Data Mesh Driven Data Infrastructure

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A Perspective

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Many commercial organizations have boldly embraced digital transformation and have capitalized upon its transformational momentum. These organizations are harvesting billions of dollars of business value from their strategic data assets and continuously innovate across their data-centric value chains to maintain a global competitive edge. What do these organizations have that others do not? At the most fundamental level, these organizations have the ability to centrally manage and readily access petabytes of data to enable their continued innovation and monetization efforts. Their business analysts and data scientists can literally execute petabyte scale queries and train advanced machine learning models to achieve near-real time detection of target conditions and automate responses. **Meanwhile, the world's most modern military struggles to overcome decades of technical and architectural debt which has resulted in an aging and incoherent data infrastructure.**

Why not Us?

Why not Now?

A Vision

- The DoD's collective data infrastructure serves as the largest and most fundamental inhibitor to the department's ability to manage and exploit data in a manner consistent with the vision outlined in the DoD Data Strategy.

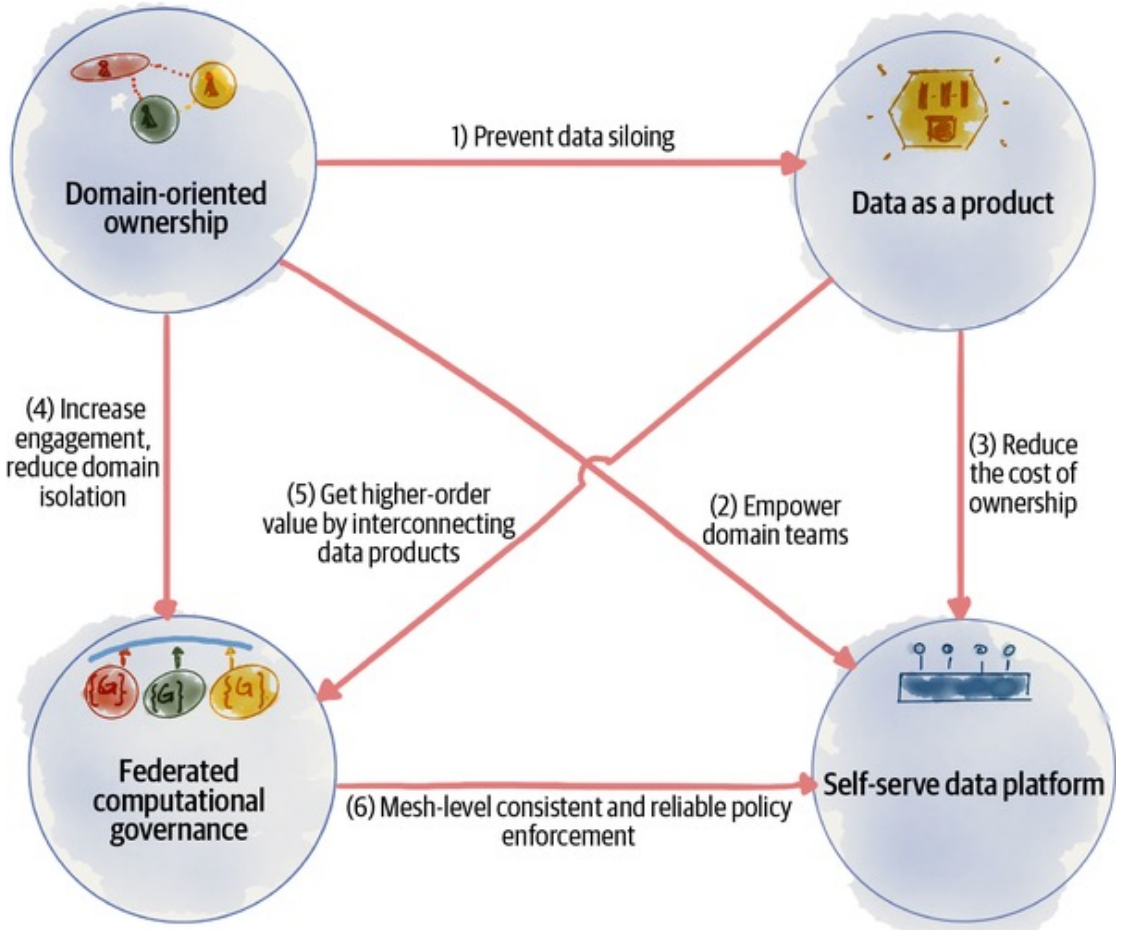
- Data infrastructure, in this context, is defined as the people, processes and technologies employed to persist, expose, monitor, organize, manage, secure, retain, archive, and purge the agency's strategic data assets.

- Currently, DISA's current data infrastructure is a product of a disparate variety of on-premises technologies and vendor proprietary solutions. These solutions lack adequate cost-effective storage and fail to provide a common, cohesive control plane through which mission aware data architects can centrally manage, organize, share, archive, retain and monitor the full breadth of the agency's data assets.

- For perspective, what other DoD assets suffer this degree of neglect? In these terms, the department's deployed fleet of strategic data assets deserve a dedicated command center complete with trained staff, continuous telemetry and centralized command and control functions.

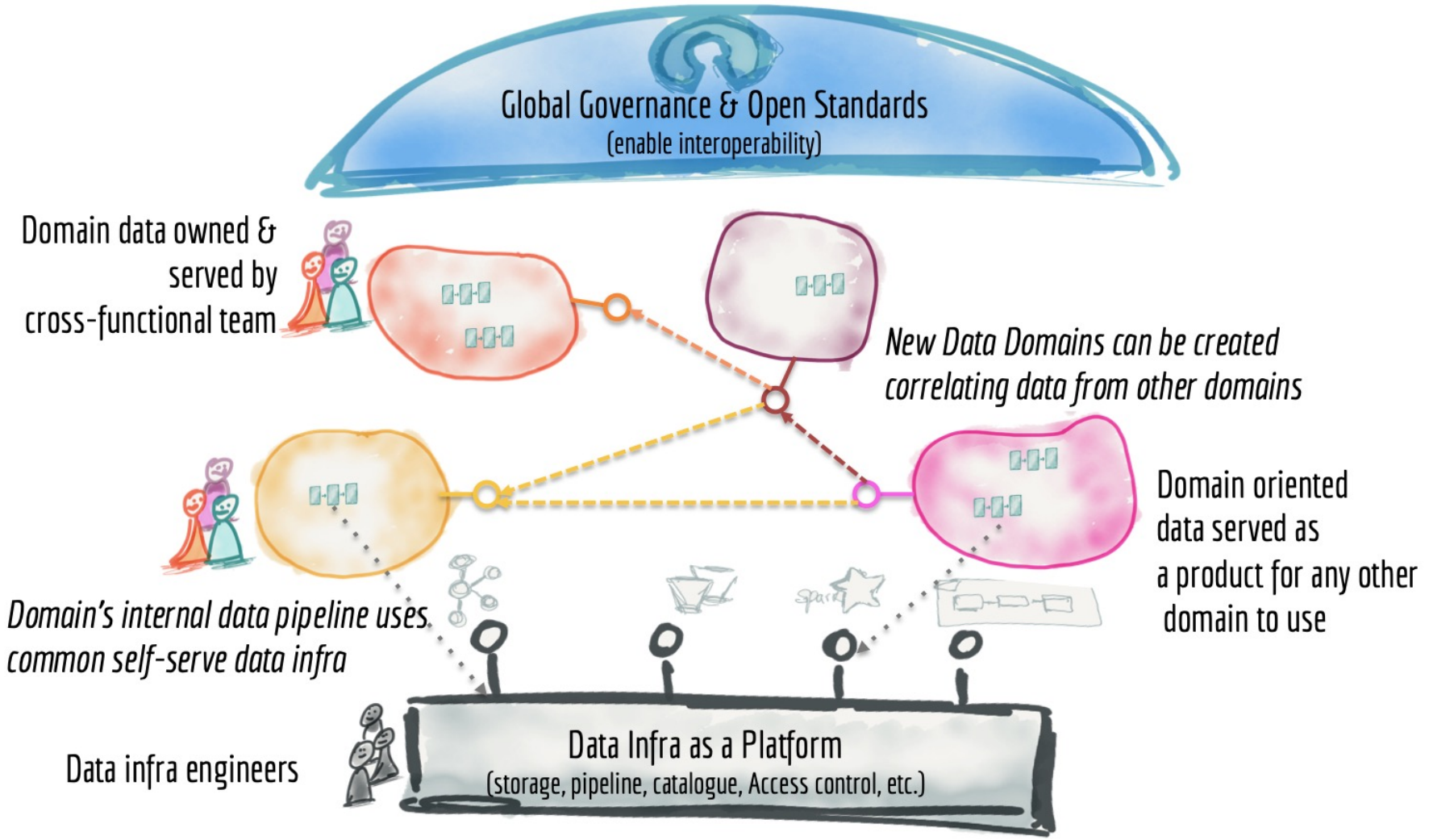
A DoD Data Asset Command Center?

Data Mesh Principles

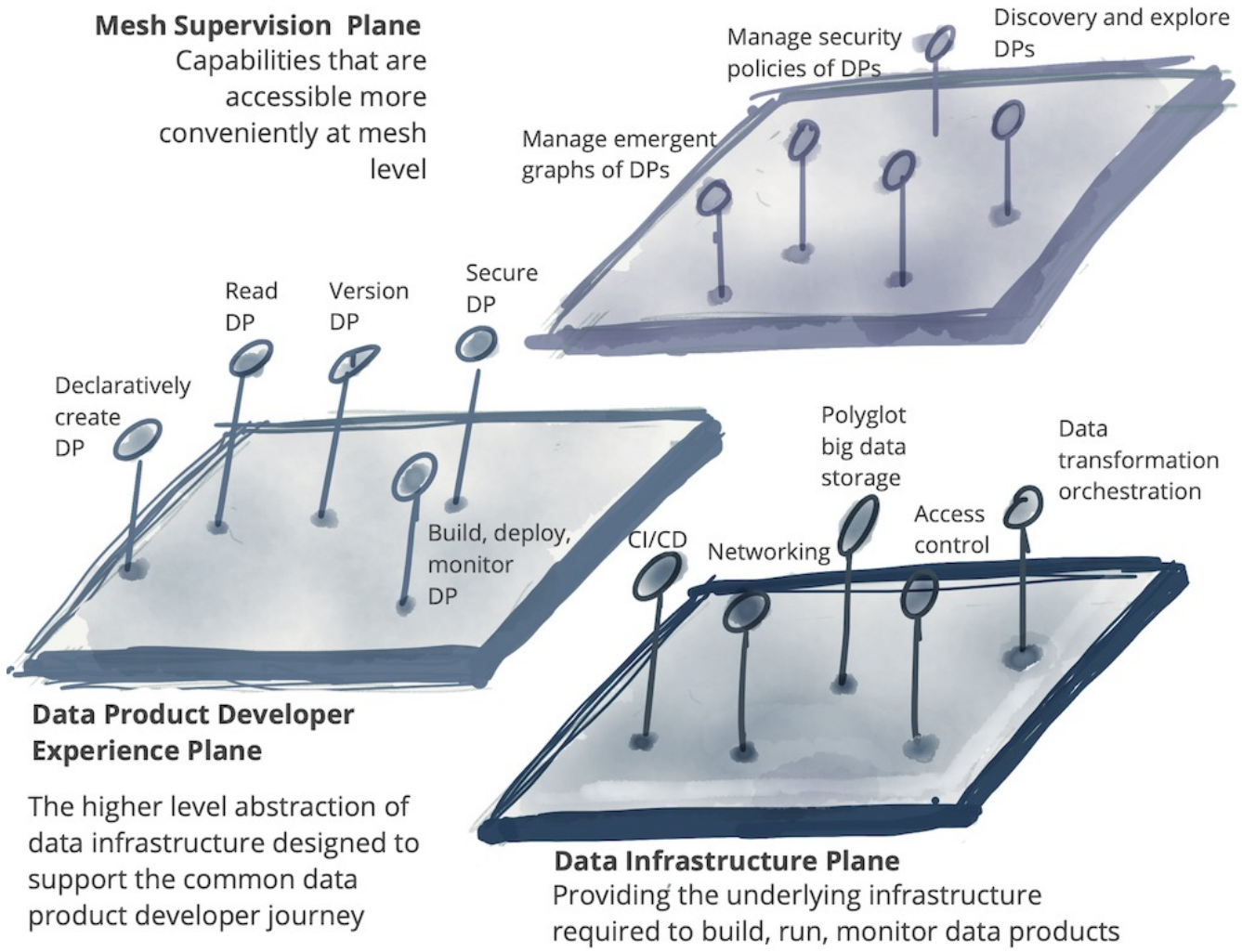


*Direction of the arrow shows the dependency from one principle to another; implementing the from principle creates the challenge that the to principle addresses.

Data Mesh Architecture



Self Serve Data Platform



Data Infrastructure as a Platform

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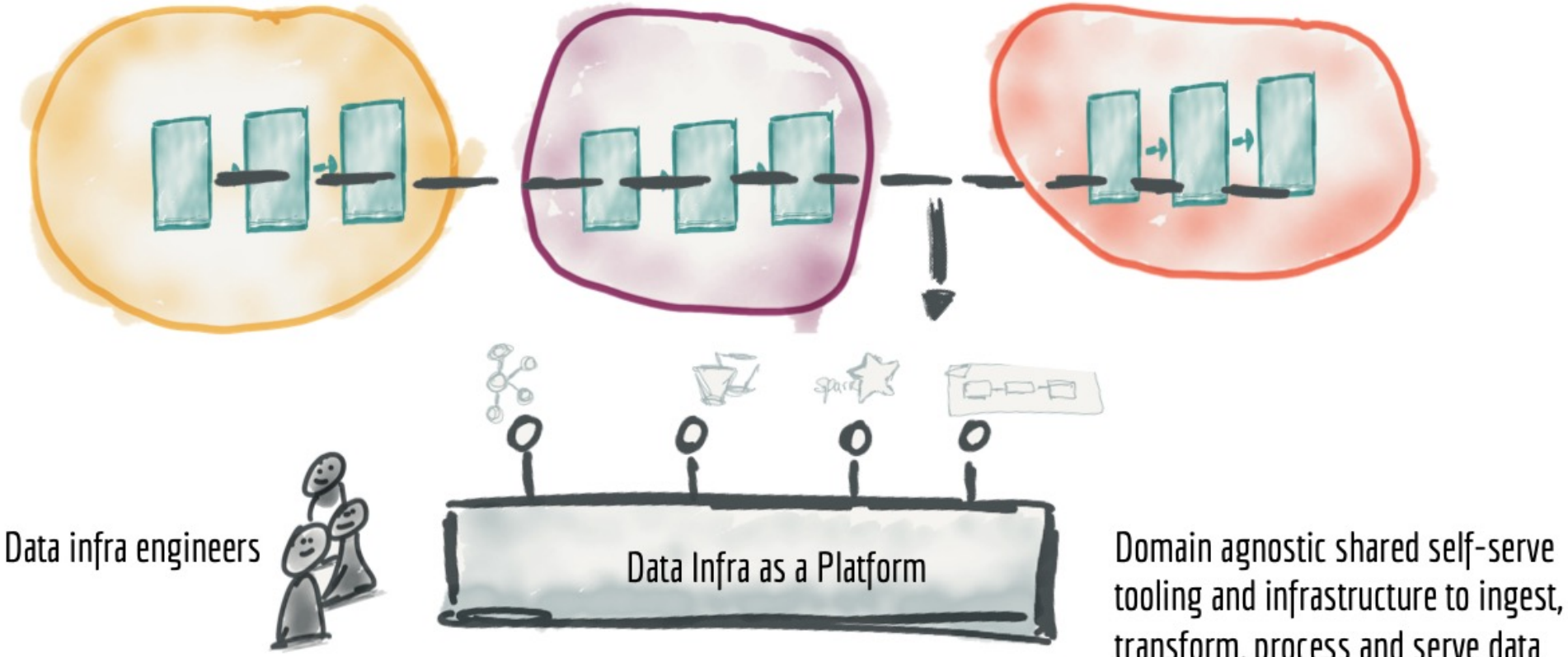

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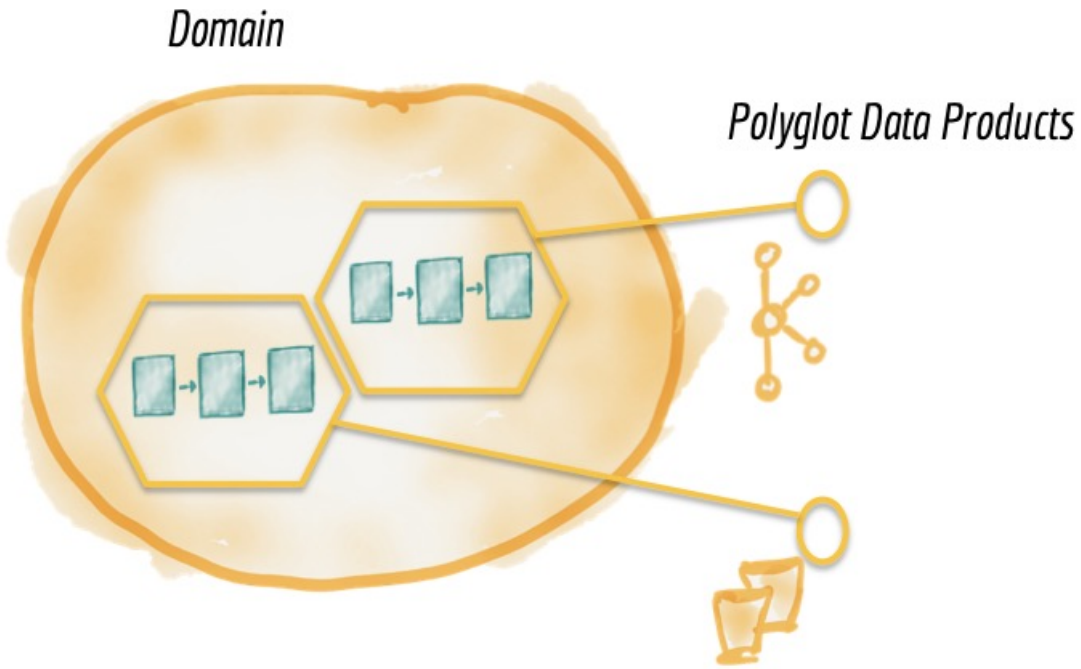


DISCOVERABLE

ADDRESSABLE

TRUSTWORTHY
(DEFINED & MONITORED SLOs)

SELF-DESCRIBING

INTER OPERABLE
(GOVERENED BY OPEN STANDARDS)

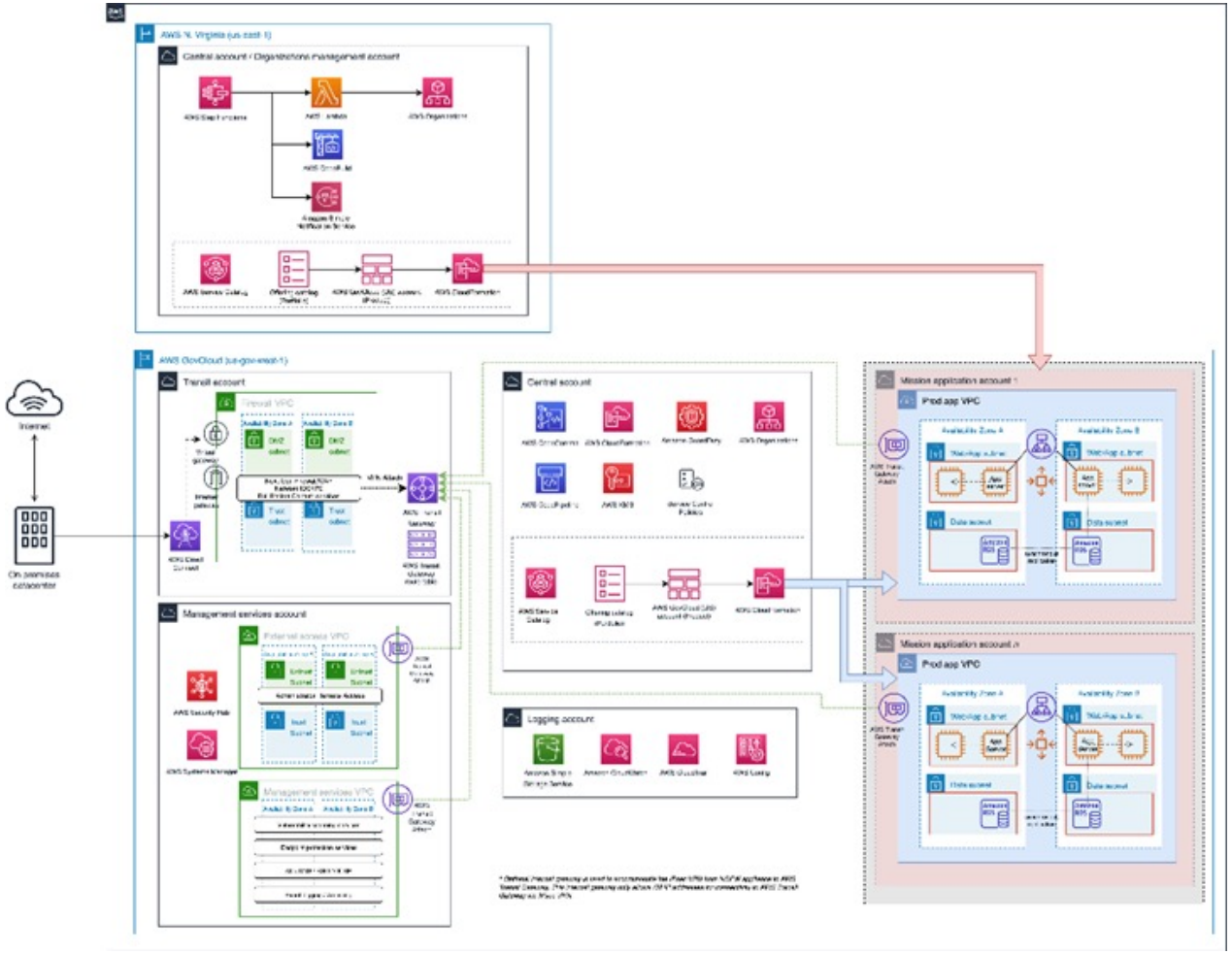
SECURE

Turnkey Security & Landing Zone Architecture (TKSA/LZA)

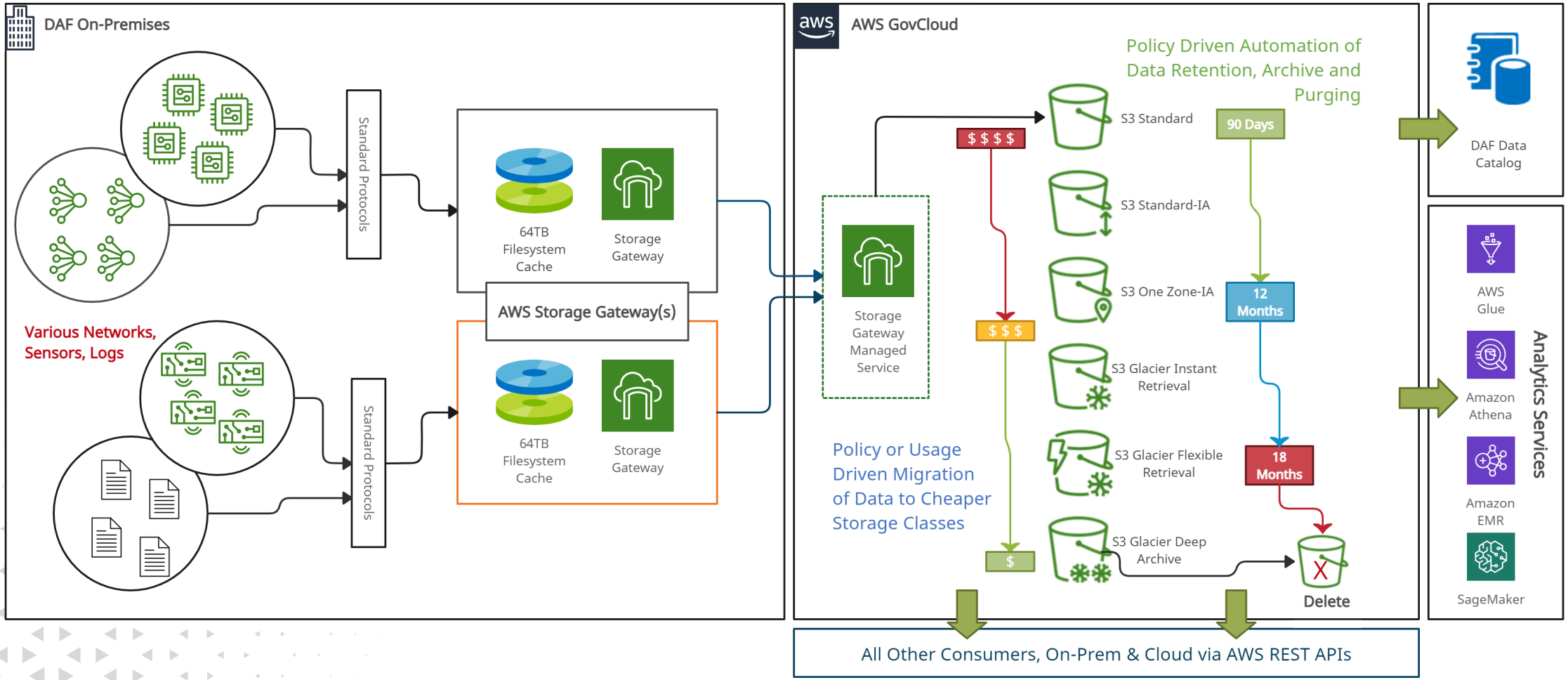
- ATO Ready, Turnkey Security and Landing Zone Architecture (TKSA/LZA) solution to accelerate the ATO and CPTC processes for our DoD and federal agency organizations migrating or building applications in AWS GovCloud or the AWS Classified Regions.

- The TKSA/LZA solution is based on the AWS Public Sector Landing Zone Accelerator. It is built with 100% IaC that can be implemented within any AWS GovCloud or Classified Region account in under two hours.

- The result is ATO Ready cloud-within-the-cloud environment that leverages AWS Control Tower and AWS Organizational Units (OU) to create a complete hierarchical, multi-account, cloud-within-a-cloud solution organization can use to manage the security, usage and costs of multiple tenant accounts.



At Scale Hybrid Storage Solution



AWS GovCloud Self-Serve Data Platform

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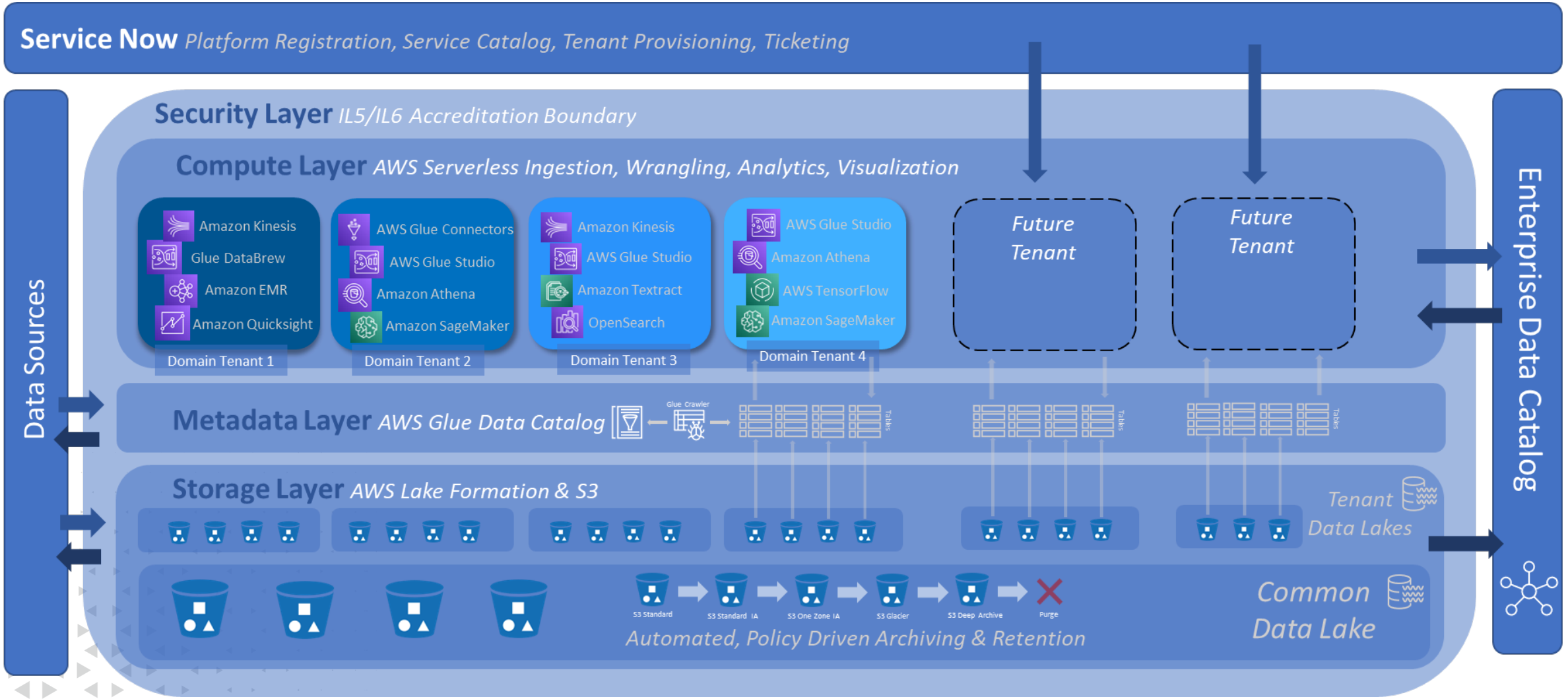

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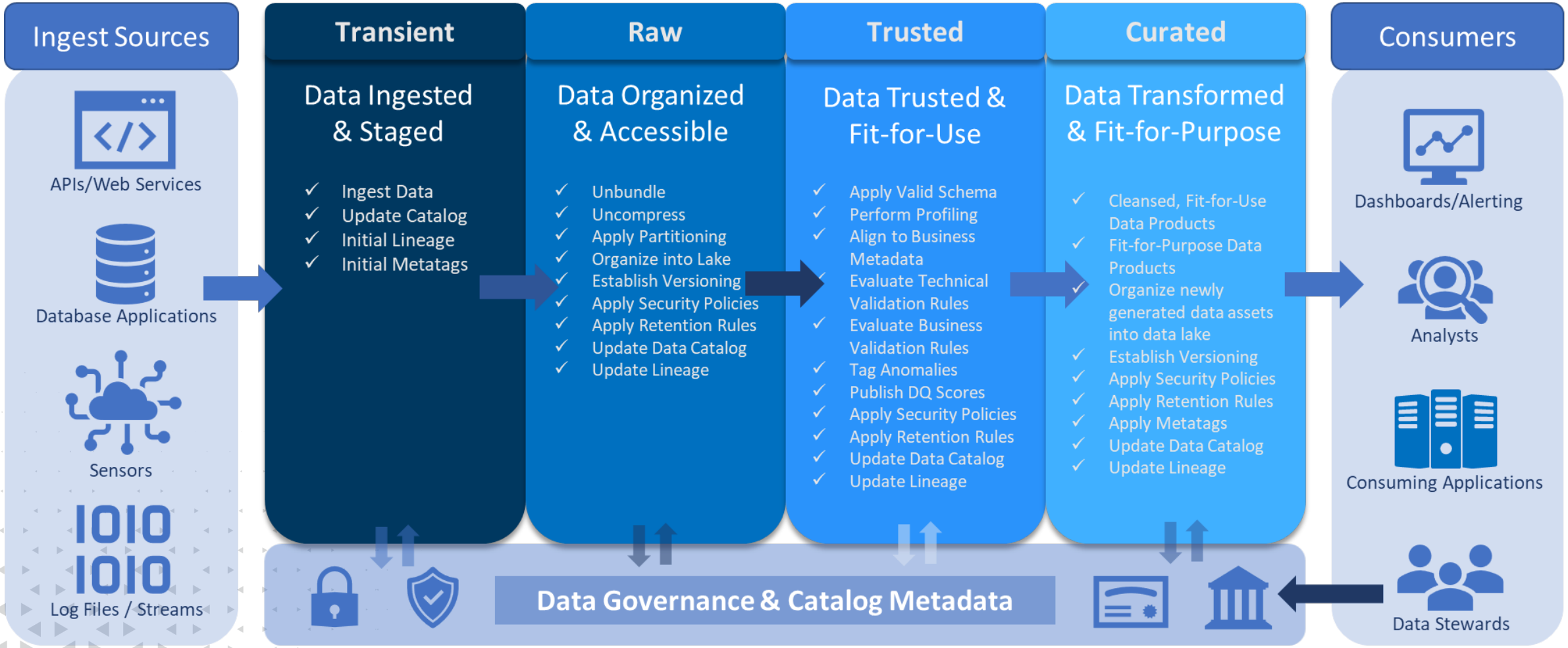

Citations

Slides 2,5 and 6:

Dehghani, Z. (n.d.). *How to Move Beyond a Monolithic Data Lake to a Distributed Data Mesh*. martinfowler.com. https://martinfowler.com/articles/data-monolith-to-mesh.html#DataAndSelf-servePlatformDesignConvergence. Used with Permission from martinfowler.com.

Slides 3 and 6:

Dehghani, Z. (n.d.-a). *Data mesh principles and logical architecture*. martinfowler.com. https://martinfowler.com/articles/data-mesh-principles.html Used with permission from martinfowler.com.

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