Qlik

COMPARISON GUIDE

Top Cloud Data Lakes for the Enterprise

How do the big six stack up?

aws Google Cloud Microsoft Azure CLOUDERA databricks snowflake

Data lakes make their move to the cloud.

For managing multiple types of data in large volumes, data lakes are fast, scalable, and cost-effective. And while on-prem solutions like Hadoop paved the way, today there's an option with more agility and efficiency: cloud data lakes. In the cloud, you can avoid the upfront costs of setting up and maintaining a lake and focus on getting the most value out of your data.

Among the variety of cloud data lake providers in the market, which solution is right for you? In this eBook, we explain the core differences among the top six platforms.

THE CLOUD HYPERSCALERS

aws

Google Cloud

Microsoft Azure

THE MULTICLOUD SOLUTIONS

CLOUDERA

databricks

snowflake

LIMITATIONS OF ON-PREMISE LAKES

- ⓧ Elasticity
- ⓧ Lack of security and governance
- ⓧ High maintenance costs

ADVANTAGES OF CLOUD-BASED LAKES

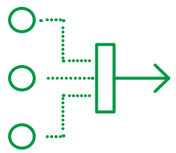
- ✓ Decoupled storage and compute
- ✓ Built-in security and encryption
- ✓ Transparent scaling
- ✓ Flexible on-demand infrastructure
- ✓ Consumption-based pricing

What makes a cloud data lake?

Every cloud data lake provider offers unique features. But at their core, all data lakes consist of a few key components.

DATA INGESTION

Extracts data from a variety of sources and loads it into the lake.



DATA PROCESSING

Runs transformation routines and algorithms on raw data.

STORAGE

Stores vast quantities of data in a range of formats.

ANALYTICS SERVICES

Allows users to analyze processed data for a variety of use cases.

SECURITY & GOVERNANCE

Ensures the availability, usability, and integrity of data.

The Cloud

Hyperscalers

aws

Google Cloud

Microsoft Azure

Amazon Web Services (AWS) Data Lake

AWS offers multiple services for building secure, flexible, and cost-effective data lakes. Two core services make up AWS-based lakes:

S3 Amazon Simple Storage Service (S3), which provides general-purpose storage. In some instances, Amazon DynamoDB, a NoSQL database, is also used to store low-latency data such as clickstream or IoT data.

EMR Amazon Elastic MapReduce (EMR) – the processing engine based on open-source tools like Apache Spark, Apache Hive, and Presto – which automates batch and streaming data processing.

AWS provides multiple web services (e.g., Kinesis Stream, Kinesis Firehose, Database Migration Service [DMS]) as well as partner solutions to help ingest and migrate data from cloud and on-premise sources into S3. Additionally, AWS offers several fully managed analytics services like Elasticsearch and Athena to help analyze log data and run interactive queries.

AWS LAKE FORMATION

To help you create data lakes more easily, Amazon offers AWS Lake Formation, a fully managed service designed to automate the setup and creation of data lakes in S3.

While it has multiple components, the heart of Lake Formation is AWS Glue, Amazon's serverless ETL and cataloging service, which helps users search, register, and merge data. Primarily focused on data access and security, Lake Formation includes its own fine-grained authorization layer on top of the identity and access management (IAM) capability of S3.

Google Data Lake

Google Cloud Platform (GCP) offers a data lake to help you securely ingest, store, and analyze large volumes of diverse data. Well integrated with other GCP services, Google Data Lake includes the following key elements:

GOOGLE CLOUD STORAGE

Google Cloud Storage (GCS), a general-purpose storage service that provides a low-cost option for companies of all sizes.

GOOGLE DATAPROC

Google Dataproc, a fully managed service – based on open-source tools like Apache Hive and Apache Spark – that processes and analyzes cloud-scale datasets.

GOOGLE BIGQUERY

Google's serverless data warehouse service, Google BigQuery, allows users to run native queries on GCS data for lakehouse-like functionality.

Google BigQuery not only gives SQL users high-performance native querying capabilities for data stored in GCS; it's also a perfect companion to Google Data Lake.

With cost-free movement of data between GCS and Google BigQuery and a compatible security model, Google gives users consistent access across both services. Also, data moved from GCS to BigQuery is automatically registered with a data catalog, eliminating the need to do it yourself.

Google provides a variety of other services that natively integrate with GCS. For the ingestion and migration of both real-time and stored data, Google offers tools like Pub/Sub, Transfer Service, and Transfer Appliance. For data processing and analysis, it includes Dataflow for serverless processing of real-time and batch data and Cloud Datalab for data exploration, analysis, visualization, and machine learning.

Microsoft Azure Data Lake

Part of the Microsoft Azure cloud platform, Azure Data Lake provides scalable storage as well as processing and analytics across multiple platforms and programming languages. The key components include:

1. Azure Data Lake Storage (ADLS) Gen2, which combines the file system storage of ADLS Gen1 with binary large object (Blob) storage to provide improved scalability, analytic workload performance, and cost.

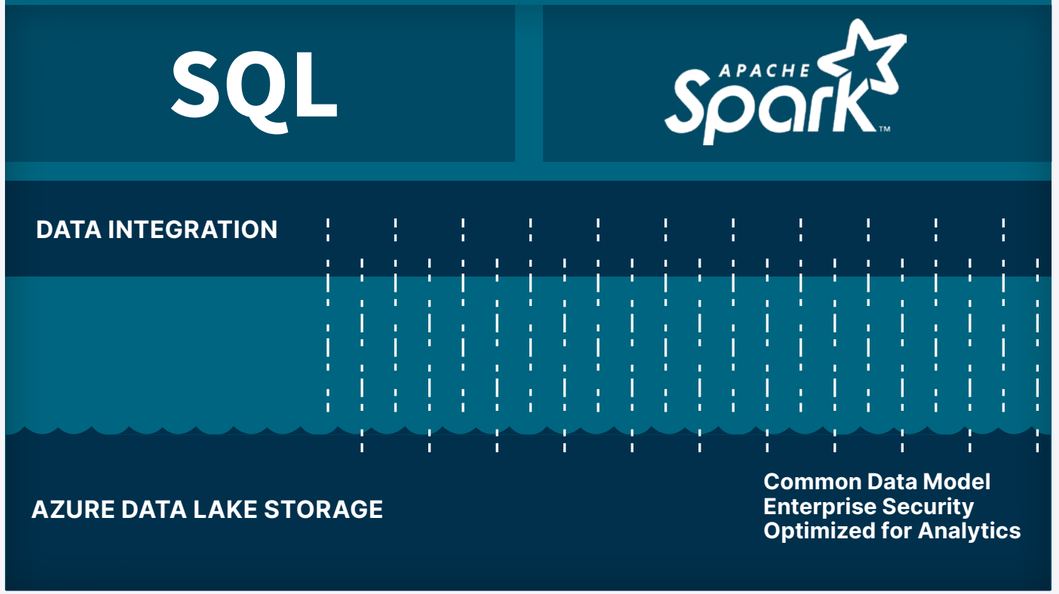
2. Azure HDInsight, a managed service based on open-source tools, and Azure Synapse, which combines SQL querying with Apache Spark-based large-scale data processing.

3. Azure Data Lake Analytics, an on-demand platform that lets you develop your own code and provides multi-language support, including for U-SQL, R, Python, and .NET.

Azure Data Lake includes disaster-recovery features and integrates with other Azure services, like Azure Active Directory, to provide role-based access controls and single sign-on capabilities. You can also extend your on-premise security controls to the Azure cloud environment.

AZURE SYNAPSE ANALYTICS

Azure Synapse Analytics is Microsoft's nod to data lakehouse architecture, an increasingly popular hybrid approach. Based on ADLS Gen2, Azure Synapse combines a SQL engine and Apache Spark in one platform to help you process and query large amounts of data.



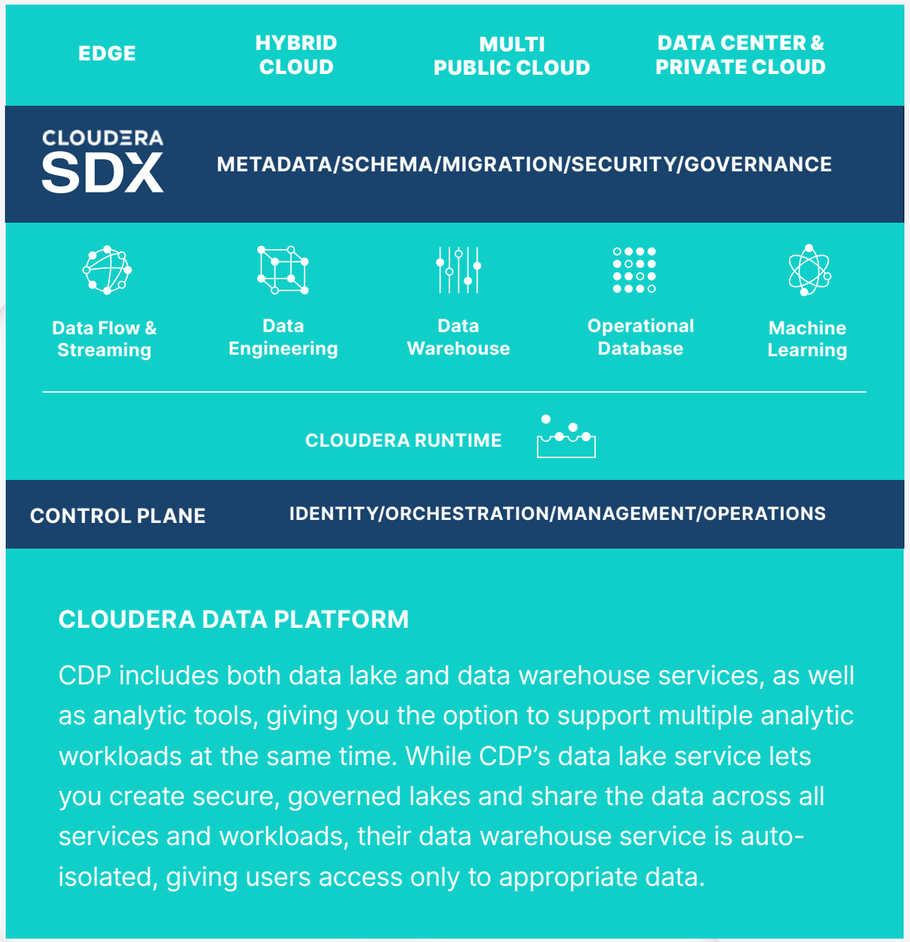
The Multicloud Solutions

CLOUDERA

databricks

snowflake®

Cloudera Data Platform (CDP)



Cloudera Data Platform is a cloud-agnostic data platform that lets you manage your infrastructure, data, and analytic workloads across every environment your business uses – public, private, hybrid, and multicloud. CDP brings the capabilities of Cloudera and Hortonworks together, moving Cloudera into lakehouse territory by providing both data lake and warehouse services in one platform. The core components and services of CDP are:

1. Data Hub, a workload service that allows you to deploy an entire cluster on the cloud with just a few clicks – no manual intervention required.
2. Shared Data Experience (SDX), which helps you consolidate all your data in one place and share it securely across teams and services.
3. Self-service analytics for data warehouses and machine learning.
4. A management console for centrally managing, monitoring, and orchestrating users and services across environments with a single interface.

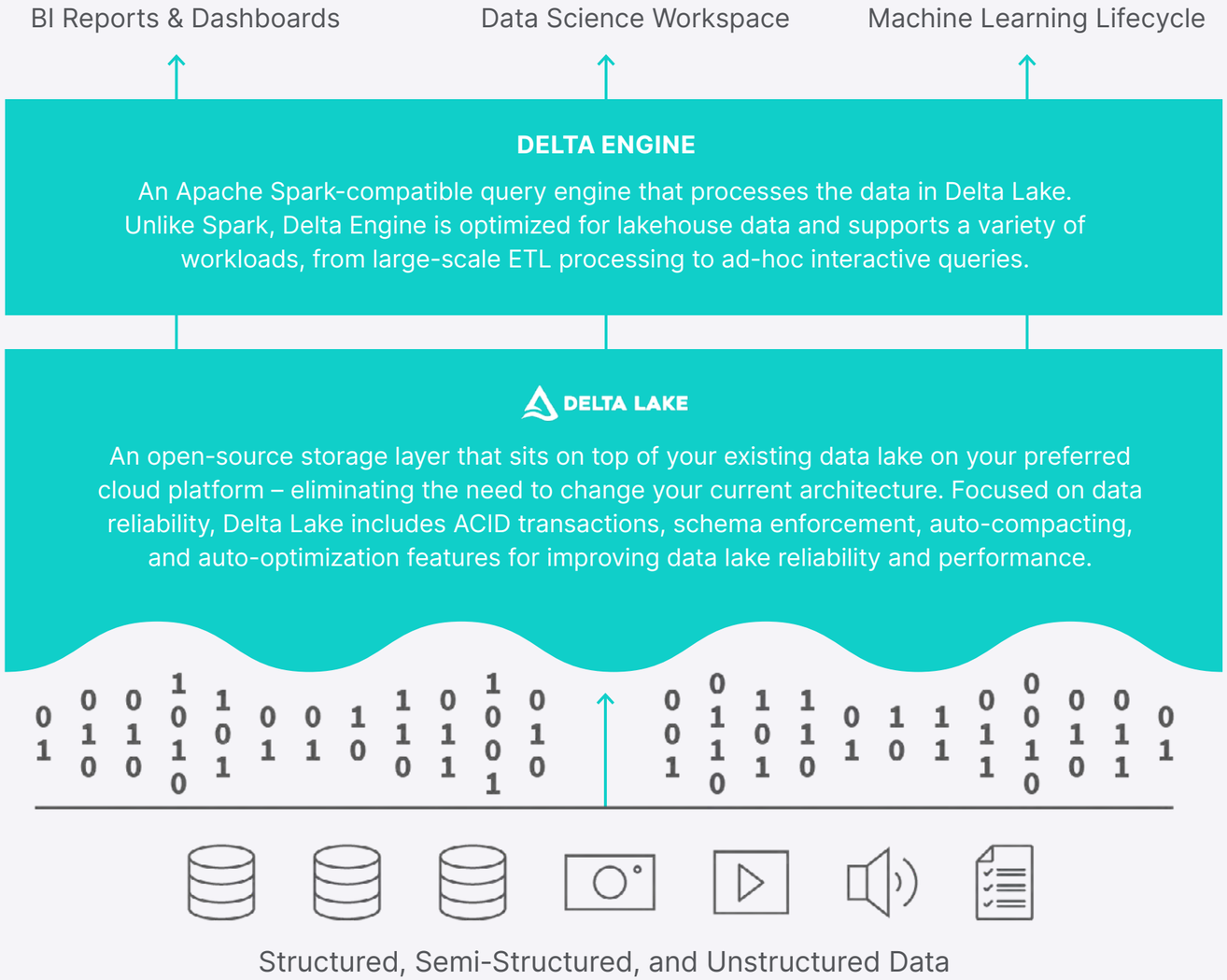
Databricks Unified Data Analytics Platform

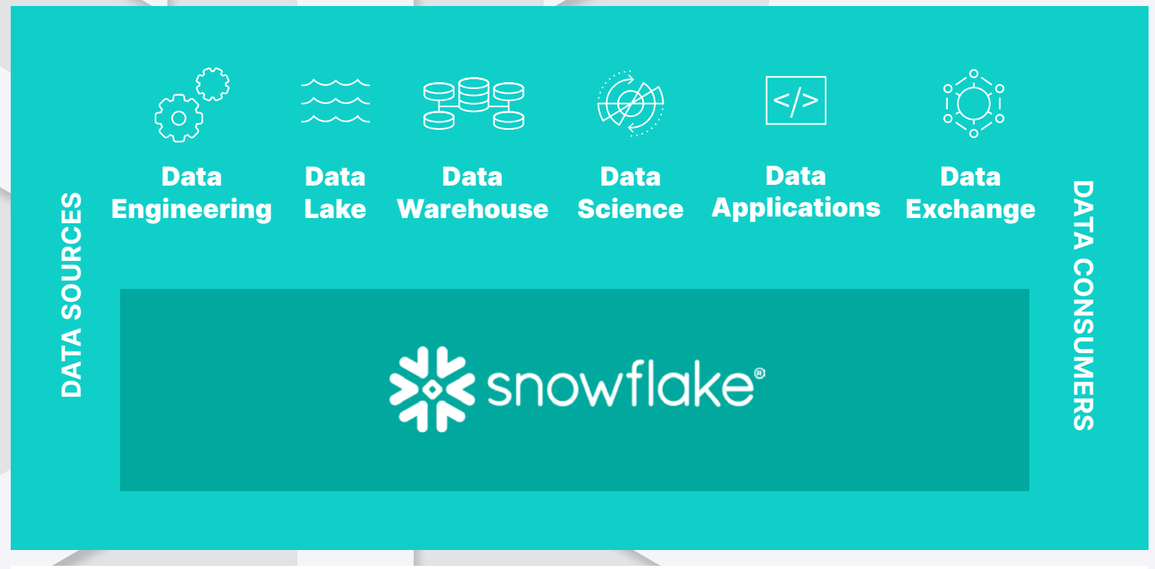
Originally focused on modernizing data lakes, Databricks now positions itself as a data lakehouse: an open, unified platform designed to store and manage all your data for analytics. The multicloud platform – available on AWS, Azure, and GCP – is built with the components shown on the right.

Additionally, Databricks provides native support for a variety of common programming languages, including R and Python, as well as a collaborative data science and machine learning platform.

DATABRICKS SQL ANALYTICS

Databricks' SQL Analytics service is the company's latest step in establishing itself as a lakehouse – a single, unified platform for all analytics initiatives. Designed to support your unique BI and reporting needs, the service gives SQL users a familiar interface for easily querying data and building dashboards.





SNOWPARK

Snowflake's developer tool further supports their lakehouse approach by allowing data scientists, engineers, and programmers to develop and deploy custom code using a variety of programming languages – including Java, Scala, and Python.

Snowflake Cloud Data Platform

Known primarily as a cloud data warehouse, Snowflake has increasingly edged into data lake territory. Built on a flexible platform, Snowflake provides the scalability, elasticity, and low-cost storage of a lake along with the security, governance, and performance of a warehouse.

Available in AWS, Azure, and GCP, Snowflake allows you to load a diverse array of data in its native format – without having to transform it – giving you the flexibility and agility of a data lake. Users can leverage Snowflake's MPP architecture to spin up multiple virtual warehouses and run multiple queries at the same time. Snowflake also enables you to share data with partner tools like Apache Spark, using ODBC and JDBC connectors for real-time, large-scale data processing.

Cloud Data Lakes at a Glance

Criteria	THE CLOUD HYPERSCALERS			THE MULTICLOUD SOLUTIONS		
	aws	Google Cloud	Microsoft Azure	CLOUDERA	databricks	snowflake
Primary Storage Service	Amazon S3	Google Cloud Storage	ADLS Gen2	Cloudera Data Platform	Data Lake atop AWS, GCS, or ADLS	Snowflake Cloud Data Platform
Processing Engine	Amazon EMR	Google Dataproc, Dataflow	Azure HDInsight, Azure Synapse	CDP Data Engineering	Delta Engine	Snowflake
SQL Support	Amazon Athena, Redshift, Spectrum	Google BigQuery	Azure Synapse	Self-Service Analytics Services for Data Warehouse	SQL Analytics Service	Snowflake
Catalog	AWS Glue	Google Data Catalog	Azure Data Catalog	Cloudera Data Platform	Unity Catalog	Partner Solutions
Pipeline Service	AWS Glue	Cloud Data Fusion, Dataflow	Azure Data Factory	Cloudera Data Engineering	Delta Live Tables	Snowpark
Apache Hive and Apache Spark Support	✓	✓	✓	✓	Apache Spark	N/A
Support for Multiple Programming Languages	✓	✓	✓	✓	✓	✓
Decoupled Storage & Compute	✓	✓	✓	✓	✓	✓
Lakehouse Architecture	✓	✓	✓	✓	✓	✓
Multicloud	✗	✗	✗	✓	✓	✓

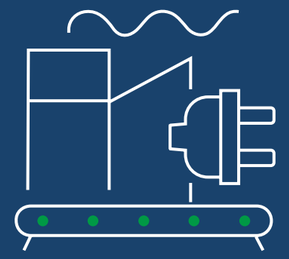
Great data lakes start with great integration.

Rapidly design, deploy, and manage data lakes with no coding.

As you begin to move your data to the cloud, more and more vendors are ready to meet you there, with a variety of solutions built for differing needs. But no matter which platform you choose, there's one thing you can't go without: robust data integration.

Whether you're using a data lake or lakehouse, you need integration – not only to ingest data from a wide range of sources but also to process that data so that it's readily available for any and every type of analytics.

That's where we come in. Qlik Data Integration® automates the continuous delivery of updated, accurate data sets for analytics. It empowers data engineers to ensure success at every step of the pipeline, from real-time ingestion to refinement, provisioning, and governance. And in the process, Qlik® makes it possible for all your users to get reliable, analytics-ready data when they need it most.



Need APIs? Meet the Qlik Connector Factory.

With an in-house R&D team dedicated to developing standard APIs, we're continually expanding access to and delivery of data from hundreds of SaaS applications and data sources. Our customers already benefit from over 250 existing connectors, and throughout 2023, we'll be adding 100 more.

Learn More

Qlik for cloud data lakes.

Qlik Data Integration can help you get more out of your cloud data lake investment sooner by continuously delivering the accurate, timely, and trusted data you need. The platform provides the unparalleled ability to automate data streams from any source – including legacy mainframes; enterprise applications like SAP, databases, data warehouses; and more – into your lake. And all of that without coding, too. **Learn more about data lake creation today.**

Curious to see how Qlik can revolutionize data delivery in your business? **Try it free.**

Qlik automates the complete data lake pipeline:

- Captures and lands real-time change data into your data lake of choice
- Catalogs and curates data to enable search and self-provision, while ensuring data security and governance
- Future-proofs by supporting all major cloud providers, source and target endpoints, and analytic tools of choice
- Automatically standardizes, merges, and refines data – and subsets it into analytics-ready data sets
- Provides an orchestration layer for easy setup, monitoring, and management of data pipelines

About Qlik

Qlik transforms complex data landscapes into actionable insights, driving strategic business outcomes. Serving over 40,000 global customers, our portfolio leverages advanced, enterprise-grade AI/ML and pervasive data quality. We excel in data integration and governance, offering comprehensive solutions that work with diverse data sources. Intuitive and real-time analytics from Qlik uncover hidden patterns, empowering teams to address complex challenges and seize new opportunities. Our AI/ML tools, both practical and scalable, lead to better decisions, faster. As strategic partners, our platform-agnostic technology and expertise make our customers more competitive.

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