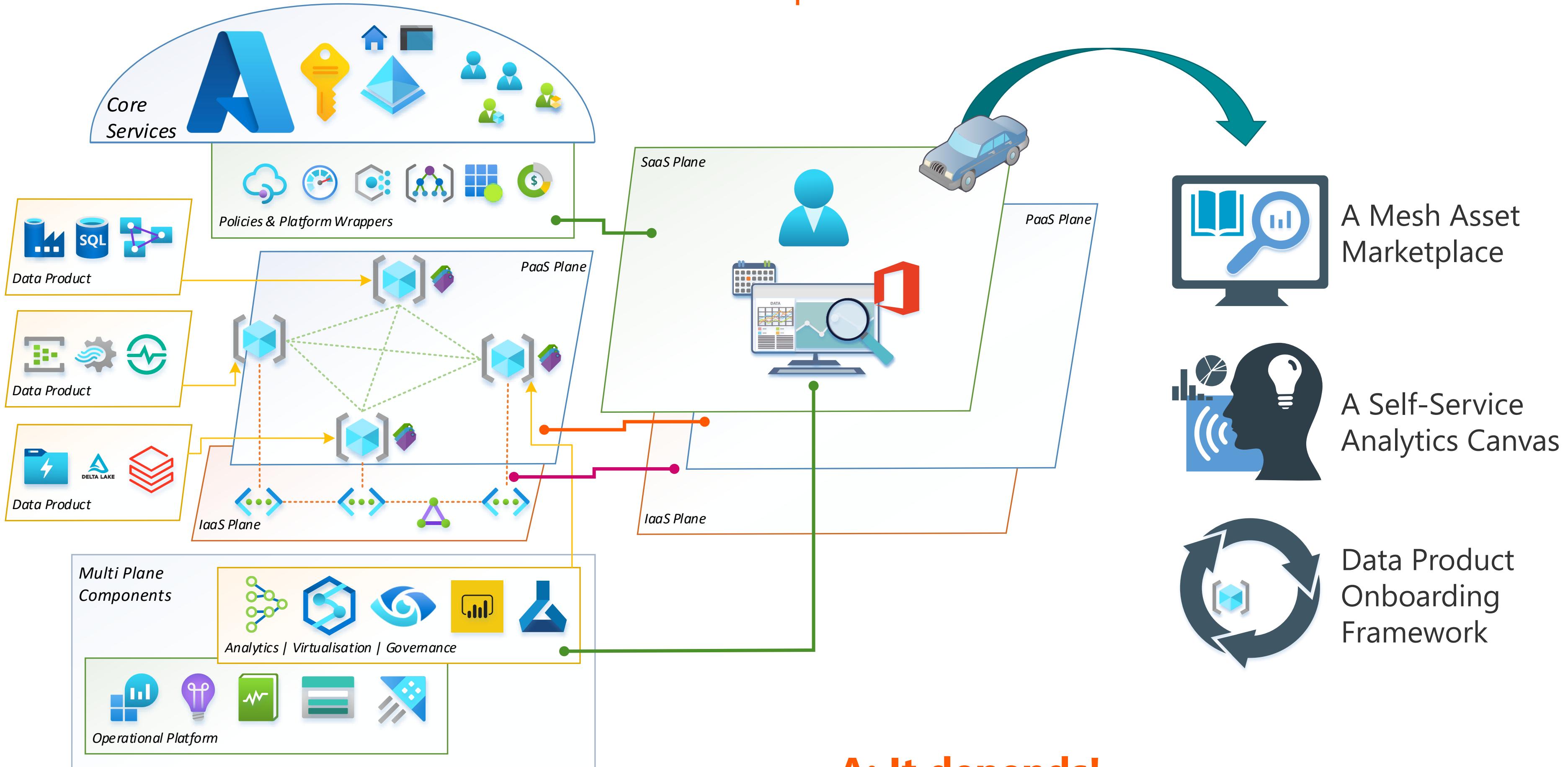
<https://mrpaulandrew.com/tag/data-mesh-vs-azure/>

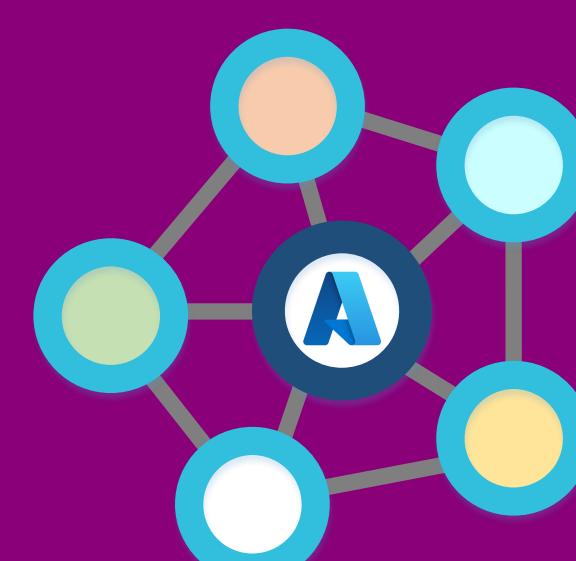


Mesh Build Team Profile View



Q: Should we implement a data mesh architecture like this?





Thank you for listening.





Paul Andrew
Technical Architect for Avanade CoE | Microsoft
Data Platform MVP | Data Relay Director

