



Hands-On Labs

Live hands-on lab  
with **Databricks SQL**



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JULHO-2023



Hands-On Labs

## Live hands-on lab with Databricks SQL



### Antes de Começar:

- 1) Testem seus acessos a plataforma DATABRICKS
- 2) Problemas de Acesso: coloquem no CHAT.
- 3) Perguntas no CHAT
- 4) Todos os exercícios estão no LINK abaixo:

[https://github.com/Databricks-BR/lab\\_sql](https://github.com/Databricks-BR/lab_sql)





Hands-On Labs

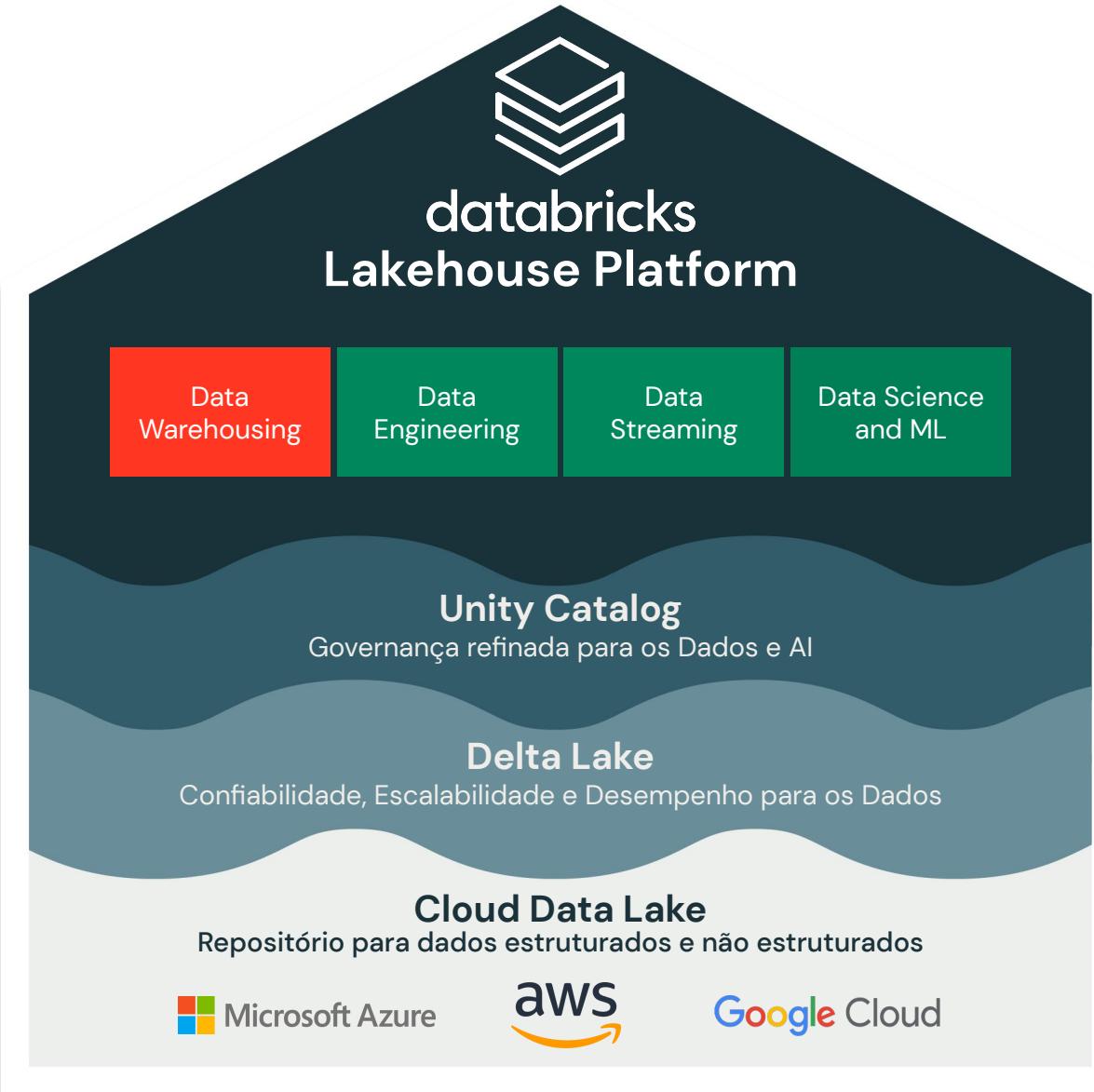
## Live hands-on lab with Databricks SQL



### AGENDA

1	Conceituação do Lakehouse e introdução ao Databricks SQL	30 min
2	Laboratório 01 - Comandos básicos em SQL no Editor de SQL	30 min
3	Laboratório 02 - Ingestão de CSV, Uso do Notebook e Data Explorer	30 min
4	Laboratório 03 - Consultas avançadas, Query History e Query Profiler	30 min
5	Laboratório 04 - Criação de um Alerta	30 min
6	Laboratório 05 - Criação de um Painel (Dashboard)	30 min
7	Considerações finais e Referências Adicionais	15 min
8	Perguntas e Respostas	15 min
9	Pesquisa de Satisfação	5 min





# Databricks

## Plataforma Lakehouse

### Simples

Unifique seu armazenamento de dados e IA em uma única plataforma, uma única **"fonte da verdade"**

### Código Aberto

Construído em **código-fonte aberto** e utilizando **padrões abertos** de armazenamento

### Multi Cloud

Uma mesma plataforma de dados consistente nos principais provedores Cloud

### Colaborativo

Engenheiros e Cientistas de Dados trabalhando de forma **colaborativa** em uma plataforma bem integrada



# Por que Lakehouse?



Data Lake

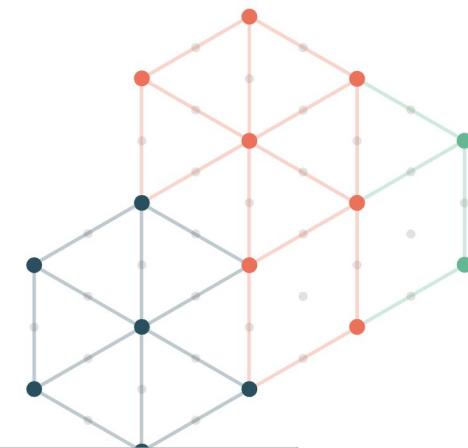
Data Warehouse

Lakehouse

Armazenamento	Formato aberto	Proprietário (BD relacional)	Formato Aberto
Tipos Dados	Todos	Apenas dados estruturados	Todos
Atomicidade	Não garantida	ACID	ACID
Escalabilidade	Vertical e Horizontal	somente Vertical	Vertical e Horizontal
Governança	limitada	ampla	ampla
Consumo dos Dados	amplo (SQL, spark, python...)	somente SQL	amplo (SQL, spark, python...)
Machine Learning	amplo uso	uso limitado	potencializado

# Databricks SQL

## Aplicações de Uso por Persona



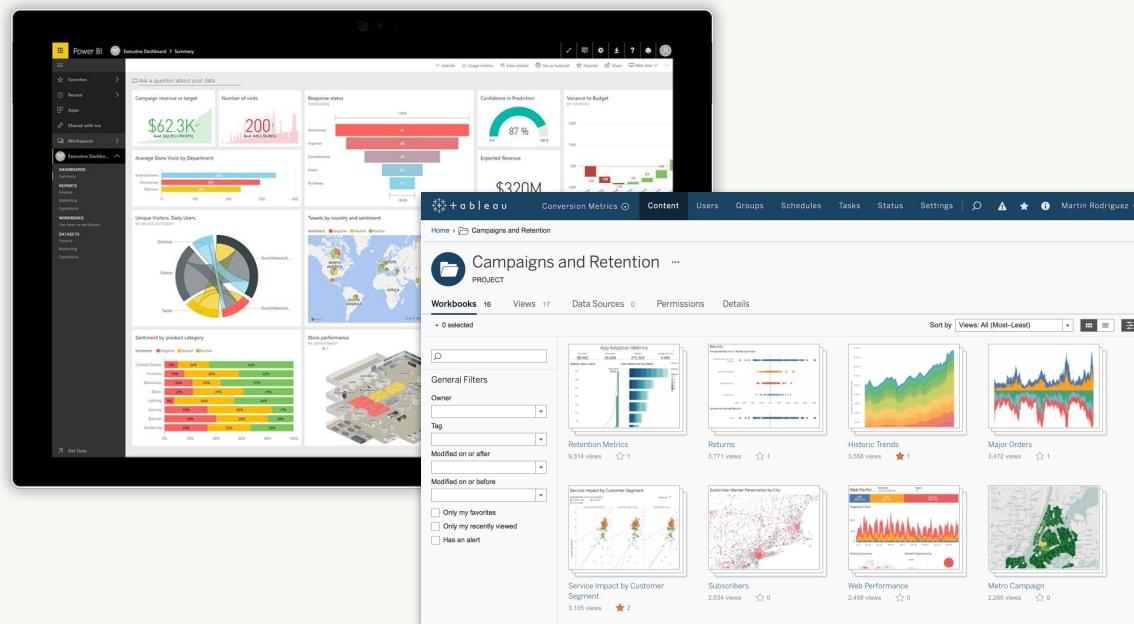
Analista de BI Analista de Negócio	Engenheiro de Dados	Cientista de Dados	Administrador de Dados Administrador de Infra
<ul style="list-style-type: none"><li>• Análise Exploratória;</li><li>• Investigações;</li><li>• Consultas AD-HOC;</li><li>• Consultas recorrentes;</li><li>• Tunning de Query;</li><li>• Estatísticas de Tabelas;</li><li>• Alertas;</li><li>• Dashboards (Painéis);</li><li>• Relatórios;</li><li>• Integração DataViz;</li><li>• Integração externa;</li></ul>	<ul style="list-style-type: none"><li>• Análise Exploratória;</li><li>• Tunning de Query;</li><li>• Apoio no Desenvolvimento;</li><li>• Estatísticas de Tabelas;</li><li>• Análise de Falhas;</li><li>• Ajustes nos Modelos;</li><li>• Reprocessamentos;</li><li>• Testes Unitários;</li><li>• Painéis de Qualidade;</li></ul>	<ul style="list-style-type: none"><li>• Análise Exploratória;</li><li>• Investigações;</li><li>• Consultas AD-HOC;</li><li>• Estatísticas de Tabelas;</li><li>• Avaliação de Contextos;</li><li>• Preparação Dados;</li><li>• Preparação Amostras;</li><li>• Transformação de Dados;</li></ul>	<ul style="list-style-type: none"><li>• Auditoria de Dados;</li><li>• Governança de Dados;</li><li>• Estatísticas de Uso;</li><li>• Estatísticas de Custo;</li><li>• Identificação de Falhas;</li><li>• Segurança de Dados;</li><li>• Controle de Acesso;</li><li>• Painéis de Monitoração;</li></ul>



# O que é Databricks SQL

Se integra nativamente nas ferramentas de BI

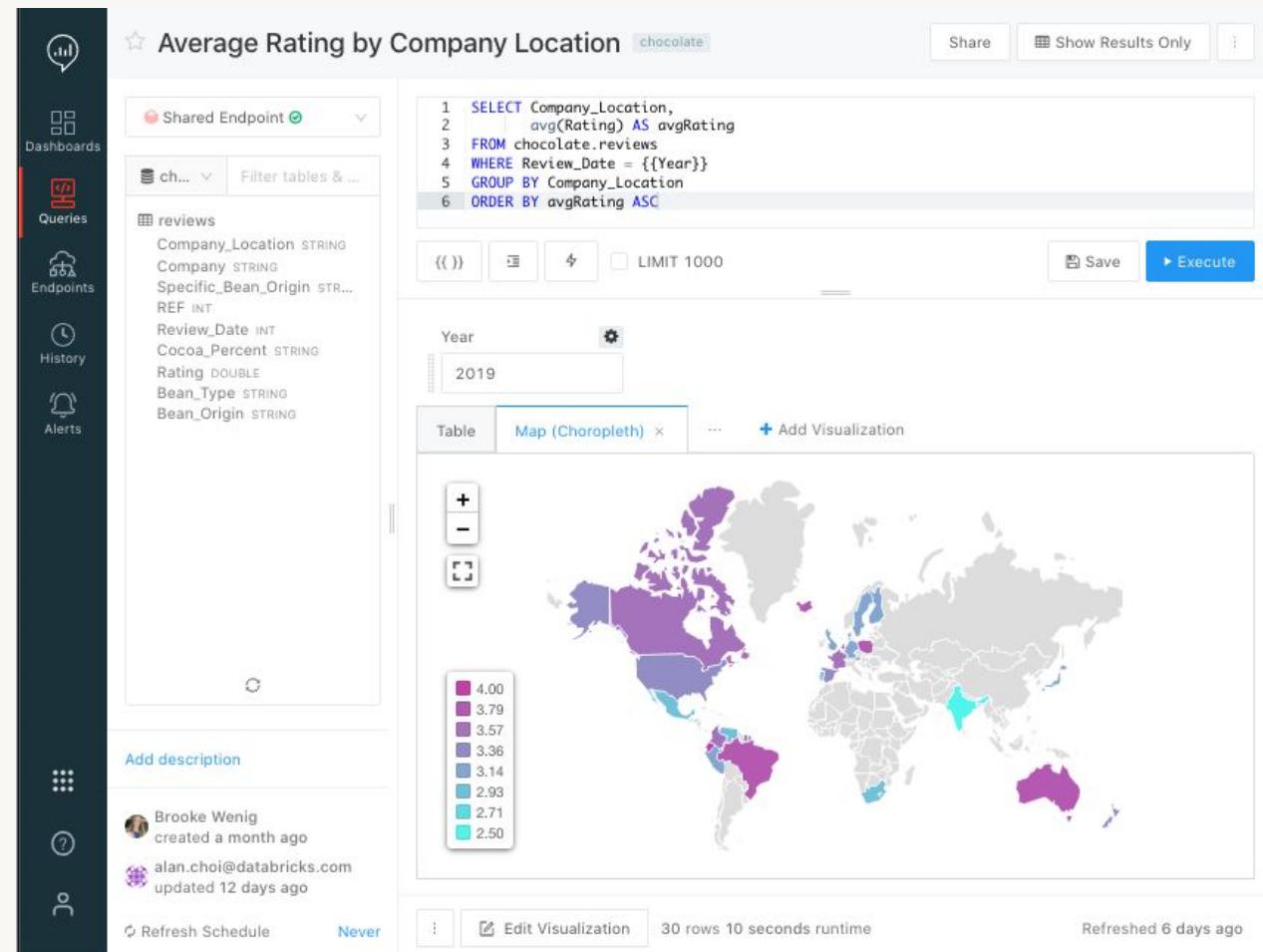
Consiga dados de negócio em um clique, aproveitando a melhor performance do Databricks SQL diretamente da sua ferramenta de BI



# O que é Databricks SQL

## É a nova casa do Analista de Dados

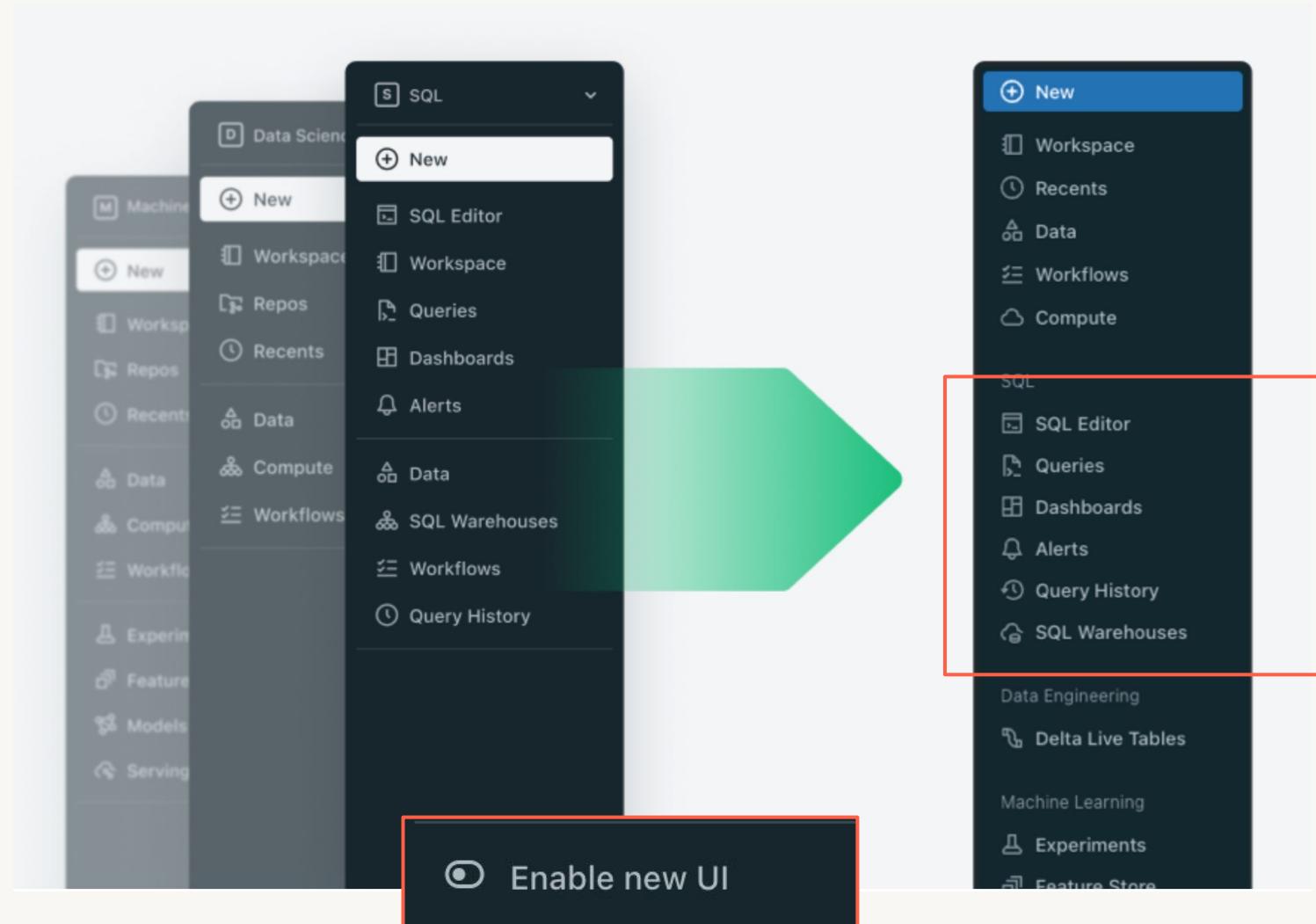
- Analistas de dados conseguem **rapidamente rodar queries pontuais e análises exploratórias** com o novo editor de queries, visualizações e dashboards.
- **Alertas automáticos** podem ser configurados para serem acionados para valores críticos, permitindo rápida resposta à necessidade do negócio



# O que é o Databricks SQL



# Nova UI (novo menu lateral)



# Editor de SQL (Query Tools, Consultas Livres e Análise Exploratória)

Microsoft Azure | Databricks

Portal miranda.luna@databricks.com

The screenshot shows the Databricks Schema Browser interface. On the left, there's a sidebar with various icons for navigation. The main area displays the schema for the 'diamonds' dataset, which includes columns for carat, cut, color, clarity, depth, table, price, x, y, and z. Below the schema, a query editor window is open with the command 'select from diamonds'. A preview of the data is shown as a table with 10 rows of sample data. The top right of the interface has buttons for Revert, Share, Save, and Run.

Schema last fetched: a minute ago

New Query +

Data McNugget 2.0 (XL)

Revert Share Save\* Run

1 select | from diamonds

Revert Share Save\* Run

1 select | from diamonds

1 diamonds

	_c0	carat	cut	color	clarity	depth	table	price	x	y	z
1	1	0.23	Ideal	E	SI2	61.50	55.00	326	3.95	3	
2	2	0.21	Premium	E	SI1	59.80	61.00	326	3.89	3	
3	3	0.23	Good	E	VS1	56.90	65.00	327	4.05	4	
4	4	0.29	Premium	I	VS2	62.40	58.00	334	4.20	4	
5	5	0.31	Good	J	SI2	63.30	58.00	335	4.34	4	
6	6	0.24	Very Good	J	VVS2	62.80	57.00	336	3.94	3	
7	7	0.24	Very Good	I	VVS1	62.30	57.00	336	3.95	3	
8	8	0.26	Very Good	H	SI1	61.90	55.00	337	4.07	4	
9	9	0.22	Fair	F	VS2	65.10	61.00	337	3.87	3	

1 2 3 4 5 ... 2158 >

Refresh Schedule Never

+ Add Visualization

Schema last fetched: a minute ago

Edit Visualization 53940 rows 4.19 s runtime

Refreshed just now

# Facilidade de administração – Histórico de Consultas

The screenshot shows the Databricks Query History interface. On the left, there's a sidebar with navigation links: SQL (selected), Create, SQL Editor, Queries, Dashboards, Alerts, Data, SQL Warehouses, and Query History. The 'Query History' link is highlighted with a red box and an arrow pointing to it. The main area is titled 'Query History' and displays a table of 100+ queries. The table has columns: Query, Started at, Duration, and SQL Warehouse. The first query listed is a CREATE OR REPLACE TABLE command. Subsequent queries are mostly SELECT statements, some with annotations like 'with cross\_items as' or 'WITH all\_sales AS'. The duration of the queries varies from 3.87s to 10.67s. The SQL warehouse for most queries is 'viji\_tpcds\_sf10\_delta\_Medium'. The interface also includes filters for All users, Last 14 days, and All SQL warehouses.

Query	Started at	Duration	SQL Warehouse
CREATE OR REPLACE TABLE hive_metastore.qinziyuan.external_upgrade (id ...)	2022-08-25 17:01	10.67 s	Shared Endpoint
select i_item_desc ,w_warehouse_name ,d1.d_week_seq ,sum(ca...)	2022-08-25 17:01	6.39 s	viji_tpcds_sf10_delta_Medium
select i_item_id ,i_item_desc ,i_category ,i_class ,i_current_pr...	2022-08-25 17:01	6.24 s	viji_tpcds_sf10_delta_Medium
--... select i_item_id ,i_item_desc ,i_category ,i_class ,i_current_pr...	2022-08-25 17:01	5.90 s	viji_tpcds_sf10_delta_Medium
--... with cross_items as (select i_item_sk ss_item_sk from item, (sel...	2022-08-25 17:01	4.99 s	viji_tpcds_sf10_delta_Medium
--... select i_brand_id brand_id, i_brand brand,t_hour,t_minute, sum(e...	2022-08-25 17:01	4.92 s	viji_tpcds_sf10_delta_Medium
--... with ssales as (select c_last_name ,c_first_name ,s_store_name ,...	2022-08-25 17:01	4.39 s	viji_tpcds_sf10_delta_Medium
--... with ssales as (select c_last_name ,c_first_name ,s_store_name ,...	2022-08-25 17:01	4.39 s	viji_tpcds_sf10_delta_Medium
--... WITH all_sales AS ( SELECT d_year ,i_brand_id ,i_class_id ,i_cat...	2022-08-25 17:01	4.27 s	viji_tpcds_sf10_delta_Medium
--... WITH all_sales AS ( SELECT d_year ,i_brand_id ,i_class_id ,i_cat...	2022-08-25 17:01	3.87 s	viji_tpcds_sf10_delta_Medium



# Query Profile – Métricas de execução

The screenshot illustrates the Databricks Query History interface and a detailed Query Profile for a specific query.

**Query History:** Shows a list of recent queries with columns for Query, Started at, and Duration. A red arrow points from the 'See query profile' button in the bottom right of the main interface to the 'See query profile' button in the bottom right of the expanded query details window.

**Query Profile (Detailed View):** An expanded view for a specific query (ID: 01ed24b0-ab6d-199f-a138-ae5e3f9f6d29). It includes:

- Overview:** Status, Creator, Run on DBSQL version, SQL Warehouse.
- Query Source:** JDBC driver.
- Query duration:** Total wall-clock duration (6.39 s) broken down into:
  - Optimizing query & pruning files (457 ms, 7%)
  - Executing (4.07 s, 64%)
  - Fetching results by client (1.86 s, 29%)
- Start time:** 2022-08-25 17:01:12.729
- End time:**
- Aggregated task time:** Tasks total time (41.27 s, 98%) broken down into:
  - Tasks time in Photon
- IO:** Rows returned (100), Rows read (139.653.403), Bytes read (727.28 MB), Bytes pruned (4.60 MB), Bytes read from cache (100 %)

# Query Profile – Plano de execução

Query ID: 01ecdd0-3234-524-b4f6-0bdwed579era...  
Finished, sean.smith@databricks.com, simon.schneider@databricks.com, source: delta.io summary metrics

Global action Global action X

93

Top consuming operators

Task-time

Hash Aggregate #7	187 ms
Hash Aggregate #41	96 ms
Shuffle #11	26 ms
Scan	7 ms
Shuffle #3	1 ms

Memory

Hash Aggregate #7	187 ms
Hash Aggregate #41	96 ms
Shuffle #11	26 ms
Scan	7 ms
Shuffle #3	1 ms

Rows

Hash Aggregate #7	187 ms
Hash Aggregate #41	96 ms
Shuffle #11	26 ms
Scan	7 ms
Shuffle #3	1 ms

Diagram showing the execution plan:

```
graph TD; SA1[Scan default.diamonds] -- "53.94 K rows" --> H1[Hash Aggregate 187 ms]; H1 -- "8 rows" --> SH[Shuffle]; SH -- "8 rows" --> H2[Hash Aggregate 96 ms];
```

Shuffle

Rows	3.52 M
Peak memory	40.95 GB

Metrics

Shuffle records written	3,517,182
Shuffle write time	69.36 ms
Records read	3,517,182
Local bytes read	1,93 MB
Fetch wait time	0
Remote bytes read	31.04 MB
Local blocks read	3
Remote blocks read	49
Data size	80.50 MB
Remote bytes read to disk	0
Shuffle bytes written	32.97 MB

Description

Output attributes

- property\_id
- elec\_latest\_customer\_read\_at

The screenshot shows the Databricks Query Profile interface. On the left, there's a sidebar with various icons for navigation. The main area displays a query profile for a finished job. At the top, it shows the query ID, finisher email, and source. Below that, there are three sections: 'Top consuming operators' (Task-time, Memory, Rows), each with a horizontal bar chart showing the duration for different operators. To the right of these charts is a detailed execution plan diagram. The plan consists of four boxes connected by arrows: 'Scan default.diamonds' at the bottom, followed by 'Hash Aggregate 187 ms', 'Shuffle', and 'Hash Aggregate 96 ms' at the top. Arrows indicate data flow from the scan to the first hash aggregate, then to the shuffle, and finally to the second hash aggregate. Row counts are labeled next to the arrows: '53.94 K rows' for the scan to the first aggregate, '8 rows' for the first aggregate to the shuffle, and '8 rows' for the shuffle to the second aggregate. To the right of the plan, there's a table of 'Metrics' and another section for 'Description' with 'Output attributes'. At the bottom right is the Databricks logo.

# Databricks SQL Serverless

A computação sem servidor para DBSQL ajuda a enfrentar os desafios que os clientes enfrentam com tempo de inicialização do cluster, gerenciamento de capacidade e custos de infraestrutura:

- **Instantâneo e elástico:** a computação sem servidor oferece um ambiente verdadeiramente elástico que está disponível instantaneamente e é dimensionado de acordo com suas necessidades. Você se beneficiará de preços simples baseados no uso, sem se preocupar com cobranças de tempo ocioso. Imagine não precisar mais esperar que os clusters fiquem disponíveis para executar consultas ou super provisionar recursos para lidar com picos de uso. O Databricks SQL Serverless aumenta e reduz dinamicamente os recursos para lidar com qualquer carga de trabalho que você jogue nele.
- **Elimine a sobrecarga de gerenciamento:** o Serverless transforma o DBSQL em um serviço totalmente gerenciado, eliminando a carga de gerenciamento de capacidade, aplicação de patches, atualização e otimização de desempenho do cluster. Você só precisa se concentrar em seus dados e nos insights que eles contêm. Além disso, o modelo de precificação simplificado significa que há apenas uma fatura para acompanhar e apenas um local para verificar os custos.
- **Custos de infraestrutura mais baixos:** nos bastidores, a plataforma de computação sem servidor usa algoritmos de aprendizado de máquina para provisionar e dimensionar recursos de computação exatamente quando você precisar deles. Isso permite economias de custos substanciais sem a necessidade de encerrar manualmente os clusters.



SQL

New

SQL Editor

Workspace

Queries

Dashboards

Alerts

Data

SQL Warehouses

Query History

## SQL Warehouses ⓘ

Filter SQL wa

Name Type State Size A

chengyin Shared Endpoint

tmp-dbt Small

FIVETRAN\_ENDPOINT

Nishant tpc test

## New SQL Warehouse ⓘ

X

Name SQL end point para PowerBI

Cluster size ⓘ Medium 24 DBU / h

Auto stop 2X-Small 4 DBU / h

X-Small 6 DBU / h

Small 12 DBU / h

Medium 24 DBU / h ✓

Large 40 DBU / h

X-Large 80 DBU / h

2X-Large 144 DBU / h

3X-Large 272 DBU / h

Learn more

Advanced options &gt;

Cancel

Create



## New SQL warehouse

X

Name

academy

Cluster size ⓘ

Small

12 DBU / h ▾

Auto stop

After  minutes of inactivity.

Scaling ⓘ

Min.

Max.

clusters (12 DBU)

Type

Serverless ⓘ  Pro ⓘ  Classic ⓘ

**i** Serverless SQL warehouses contain all advanced features and are Databricks' fastest warehouse type.

Prices are reduced (up to 40%) until Jul 31, 2023. Try a Serverless SQL warehouse today!

[Learn more](#)

Advanced options ▾

Tags ⓘ

Key

Value

Unity Catalog



Channel ⓘ

Current

Preview

Cancel

Create



FEATURE MATRIX		<a href="#">Details here</a>	CLASSIC Self-Managed, Introductory SKU	PRO Self-Managed, Compute in your account	SERVERLESS Fully Managed, Elastic, Best Value
			GOOD	BETTER	BEST
EXPLORATORY SQL	SQL Editor with intelligent auto complete, ANSI SQL	✓	✓	✓	✓
MANAGEMENT & GOVERNANCE	Query History & Profile, Data Explorer (Unity Catalog), Managed Data Sharing	✓	✓	✓	✓
CONNECTIVITY	<a href="#">SQL Rest API</a> , <a href="#">Python</a> , <a href="#">Node.js</a> , <a href="#">Go*</a> , <a href="#">Partner Connect</a>	✓	✓	✓	✓
PERFORMANCE	<a href="#">Photon Engine</a> (Massively Parallel Processing)	✓	✓	✓	✓
	Predictive I/O	✗	✓	✓	✓
SQL ETL/ELT	<a href="#">Query Federation*</a> , <a href="#">Materialized Views*</a> , <a href="#">Workflows Integration*</a>	✗	✓	✓	✓
DATA SCIENCE & ML	<a href="#">Python UDFs*</a> , <a href="#">Notebooks Integration*</a> , <a href="#">Geospatial</a>	✗	✓	✓	✓
SERVERLESS DATA WAREHOUSE	<a href="#">Instant</a> , <a href="#">Elastic</a> , <a href="#">Fully Managed Compute*</a>	✗	✗	✗	✓
HIGH CONCURRENCY BI	<a href="#">Intelligent Workload Management*</a>	✗	✗	✗	✓
	Serverless Query Result Caching*	✗	✗	✗	✓

Note: for descriptions of each of the above features, please refer to the [DW/DBSQL Technical Pitch Deck](#), this 7 minute [video](#), and this [post](#).

\* Capability in preview

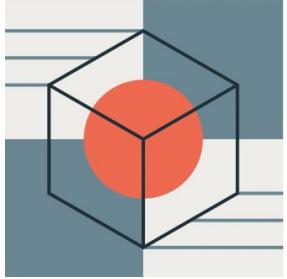


Feature Matrix		Classic Self-Managed, Introductory SKU	Pro Self-Managed, Compute in your account	Serverless Fully Managed, Elastic, Best Value
Serverless Data Warehouse	Instant, Elastic, Fully Managed Compute	X	X	✓
	Basic (Sort & Window Function, Photon JSON Scans,...)	✓	✓	✓
Performance Optimizations	Query Results Caching	✓ (until cluster is off)	✓ (until cluster is off)	✓ (persistent cache)
	Query Performance (Photon Scan for Flat Schemas, Lazy Materialization,...)	X	✓	✓
Management & Governance	Query History & Profile, Data Explorer (UC), Managed Data Sharing	✓	✓	✓
Connectivity	SQL Rest API	✓	✓	✓
Exploratory SQL	SQL Editor, Alerts, Dashboards	✓	✓	✓
EDW & SQL ETL	Query Federation, Materialized Views, Notebooks & Workflows Integration	X	✓	✓
Advanced Analytics & ML	Python UDF / Pyspark UDF, Geospatial	X	✓	✓
BI	Fast Lane	X	X	✓
	High-Concurrency	GOOD	BETTER	BEST

Working plan - Details subject to change. Target AWS & Azure availability is November.



# Unity Catalog



## Governança centralizada

Com um modelo de governança comum baseado em ANSI SQL, governe de forma centralizada arquivos, tabelas, painéis e modelos de ML em qualquer nuvem.



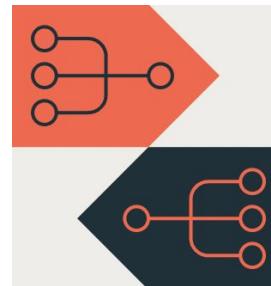
## Pesquisa e descoberta de dados

Encontre, entenda e faça referência a dados rapidamente de todo o seu patrimônio de dados, aumentando a produtividade.



## Integrado com suas ferramentas

Prepare seus dados e governança de IA para o futuro com a flexibilidade de aproveitar seus catálogos de dados e soluções de governança existentes.

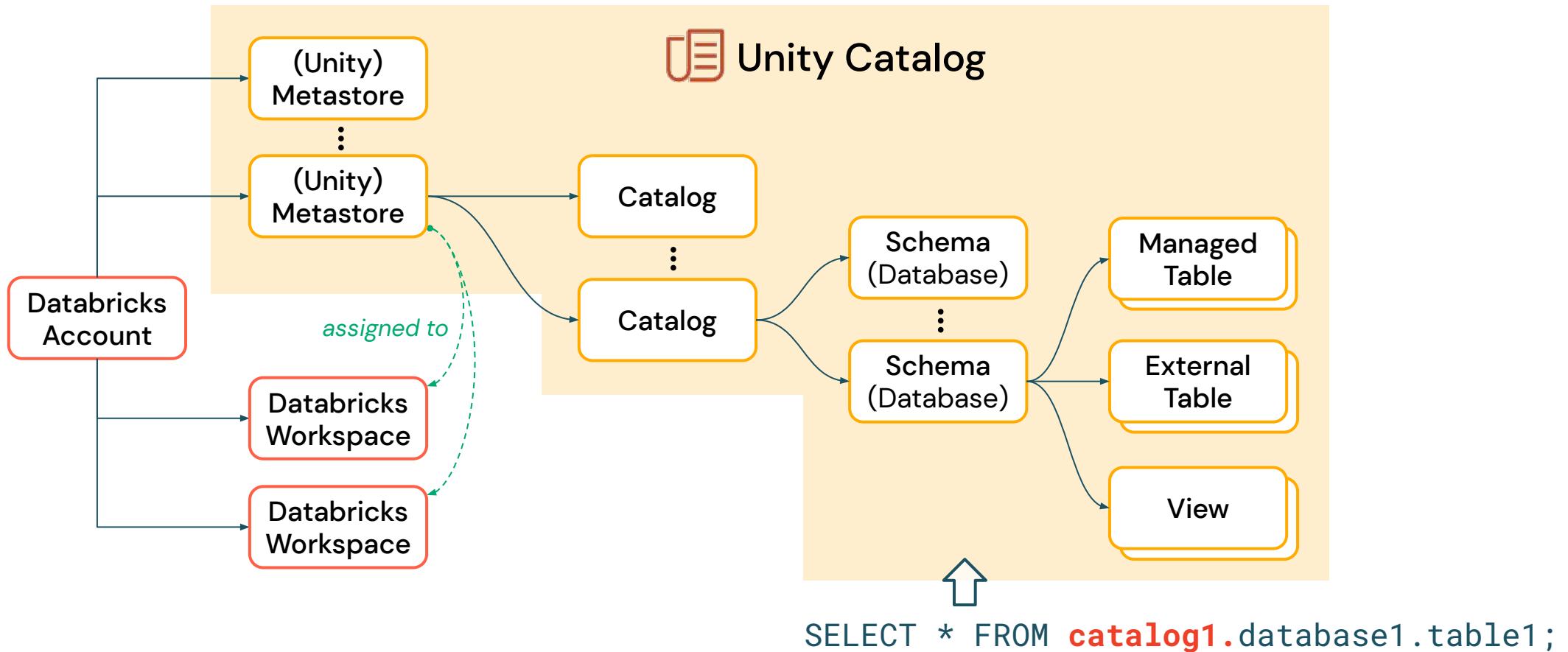


## Linhagem automatizada

Crie uma visão unificada e transparente de todo o seu ecossistema de dados com linhagem automatizada e granular para todas as cargas de trabalho em SQL, R, Python, Scala e em todos os tipos de ativos — tabelas, notebooks, fluxos de trabalho e painéis.



# Os três níveis (*namespace*) do Unity Catalog



# Controle de acesso centralizado

Conceda e gerencie centralmente as permissões de acesso

## Usando comandos ANSI SQL DCL

```
GRANT <privilege> ON <securable_type>  
<securable_name> TO `<principal>`
```

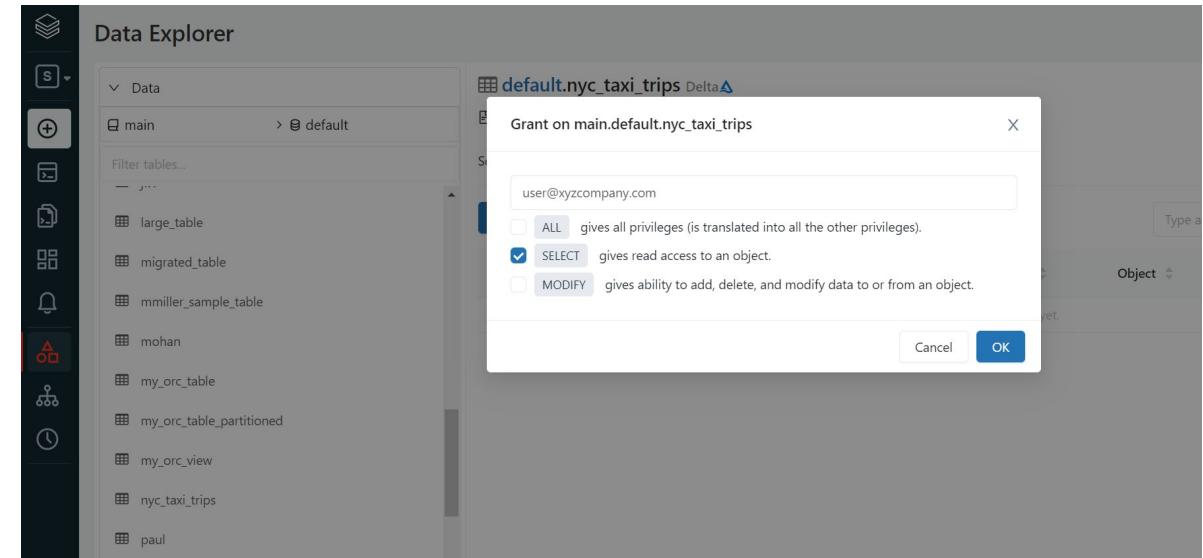
```
GRANT SELECT ON iot.events TO engineers
```

Nível de  
Permissão  
(privilegios)

'Table'= collection of  
files in S3/ADLS

Nomes dos grupos  
sincronizados com  
seu provedor de  
identidades (IAM)

## Usando a Interface Visual (UI)



# Controle de acesso centralizado

Usando comandos ANSI SQL DCL

```
GRANT <privilege> ON <securable_type>  
<securable_name> TO `<principal>`
```

## Privilégios

- SELECT: fornece acesso de leitura a um objeto.
- CREATE: fornece a capacidade de criar um objeto (por exemplo, uma tabela em um esquema).
- MODIFY: permite adicionar, excluir e modificar dados de ou para um objeto.
- USAGE: não fornece nenhuma capacidade, mas é um requisito adicional para executar qualquer ação em um objeto de esquema.
- READ\_METADATA: fornece a capacidade de exibir um objeto e os metadados dele.
- CREATE\_NAMED\_FUNCTION: fornece a capacidade de criar um UDF nomeado em um catálogo ou esquema existente.
- MODIFY\_CLASSPATH: fornece a capacidade de adicionar arquivos ao caminho de classe do Spark.
- ALL PRIVILEGES: fornece todos os privilégios (é convertido em todos os privilégios acima).

# Exemplos

SQL

Copiar

```
GRANT SELECT ON SCHEMA <schema-name> TO `<user>@<domain-name>`  
GRANT SELECT ON ANONYMOUS FUNCTION TO `<user>@<domain-name>`  
GRANT SELECT ON ANY FILE TO `<user>@<domain-name>`  
  
SHOW GRANTS `<user>@<domain-name>` ON SCHEMA <schema-name>  
  
DENY SELECT ON <table-name> TO `<user>@<domain-name>`  
  
REVOKE ALL PRIVILEGES ON SCHEMA default FROM `<user>@<domain-name>`  
REVOKE SELECT ON <table-name> FROM `<user>@<domain-name>`  
  
GRANT SELECT ON ANY FILE TO users
```

## Funções de exibição dinâmica

O Azure Databricks inclui duas funções de usuário que permitem expressar permissões em nível de coluna e de linha dinamicamente no corpo de uma definição de exibição.

- `current_user()`: retorna o nome de usuário atual.
- `is_member()`: determina se o usuário atual é um membro de um grupo específico do Azure Databricks.





D Data Science & En...

+ Create

Workspace

Repos

Recents

Search

Data

## 00-UC-Table-ACL

SQL

Detached



File

Edit

View: Standard

Run All

Clear

Help

1 SHOW GRANTS ON TABLE uc\_acl.customers

Table

+

	Principal	ActionType	ObjectType	ObjectKey
1	dataengineers	MODIFY	TABLE	uc_demos_reishin_toolsi.uc_acl.customers
2	dataengineers	SELECT	TABLE	uc_demos_reishin_toolsi.uc_acl.customers
3	account users	SELECT	TABLE	uc_demos_reishin_toolsi.uc_acl.customers

Showing all 3 rows. | 0.19 seconds runtime

# INTEGRAÇÃO

SQL Search ⌘ + P e2-field-eng-west ⓘ luis.assuncao@databricks.com

**Partner Connect**

Try partner solutions within minutes, even if you don't have a partner account. [Provide feedback](#)

Search by partner name All categories

**Data ingestion**

 **Fivetran**  
Fivetran automated data integration adapts as schemas and APIs change, ensuring reliable data access and simplified analysis with ready-to-query schemas.

 **arcion**  
Arcion unlocks the value of transactional and operational data with real-time, distributed CDC that has built-in heterogeneous schema management, HA, and auto-scaling.

 **HEVO**  
Hevo is an end-to-end data pipeline platform that ingests data from 150+ sources, loads it into Databricks Lakehouse, and transforms it to derive business insights.

 **Rivery**  
Rivery provides a cloud-native ELT+ platform that accelerates the entire Databricks workflow through data ingestion, transformation, orchestration, and reverse ETL.

**BI and visualization**

 **Microsoft Power BI**  
Quickly find meaningful insights within your data and easily build rich, visual analytic reports.

 **Tableau**  
Tableau helps people see and understand data with the world's broadest and deepest analytics platform.

 **Hex**  
Hex is a modern Data Workspace for teams. With Hex, Analysts and Data Scientists can explore, analyze, and visualize in collaborative data notebooks, and then share their work as interactive apps and stories that anyone can use.

 **preset**  
A free tool to quickly build interactive charts and dashboards on top of your data workspace. Preset (powered by Apache Superset) is the visualization layer for your modern data stack.

 **Qlik Sense**  
Qlik Sense delivers best-in-class cloud analytics that help people of all skill levels to make data-driven decisions and take action.

 **sigma**  
Sigma unlocks the value of data by delivering cloud-scale analytics to empower organizations with data-driven insights.

 **ThoughtSpot**  
ThoughtSpot is the Modern Analytics Cloud enabling answers and insights through natural language search and AI for all users drawing on all data from the Lakehouse.

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## Partner Connect

Try partner solutions within minutes, even if you don't have time to learn them.

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## Data ingestion



Fivetran automated data integration adapts as schemas and APIs change, ensuring reliable data access and simplified analysis with ready-to-query schemas.

## BI and visualization



## Microsoft Power BI

Quickly find meaningful insights within your data and easily build rich, visual analytic reports.



Qlik Sense delivers best-in-class cloud analytics that help people of all skill levels to make data-driven decisions and take action.

## Connect to partner



## Microsoft Power BI

Quickly find meaningful insights within your data and easily build rich, visual analytic reports.

You can use Partner Connect to connect Power BI Desktop to a Databricks SQL Warehouse. Select the target SQL Warehouse, and then download and open the connection file to start Power BI Desktop. You must have Power BI Desktop version 2.99.563.0 or above installed.

[Learn more](#)

## Compute ⓘ

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