



Bloomberg Snow Day

Data Strategy & Architecture

AGENDA

- **Introduction**
- Data Strategy Informs Data Architecture
- Modern Data Architecture
- Open Lakehouse Platform
- Horizon Catalog & Polaris Catalog
- Cross Cloud Data Sharing
- Internal Marketplace



My Background: Jim Lebonitte



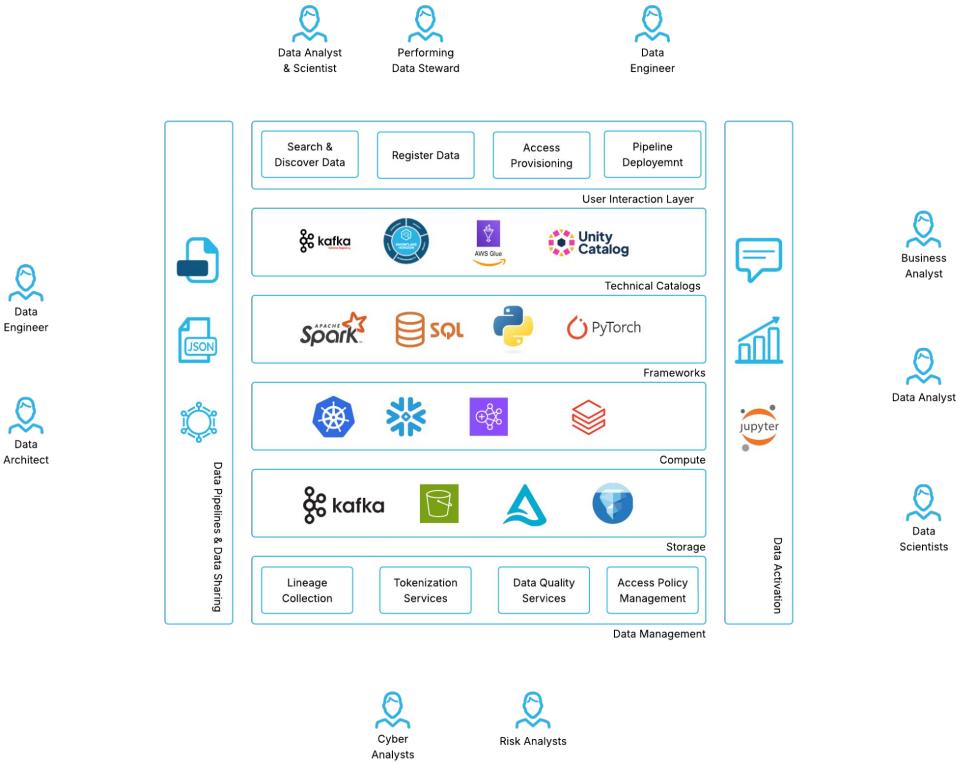
Senior Distinguished Engineer
Enterprise Data Platforms &
Corporate Architecture Strategy
Thought Leader



Field CTO - Platform Architecture

- **Lakehouse Platform**
- **Data Pipeline Platform**
- **Composable CDP**
- **Data Products**
- **Data Management Control Implementations**

Fortune 100 Bank Architecture



Platform Highlights

- Journey began almost 5 years ago before there were platforms that could do everything
- Federated ecosystem with self service enabled out of the box for Lines Of Business
- Single set of data management controls for the enterprise
- Interoperable architecture across AWS, Snowflake and Databricks
- Has grown very complex over time



What I Learned From That Experience

**Have A Metadata
Strategy**

**Automate Data
Management
Controls**

**Make Open &
Interoperable
Choices**

**Continuously
Measure Cost &
Performance**



Constantin Stanca

Product
Development



Solutions Architect

Big Data Solutions



Principal Industry Architect
Field CTO, Financial Services

FinServ Solutions



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“

**Technology is not a
Silver Bullet**



Business Strategy Drives Data Strategy

There is no Data Strategy without a People Strategy



Secure, Governed, Compliant, Trusted - Data and Data Products



Fully Connected Ecosystem - Data, Tools, Products and People



Optimized Total Cost of Ownership - Direct and Indirect Costs



Developer Productivity & Ongoing Innovation - Time to Market, Future-proof



Democratized Products - Adoption and Reusability of Apps, AI & Data, Discoverability



Modern Architecture Considerations / Trade-Offs



Minimize Data Movement - reducing data latency and duplication of data



Interoperability and Flexibility - provide optionality and choice



Infrastructure Management - drive focus on what matters most



Business Continuity - resilience, high-availability, disaster recovery in the cloud



Mitigate Technology Lock-In - avoid getting stuck in legacy technology



Future-Proof for Scale, Innovation, & Disruption - data, users, tech disruption, etc.



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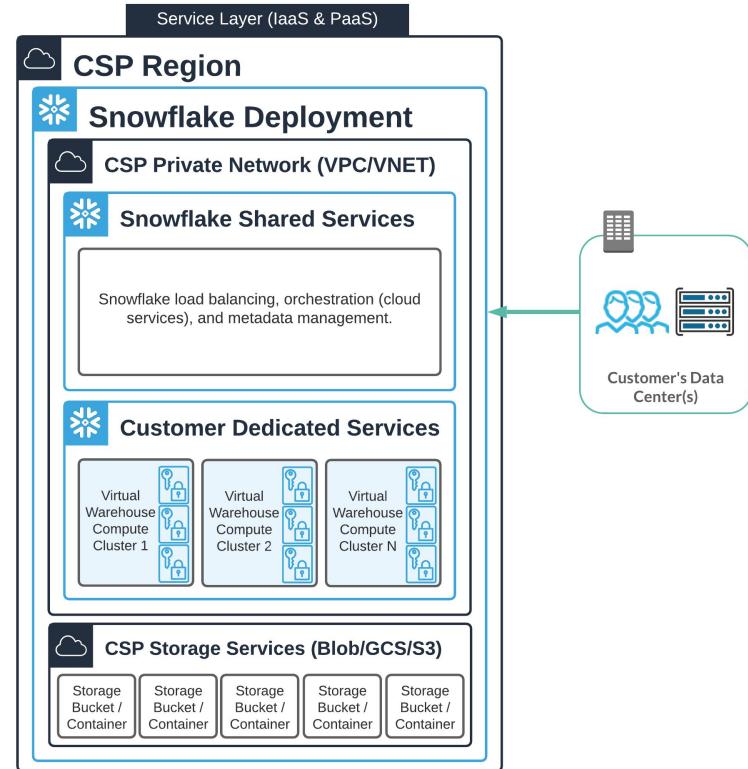
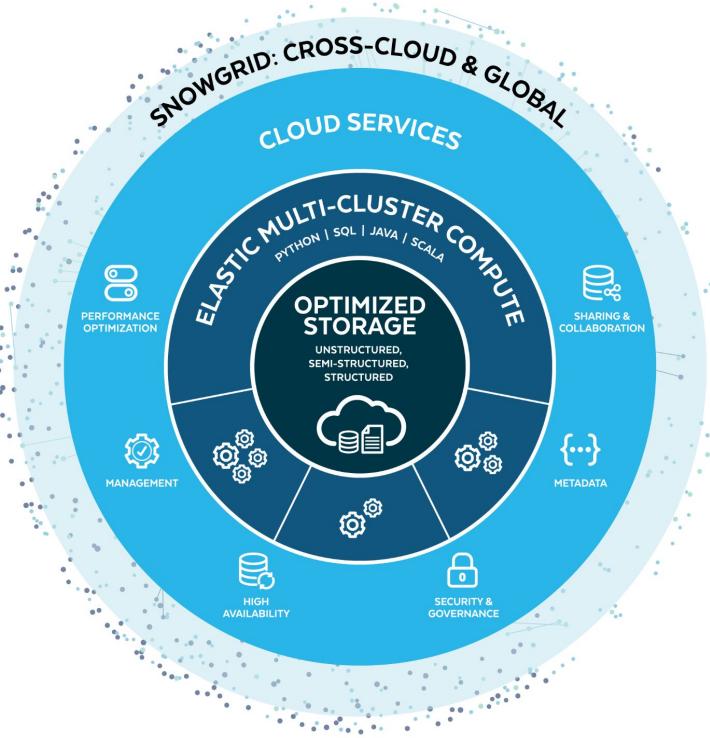
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**Interoperability is forcing
vendors to decompose their
proprietary architectures to give
customers flexibility**



Snowflake's Architecture Is Built To Handle The Future

SNOWFLAKE PLATFORM ARCHITECTURE



Snowflake is a leader at enabling a fully resilient data mesh

Horizon Catalog as the source of truth for data management and your single pane of glass for data access

Consumer Flexibility

- Architecture
- Tooling
- Cloud/Region
- Security
- Patterns



Data Democratization



Global Data Unification



Platform Capabilities



Enterprise Governance



Data Estate Flexibility

- Architecture
- Tooling
- Cloud/Region
- Security
- Patterns



Key aspects of the platform architecture



Lakehouse Platform - enabled via open table formats



Horizon Catalog - one stop shop for data management capabilities



Business Continuity - resilience, high-availability, disaster recovery in the cloud



Internal Market Place For Data Products - central portal for your organization to make data easy to find and use



External Data Sharing & Data Monetization - how you can efficiently monetize your data across clouds with minimal effort



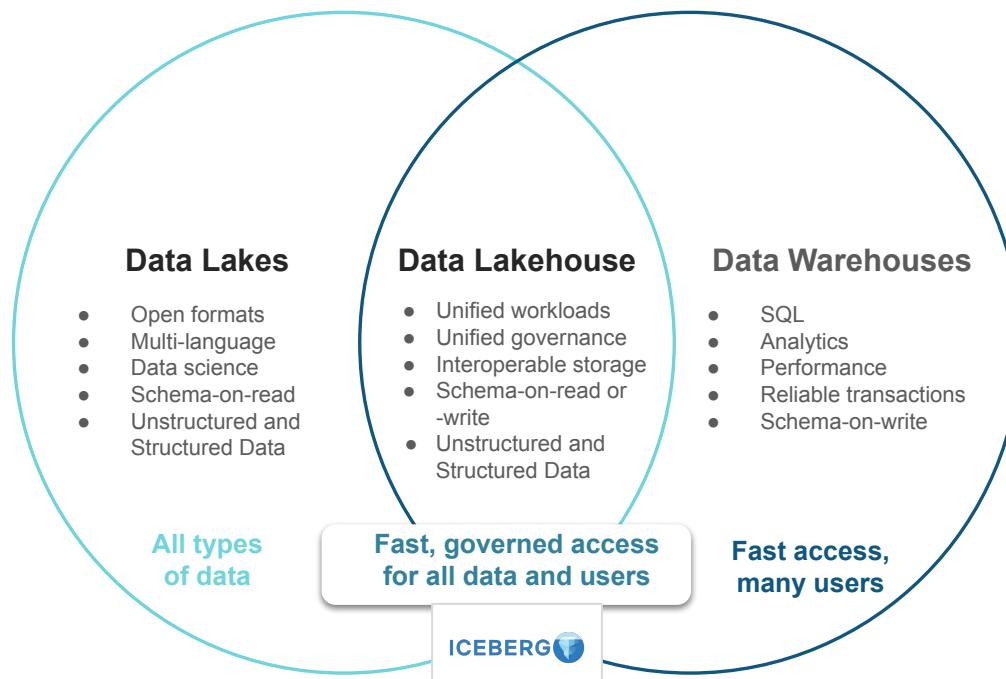
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The Lakehouse Answer: Securely Unify Data

Organizations are choosing to unify their data silos by combining the flexibility and scale of a data lake with the performance and reliability of a data warehouse



Apache Iceberg

What is Iceberg, what does it do, and why is it important?



What it is

Iceberg is an *open table format for huge analytic datasets*. It enables high-perf analytics on open data formats.



Use case

Provides consistent view of table data to many query engines and makes it possible to change tables easily over time.



Major benefits

Provides oft missing features on lakes - ACID compliance, high performance, consistency, and evolution support.

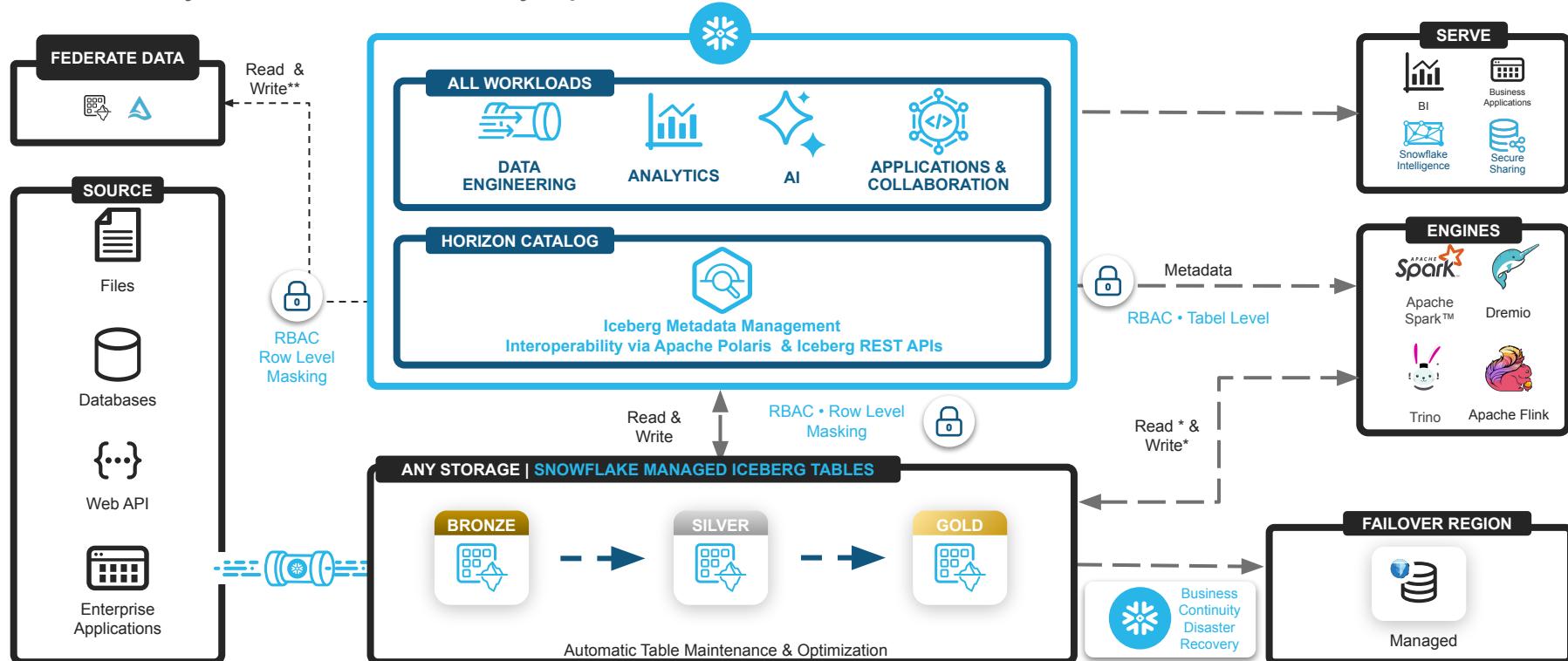


Unique features

- Agnostic to processing engines
- Schema evolution and high performance
- Strongest open source community

Enterprise Lakehouse - Reference Architecture

Powered by Snowflake. Reliably open and secure.



Snowflake Managed Iceberg Tables

WHAT IS IT

Horizon Catalog manages the metadata and multi-engine access for these Iceberg tables. Manage multi-engines access via Horizon's Implementation of Polaris IRC API

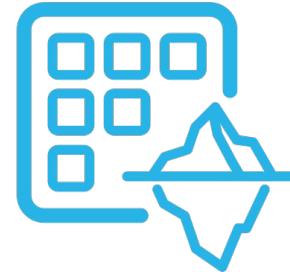
```
CREATE ICEBERG TABLE  
my_db.my_schema.my_iceberg_table (  
    id          INT,  
    name        STRING,  
    created_at TIMESTAMP  
)  
CATALOG = 'SNOWFLAKE';
```

WHY USE IT

Native support for all Snowflake platform features, including: BC/DR, data sharing, cloning, governance and more. Unlock optimized performance on Snowflake with automated table optimization and option to update file size and partitions for optimal external engine performance

HOW TO USE IT

Use catalog = 'Snowflake' when creating this Iceberg table



Iceberg Product Roadmap: Already in GA

* Snowflake Roadmap: GA*

Snowflake platform features

- Cross-region, cross-cloud Data Sharing
- Dynamic Tables
- S3-compatible Storage
- Snowpipe/copy into (with no parquet re-write)
- Snowpipe Streaming
- Search Optimization

Integrating with External catalogs

- Snowpark
- Catalog-linked databases
- Catalog-vended credentials
- Private Link for Catalog Integration
- Auto-refresh of tables
- Writing to Externally managed iceberg tables

Iceberg format features

- Partitioned Iceberg
- Write a target file size
- Merge-On-Read (positional deletes)
- Delta Direct
- Table optimization for Snowflake-managed Iceberg tables

* List not 100% exhaustive



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ROADMAP IS UPDATED AT SNOWFLAKE'S SOLE DISCRETION.

Iceberg Product Roadmap: Growing Native Support

Snowflake roadmap			
PREVIEW		IN DEVELOPMENT	
PUBLIC	PRIVATE	V3 Support	
<ul style="list-style-type: none">Write to OneLakeReplication, BC-DRSecure Multi-Engine Access via Apache Polaris APIs in Horizon: Reads	<ul style="list-style-type: none">Add parquet files by referenceStorage for Iceberg TablesIceberg V3 SupportSecure Multi-Engine Access via Apache Polaris APIs in Horizon: Writes	<ul style="list-style-type: none">Drivers support for Structured TypesPartitioning improvements: Hierarchical paths, Partitioning Evolution, Positional Deletes (In-Dev →GA)Deletion Vector read support for Delta Direct	<ul style="list-style-type: none">Row LineageDeletion vectors (read)Default ValuesVARIANT data typeNanosecond timestampsGeometryGeography
<small>* List not 100% exhaustive</small>			



APACHE POLARIS

- Delta support
- Catalog federation
- Fine-grained access control



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Demo 1

- Let's show some Iceberg tables and how they interact with AWS S3



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Snowflake Horizon Catalog

THE UNIVERSAL
AI CATALOG

CONSISTENT GOVERNANCE, ANY ENGINE



Snowflake Horizon Catalog

Context and Governance for AI Over All Data

INTEROPERABLE THROUGH OPEN APIs

(Apache Polaris™ and Iceberg REST Catalog)



COMPLIANCE



SECURITY



PRIVACY



DISCOVERY



COLLABORATION



Tabular
data



Semantic
models



Unstructured
data



AI & ML
models



Notebooks



Dashboards



Data
products

...and more

ANY DATA, ANYWHERE



FEDERATION WITH OPERATIONAL METASTORES

Iceberg REST

Unity Catalog

GCP Big Lake

AWS Glue



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Horizon Catalog: One Management Plane for All Data

WHAT IS IT

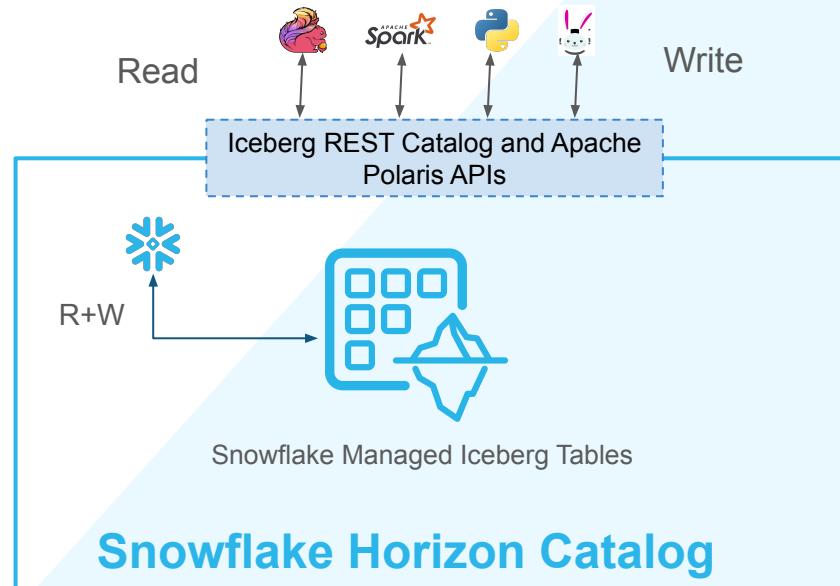
- Manage secure, multi-engine access to Snowflake managed Iceberg tables directly in Horizon Catalog via embedded open APIs [Apache Polaris and Iceberg REST Catalog (IRC)].
- External engines can **read**** from or **write*** to Snowflake managed Iceberg tables

WHY USE IT

- Interoperability without vendor lock in: Snowflake Horizon Catalog delivers enterprise security, governance, and interoperability without lock-in for your lakehouse.

HOW TO USE IT

- Create your Snowflake managed Iceberg tables in Snowflake.
- Manage secure access to Iceberg tables via Horizon Catalog for any compatible external client



Snowflake Horizon Catalog

THE UNIVERSAL AI CATALOG: CONTEXT AND GOVERNANCE FOR AI OVER ALL DATA



Interoperable
without vendor
lock-in



Enterprise-grade
security and
governance for
data and AI



Helps AI better
understand
your data



Cross-region,
cross-cloud
manageability and
sharing at scale



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Snowflake Horizon Catalog

Interoperable without vendor lock-in

Multi-engine READ/WRITE to Iceberg tables with one catalog

Federation with Iceberg REST catalogs like Glue & Unity

Option of full vendor neutrality with migration to Apache Polaris

Enterprise-grade security and governance

RBAC for data, AI models, and AI agents

Advanced, fine-grained access controls (FGAC) and attribute-based access controls (ABAC)

Dynamic data masking and advanced privacy controls

Helps AI better understand your data

Business context that helps AI agents understand and correctly interpret your data

Learns your metadata and query patterns

Uses AI to automate creation of data descriptions, products, and semantic models

Cross-region, cross-cloud manageability and sharing at scale

Streamlined Business Continuity and Disaster Recovery across regions and clouds

Unified and global management plane across regions and clouds

Seamless data sharing and discovery across regions and clouds





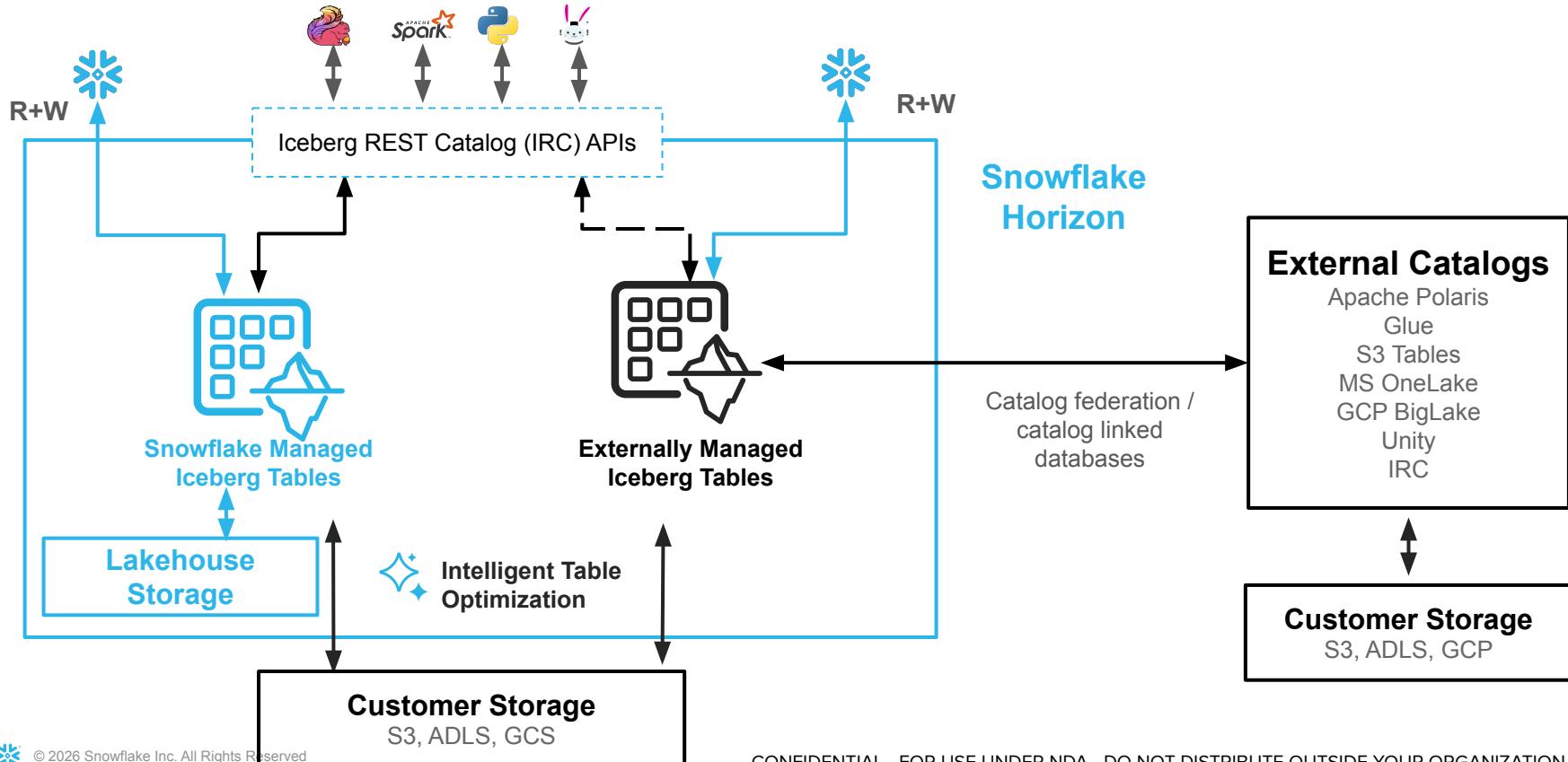
POLARIS CATALOG

An interoperable, open source catalog for Apache Iceberg™



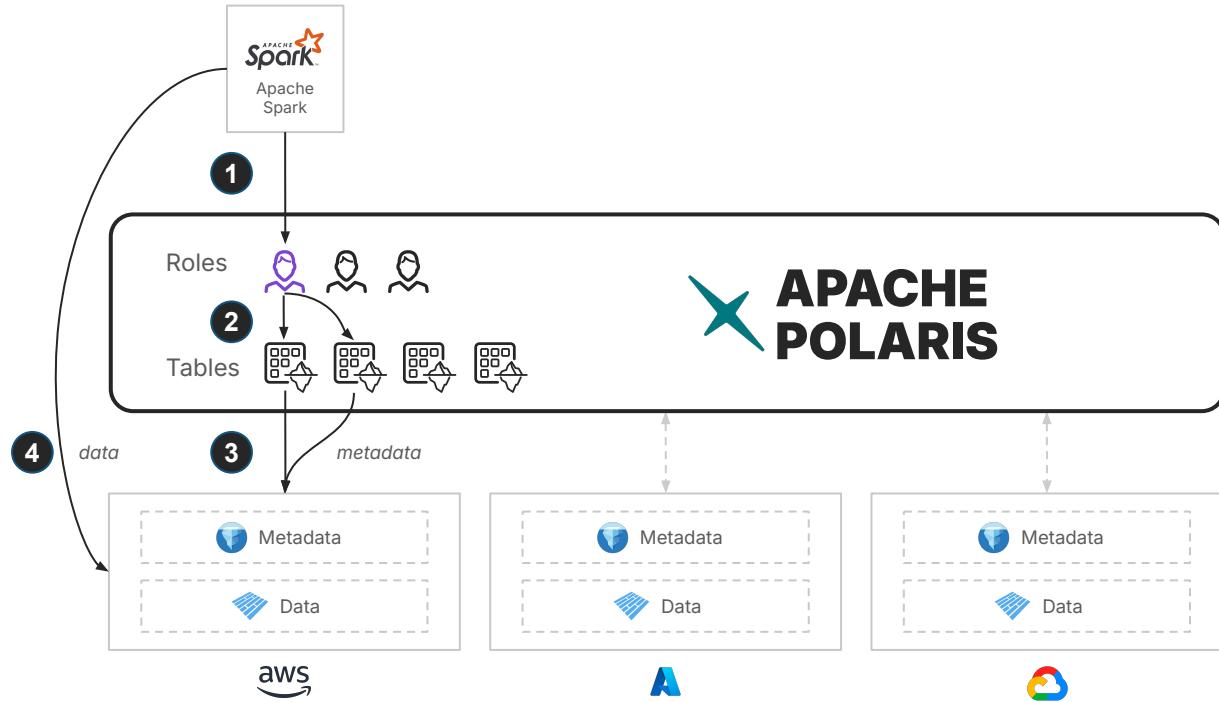
Apache Polaris is currently undergoing Incubation at the Apache Software Foundation

Catalog feature: Full Interoperability



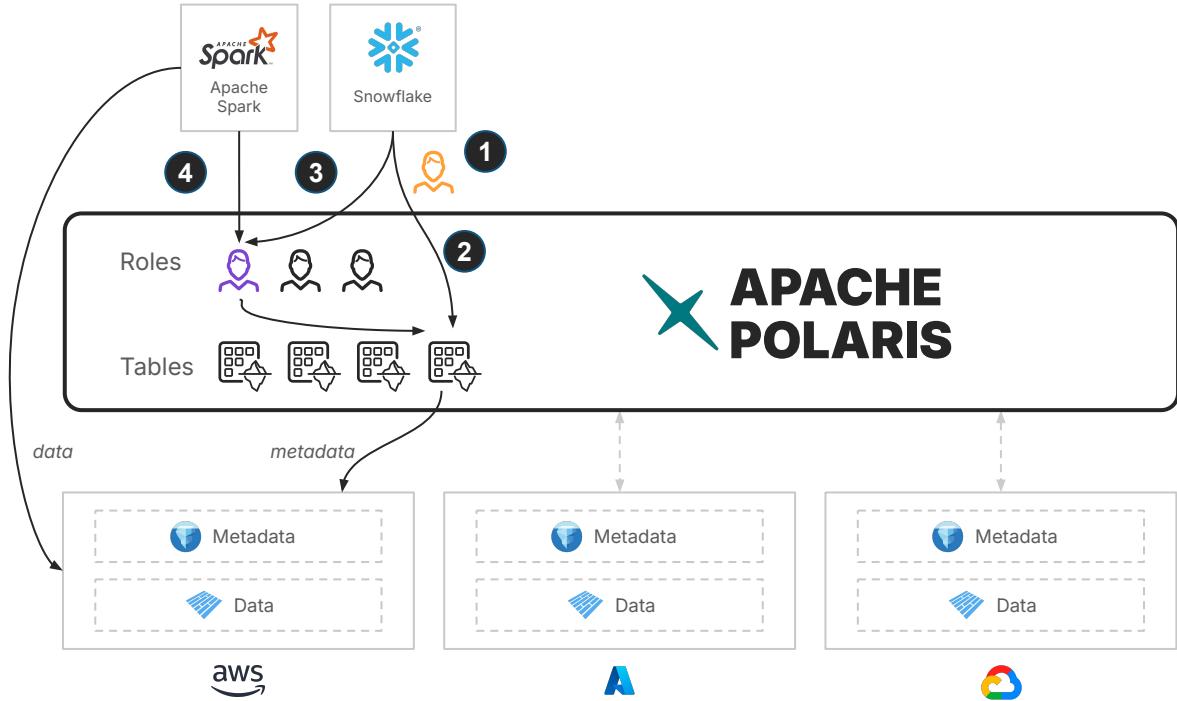
Example: Secure query execution

1. Spark is configured to use credentials of user Alice. Spark runs a query to read data from Table1
2. Apache Polaris verifies that Alice has access to Table1
3. Apache Polaris generates scoped credentials for storage in Amazon S3 where Table1 data is stored and gives Table metadata and temporary credentials to Spark
4. Spark reads Table data from S3



Example: Create from Snowflake, query from Spark

1. Bob creates an Iceberg table Table1 in Snowflake. It is stored on Amazon S3
2. Bob makes table available in Apache Polaris for Alice to use
3. Bob gives privileges to Alice in Apache Polaris
4. Alice uses Spark to read Table1 from S3 using Polaris

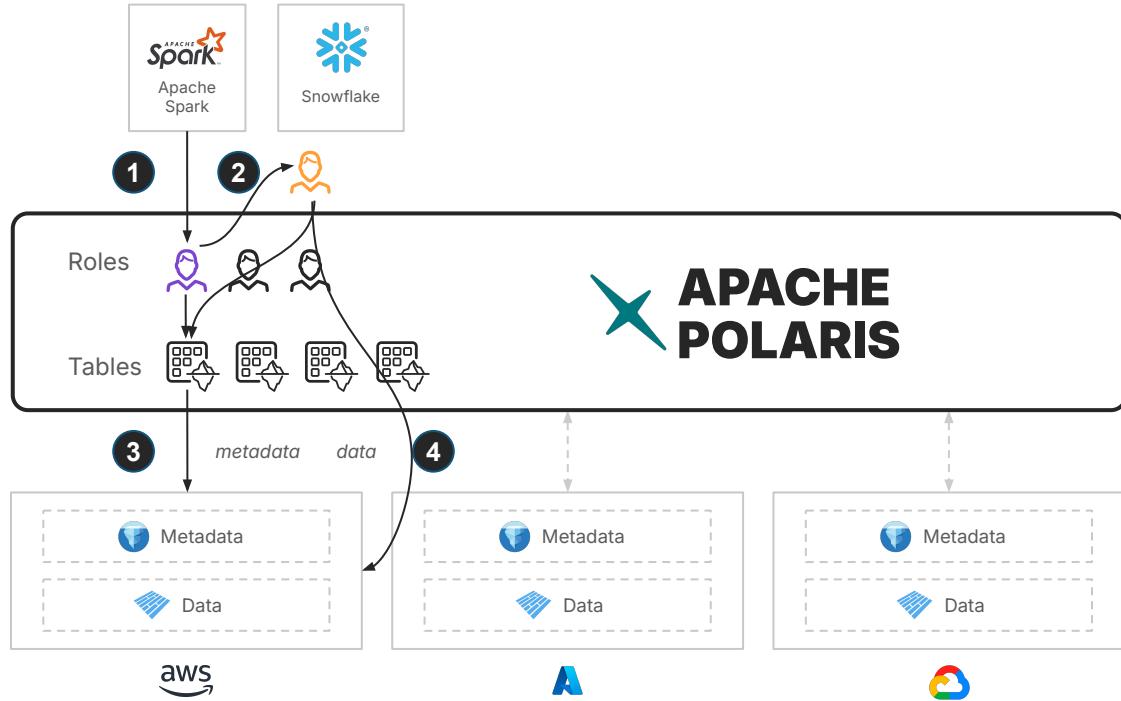


Apache Polaris is currently undergoing Incubation at the Apache Software Foundation



Example: Create from Spark, query from Snowflake

1. Bob creates an Iceberg table Table1 in Apache Polaris using Spark. It is stored on Amazon S3
2. Bob grants Alice to use the Table1
3. Table1 shows up in Snowflake and Alice runs query on Table1



Apache Polaris is currently undergoing Incubation at the Apache Software Foundation



Demo 2 and 3

- Show a pipeline that creates multiple tables with different tech (SQL, Spark, etc.) so we can walk through a lineage use case and how the catalog captures it all
- Show an external jupyter notebook connecting from external to snowflake to illustrate IRC endpoints



External Lineage

Tracking lineage for non-Snowflake objects

WHAT IS IT

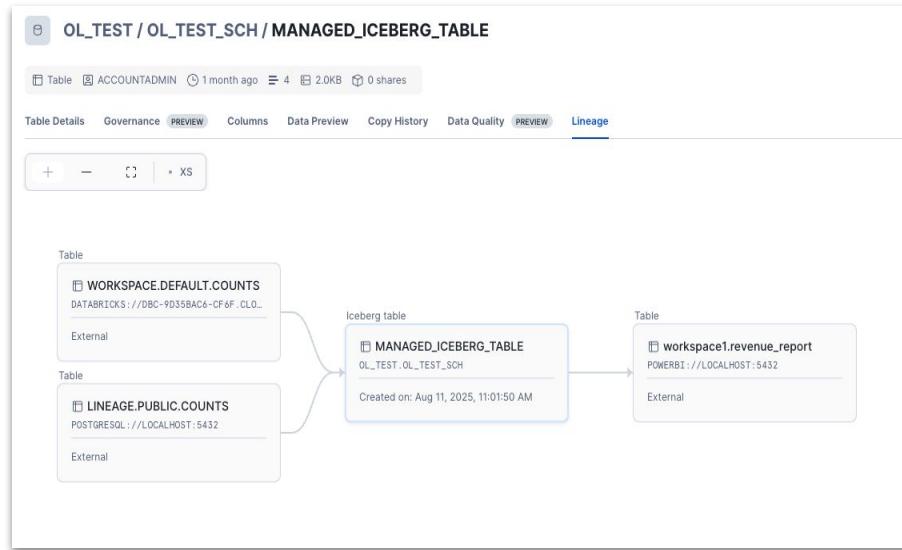
We understand that we are part of an ecosystem and interoperability is key. Therefore we extended Snowflake's native lineage to include **external data sources** through integrations with data engineering tools including Airflow, Spark, and dbt!

WHY USE IT

Gain a unified view of lineage across your entire data ecosystem, from source to dashboard, to serve as a single pane of glass.

HOW TO USE IT

- You can ingest OpenLineage compatible events into a new REST HTTP Endpoint provided by Snowflake, to automatically surface lineage from external sources directly in Snowflake Data Lineage.



New: Data Quality Monitoring UI and Data Profiling

WHAT IS IT

- A user interface to visualize data quality results for your tables, with built-in actions to identify root-cause analysis and integration with Snowflake Data Lineage.

WHY USE IT

- Data Teams can easily operationalize and take actions on data quality results when reviewing details for data quality rules.
- Data Engineers can identify root causes of data issues with Lineage integration.
- Data Engineers can identify implicate assets and proactively notify business users about data quality issues.

HOW TO USE IT

- Use Snowsight UI to access the Data Quality tab and monitor data quality results.

The screenshot displays the Snowsight Data Quality Monitoring UI. On the left, the Database Explorer shows a tree view of databases and tables, with the 'Catalog' and 'SHIPPMENTS' nodes expanded. The main area is titled 'SUMMIT / DEMO / SHIPPMENTS' and contains tabs for 'Monitoring' (selected) and 'Data Profile'. The 'Monitoring' tab shows a summary: '5 minutes' run schedule, '2 (33%)' Passed quality checks, and '4 (67%)' Failed quality checks. Below this are sections for 'Checks by dimension' (Freshness, Volume, Accuracy) and 'Quality Dimensions' (Freshness, Volume). The 'Run History' section at the bottom shows a timeline of freshness runs from Oct 3 to Oct 9, with various time intervals labeled (e.g., 2h 30m, 1h 40m).

New: AI Copilot for Horizon Catalog

WHAT IS IT

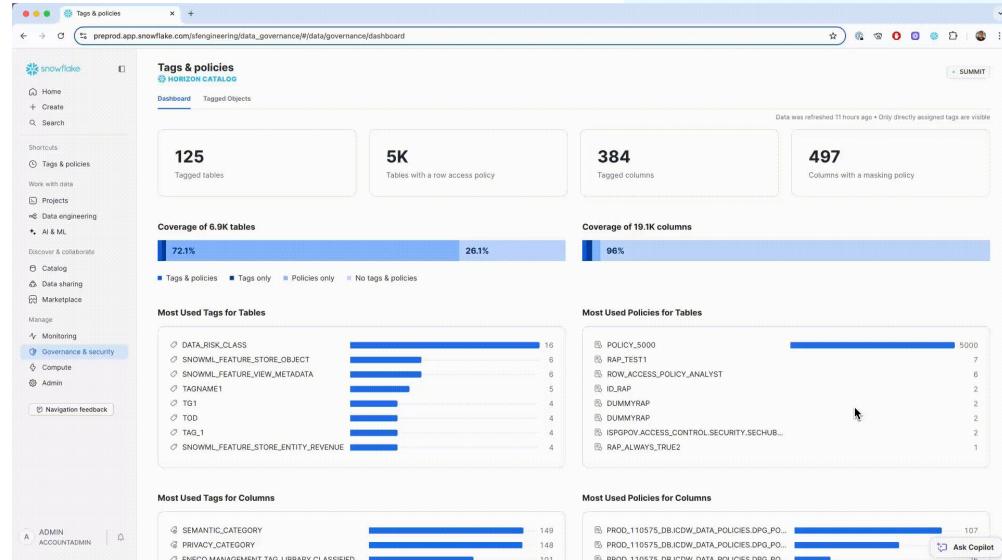
- A conversational interface to the metadata and usage data in your Snowflake account
- It enables data governors, stewards, and security admins to self-serve without requiring SQL knowledge or knowledge of account usage views

WHY USE IT

- Faster time to governance and security insights
- Less dependency on data teams with specialized knowledge

HOW TO USE IT

- Chat with it directly in the UI

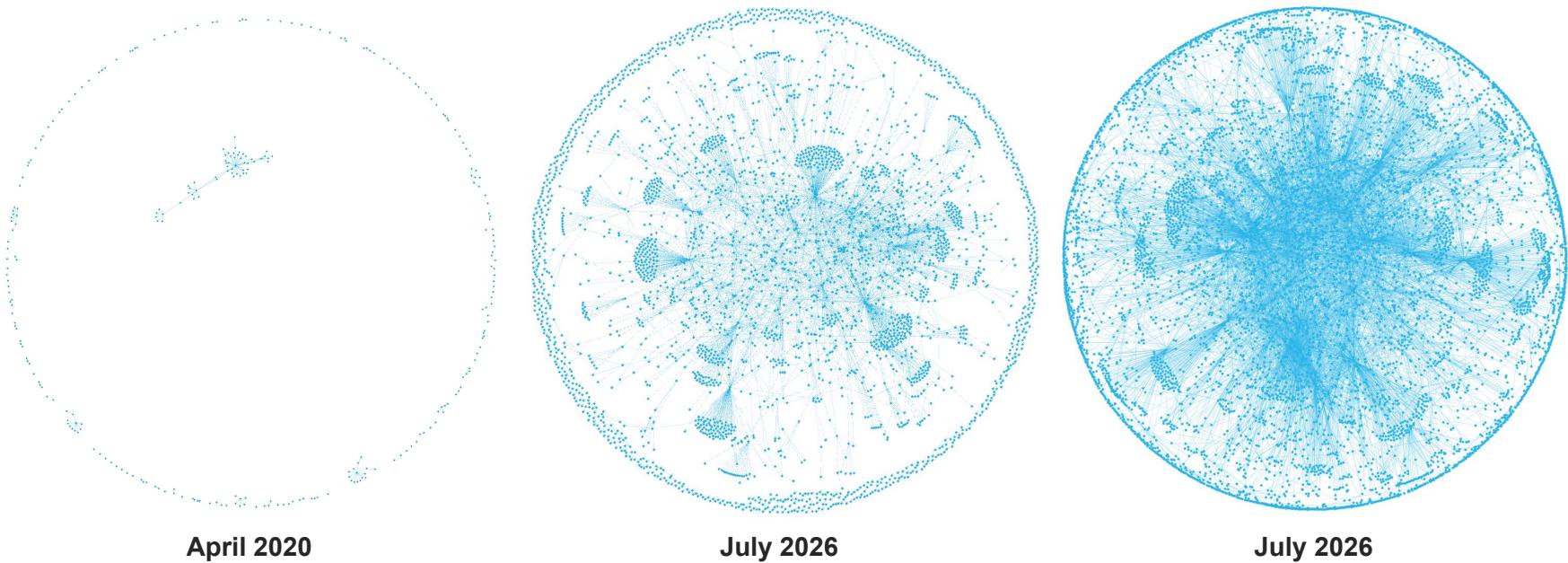


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- **Cross Cloud Data Sharing**
- Internal Marketplace & Data Products



Data Sharing Has Been Accelerating On The Snowflake Platform



Snowflake Global Data Sharing

Powers The Data Cloud

1 Across Cloud & Region w/Snowgrid

- Live, Ready-to-Query, No ETL
- On Demand Provisioning
- Public & Private Marketplace

2 Share More than Data

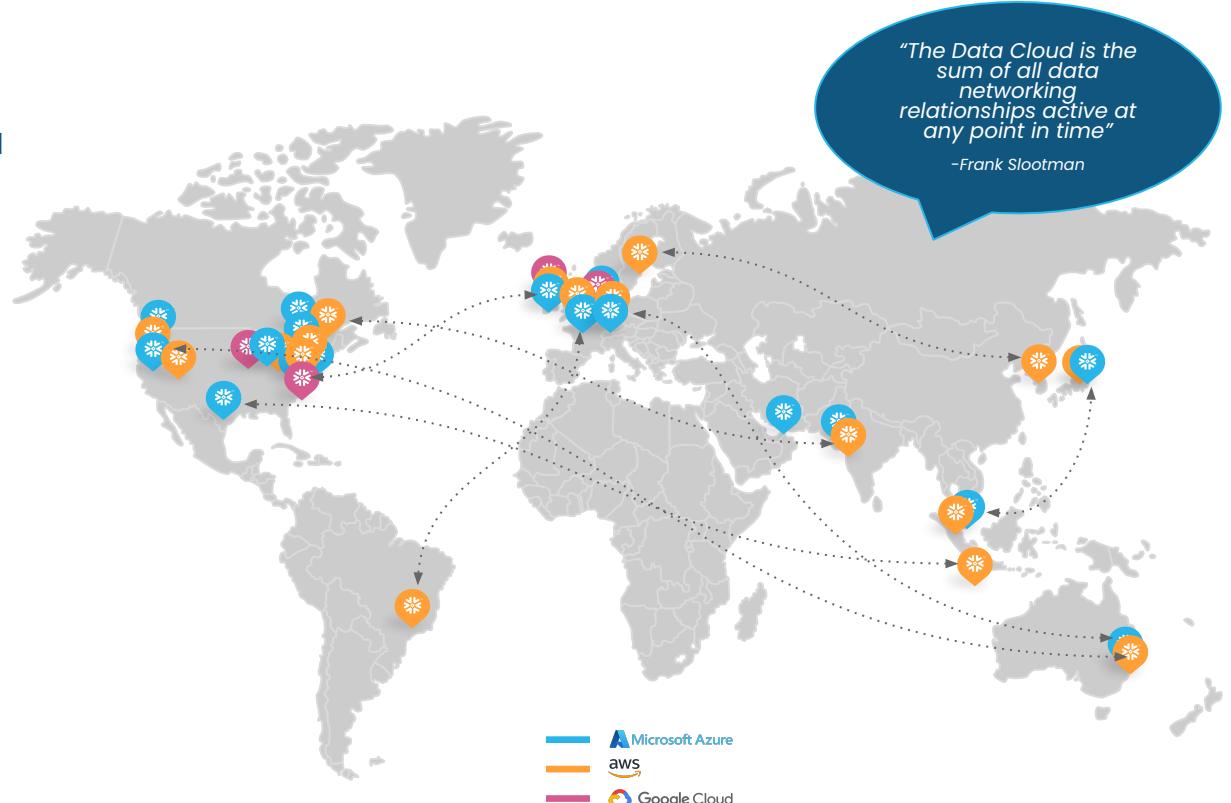
- Applications, Connectors
- Multi-party Clean Rooms*
- Usage-based Monetization

3 Robust Governance

- Policies, Entitlements, Masking
- Revocable Access
- Custom Event Logging

*Native Cleanrooms is in private preview as of Aug 2026

Doc: [supported Snowflake cloud regions](#)



Simplifying BCDR

Common Failover Group

All account objects and shared databases.

Refresh schedule < 5 minutes.

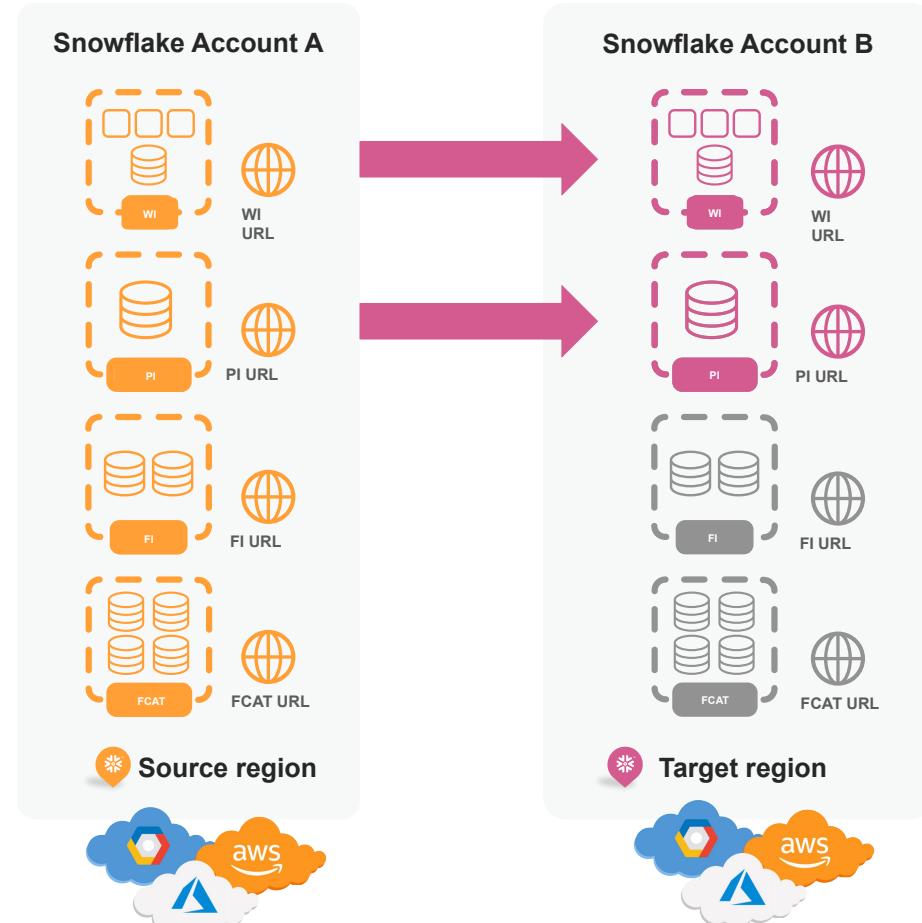
Failover managed by admin team.

Failover Group & Connection per team

Workload specific databases and shares.

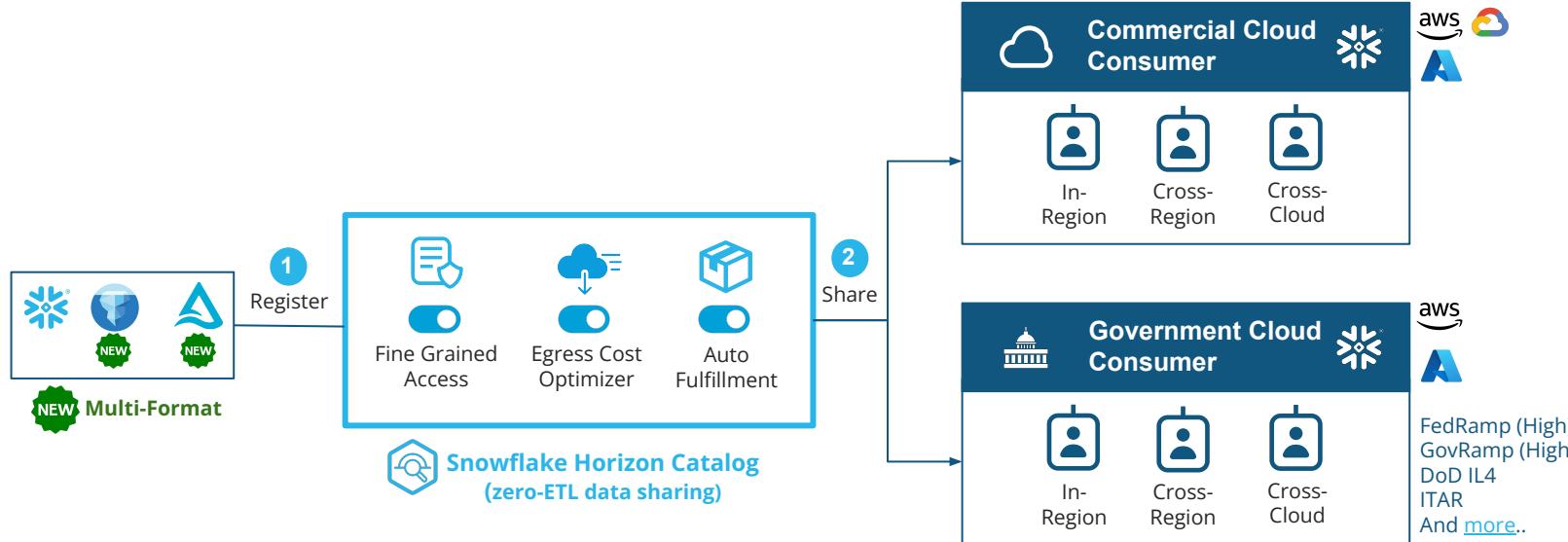
Tailored refresh schedule per group.

Each team independently manages failover and fallback.

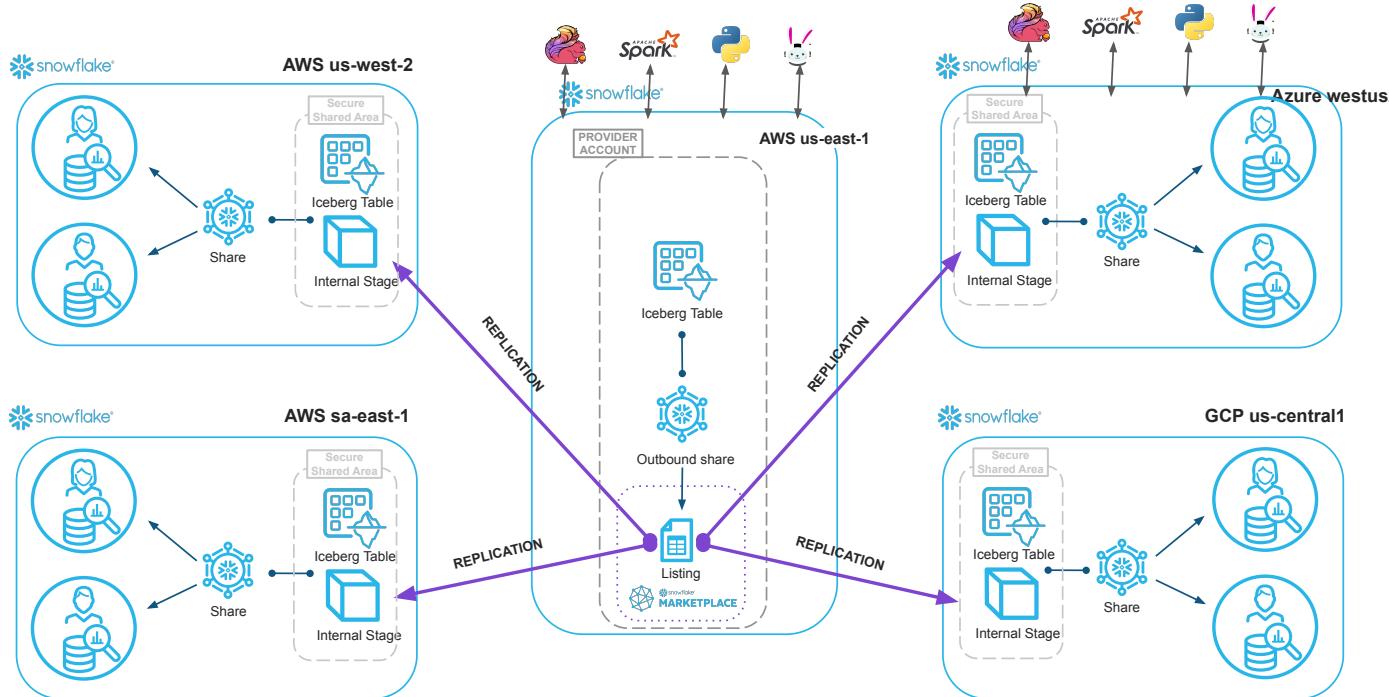


Share Secure Access to Open Table Formats

Connect your business ecosystem with governed data for AI



Catalog Feature: Interoperable Data Sharing



Catalog provides secure cross-region, cross-cloud auto-fulfillment.

Share tables without unbounded egress costs.

Catalog enables cross-engine data sharing. No need to duplicate data to share with 3rd party engines.

Bloomberg is a heavily requested data provider on Snowflake!

Show them data cloud bridge



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AI success is dependent on a connected, well managed data foundation

62%

[Salesforce](#)

Say their data systems
are not ready to fully
leverage AI

64%

[Snowflake](#)

Find integrating data
sources for GenAI
challenging – further
complicated by growth
in unstructured data,
open table formats

85%

[Forbes](#)

AI initiatives
unsuccessful due
largely to data
governance issues



But, your strategy will suffer without certified and secure data products

CHALLENGES

- 🚫 Data **locked in silos**, limiting access
- 🚫 Limited **knowledge** of existing data
- 🚫 **Difficulty** finding the right data
- 🚫 **Low quality** and/or duplicative data
- 🚫 **Brittle pipelines** from missing data contracts (producer-consumer).
- 🚫 **Lack of ownership** when data consumers need new data assets

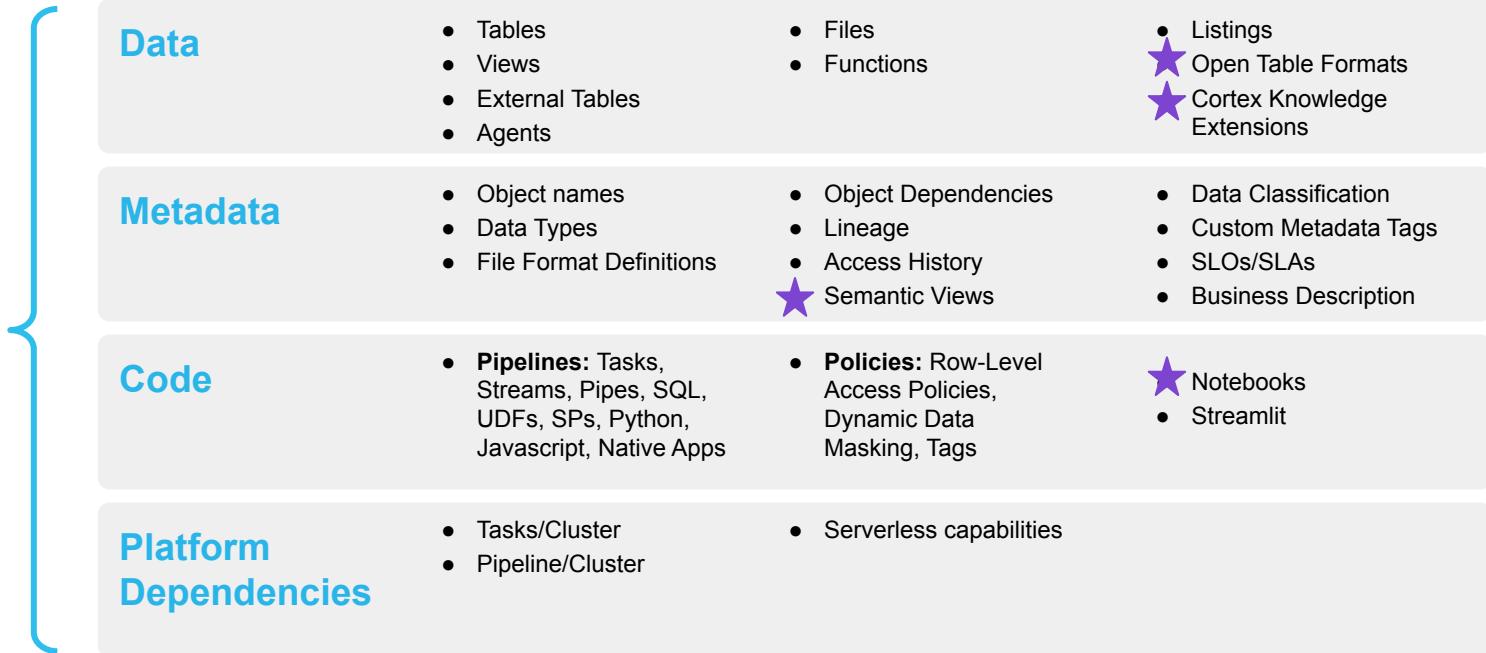


The modern solution: Secure, interoperable data products that are AI-Ready

Curated collection of data assets which enable actionable intelligence and insights towards achieving specific business outcomes.



Data Product



What does it mean for data products to be AI-ready?



Data Quality

- Clearly defined sources for AI use case
- Fresh, complete
- Data contracts



Governed & Secure

- Access roles defined
- Discoverable



Semantic Layer

- Semantic view for business context
- Metadata for Agentic AI



Data Architecture

- Reusable Across Use Cases
- Minimize Hops / Real Time

- Abstraction



Data products will introduce a new working model

Producers



- Data Acquisition
- Monitoring & Alerting
- Data Curation

Data Product



Consumers



- Change Management
- Requirements & Data Contracts
- Use Case Governance
- Business Definitions
- Schema
- SLAs

- AI / ML
- Applications
- Data Sharing



Core functions for data product initiatives

Data Product Governance & Strategy

- Identify & Maintain Domain Boundaries
- Define Owners
- Define Architecture Standards
- Define Data Management Requirements
- Define Implementation Patterns

Data Product Development & Delivery

- Codify Business Entities & Definitions
- Define Requirements, SLAs, etc. based on business needs
- Build It! (e.g. Semantic Views, Producer Changes)
- Govern Access, Cost, Usage, etc.



New functions, roles and responsibilities

Data Product Governance & Strategy

Platform Teams



Creates Shared Services & Capabilities
Area: Security | Network | Cloud

Data Arch, Governance & Management



Area: Standards | Guidelines | Patterns of the Data Product

Business Domain Owner



Area: Business Owner, Defines Use Cases

Data Product Development & Delivery



Data Product Owner

Area : Chairs the Council / Lifecycle of the Product



Data Product Consumers

Area : Systems / Stakeholders of the Data Product



Data Engineering Team

Designs & Builds the Product
Area: End-End Data Pipelines / Interfaces



Data Producers

Area: Owns the Upstream Data Sources of the Data Product

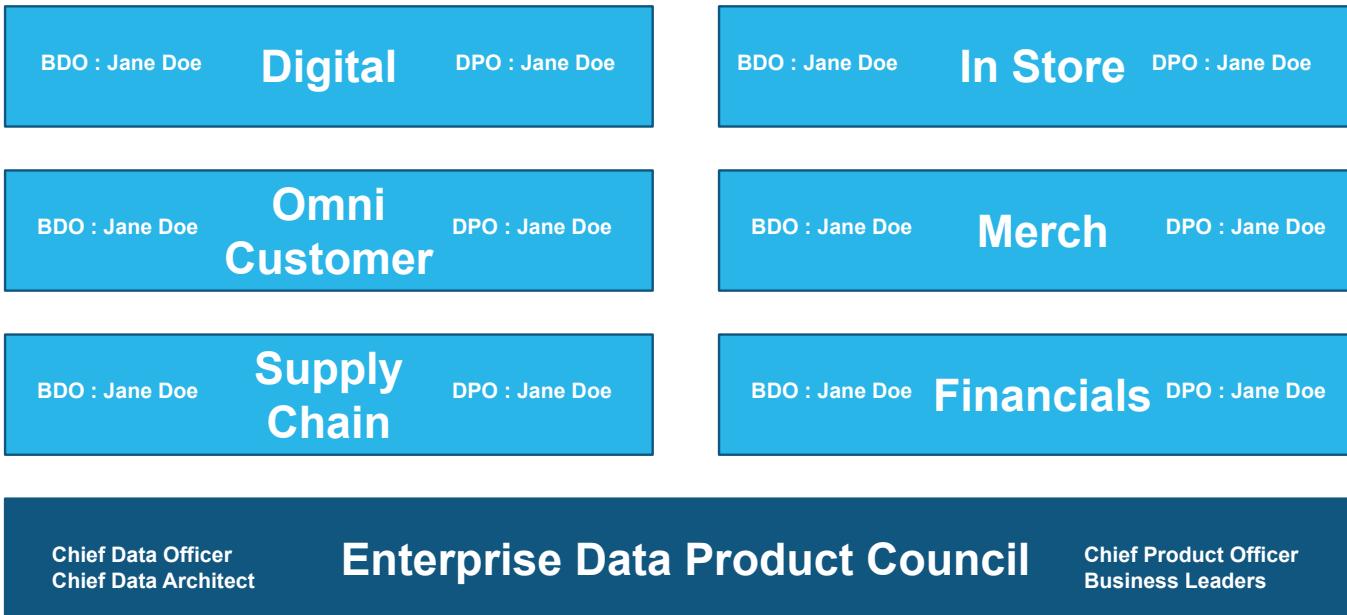


Data Analysts

Area: Data SME's



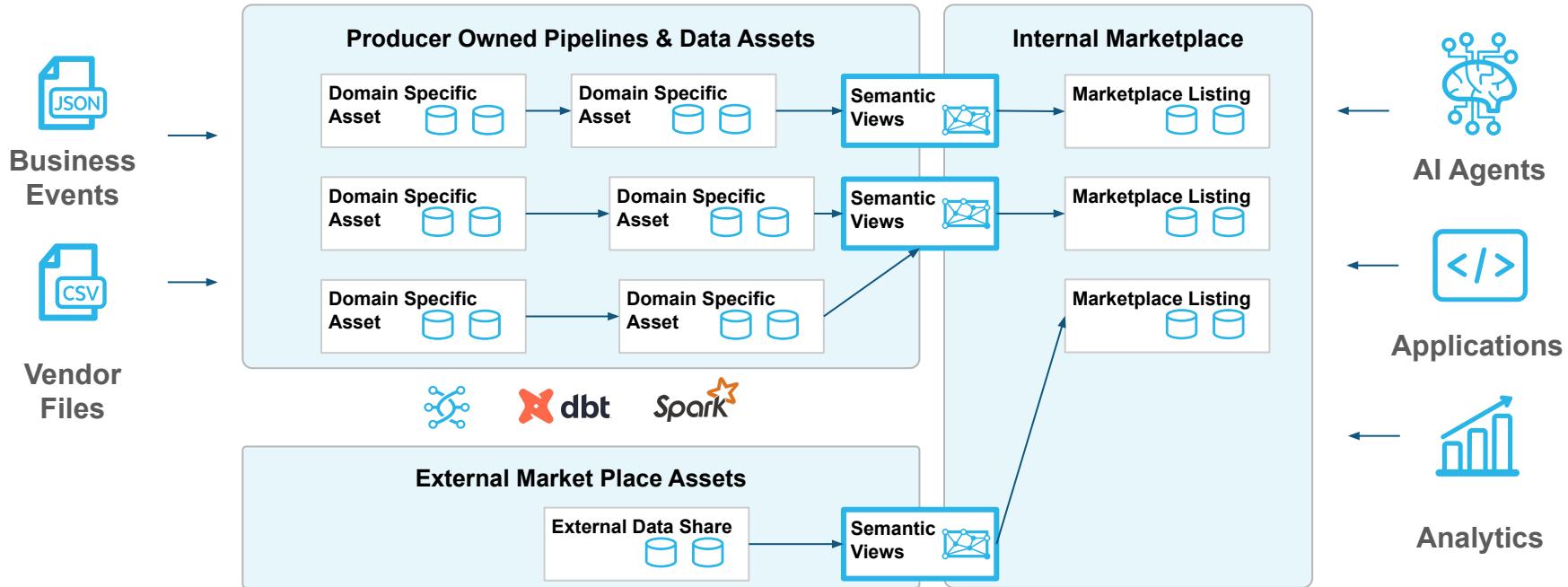
Example retail domain structure for data product success



Snowflake provides important capabilities that will make data products successful



Data product flow: From producer to consumer



Snowflake Semantic Views

Unlock Conversational Analytics

Semantic Models **ensure high quality, consistent, and governed conversational analytics** in Cortex Analyst, Snowflake Intelligence, and other text-to-sql clients.

Any Analytics Surface, Same Answer

Whether you are talking to your data, writing a SQL query, or using a BI client, Semantic Views **ensure that all analytics consumers get consistent answers, regardless of the UI.**

Snowflake Security and Governance

Semantic Views are **securable schema objects**, which means the support object-level RBAC and respect any and all underlying data access controls. Replication and DR capabilities are built- in.

The screenshot shows the Snowflake Semantic View details page for the semantic view `TOTAL_SALES_ANALYSIS_SV`. The left sidebar lists various databases and schemas, with `MY_SAMPLE_DATA` expanded to show its contents. The right panel displays the semantic view's details under the `Semantic Concepts` tab.

Logical Table Concepts:

- `Store Sales`: Fact table for sales transactions in physical stores.
- `Web Sales`: Fact table for sales transactions via web.
- `Customers`: Dimension table for customer information.

Metrics:

NAME	EXPRESSION	SYNOMYS
# total_net_revenue	SUM(store_sales.net_revenue) + SUM(web_sales.net_revenue)	"Store area", "Store location"
# profit_margin	(SUM(total_net_revenue) - SUM(total_cost)) / SUM(total_net_revenue)	"Store zone", "Store division"

Dimensions:

NAME	EXPRESSION	SYNOMYS
store_region	store.region	"Store area", "Store location"
store_district	store.district	"Store zone", "Store division"

Facts:

NAME	EXPRESSION	SYNOMYS
# store_net_revenue	SUM(os.net_paid)	"Store area", "Store location"
# store_total_units_sold	SUM(os.quantity)	"Store zone", "Store division"

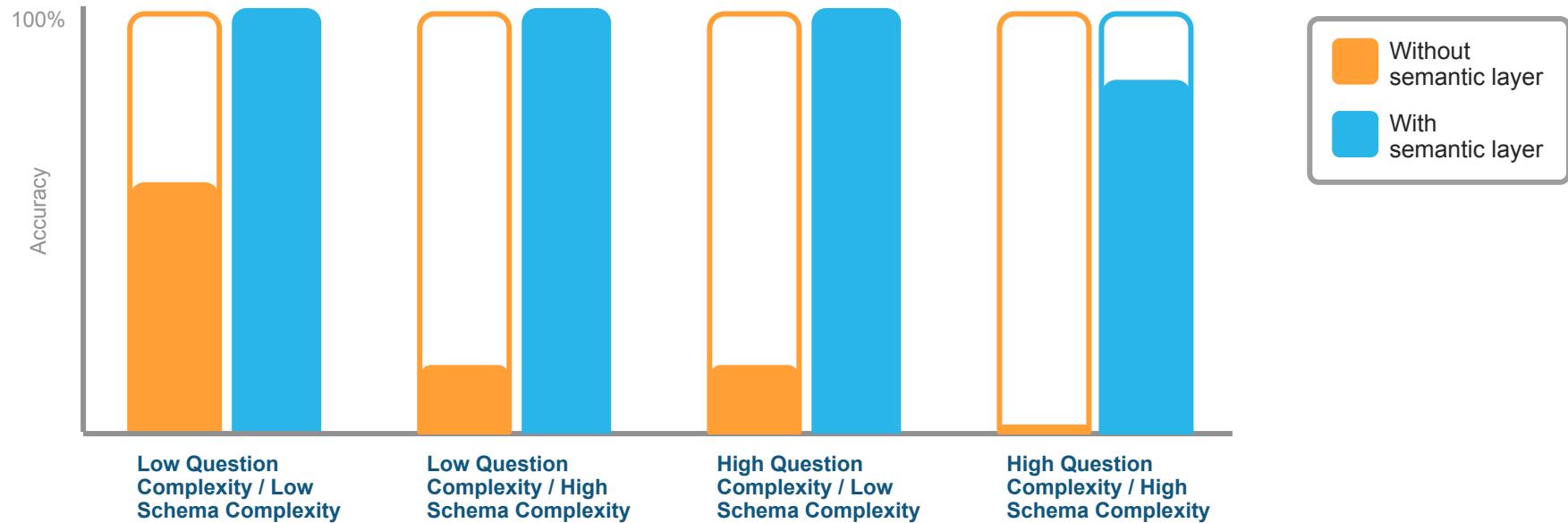
Model-wide Concepts:

Relationships:

NAME	LEFT TABLE	RIGHT TABLE	RELATIONSHIP COLUMNS
customer_to_store_sales	customer	store_sales	customer.c_customer_sk = store_sales.store_sk
customer_to_web_sales	customer	web_sales	customer.c_customer_sk = web_sales.customer_sk



Semantic views unlock high quality insights for Cortex Analyst & Snowflake Intelligence



Source: Enabling NLP with AtScale Semantic Layer and GenAI, Aug 2026

Horizon Catalog Internal Marketplace

Make AI-ready data products successful with centralized place for users to discover data

- A self-service hub of all **data products** shared with you by teams within your company
- Allows you to **quickly discover available data, apps and AI products** from other teams and business units.
- Search and browse available Listings and Profiles to discover and directly access data and apps from other teams within your company.

The screenshot displays the Internal Marketplace interface. On the left, a sidebar shows navigation links for Home, Create, Search, Shortcuts (Internal Marketplace, Database Explorer, Marketplace), Work with data (Projects, Data engineering, AI & ML), Discover & collaborate (Catalog, Data sharing, Marketplace), Manage (Monitoring, Governance & security, Compute, Admin), and a Navigation feedback section. The main area is titled "Internal Marketplace" and "HORIZON CATALOG". It features a banner stating "Trusted resources shared by teams within your organization" and "Browse the curated set of internal listings recommended by your organization". Below the banner is a search bar and filters for Availability (All), Profiles (All), Geographic coverage (All), Time coverage (All), and a button to "View Documentation". The main content area lists several data products in cards:

- Publisher Data**: Annual report — List of authors and their posts for the 2023
- Key Monthly Financial Performance Metrics Aggregated by Department**: Monthly summaries of revenue, expenses, and profit/loss by department. Track financial perform...
- Website Traffic and Engagement Metrics Reports (Daily/Monthly/Yearly)**: Aggregated data on website visitors, page views, session duration, and conversion rates. Track cam...
- Supply Chain Inventory Levels (Real-Time)**: Up-to-the-minute inventory levels across all warehouses and distribution centers. Ensure product availability and optimize supply chain effi...
- Employee Performance & Satisfaction Survey Results (Historical Data)**: Anonymized survey data on employee performance, satisfaction, and engagement. Gain...
- US Open Census Data & Neighborhood Insights**: SafeGraph's Open Census Data contains 7500+ demographic attributes (like income, age, education, etc.) available at the Census Block Gro...
- Real-Time Monitoring of Server Infrastructure Performance and Resource Utilization with Auto...**: Provides real-time monitoring of server performance metrics, including CPU usage, memo...
- Customer Churn Prediction Model (EMEA segment only)**: Predicts likelihood of customer churn using machine learning. Includes model documentation...
- Monthly Report on Sales Performance by Product Line and Customer Segment**: Presents monthly sales performance data, broken down by product line and customer segment, with...
- Finance**: By request
- Sales**: By request
- Supply chain**: By request
- Marketing**: By request
- Supply chain**: By request
- Sales**: By request



Demo 4

Show marketplace with semantic views -
Demo

