Introduction to Databricks Lakehouse

INTRODUCTION TO DATABRICKS

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The Data Warehouse

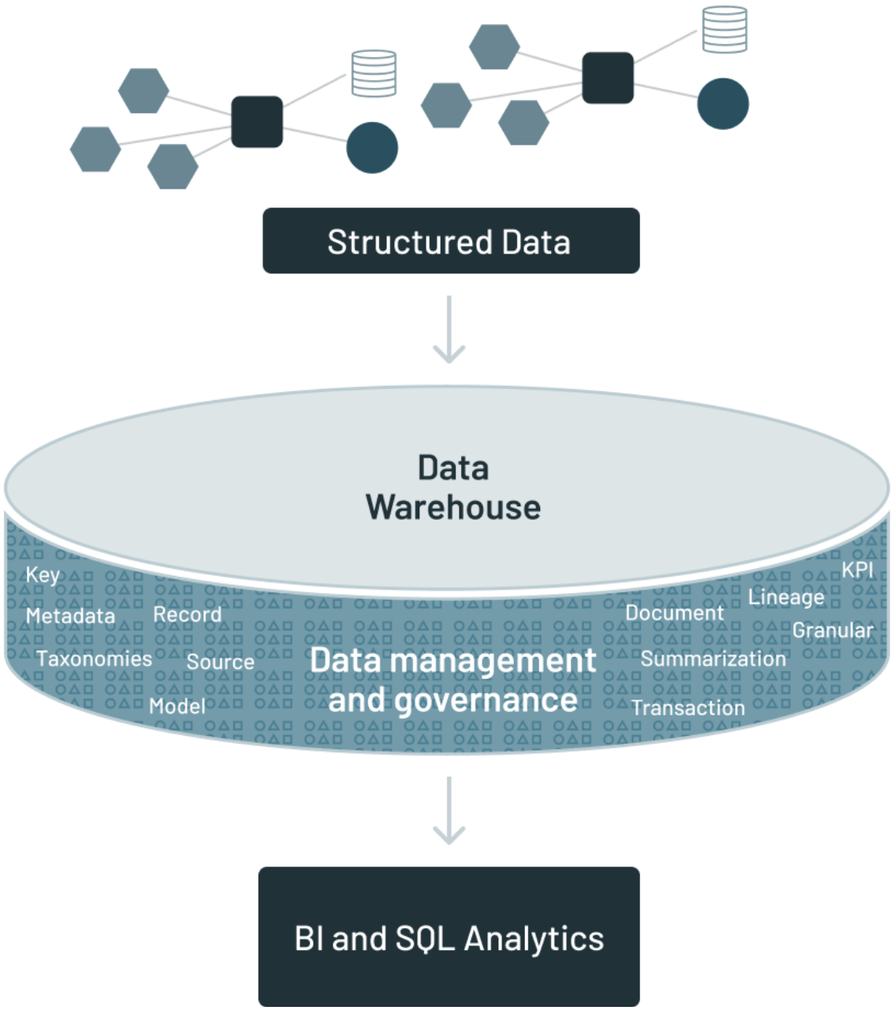
Data Warehouse

Pros

- Great for structured data
- Highly performant
- Easy to keep data clean

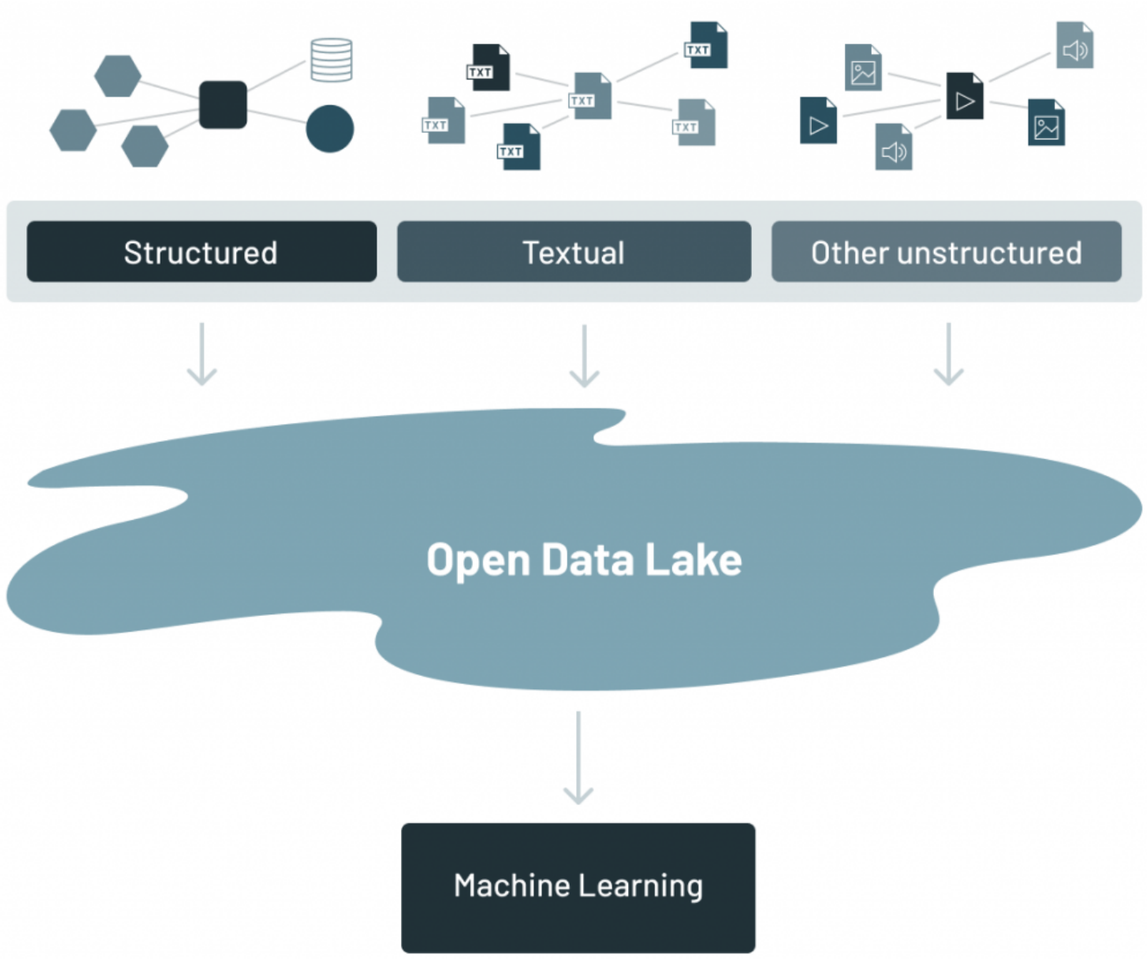
Cons

- Very expensive
- Cannot support modern applications
- Not built for Machine Learning



[1] https://www.databricks.com/blog/2021/05/19/evolution-to-the-data-lakehouse.html

The Data Lake



Data Lake

Pros

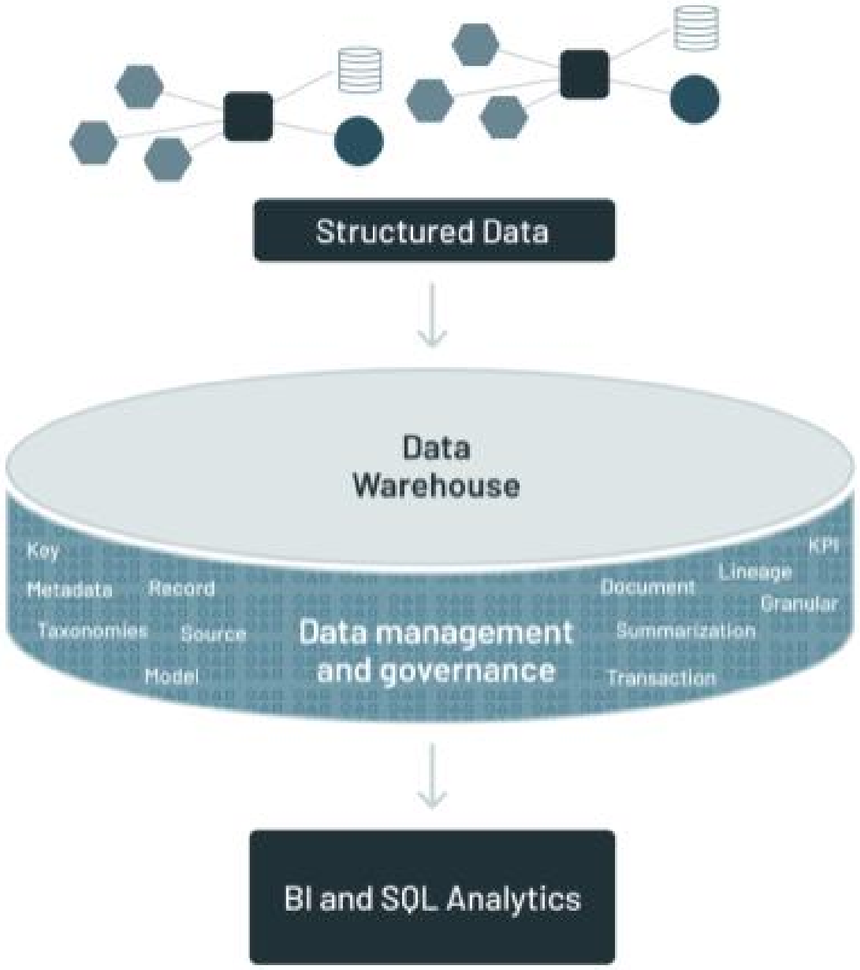
- Support for all use cases
- Very flexible
- Cost effective

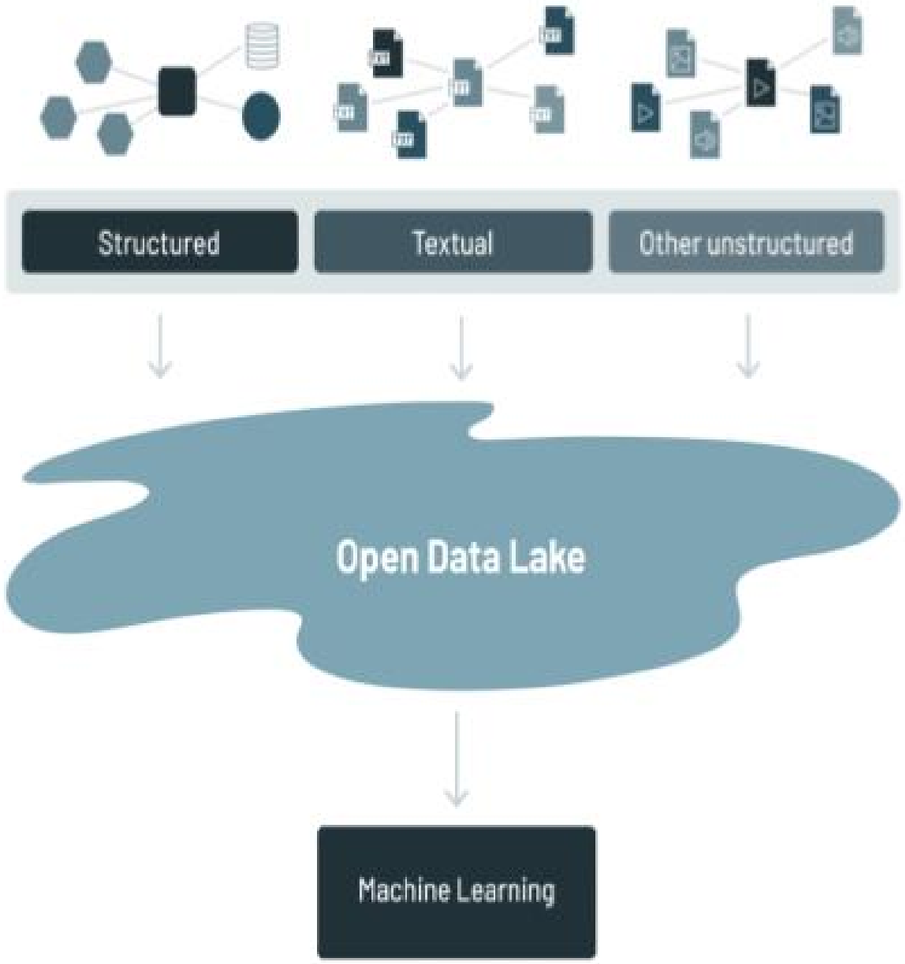
Cons

- Data can become messy
- Historically not very performant

[1] https://www.databricks.com/blog/2021/05/19/evolution-to-the-data-lakehouse.html

Birth of the Lakehouse





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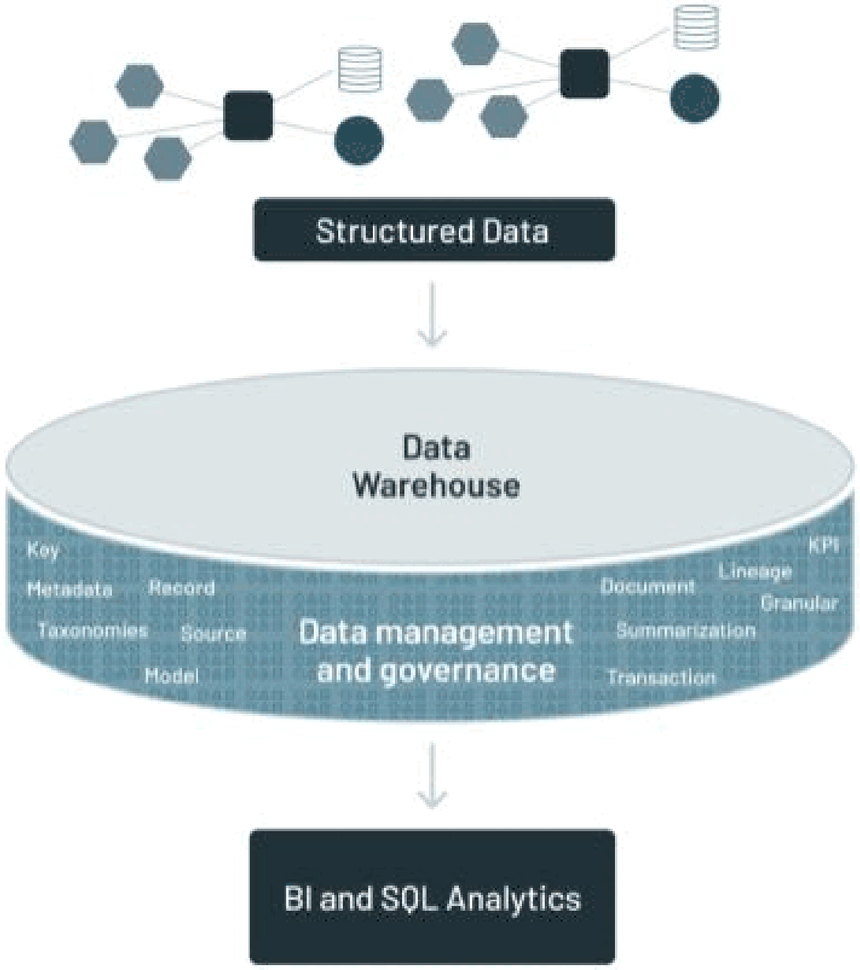
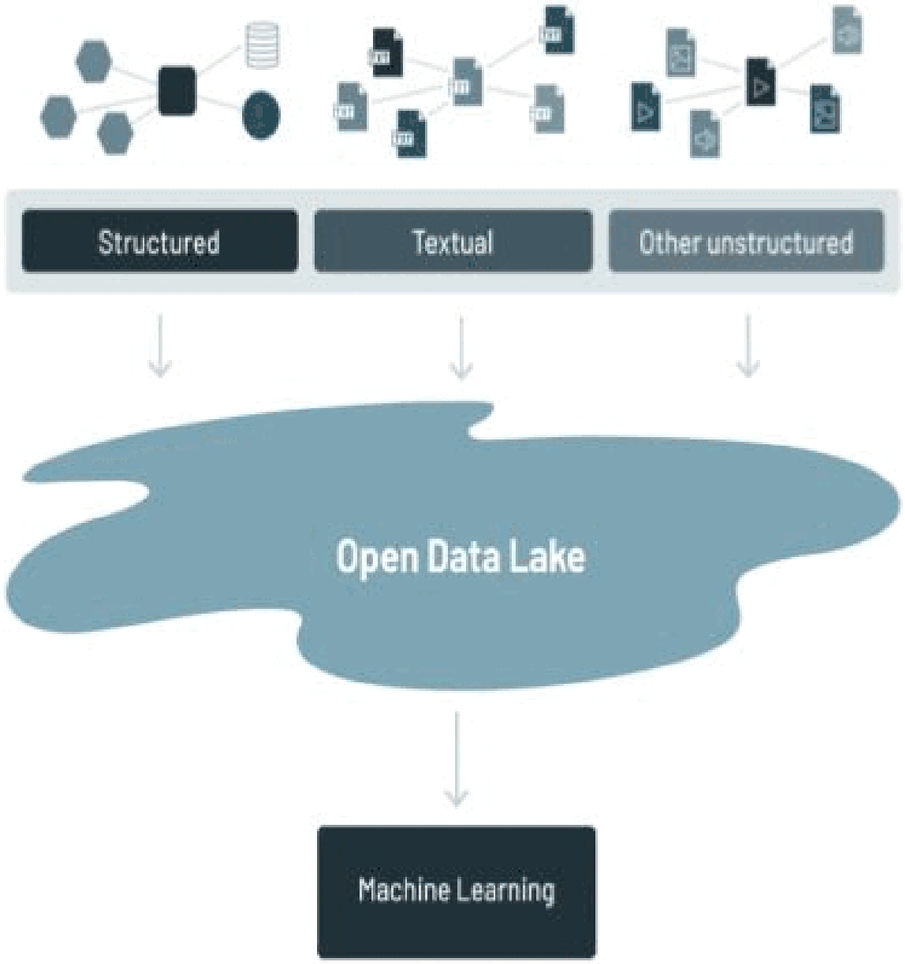
Birth of the Lakehouse



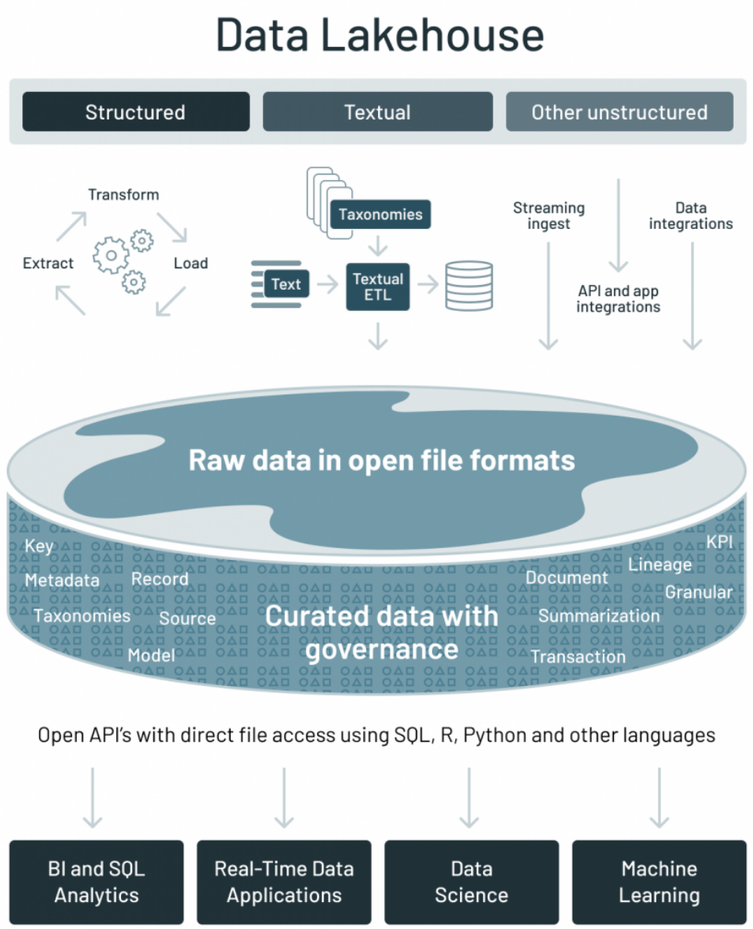


[1] https://www.databricks.com/blog/2021/05/19/evolution-to-the-data-lakehouse.html

The Databricks Lakehouse

The Databricks Lakehouse Platform

- Single platform for all data workloads
- Built on open source technology
- Collaborative environment
- Simplified architecture



[1] https://www.databricks.com/blog/2021/05/19/evolution-to-the-data-lakehouse.html

Databricks Architecture Benefits

Unification

- Every use case from AI to BI
- Benefits of data warehouse and data lake

Multi-Cloud

- Bring powerful platform to your data
- No lock-in to a specific cloud platform

Databricks Development Benefits

Collaborative

- Every data persona
- Ability to work in same platform in real-time

Open-Source

- Underpinned by Apache Spark
- Support for most popular languages (Python, R, Scala, SQL)

Let's practice!

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Core features of the Databricks Lakehouse Platform

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Apache Spark

Apache Spark is an open-source data processing framework and is the engine underneath Databricks.

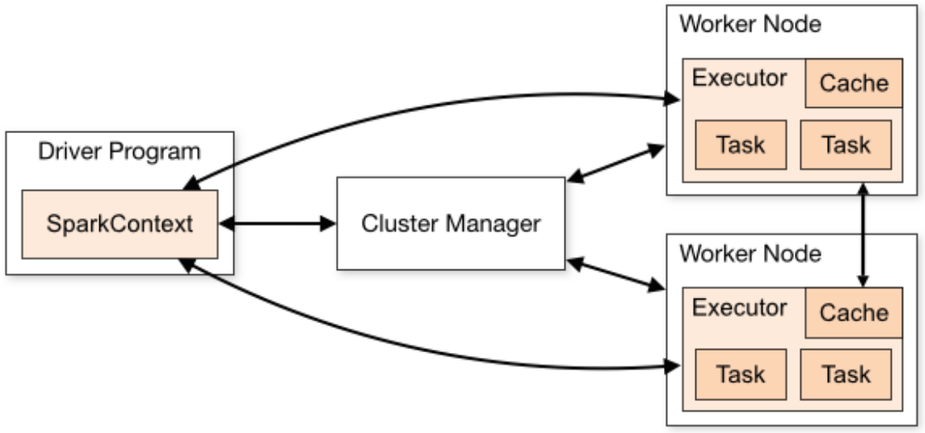
DataCamp Courses

- Introduction to Pyspark
- Big Data Fundamentals with Pyspark
- Cleaning Data with Pyspark
- Machine Learning with Pyspark
- Introduction to Spark SQL in Python

Benefits of Spark

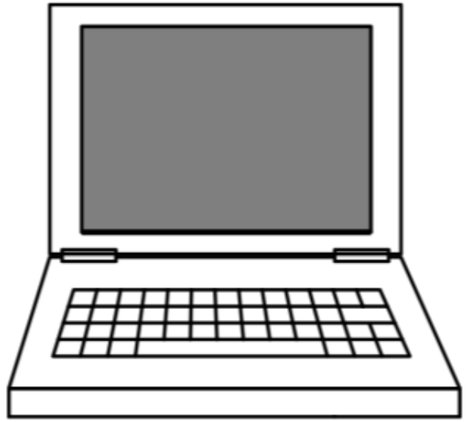
Key Benefits:

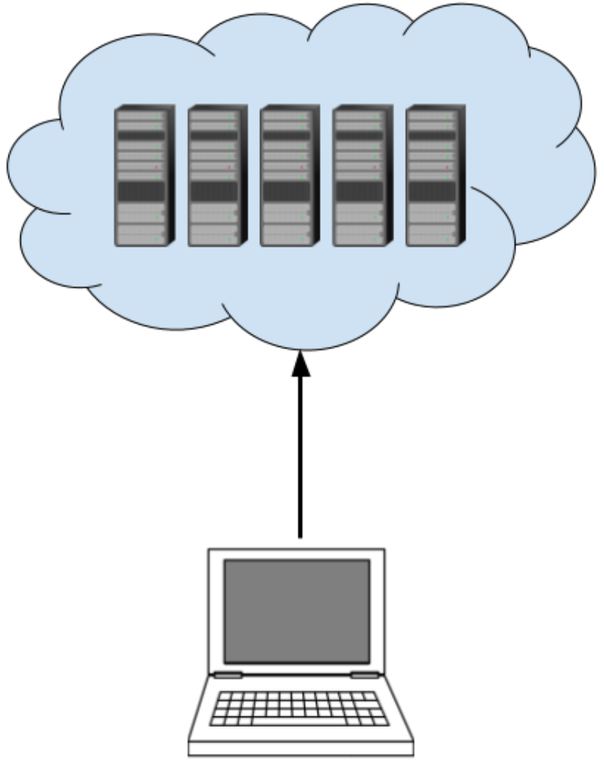
1. Extensible, flexible open-source framework
2. Large developer community
3. High performing
4. Databricks optimizations



[1] https://spark.apache.org/docs/latest/cluster-overview.html

Cloud computing basics





Databricks Compute

Clusters

- Collection of computational resources
- All workloads, any use case
- All-purpose vs. Jobs



SQL Warehouses

- SQL only
- BI use cases
- Photon

Cloud data storage

Parquet

CSV

JSON

Delta

Delta is an open-source data storage file format, and provides:

- ACID transactions
- Unified batch and streaming
- Schema evolution
- Table history
- Time-travel

[1] delta.io

Unity Catalog

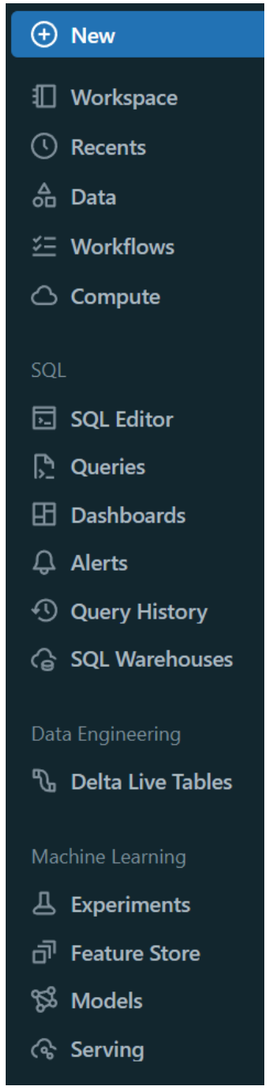
Unity Catalog is an open data governance strategy that controls access to all data assets in the Databricks Lakehouse platform.

- `SQL GRANT`, `REVOKE` statements to control access
- Simple interface for governance

Databricks UI

Designed for easier access to capabilities based on your data workload.

- All users have access to data and compute
- SQL users get a familiar interface for queries and reports
- Data engineers leverage Delta Live Tables
- Machine Learning workloads use models, features, and more



Let's review!

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Administering a Databricks workspace

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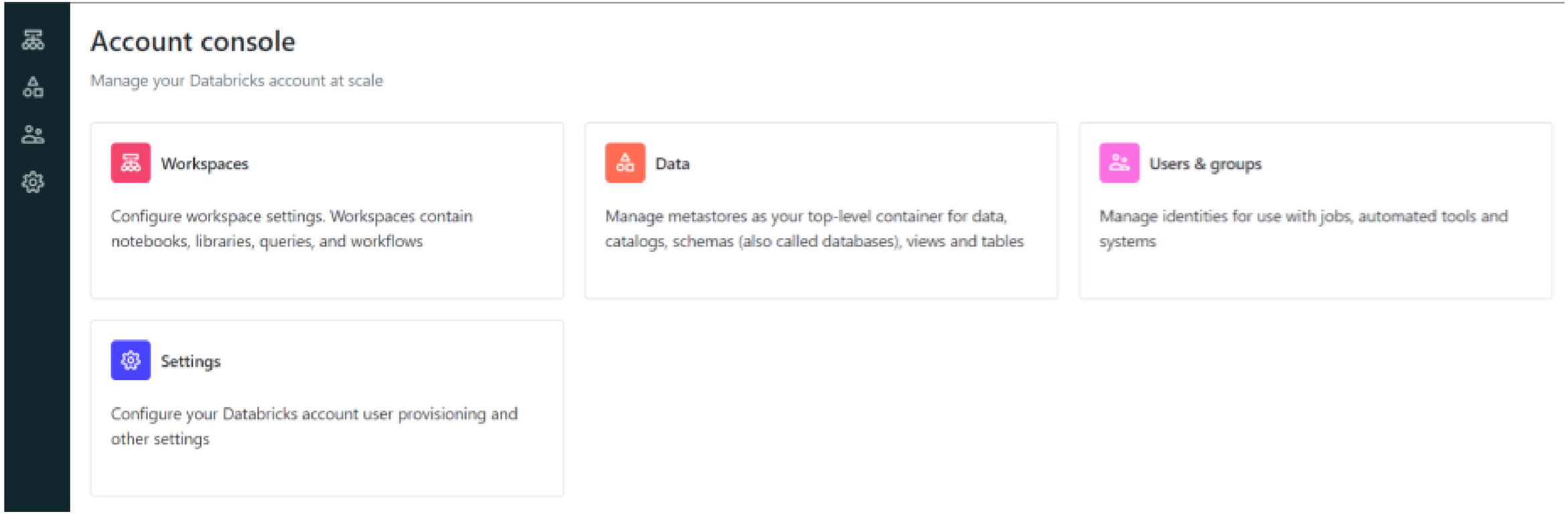
Account Admin

Key Responsibilities:

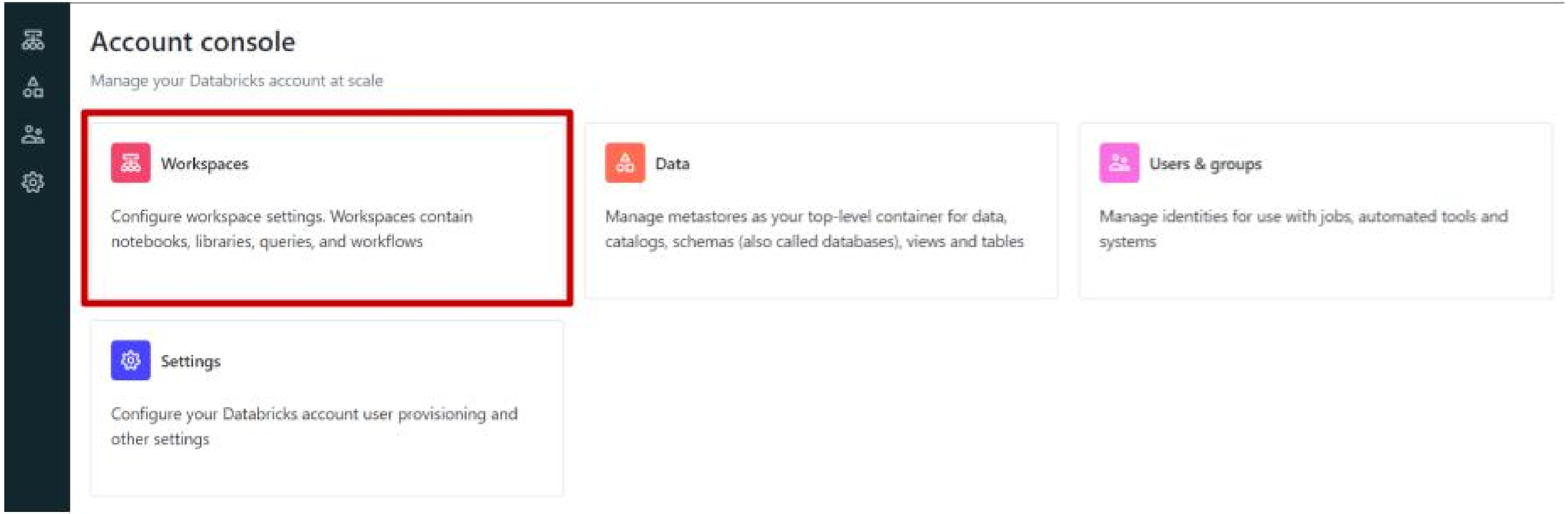
- Creating and managing workspaces
- Enabling Unity Catalog
- Managing identities
- Managing the account subscription

Account Console



https://accounts.cloud.databricks.com/

Account Console - Workspaces



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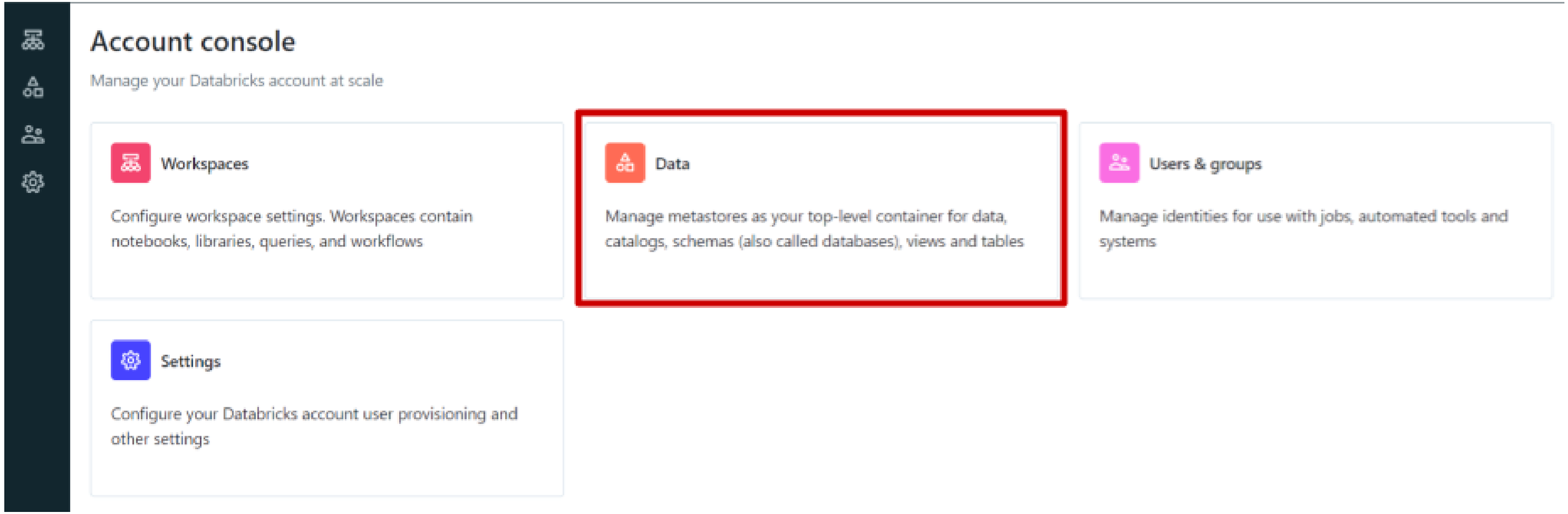
Account Console - Data



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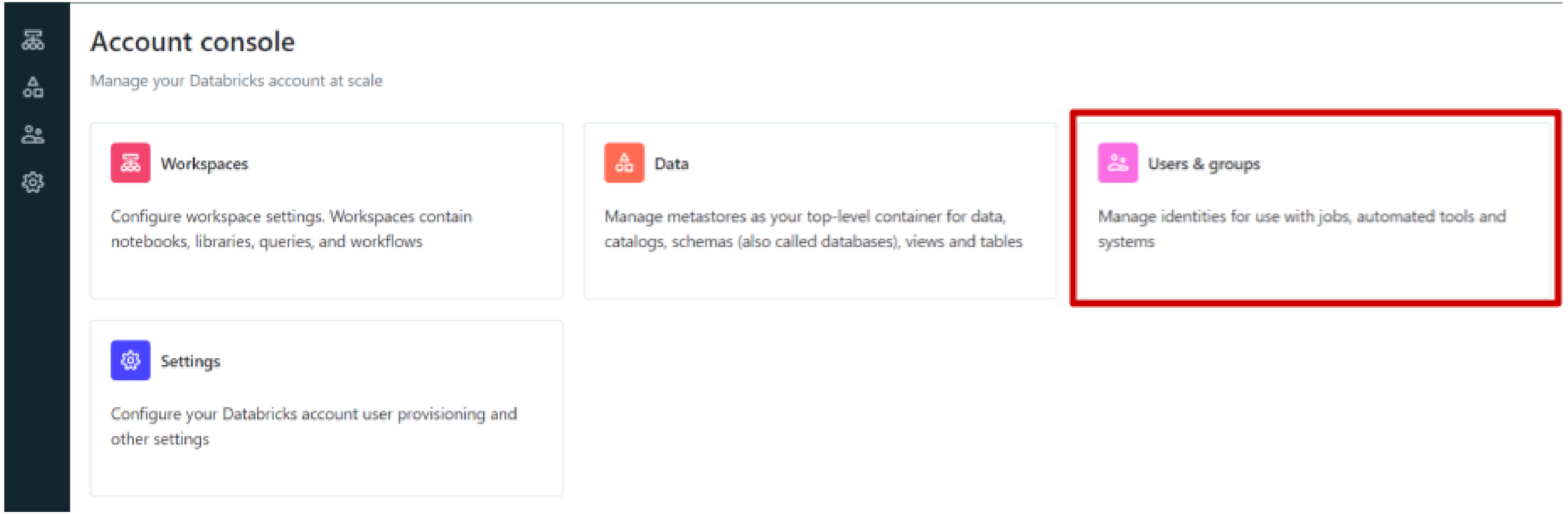
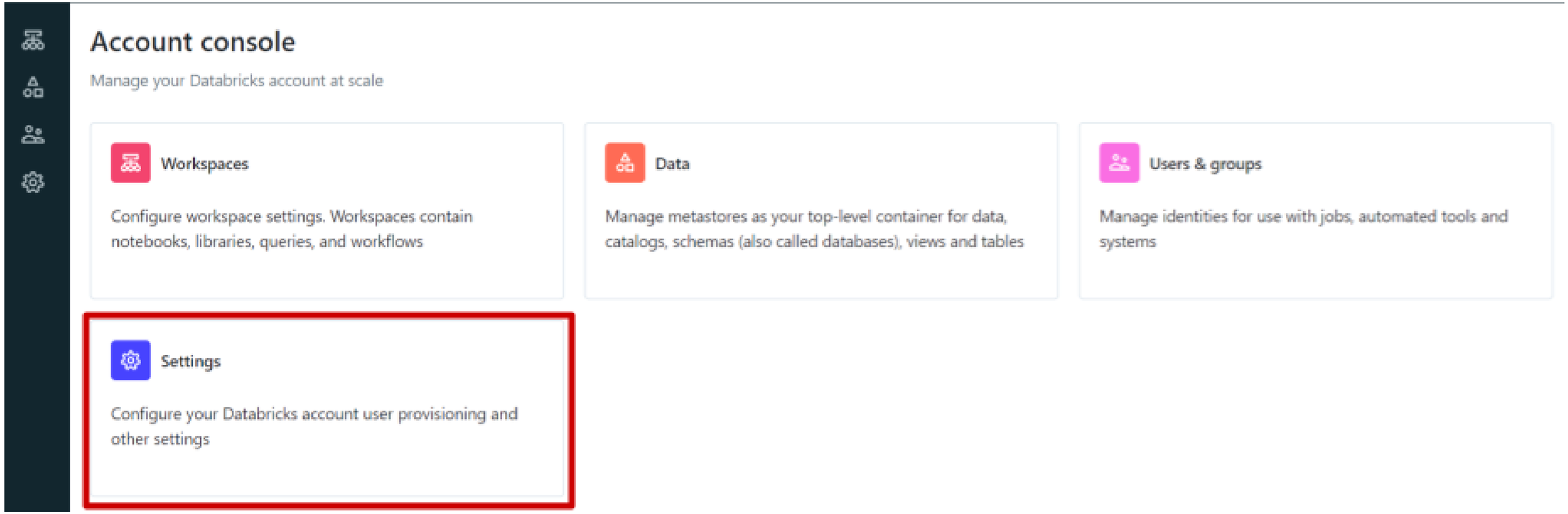
Account Console - Users & Groups



https://accounts.cloud.databricks.com/

Account Console - Settings

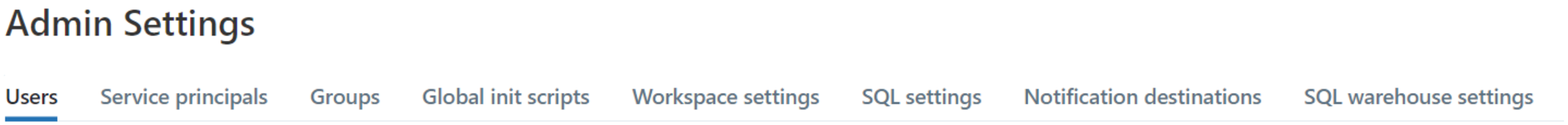


https://accounts.cloud.databricks.com/

Workspace Admin

Key Responsibilities:

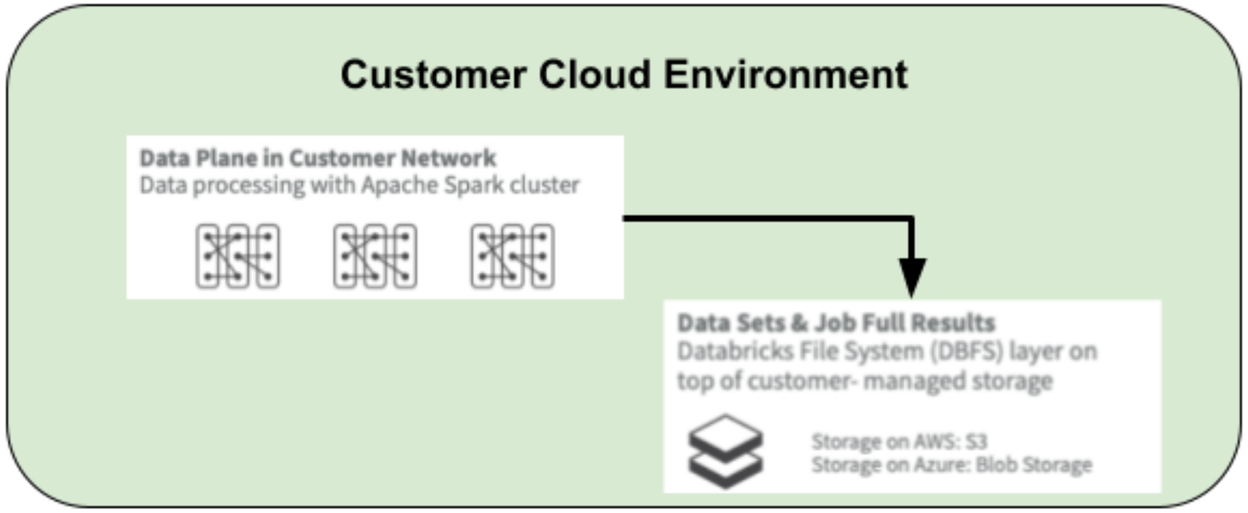
- Managing identities in your workspace
- Creating and managing compute resources
- Managing workspace features and settings



Data Plane

Contains all of the customer's assets needed for computation with Databricks.

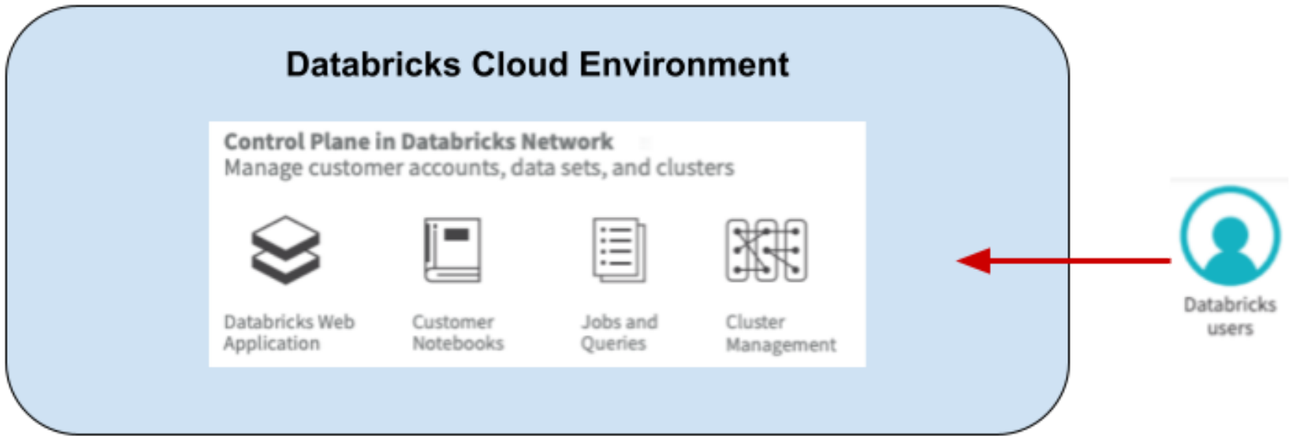
- Data is stored in the customer's cloud environment
- Clusters / SQL Warehouses run in customer's cloud tenant.



Control Plane

The portion of the platform that is managed and hosted by Databricks.

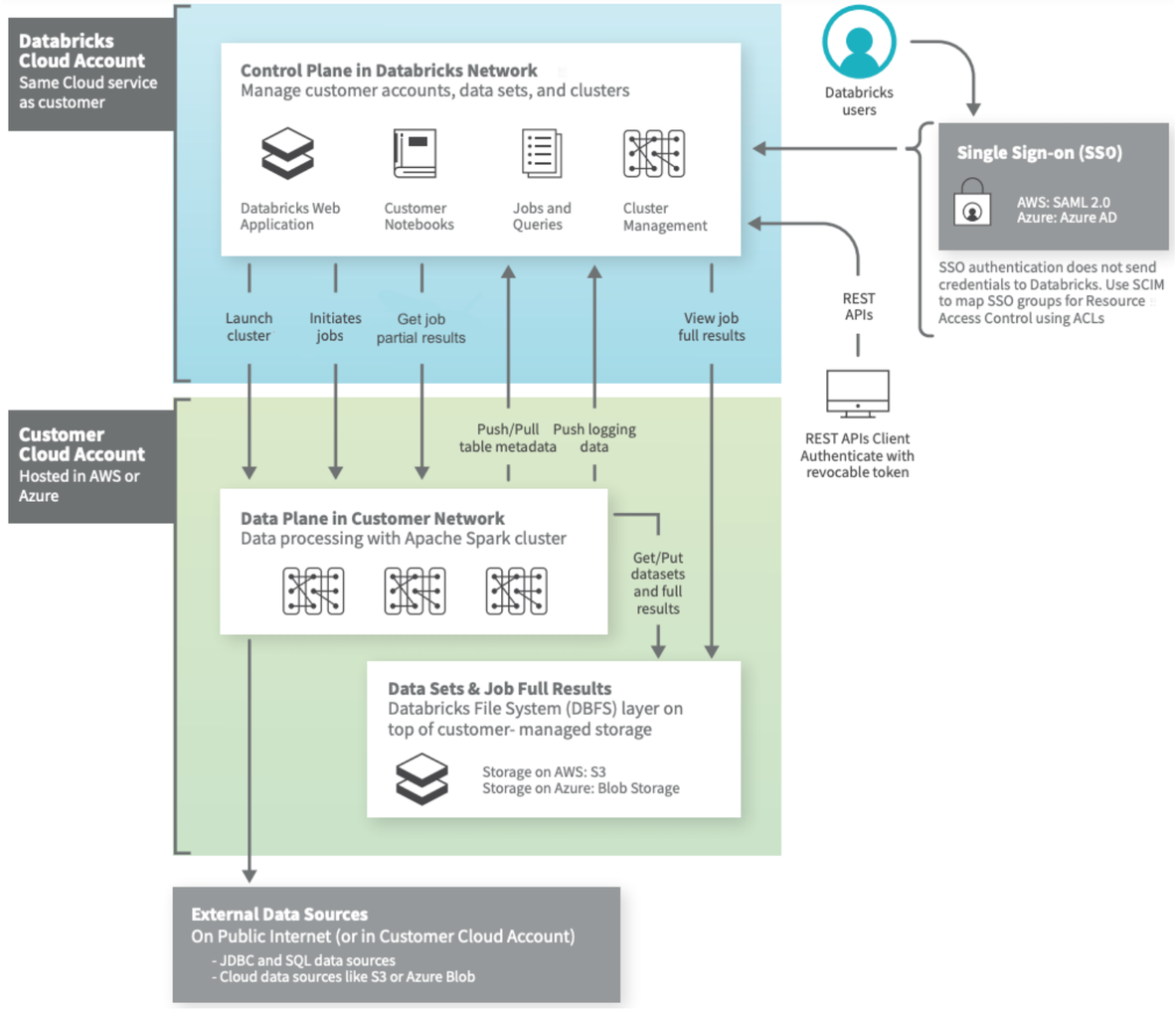
- Orchestrates various background tasks in Databricks
- Sends requests to Data Plane to create clusters, run jobs, etc.



Databricks Platform Architecture

Each cloud will have the same general options to create a workspace:

- Cloud Service Provider marketplace
- Account Console
- Using the Accounts API with Databricks
- Programmatic deployment (e.g., Terraform)



[1] https://docs.databricks.com/getting-started/overview.html

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Setting up a Databricks workspace example

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