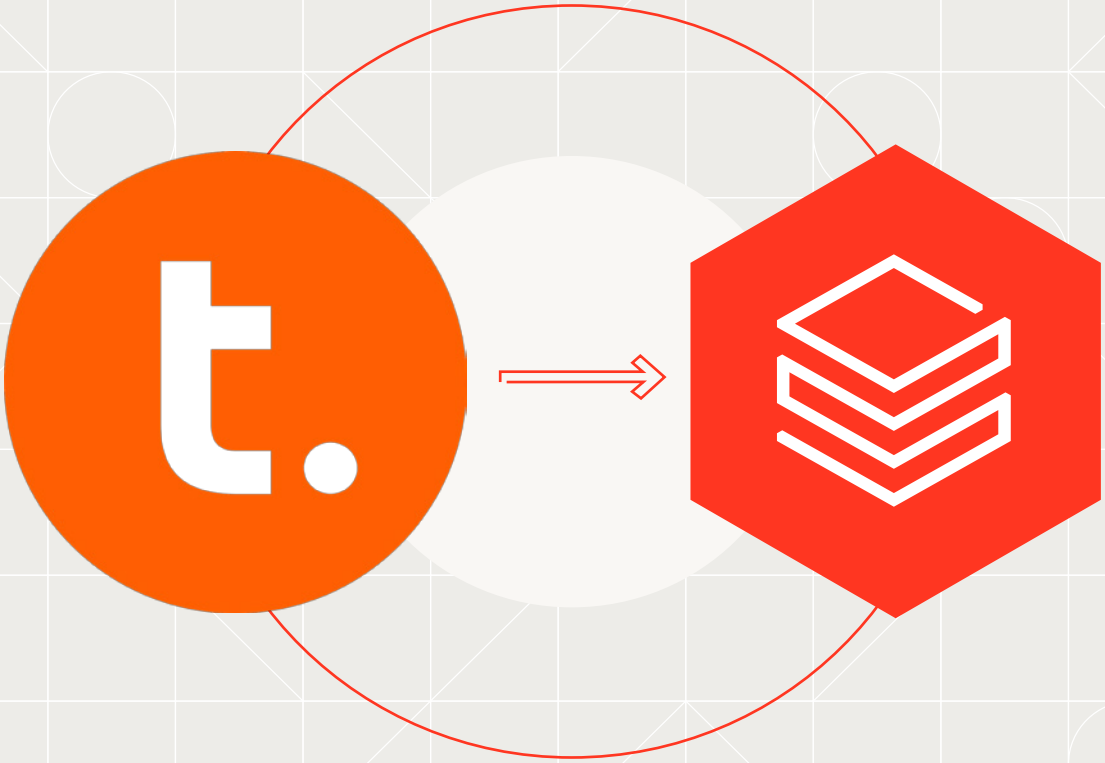
databricks

Guide

Teradata to Databricks Migration Guide



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Introduction

Traditional enterprise data warehouse (EDW) appliances like Teradata come with significant limitations — high costs, lack of support for unstructured data, no support for built-in AI or ML or real-time streaming capabilities and scaling storage or compute is challenging and expensive. To solve this, enterprises have different data marts and data warehouses, data lakes, ML platforms and streaming platforms that create silos as it requires constant ETL processes to move data between platforms for different workloads, increasing complexity and slowing down insights.

Databricks' Data Intelligence Platform introduces a paradigm shift by eliminating the need for separate data processing systems and constant data movement. Instead of copying data between warehouses, marts, lakes and ML platforms, Databricks brings different processing engines to a single copy of data in the cloud, enabling seamless data warehousing, AI, ML and GenAI use cases on a single platform and data asset. With its lakehouse architecture, Databricks provides governance, scalability and advanced analytics while decreasing costs and operational complexity. Migrating to Databricks ensures your organization is ready for the future with a unified, efficient and intelligent data platform.

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ABOUT THIS GUIDE

This guide provides a detailed roadmap for migrating data warehouse workloads from Teradata to the Databricks Data Intelligence Platform. It outlines key differences between the two systems, standard data and code migration patterns and best practices to streamline the transition.

Additionally, it compiles proven methodologies, tool options and insights gained from successful migrations. This migration guide covers theoretical concepts and practical applications and is a comprehensive resource for organizations looking to leverage Databricks for enhanced performance, scalability and advanced analytics.

MIGRATION STRATEGY

Successfully migrating from Teradata to Databricks requires careful planning, strategic alignment, clear target architecture and successful objectives. Following a proven structured migration process is critical to achieving a seamless, effective migration to Databricks, enabling your organization to realize value and position itself for rapid future innovation.

OVERVIEW OF THE MIGRATION PROCESS

Proper planning is required to migrate data and ETL processes from legacy on-premises systems to cloud technologies. This migration involves transferring data and business logic from on-premises infrastructure to the cloud.

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Despite the substantial differences between Teradata and Databricks, there are surprising similarities that can facilitate the migration process:

- Despite its proprietary SQL dialect, Teradata adheres mostly to ANSI SQL standards, providing compatibility with Databricks SQL syntax.
- Code migration can be accomplished through code refactoring, leveraging the shared ANSI SQL compliance between the two systems.
- Fundamental data warehouse concepts exhibit similarities across Teradata and Databricks, streamlining the transition process.

The migration process typically consists of the following technical implementation phases:

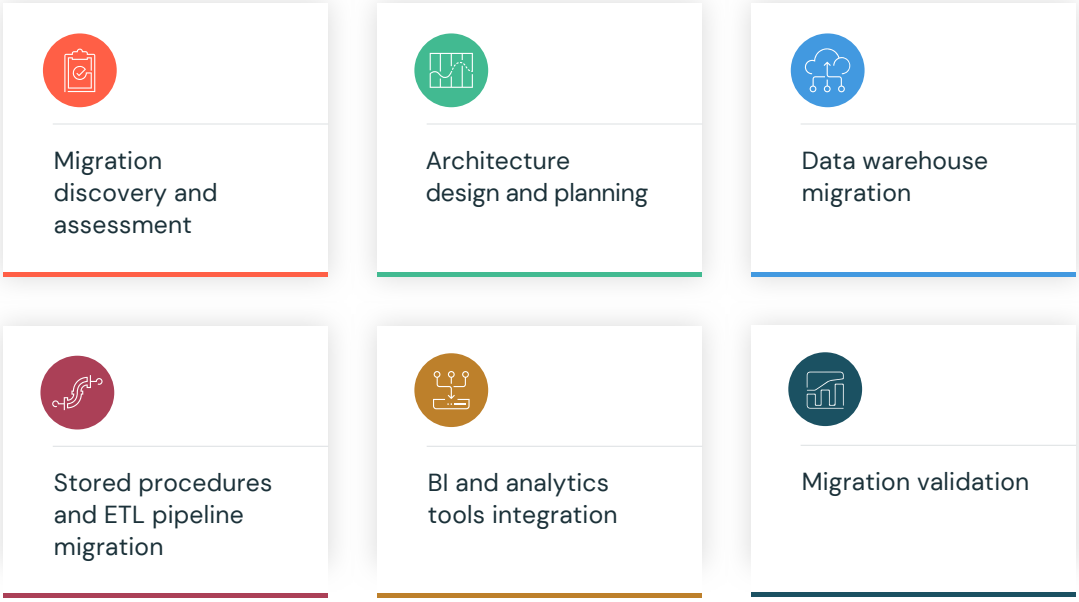

Figure 1: Technical migration approach

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Phase 1: Migration Discovery and Assessment

Conducting a migration assessment is crucial before migrating any data or workloads. This assessment enables us to:

- Gain insight into data ingress and egress, ETL patterns, data volume, orchestration tools and execution frequency
- Understand the technologies involved in upstream and downstream integrations
- Assess the business criticality and value of the existing systems
- Evaluate the existing security framework and access control mechanisms
- Gather pertinent information to provide a realistic estimation of the effort required for migration
- Compare and calculate infrastructure costs
- Identify any imminent deadlines, particularly about license renewal fees for the existing Teradata setup
- Document any functional or cross-functional dependencies in the migration plan

Databricks recommends automation tools, such as our Teradata Profiler and our recently acquired BladeBridge Code Analyzer, to expedite the gathering of migration-related information during this phase.

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Typically, these profiling tools examine Teradata system usage via its system views and catalog tables, providing consumption and complexity insights and an inventory of objects and code migration complexity. They capture the types of workloads, long-running ETL queries and user access patterns. This level of analysis aids in pinpointing databases and pipelines that contribute to high operational costs and complexity, thereby supporting the prioritization process.

BladeBridge Code Analyzer not only classifies queries based on their complexity in "T-shirt sizes" (small, medium, large, extra-large, etc.) — but also assesses function compatibility of Bteq scripts and stored procedures, which is vital in ensuring seamless migration.

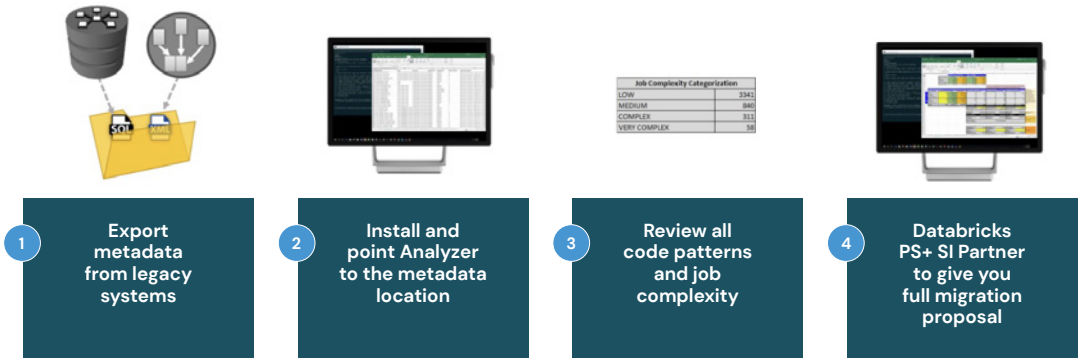

Figure 2: Running Databricks migration analyzer

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Phase 2: Architecture Design and Planning

Teradata and Databricks operate in markedly different ways. As an on-premises system, Teradata requires careful selection of a suitable Primary Index with high cardinality to ensure proper data distribution across all participating Access Module Processors (AMPs).

By contrast, the Databricks Data Intelligence Platform is a distributed system by design; the data distribution depends on the configuration of your cluster and the nature of your data. For example, if you load data into Databricks, the data will be automatically distributed across the nodes in your cluster. By default, Spark will split the data into partitions, processing each partition by a separate task on an individual node. This split allows for efficient parallel processing of the data.

The Databricks distributed design facilitates horizontal scaling, enabling data distribution and computations across multiple nodes in a cluster. This capability allows Databricks to process large datasets and handle high query volumes efficiently, surpassing the capabilities of a traditional EDW system.

It is essential to consider these distinctions when migrating from Teradata to Databricks. By consciously mapping the similarities and differences between the two platforms, customers can better understand Databricks' capabilities concerning Teradata.

EDW ARCHITECTURE

In legacy EDW architectures, data from various systems is typically ingested via ETL tools or ingestion frameworks. After landing in the raw layer, the data progresses to the stage or central layer, where further cleansing and processing occur. Finally, it moves to the final layer, containing the most complex business logic.

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After you prepare the final layer, use it for reporting purposes through third-party tools such as Microstrategy or BusinessObjects.

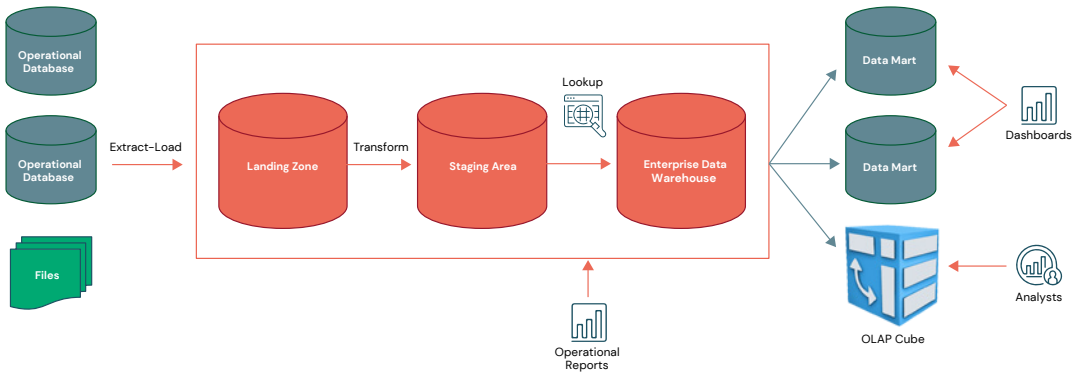

Figure 3: Typical enterprise data warehouse architecture

It is imperative to comprehensively analyze the current architecture, which involves understanding upstream and downstream integrations and the respective technologies utilized.

Following this analysis, we must assess the potential for modernizing each stage of the target architecture. This entails evaluating how well we can transition from legacy systems to modern alternatives at each stage. Key decisions on data ingest into cloud storage include evaluating features like Databricks Autoloader, Lakeflow Connect or Lakehouse Federation. You should also assess ETL modernization and compatibility with partners and BI tools. A target architecture and tooling roadmap is created that guides the migration process.

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Below is an example of a data warehousing architecture on Databricks with various ISV Partner Integration options.

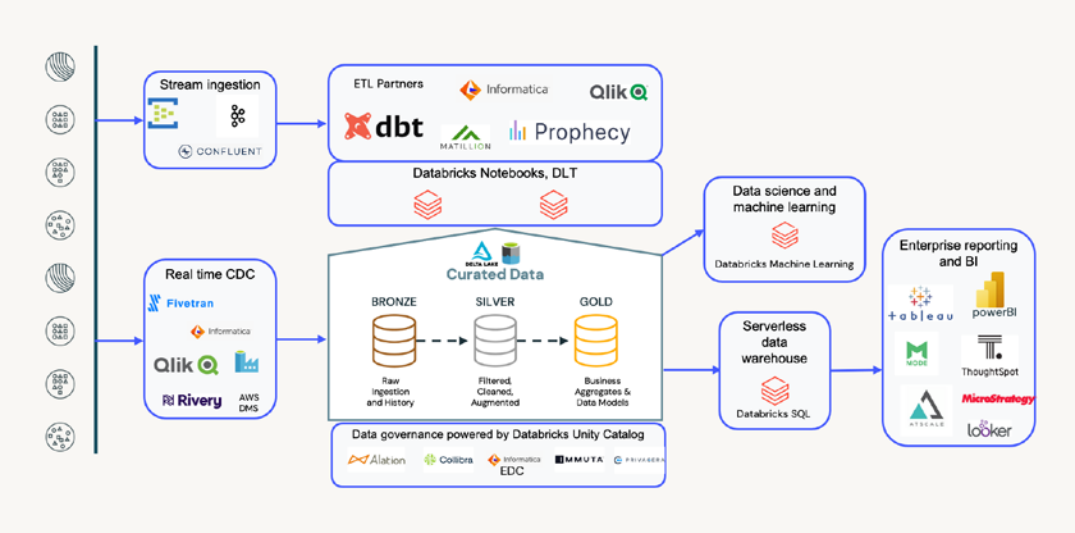

Figure 4: Modern data warehousing on Databricks

Following the architectural alignment, we will deeply investigate Teradata's current features.

TERADATA VS. DATABRICKS FEATURE MAPPING EXAMPLE

OBJECTS/ WORKLOAD	TERADATA	DATABRICKS
Compute	Teradata on-premises compute Teradata Vantage Cloud based compute clusters	Databricks Managed Clusters optimized for workload types with a runtime: • All-purpose for interactive/ developer use • Job clusters for scheduled pipelines • SQL warehouse for BI workloads
Storage	Physical HDD or SSD for on-premises deployment. Teradata Single Data Store for Vantage Cloud	Cloud storage (Amazon S3, Azure Blob Storage, Azure data lake Storage Gen2, Google Cloud Storage)
Tables	Teradata Tables	Delta tables in Unity Catalog
Format	Teradata proprietary	Delta and Iceberg Format (open source)

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OBJECTS/ WORKLOAD	TERADATA	DATABRICKS
User Interface	• Teradata Studio • Teradata Studio Express • Teradata SQL Assistant - deprecated	Databricks workspace Databricks collaborative notebooks Databricks SQL Query Editor Databricks CLI Visual Studio Code Spark Connect Databricks API Terraform
Database Objects	Tables, Views, Materialized Views (Join Index), Stored Procedures, UDFs	Tables, Views, Materialized Views, DLT, UDFs
Metadata Catalog	Built-in system tables under the DBC schema	Unity Catalog
Data Sharing	No native support for on-premises mode	Delta Sharing Delta Sharing Marketplace
Data Ingestion	Teradata Parallel Transporter(TPT) Teradata FastLoad Teradata MultiLoad Teradata Tpump	COPY INTO CONVERT TO DELTA Auto Loader DataFrameReader Integrations via Partner Connect Add data UI
Data Types	Teradata Data types	Data Types in Databricks
Workload Management	Workload Management	Cluster configuration (policies) Multi-clustering Intelligent Workload Management Intelligent Autoscaling Adaptive Routing
Security	RBAC Database roles Database object permissions Row-level security	IAM, RBAC Database object permissions (UC) Dynamic data masking Row-level security Column level security
Storage Format	Teradata Proprietary	Delta (Parquet files with metadata) and Iceberg format

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OBJECTS/ WORKLOAD	TERADATA	DATABRICKS
Sorting	Unsupported	Z-Ordering Liquid Clustering
Distribution Styles	Based on a proprietary algorithm and driven by the choice of Primary Index	NA. Cloud Storage vs. storing on disks. As Databricks does not have the concept of data distribution in storage, it simplifies the physical design of tables
Programming Language	SQL only	SQL, Python, R, Scala, Java
Data Integration	External tools (dbt, Matillion, Talend, Pentaho, Informatica, etc.)	DLT Databricks workflows External tools (dbt, Matillion, Prophecy, Informatica, Talend, etc.)
Orchestration	Teradata Query Scheduler Third-party tools(Control-M, Autosys, ActiveBatch, etc.)	Databricks Workflows, Airflow
Machine Learning	Unsupported	Databricks ML (Runtime with OSS ML packages, MLflow, feature store, AutoML)
Pricing Unit	AMPCpu (charged per CPU cycle) + Storage charges + Annual licensing and an optional support package(typically for production instance)	Databricks units (DBUs)

The table above compares key features between Teradata and Databricks. Undertaking a thorough comparison is essential during this stage of the migration process. This systematic process ensures a comprehensive understanding of the required transformation, facilitating a smoother transition by identifying equivalent services, functionalities and potential gaps or challenges.

Typically, by the end of this phase, we have a good handle on the scope and complexity of the migration and can come up with a more accurate migration plan and cost estimate.

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Phase 3: Data Warehouse Migration

The Databricks environment can be set up by following the Setup and Administration Guides. Please see the Azure Databricks Administration Guide, Databricks on AWS administration introduction or Databricks administration introduction on GCP, depending on the cloud of your choice.

CONSIDERATIONS FOR SCHEMA AND DATA MIGRATION

After establishing Databricks workspaces, the initial migration phase involves migrating table schema and data, including metadata like table data definition language (DDL) scripts, views and table data.

Here are a few recommendations that can help to enable a smoother and less risky migration:

- Data modeling: As part of the migration, there might be a need to refactor or reproduce a similar data model in an automated and scalable fashion. You can find visual data modeling tools like Quest ERWIN or sqldbm on Databricks Partner Connect. These tools can help accelerate the development and deployment of the refactored data model in just a few clicks. Such a tool can reverse engineer a Teradata data model (table structures and views) in a way that can be implemented in Databricks easily.
- When migrating DDLs, verifying the provenance of the data schema (e.g., source data) is essential. Consider an instance where one of the Teradata tables is presented with a data type that is proprietary to Teradata (Ex. Interval, Period, etc.). That exact data type might not find a precise equivalent for such data types in Databricks, so replacement data types are needed.
- We recommend using the Databricks medallion architecture to call out landing zones in Bronze, central repository or data domains in Silver and presentation layers in Gold for logical data organization in the Lakehouse architecture. For more details on modeling approaches and design patterns, refer to Data Warehouse Modeling Techniques.

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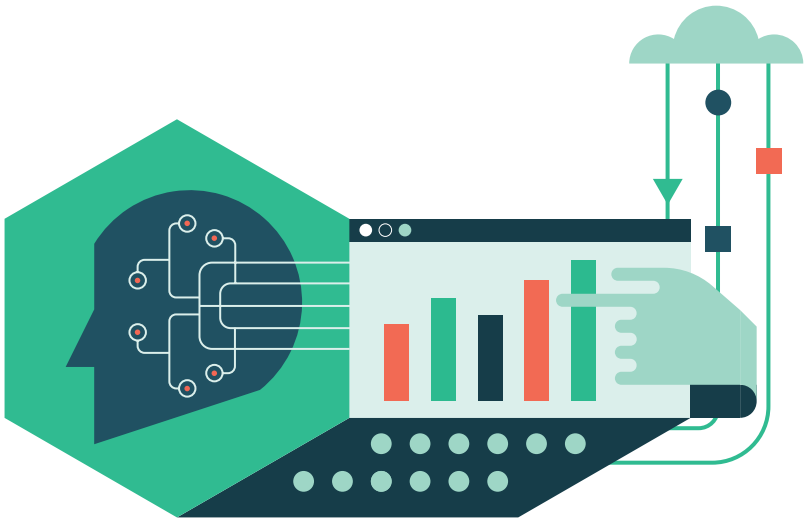
PHASE 3.1: SCHEMA MIGRATION

Before offloading tables to Databricks, it's essential to establish the schema of the tables within the Databricks environment. These can be beneficial if you possess DDL scripts from your existing system. With minor adjustments, mainly to accommodate the data types used in Databricks, these scripts can be utilized to create corresponding table schemas in Databricks. Reusing existing scripts can streamline the preparation process, thus fostering efficiency and maintaining schema consistency during the migration.

Teradata DDLs can also be extracted from the dbc schema by querying the view dbc.tablesv.



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Once the DDLs are extracted, converting them to comply with Databricks is essential. Below are some of the example scenarios to be considered:

1. Several keywords in the Teradata CREATE TABLE statement are no longer valid in Databricks, for example, SET or MULTISET, BEFORE or AFTER JOURNAL, FALLBACK, PRIMARY INDEX, etc.

2. Databricks supports IDENTITY columns only on bigint columns.

3. Table options such as distributions and indexes are not applicable in Delta tables.

4. Caution must be exercised when converting PRIMARY and SECONDARY Indexes to partitions in Delta tables. Over Partitioning can lead to unnecessary overhead and minor file problems, ultimately compromising performance in the Lakehouse architecture. Delta's default partition size is 1TB, and Z-order indexes and predictive optimizations simplify the design in Databricks.

5. Additional Delta table properties can be specified via the TBLPROPERTIES clause, e.g., delta.targetFileSize, delta.tuneFileSizesForRewrites, delta.columnMapping.mode, and others.

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PHASE 3.2: DATA MIGRATION

Transferring legacy on-premises data to a cloud storage location for seamless consumption in Databricks can be a demanding task, but we have a few viable options:

1. **Teradata Fastexport + AzCopy:** Leveraging Teradata's FastExport utility, we can export data to a Unix jumpbox and subsequently utilize Microsoft's AzCopy utility to store it in a cloud storage account, formatted in a Databricks-compatible manner (e.g., Parquet, CSV).

2. **Microsoft Azure Data Factory (ADF):** Another approach involves using Azure ADF to extract data directly from Teradata using a Teradata JDBC/ODBC connector and then store it in a Blob.

3. **Teradata WRITE_NOS:** Teradata Utility leverages Teradata AMPs to export data from Teradata to cloud storage in Parquet/CSV formats. It is the fastest and most efficient way to export data. A few things to remember: 1) Set MAXOBJECTSIZE to 16MB, as that is the maximum file size allowed. 2) Since it uses all the AMPs available, it can be intensive on the Teradata system. No more than 2-4(depending on table size) write_nos commands are recommended to run in parallel. For more details on the syntax, refer to WRITE_NOS Syntax.

4. **Ingestion ISV Partners:** Databricks Ingestion ISV partners like Qlik can replicate data from Teradata to the Databricks Delta table for historical and CDC data.

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PHASE 3.3: OTHER DATABASE OBJECTS MIGRATION

Other Database Objects such as Views, Stored Procedures, Macros, Functions and Teradata Load Utilities can also be easily migrated to Databricks via our automated code conversion processes. Please review this helpful cheat sheet packed with essential tips and tricks to help you start on Databricks using SQL programming in no time. Some key pointers while converting Teradata-specific SQL objects:

- **Teradata Join Indexes (Materialized Views)** — Join indexes are designed to permit queries (join queries in the case of multi-table join indexes) to be resolved by accessing the index instead of accessing and possibly joining their underlying base tables. Databricks' Materialized Views can either replace this functionality or persist the query results as a delta table.
- **Stored Procedures** — Teradata stored procedures can be easily migrated to Databricks using the newly supported SQL scripting that provides stored procedure functionality to Databricks. Databricks Notebooks and Workflows can also modularize and orchestrate the stored procedure steps. For more details, see the blog post on Converting Stored Procedures to Databricks.
- **Macros and Functions** — Teradata macros are SQL code blocks stored within the Teradata database management system and can be executed as a unified unit. You can pass parameters in Functions. These objects can be easily converted to Databricks SQL Functions.
- **Teradata Proprietary Utilities** — Teradata's proprietary utilities, such as Fastload, Multiload, Teradata Parallel Transporter (TPT) and Teradata Bteq, need to be rewritten using either Databricks-compliant SQL or PySpark. Our Migration Automation tooling (acquired via BladeBridge) makes this very simple.

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Stored procedures implementation in Databricks

Note that with the newly released Databricks SQL Scripting support, you can now easily deploy or convert powerful procedural logic within Databricks. Databricks SQL scripting supports compound statement blocks (with BEGIN....END). Within the Databricks SQL scripting procedures, we can declare local variables, user-defined functions, use condition handlers for catching exceptions and use flow control statements such as FOR loops over query results, conditional logic such as IF and CASE and means to break out loops such as LEAVE and ITERATE. These features make stored procedures migration to Databricks even easier.

Implement Slowly Changing Dimensions

Slowly Changing Dimensions (SCDs) are crucial in data warehousing. They manage historical changes to dimensional data over time, including updates, inserts or deletions, to maintain accurate historical data. DLT pipelines make implementing SCD pipelines very easy, with simple SCD keywords like STORED AS SCD TYPE 1 and STORED AS SCD TYPE 2 to decide whether to overwrite the history or store history as a type 2 dimension.

Here are a few resources that can assist in achieving a successful transition:

- How to implement SCDs when you have duplicates - Part 1
- How to implement SCDs when you have duplicates - Part 2: DLT
- APPLY CHANGES API: Simplify change data capture in DLT

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PHASE 3.4: DATA GOVERNANCE MIGRATION

When discussing Data Security Migration, it's essential to consider both authentication and authorization. When planning the migration of Teradata security objects, it's critical to understand the differences between the two platforms and accurately map Teradata's security capabilities to Databricks Data Intelligence Platform's security capabilities.

Audit Logging

Teradata offers row-level and column-level security, data masking, integration with LDAP and AD and audit logging. In Databricks, most user-related security features are managed through the Unity Catalog. Audit logging is also available in system tables. For more information, refer to the Audit log system.

Unity Catalog

We recommend leveraging Databricks Unity Catalog, which offers a unified governance layer for data and AI within the Databricks Data Intelligence Platform. With Unity Catalog, organizations can seamlessly govern their structured and unstructured data, machine learning models, notebooks, dashboards and files on any cloud or platform.

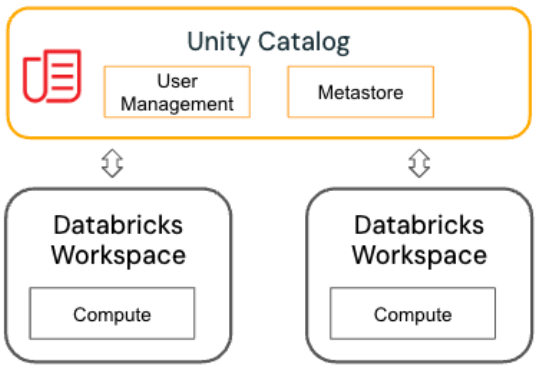

Figure 5: Unity Catalog works across clouds or platforms

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Key features of Unity Catalog include:

- **Define once, secure everywhere:** Unity Catalog offers a single place to administer data access policies that apply across all workspaces.
- **Standards-compliant security model:** Unity Catalog's security model is based on standard ANSI SQL and allows administrators to grant permissions in their existing data lake using familiar syntax at the level of catalogs, databases (also called schemas), tables and views.
- **Built-in auditing and lineage:** Unity Catalog automatically captures user-level audit logs that record access to your data. Unity Catalog also captures lineage data that tracks how data assets are created and used across all languages.
- **Data discovery:** Unity Catalog lets you tag and document data assets and provides a search interface to help consumers find data.
- **System tables:** Unity Catalog lets you easily access and query your account's operational data, including audit logs, billable usage and lineage.

Unity Catalog Object Hierarchy

Unity Catalog consists of a hierarchy of securable objects. The following illustrates a top flow of primary objects:

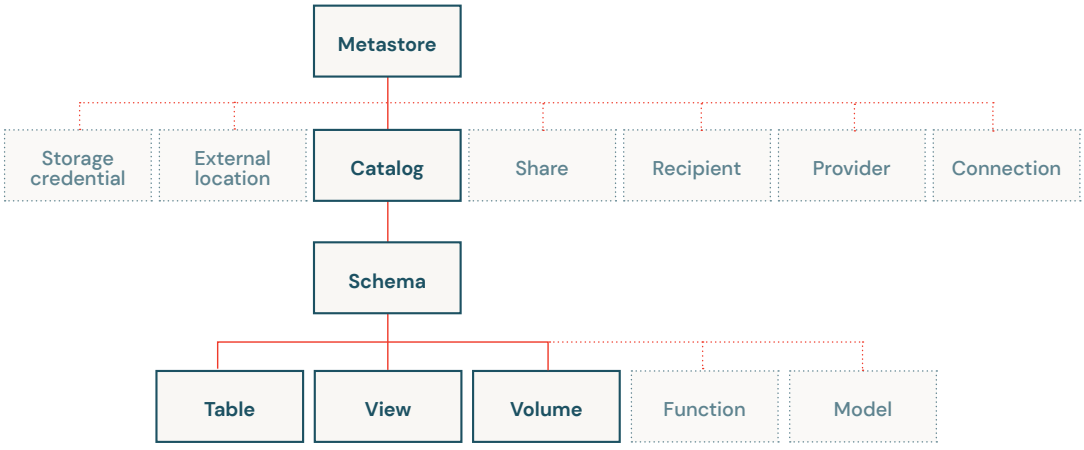

Figure 6: Unity Catalog object hierarchy

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Phase 4: Stored Procedures and ETL Pipelines Migration

Data orchestration migration, stored procedure migration, and ETL migration are the key elements of the migration process, and Databricks Automated Code converters can help here.

ORCHESTRATION MIGRATION

ETL orchestration involves coordinating and scheduling end-to-end pipelines, including data ingestion, integration and result generation. Teradata typically manages this orchestration using third-party tools like Control-M or Autosys. When migrating these workflows, there are usually several options available to replicate this orchestration functionality:

1. Use Databricks Workflows to orchestrate the migrated pipelines. Databricks Workflows support various tasks, such as Python scripts, Notebooks, dbt transformations and SQL tasks. The customer needs to provide job sequences and schedules as a prerequisite for converting them into Databricks workflows.

2. DLT provides a standard framework for building batch and streaming use cases. It also includes critical data engineering features such as automatic data testing, deep pipeline monitoring and recovery. It also has out-of-the-box functionality for Slow Change Dimension (SCD) Type 1 and Type 2 tables.

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3 | It is also possible to use external tools like Apache Airflow. Considering how tightly coupled Databricks Workflows is with the Databricks Intelligence Platform, it is recommended that Databricks Workflows be used for better integration, simplicity and lineage.

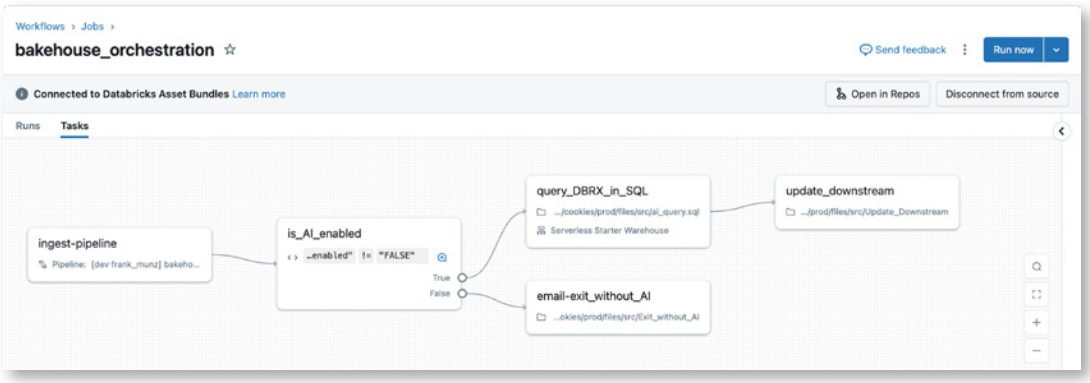

Figure 7: Databricks Workflows

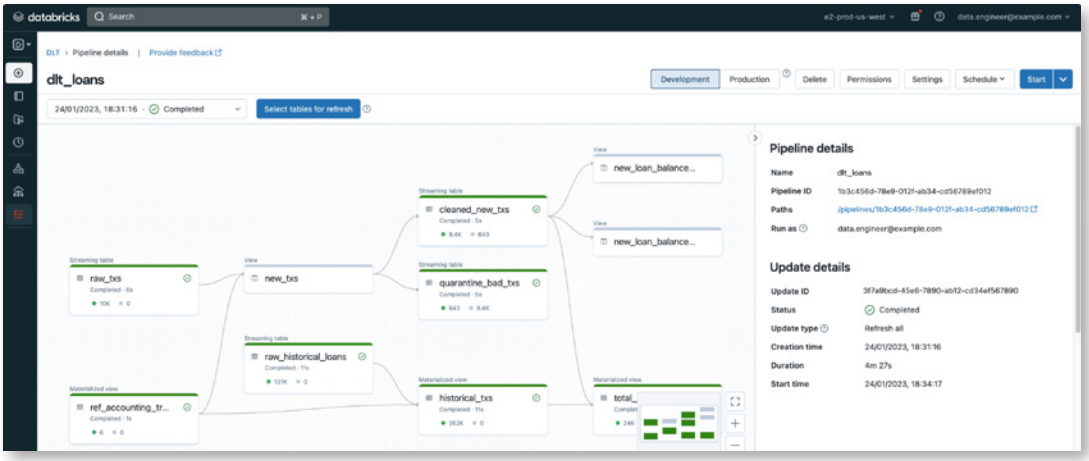

Figure 8: DLT pipelines

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STORED PROCS AND ETL CODE CONVERSION

Migrating from Teradata SQL to Databricks SQL requires identifying and replacing any incompatible/proprietary Teradata SQL functions or syntax. Databricks have mature code converters and migration tooling to make this process smoother and highly automated.

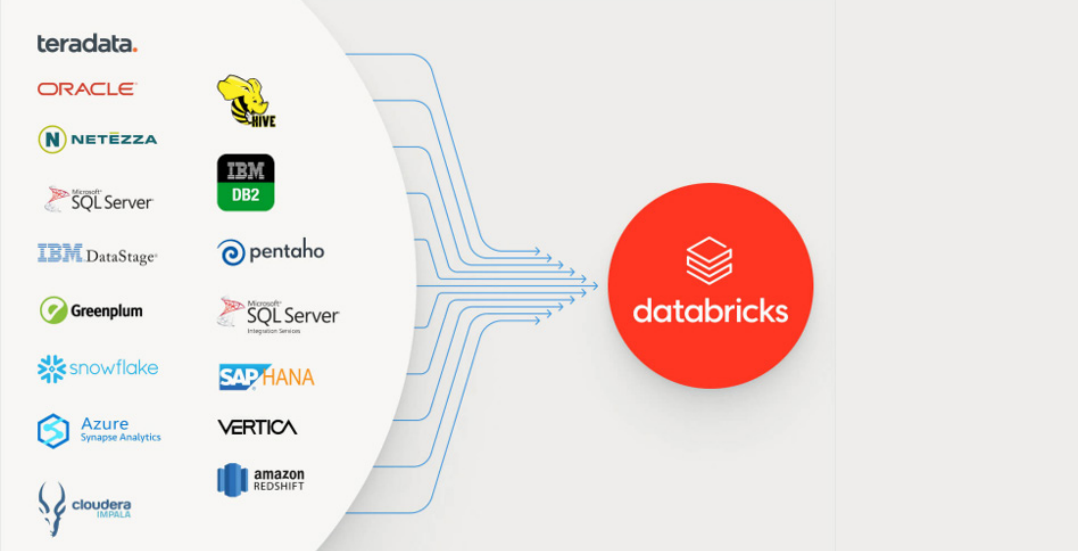

Figure 9: Databricks migration tooling simplifies legacy EDW migrations

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Databricks Code Converter (BladeBridge)

Databricks Code Converter (acquired from BladeBridge) offers automated tooling to modernize and convert Teradata code to Databricks.

- **Automated conversion:** Databricks Converter can automatically convert SQL workloads, significantly speeding up and de-risking migration projects.
- **Broad support:** It supports a wide range of legacy EDW and ETL platform syntax and can convert legacy code to Databricks.
- **Broad adoption by services firms:** Most System Integrator partners have deep expertise and access to our converters.
- **Cost and time-effective:** Our Converter reduces the cost and time required for a migration project by automating the process.
- **Decreases complexity:** The tool reduces the complexity of the migration process by providing a systematic approach to conversion.

Databricks Code Converter supports schema conversion (tables and views), SQL queries (select statements, expressions, functions, user-defined functions, etc.), stored procedures and data loading utilities such as FastLoad, MultiLoad, etc. The conversion configuration is externalized, meaning users can extend conversion rules during migration projects to handle new code pattern sets to achieve a more significant percentage of automation. A migration proposal with automated converter tooling can be created for your organization via Databricks Professional Services or our certified Migration Brickbuilder SI Partners. Databricks Code Converter tooling requires Databricks professional services or a Databricks SI Partner agreement.

Please review this short demonstration of the conversion tool.

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CODE OPTIMIZATION

Many queries will likely need to be refactored and optimized during the migration process. Easy techniques like automated liquid clustering and predictive optimization make performance tuning almost an automated process in Databricks. Predictive Optimization uses techniques like:

1. Compaction - which optimizes file sizes.
2. Liquid clustering - which incrementally clusters incoming data, enabling optimal data layout and efficient data skipping.
3. Running vacuum - which reduces costs by deleting unneeded files from storage.
4. Automatic updating of statistics - running the ANALYZE STATISTIC command on the required columns for best performance.

Figure 10: Automatic liquid clustering

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UNLOCK ADVANCED ANALYTICS WITH DATABRICKS SQL

With the data and ETL migration done and security and governance setup via Unity Catalog - unleash your AI and BI use cases by spinning up Databricks SQL!

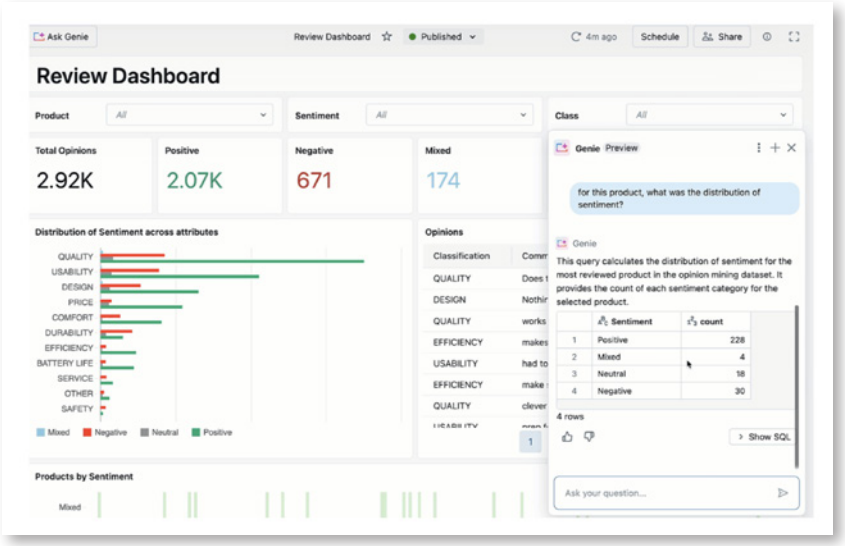

Figure 11: Databricks SQL

Databricks SQL is a serverless data warehousing solution that integrates seamlessly with the Databricks Data Intelligence Platform, offering a unified environment for data, analytics and AI workloads. Key features include:

- **Serverless Architecture:** Provides instant and elastic compute resources, eliminating the need for manual infrastructure management and ensuring rapid scalability to handle varying workloads efficiently.
- **AI-Driven Performance:** Utilizes AI-powered optimizations, such as the Photon query engine, Predictive IO and Intelligent Workload Management, to enhance query execution speed and resource efficiency.

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- **Unified Governance with Unity Catalog:** This solution offers centralized governance and security features, including data discovery, auditing and fine-grained access controls, ensuring compliance and data integrity across the organization.
- **Comprehensive SQL Functionality:** Supports standard ANSI SQL, materialized views, primary and foreign key constraints and advanced data types like 'Variant' for semi-structured data, enabling efficient and flexible data modeling and querying capabilities.
- **Seamless Integration with BI tools:** It integrates with various business intelligence tools like Tableau, Power BI, Thoughtspot, Mode and more. It also supports Lakehouse Federation to legacy EDWs like Teradata and Oracle. This integration allows users to query and govern siloed data systems as an extension of their lakehouse, enhancing data accessibility and collaboration.

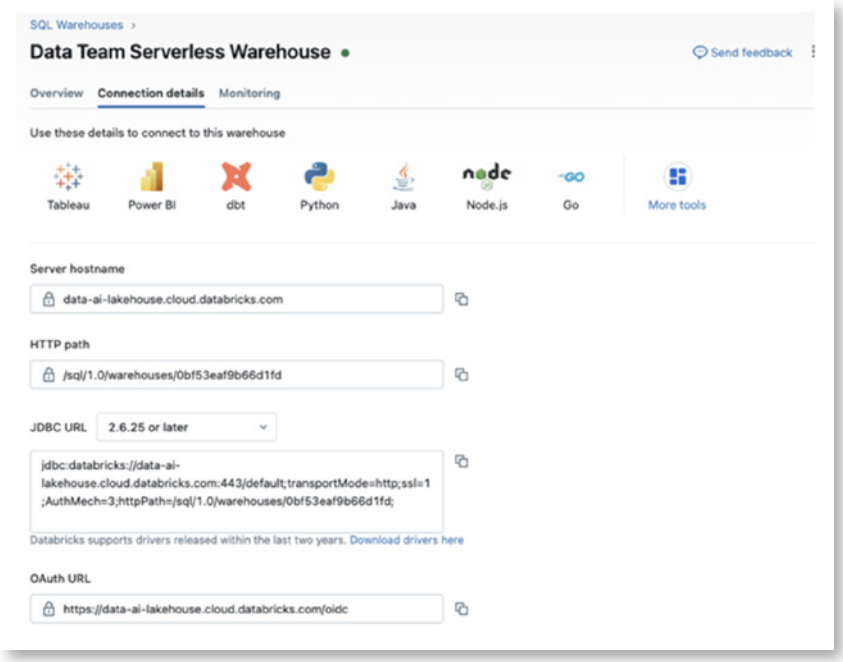

Figure 12: Databricks SQL BI integrations

These features empower organizations to perform high-performance analytics, streamline data workflows and derive actionable insights from their data with reduced operational complexity.

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DATA WAREHOUSING AND BI REPORT MODERNIZATION

Once ingestion and transformation pipelines are migrated to the Databricks Data Intelligence Platform, it is critical to ensure the business continuity of downstream applications and data consumers. Databricks Data Intelligence Platform has validated large-scale BI integrations with many popular BI tools like Tableau, Power BI, Qlik, ThoughtSpot, Sigma, Looker and more.

As described in the blog (see section 3.5 Repointing BI workloads), one common way to repoint BI workloads after data migration is to test sample reports, renaming existing tables' data source/table names and pointing to the new ones.

Typically, if the schema of the tables and views post-migration hasn't changed, repointing is a straightforward exercise in handling switching databases on the BI dashboard tool. If the schema of the tables has changed, you will need to modify the tables/views in the lakehouse to match the expected schema of the report/dashboard and publish them as a new data source for the reports.

Many customers take this opportunity to optimize their BI models and semantic layers to align with business needs.

Figure 13: Future-state architecture

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One additional advantage of using Databricks for BI is that you get a conversational user interface to chat with your data using our Genie AI/ BI Interface, which opens up your data for analytics and Q&A even for non-SQL users.

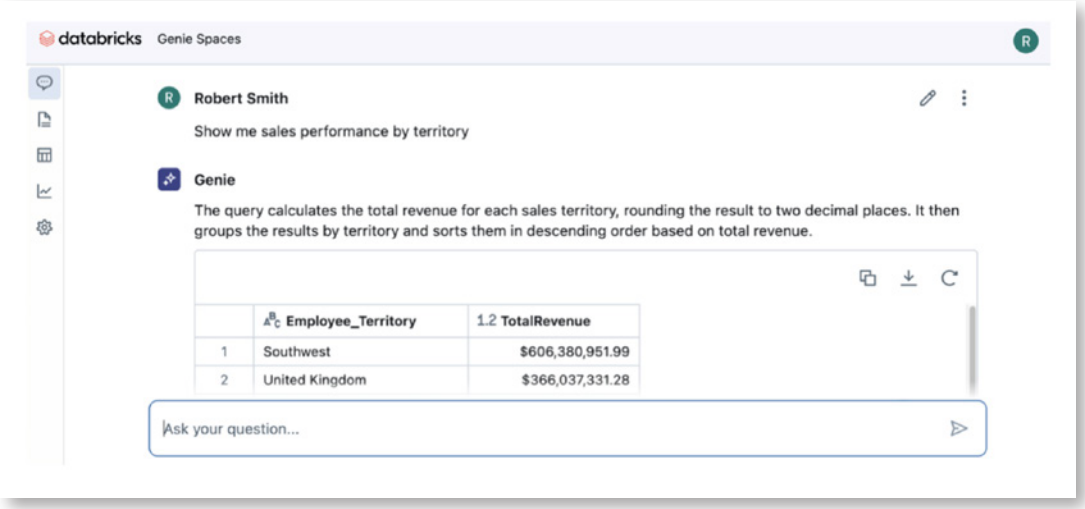

Figure 14: Databricks Genie

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The primary validation method for a data pipeline is the resulting dataset itself. We recommend establishing an automated testing framework that can be applied to any pipeline. Typically, this involves using a testing framework with a script capable of automatically comparing values in both platforms.

Databricks recommends you perform the following checks at a minimum:

- Check to see if a table exists
- Check the counts of rows and columns across the tables
- Calculate various aggregates over columns and compare, for example:
  - SUM, MIN, MAX, AVG of numeric columns
  - MIN, MAX for string and date/time columns
  - COUNT(*), COUNT(NULL), COUNT(DISTINCT) for all columns

Run the pipelines in parallel for a specific period and review the comparison results to ensure the data is ingested and transformed into the proper context.

It is advisable to initiate validation with your most critical tables, which often drive the results or calculations of tables in the gold layer. This includes control tables, lookup tables and other essential datasets.

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A robust data validation requires the following components:

- **Snapshot(s):** Data to work with, including a *pre-* and *post-version* for each script (ideal) and job being migrated.
- **Table comparison code:** A standardized way to compare the result table to determine whether the test is successful. The tables can be compared based on:
  - schema checks
  - row count checks
  - row-by-row checks
- Identifying the primary key combination from the customer is essential to check counts and row-by-row comparisons.

We have tooling such as Remorph Reconcile to streamline the reconciliation process between source data and target data residing on Databricks and other source platforms.

For more advanced table data and schema comparison, tools like Datacompy can be used.

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Need Help Migrating?

Regardless of size and complexity, the Databricks Professional Services team and an ecosystem of certified migration services partners and ISV partners offer different levels of support (advisory/assurance, staff augmentation, scoped implementation) to accelerate your migration and ensure successful implementation.

When engaging with our experts, you can expect:

- **Discovery and Profiling:** Our team starts by clearly understanding migration drivers and identifying challenges within the existing Teradata deployment. We conduct collaborative discussions with key stakeholders, leveraging automated profiling tools to analyze legacy workloads. This is used to determine drivers of business value and total cost of ownership (TCO) savings achievable with Databricks.
- **Assessment:** Using automated tooling, we perform an analysis of existing code complexity and architecture. This assessment helps estimate migration effort and costs, refine migration scope and determine which parts of the legacy environment require modernization or can be retired.
- **Migration Strategy and Design:** Our architects will work with your team to finalize the target Databricks architecture, detailed migration plan and technical approaches for the migration phases outlined in this guide. We will help select appropriate migration patterns, tools and delivery partners and collaborate with our certified SI partners to develop a comprehensive Statement of Work (SOW).

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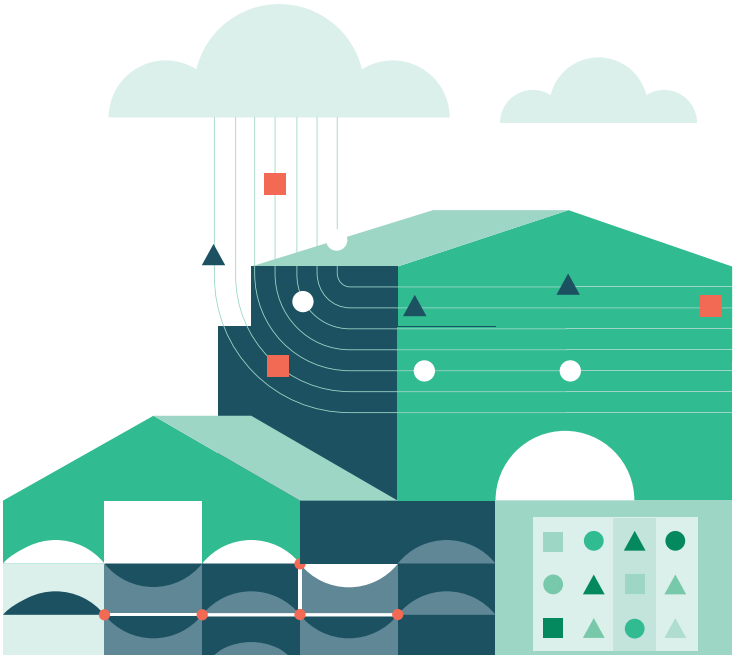
- **Execute and Scale:** We and our certified partners deliver on our comprehensive migration plan and then work with your team to facilitate knowledge sharing and collaboration and scale successful practices across the organization. Our experts can help you set up a Databricks Center of Excellence (CoE) to capture and disseminate lessons learned and drive standardization and best practices as you expand to new use cases.

Contact your Databricks representative or use this form for more information. Our specialists can help you every step of the way!



About Databricks

Databricks is the data and AI company. More than 10,000 organizations worldwide — including Block, Comcast, Condé Nast, Rivian, Shell and over 60% of the Fortune 500 — rely on the Databricks Data Intelligence Platform to take control of their data and put it to work with AI. Databricks is headquartered in San Francisco, with offices around the globe, and was founded by the original creators of Lakehouse, Apache Spark™, Delta Lake and MLflow.

To learn more, follow Databricks on LinkedIn, X and Facebook.

Start your free trial