

eBook

A New Approach to Data Sharing

Collaborate better with Delta Sharing



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Introduction

Data Sharing in Today's Digital Economy

On January 5, 2021, the first sample of the coronavirus genome was uploaded to the internet. This set the stage for the world's first batch of COVID-19 vaccines to be developed. Every day since, coronavirus experts have exchanged public data sets, searching for better treatments and tests, and tracking mutations. This is just one example of how data sharing can drive urgently needed innovation.

Today's economy revolves around data. More and more, organizations must exchange data with their customers, suppliers and partners. Security is critical. And yet, efficiency and immediate accessibility are equally important. To be truly data-driven, organizations need a better way to share data. Gartner predicts that by 2023, organizations that promote data sharing will outperform their peers on most business value metrics.

Where data sharing was once considered optional, it's now fundamental. More organizations are investing in streamlining internal and external data sharing across the value chain. But they still face major roadblocks — from human inhibition to legacy solutions to vendor lock-in.

To compete in the digital economy, organizations need an open — and secure — approach to data sharing. This eBook takes a deep dive into the modern era of data sharing: from common use cases and key benefits to conventional approaches and the challenges of those methods. You'll get an inside view into the world's first open standard for secure data sharing: Databricks Delta Sharing. Most importantly, you'll see how your organization can use Delta Sharing to unlock the true value of your data.

Chapter 1

What Is Data Sharing and Why Is It Important?

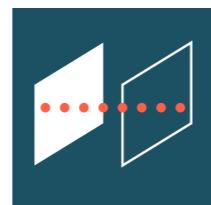
Data sharing is the ability to make the same data available to one or many stakeholders — both external and internal. Nowadays, the ever-growing amount of data has become a strategic asset for any company. Data sharing — within your organization or externally — is an enabling technology for data commercialization and enhanced analysis. Sharing data as well as consuming data from external sources allow companies to collaborate with partners, establish new partnerships and generate new revenue streams with data monetization. Data sharing can deliver benefits to business groups across the enterprise. For those business groups, data sharing can get them access to data needed to make critical decisions. This includes but is not limited to roles such as the data analyst, data scientist and data engineer.

Common data-sharing use cases



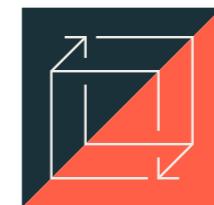
Data monetization

Companies across industries are commercializing data, and this segment continues to grow across industries. Large multinational organizations have formed exclusively to monetize data, while other organizations are looking for ways to monetize their data and generate additional revenue streams. Examples of these companies can range from an agency with an identity graph to a telecommunication company with proprietary 5G data or to retailers that have a unique ability to combine online and offline data. Data vendors are growing in importance as companies realize they need external data for better decision-making.



Data sharing with partners or suppliers (B2B)

Many companies now strive to share data with partners and suppliers as similarly as they share it across their own organizations. For example, retailers and their suppliers continue to work more closely together as they seek to keep their products moving in an era of ever-changing consumer tastes. Retailers can keep suppliers posted by sharing sales data by SKU in real time, while suppliers can share real-time inventory data with retailers so they know what to expect. Scientific research organizations can make their data available to pharmaceutical companies engaged in drug discovery. Public safety agencies can provide real-time public data feeds of environmental data, such as climate change statistics or updates on potential volcanic eruptions.



Internal lines of business (LOBs) sharing

Within any company, different departments, lines of business and subsidiaries seek to share data so that everyone can make decisions based on a complete view of the current business reality. For example, finance and HR departments need to share data as they analyze the true costs of each employee. Marketing and sales teams need a common view of data as they seek to determine the effectiveness of recent marketing campaigns. And different subsidiaries of the same company need a unified view of the health of the business. Removing data silos — which are often established for the important purpose of preventing unauthorized access to data — is critical for digital transformation initiatives and maximizing business value of data.

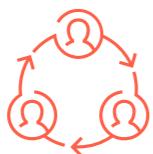
Key benefits of data sharing

As you can see from the use cases we've described, the benefits of data sharing are many.

They include:



Ability to generate new revenue streams. With data sharing, organizations can generate new revenue streams by offering data products or data services to their end consumers.



Greater collaboration with existing partners. In today's hyper-connected digital economy, no organization can advance their business objectives without partnerships. Data sharing helps cement existing partnerships and establish new ones.



Ease of producing new products, services or business models. Product teams can leverage both first-party data and third-party data to refine their products and services and expand their product/service catalog.



Greater efficiency of internal operations. Teams across the organization can meet their business goals far more quickly when they don't have to spend time figuring out how to free data from silos. When teams have access to live data, there's no lag time between the need for data and the connection with the appropriate data source.

Chapter 2

Conventional Methods of Data Sharing and Their Challenges

Sharing data across different platforms, companies and clouds is no easy task. In the past, organizations have hesitated to share data more freely because of the perceived lack of secure technology, their competitive concerns and the cost of implementing data-sharing solutions.

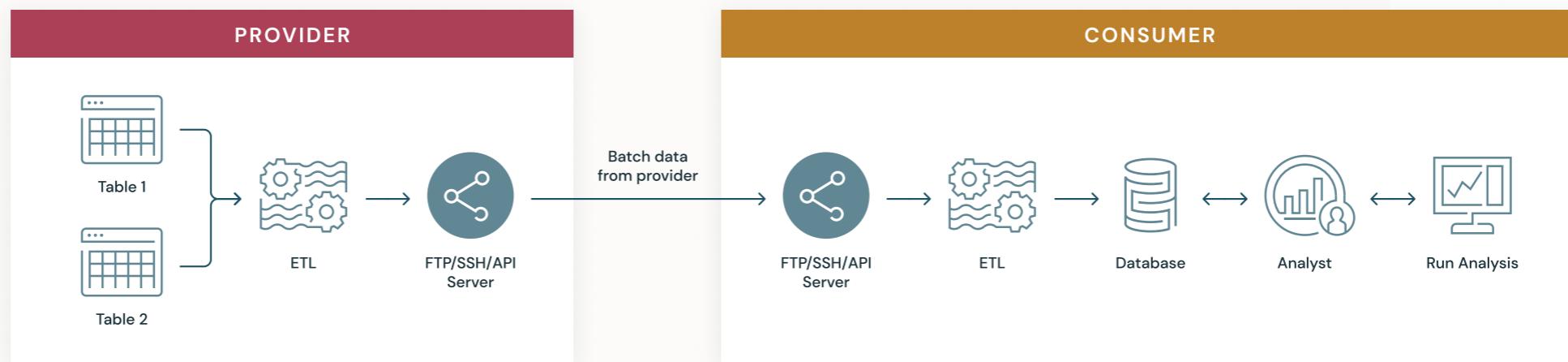
Even for companies that have the budget to implement data-sharing technology, many of the current approaches can't keep up with today's requirements for open-format, multicloud, high-performance solutions. Most data-sharing solutions are tied to a single vendor, which creates friction for data providers and data consumers who use noncompatible platforms.

Over the past 30 years, data-sharing solutions have come in three forms: legacy and homegrown solutions, cloud object storage, and closed source commercial solutions. Each of these approaches comes with its pros and cons.



Legacy and homegrown solutions

Many companies have built homegrown data-sharing solutions based on legacy technologies such as email, (S)FTP or APIs.



Pros

- **Vendor agnostic.** FTP, email and APIs are all well-documented protocols. Data consumers can leverage a suite of clients to access data provided to them.
- **Flexibility.** Many homegrown solutions are built on open source technologies and will work both on-prem and on clouds.

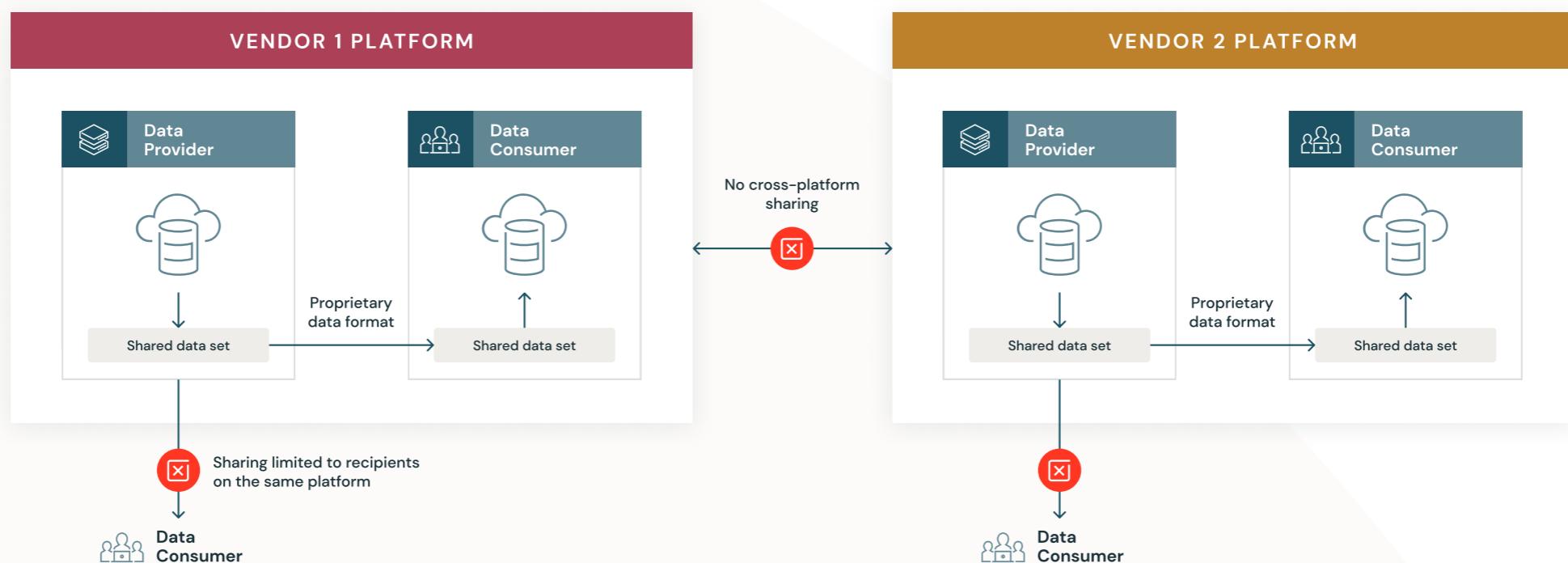
Cons

- **Data movement.** It takes significant effort to extract data from the cloud storage, transform it and host it on an FTP server for different recipients. Additionally, this approach results in creating copies of data sets. Data copying causes duplication and prevents organizations from instantly accessing live data.
- **Complexity of sharing data.** Even more significantly, homegrown solutions are typically built on complex architectures due to replication and provisioning. This can add considerable time to data-sharing activities and result in out-of-date data for end consumers.
- **Operational overhead for data recipients.** Data recipients have to extract, transform and load (ETL) the shared data for their end use cases, which further delays the time to insights. For any new data updates from the providers, the consumers have to rerun ETL pipelines again and again.
- **Security and governance.** As modern data requirements become more stringent, homegrown and legacy technologies have become more difficult to secure and govern.
- **Scalability.** Such solutions are costly to manage and maintain and don't scale to accommodate large data sets.

Proprietary vendor solutions

Commercial data-sharing solutions are a popular option among companies that don't want to devote the time and resources to building an in-house solution yet also want more control than what cloud object storage can offer.

Figure 2:
Proprietary
vendor solutions



Pros

- **Simplicity.** Commercial solutions allow users to share data easily with anyone else who uses the same platform.

Cons

- **Vendor lock-in.** Commercial solutions don't interop with other platforms well. While data sharing is easy among fellow customers, it's usually impossible with those who use competing solutions. This in turn reduces the reach of data, resulting in vendor lock-in. Furthermore, differences in platforms between data providers and data recipients introduce complexities in data sharing.
- **Data movement.** Data must be loaded onto the platform, requiring additional ETL and data copies.
- **Scalability.** Commercial data sharing comes with scaling limits from the vendors.
- **Cost.** All the above challenges create additional cost for sharing data with potential consumers, as data providers have to replicate data for different recipients on different cloud platforms.

Cloud object storage

Object storage is considered a good fit for the cloud because it is elastic and it can more easily scale into multiple petabytes to support unlimited data growth. The big three cloud providers all offer object storage services (AWS S3, Azure Blob, Google Cloud Storage) that are cheap, scalable and extremely reliable.

An interesting feature of cloud object storage is the ability to generate signed URLs, which grant time-limited permission to download objects. Anyone who receives the presigned URL can then access the specified objects, making this a convenient way to share data.

Pros

- **Sharing data in place.** Object storage can be shared in place, allowing consumers to have access to the latest available data.
- **Scalability.** Cloud object storage profits from availability and durability guarantees that typically cannot be achieved on-prem. Data consumers retrieve data directly from the cloud providers, saving bandwidth for the providers.

Cons

- **Limited to a single cloud provider.** Recipients have to be on the same cloud to access the objects.
- **Cumbersome security and governance.** Complexity of assigning permissions and managing access. Custom application logic is needed to generate signed URLs.
- **Complexity.** Personas managing data sharing (DBAs, analysts) find it difficult to understand IAM policies and how data is mapped to underlying files. For companies with large volumes of data, sharing via cloud storage is time consuming, cumbersome and nearly impossible to scale.
- **Operational overhead for data recipients.** The data recipients have to run extract, transform and load (ETL) pipelines on the raw files before consuming them for their end use cases.

The lack of a comprehensive solution creates a struggle for data providers and consumers to easily share data. Cumbersome and incomplete data-sharing processes also constrain the development of business opportunities from shared data.

Chapter 3

Introducing Delta Sharing – An Open Standard for Secure Sharing of Data Assets

We believe the future of data sharing should be characterized by open technology. Data sharing shouldn't be tied to a proprietary technology that introduces unnecessary limitations and financial burdens to the process. It should be readily available to anyone who wants to share data at scale. This philosophy inspired us to develop and release a new protocol for sharing data: Delta Sharing.

What is Delta Sharing?

Delta Sharing provides an open solution to securely share live data from your lakehouse to any computing platform. Recipients don't have to be on the Databricks platform or on the same cloud or a cloud at all. Data providers can share live data without replicating it or moving it to another system. Recipients benefit from always having access to the latest version of data and can quickly query shared data using tools of their choice for BI, analytics and machine learning, reducing time-to-value.

Data providers can centrally manage, govern, audit and track usage of the shared data on one platform. Delta Sharing is natively integrated with [Unity Catalog](#), enabling organizations to centrally manage and audit shared data across organizations and confidently share data assets while meeting security and compliance needs.

With Delta Sharing, organizations can easily share existing large-scale data sets based on the open source formats Apache Parquet and Delta Lake without moving data. Teams gain the flexibility to query, visualize, transform, ingest or enrich shared data with their tools of choice.

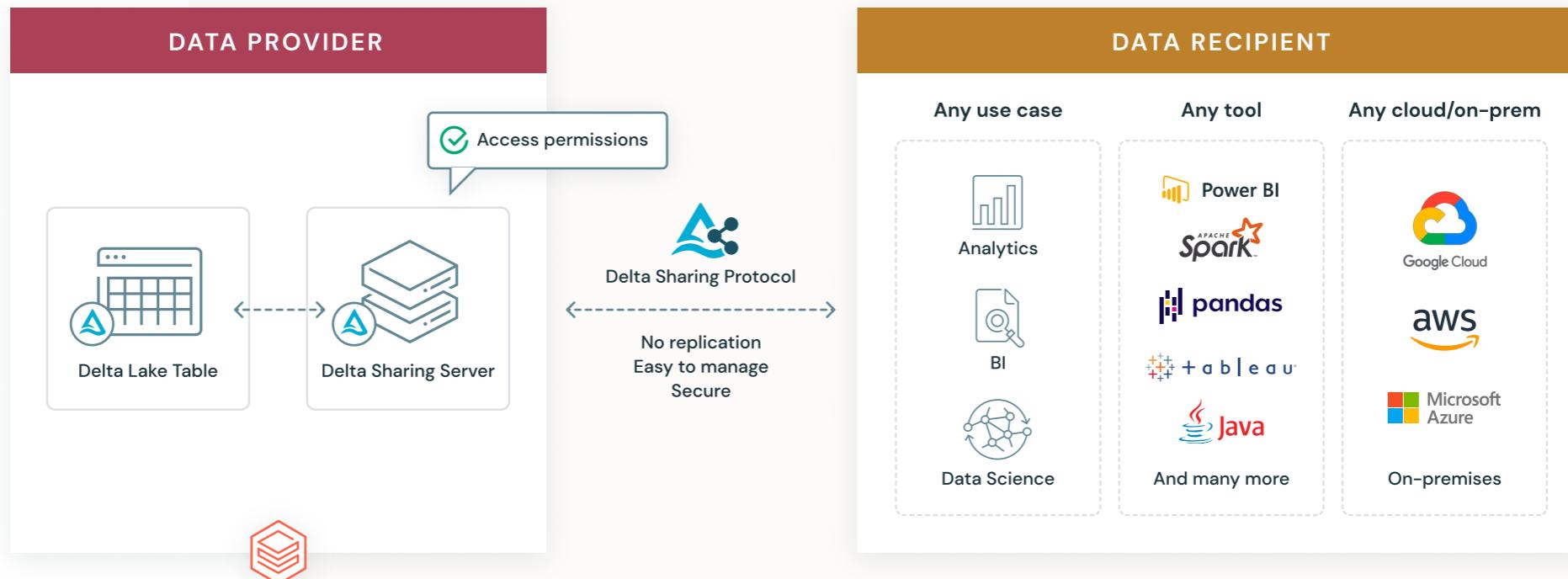


Figure 3

Databricks designed Delta Sharing with five goals in mind:

- Provide an open cross-platform sharing solution
- Share live data without copying it to another system
- Support a wide range of clients such as Power BI, Tableau, Apache Spark™, pandas and Java, and provide flexibility to consume data using the tools of choice for BI, machine learning and AI use cases
- Provide strong security, auditing and governance
- Scale to massive structured data sets and also allow sharing of unstructured data and future data derivatives such as ML models, dashboards and notebooks, in addition to tabular data

Key benefits of Delta Sharing

By eliminating the obstacles and shortcomings associated with typical data sharing approaches, Delta Sharing delivers several key benefits, including:



Open cross-platform sharing. Delta Sharing establishes a new open standard for secure data sharing and supports open source Delta and Apache Parquet formats. Data recipients don't have to be on the Databricks platform or on the same cloud, as Delta Sharing works across clouds and even from cloud to on-premises setups. To give customers even greater flexibility, Databricks has also released open source connectors for pandas, Apache Spark, Elixir and Python, and is working with partners on many more.



Securely sharing live data without replication. Most enterprise data today is stored in cloud data lakes. Any of these existing data sets on the provider's data lake can easily be shared without any data replication or physical movement of data. Data providers can update their data sets reliably in real time and provide a fresh and consistent view of their data to recipients.



Centralized governance. With Databricks Delta Sharing, data providers can grant, track, audit and even revoke access to shared data sets from a single point of enforcement to meet compliance and other regulatory requirements. Databricks Delta Sharing users get:

- Implementation of Delta Sharing as part of Unity Catalog, the governance offering for Databricks Lakehouse
- Simple, more secure setup and management of shares
- The ability to create and manage recipients and data shares
- Audit logging captured automatically as part of Unity Catalog
- Direct integration with the rest of the Databricks ecosystem
- No separate compute for providing and managing shares



Sharing data products, including machine learning models, dashboards and notebooks, with greater flexibility. Data providers can choose between sharing the entire table, or being more fine-grained and sharing only a version or specific partitions of a table. However, sharing just tabular data is not enough to meet consumer demands of today. Delta Sharing also supports sharing of non-tabular data and data derivatives such as data streams, ML models, SQL views and arbitrary files, allowing increased collaboration and innovation. Data providers can build, package and distribute data products including data sets, ML and notebooks, enabling data recipients to get to insights faster. Furthermore, this approach promotes and empowers exchange of knowledge and not just data between different organizations. With Delta Sharing we are able to achieve a truly open marketplace and truly open ecosystem. In contrast, commercial products are mostly limited to sharing raw tabular data and cannot be used to share these higher-valued data derivatives.



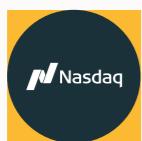
Sharing data at a lower cost. Delta Sharing lowers the cost of managing and consuming shares for both data providers and recipients. Providers can share data from their cloud object store without replicating, thereby reducing the cost of storage. By contrast, existing data-sharing platforms require data providers to first move their data into their platform or store data in proprietary formats in their managed storage, which often costs more and also results in data duplication. With Delta Sharing, data providers are not required to set up separate computing environments to share data. Consumers can access shared data directly using their tools of choice without having to set up specific consumption ecosystems, thereby reducing costs.



Reduced time-to-value. Delta Sharing eliminates the need to set up a new ingestion process to consume data. Data recipients can directly access the fresh data and query it using tools of their choice. Recipients can also enrich data with data sets from popular data providers. The Delta Sharing ecosystem of open source and commercial partners is growing every day.

Maximizing value of data with Delta Sharing

Given the sheer variety of data available and the technologies that are emerging, it is hard to anticipate all the possible use cases Delta Sharing can address. The Delta Sharing approach is to share any data anytime with anyone easily and securely, and in this section we will explore the building blocks of such an approach and the use cases emerging from these. Delta Sharing is already transforming data-sharing activities for companies in a wide range of industries.



"Delta Sharing helped us streamline our data delivery process for large data sets. This enables our clients to bring their own compute environment to read fresh curated data with little-to-no integration work, and enables us to continue expanding our catalog of unique, high-quality data products."

— **William Dague**, Head of Alternative Data, Nasdaq



"We recognize that openness of data will play a key role in achieving Shell's Carbon Net Zero ambitions. Delta Sharing provides Shell with a standard, controlled and secure protocol for sharing vast amounts of data easily with our partners to work toward these goals without requiring our partners be on the same data sharing platform."

— **Bryce Bartmann**, Chief Digital Technology Advisor, Shell



"Leveraging the powerful capabilities of Delta Sharing from Databricks enables Pumpjack Dataworks to have a faster onboarding experience, removing the need for exporting, importing and remodeling of data, which brings immediate value to our clients. Faster results yield greater commercial opportunity for our clients and their partners."

— **Corey Zwart**, Head of Engineering, Pumpjack Dataworks



"Data accessibility is a massive consideration for us. We believe that Delta Sharing will simplify data pipelines by enabling us to query fresh data from the place where it lives, and we are not locked into any platform or data format."

— **Rayne Gaisford**, Global Head of Data Strategy, Jefferies

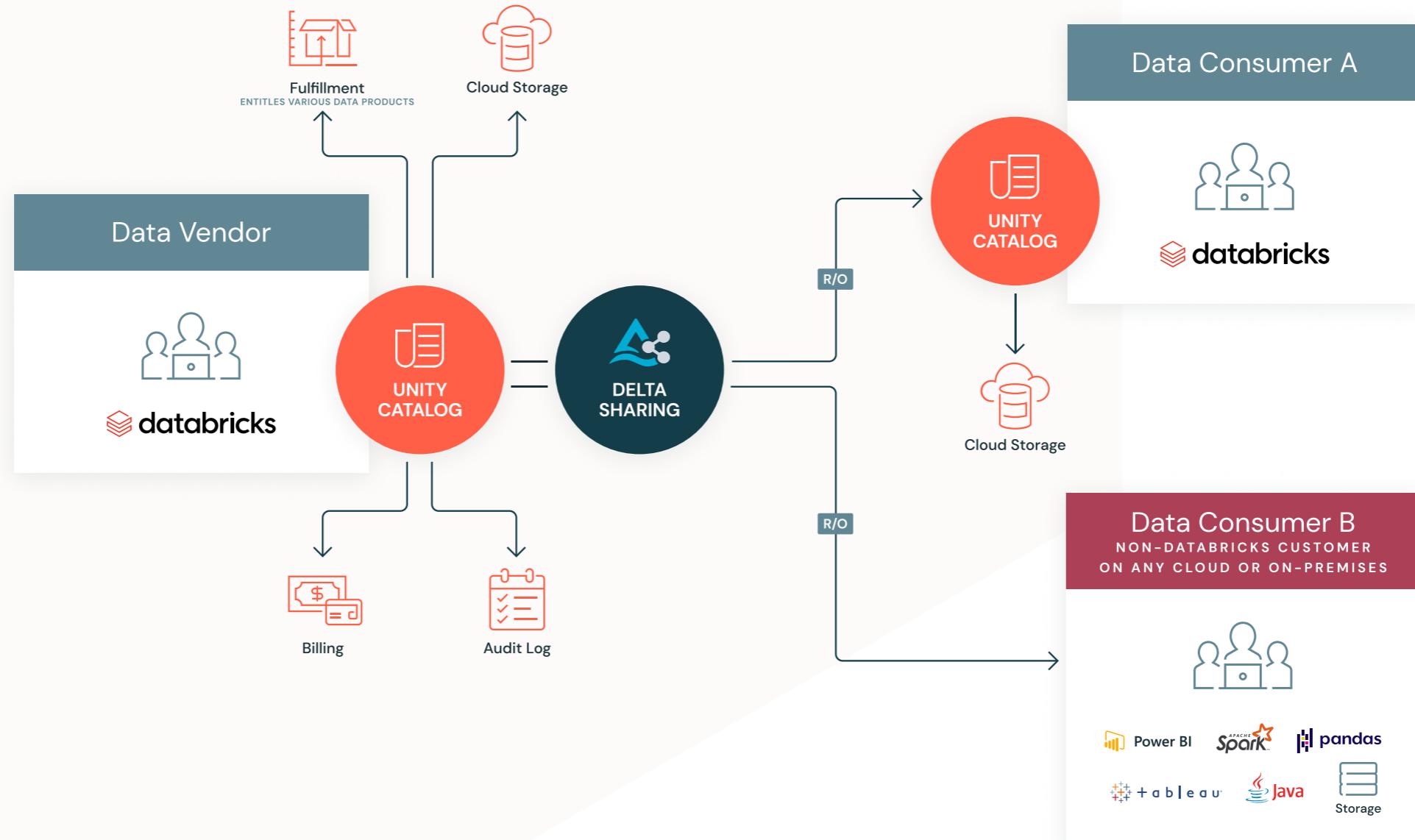


"As a data company, giving our customers access to our data sets is critical. The Databricks Lakehouse Platform with Delta Sharing really streamlines that process, allowing us to securely reach a much broader user base regardless of cloud or platform."

— **Felix Cheung**, VP of Engineering, SafeGraph

Data monetization with Delta Sharing

Delta Sharing enables companies to monetize their data product simply and with necessary governance.



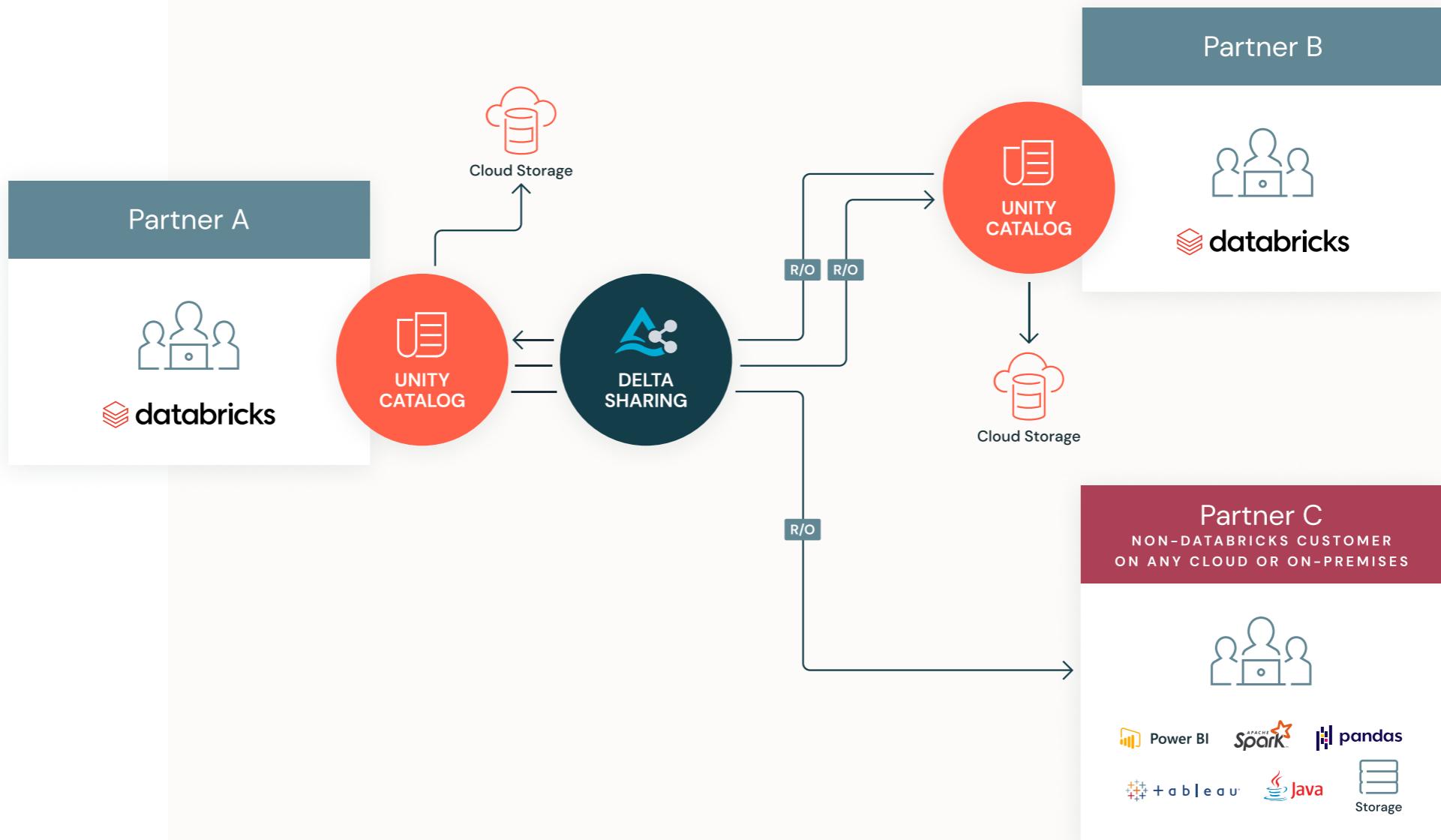
With Delta Sharing, the data provider can seamlessly share large data sets and overcome the scalability issues associated with SFTP servers. Data providers can easily expand their data product lines since Delta Sharing doesn't require you to build a dedicated service for each of your data products like API services would. The company simply grants and manages access to the data recipients instead of replicating the data — thereby reducing complexity and latency. Any data that exits your ELT/ETL pipelines becomes a candidate for a data product. Any data that exists on your platform can be securely shared with your consumers. This grants a wider addressable market — your products have appeal to a broader range of consumers, from those who say "we need access to your raw data only" to those who say "we want only small subsets of your Gold layer data."

To mitigate cost concerns, Delta Sharing maintains an audit log that tracks any permitted access to the data. Data providers can use this information to determine the costs associated with any of the data products and evaluate if such products are commercially viable and sensible.



B2B sharing with Delta Sharing

Figure 5:
B2B sharing with
Delta Sharing



Delta Sharing applies in the case of bidirectional exchange of data. Companies use Delta Sharing to incorporate partners and suppliers seamlessly into their workflows. Traditionally this is not an easy task. Naturally, an organization has no control over how their partners are implementing their own data platforms. The complexity increases when we consider that the partners and suppliers can reside in public cloud, private cloud or on-premises deployed data platforms. The choices of platform and architecture are not imposed on your partners and suppliers. Delta Sharing as a protocol, due to its open nature, addresses this requirement foundationally. Through a wide array of already implemented connectors (and many more already being implemented), your data can land anywhere your partners and suppliers need to consume it.

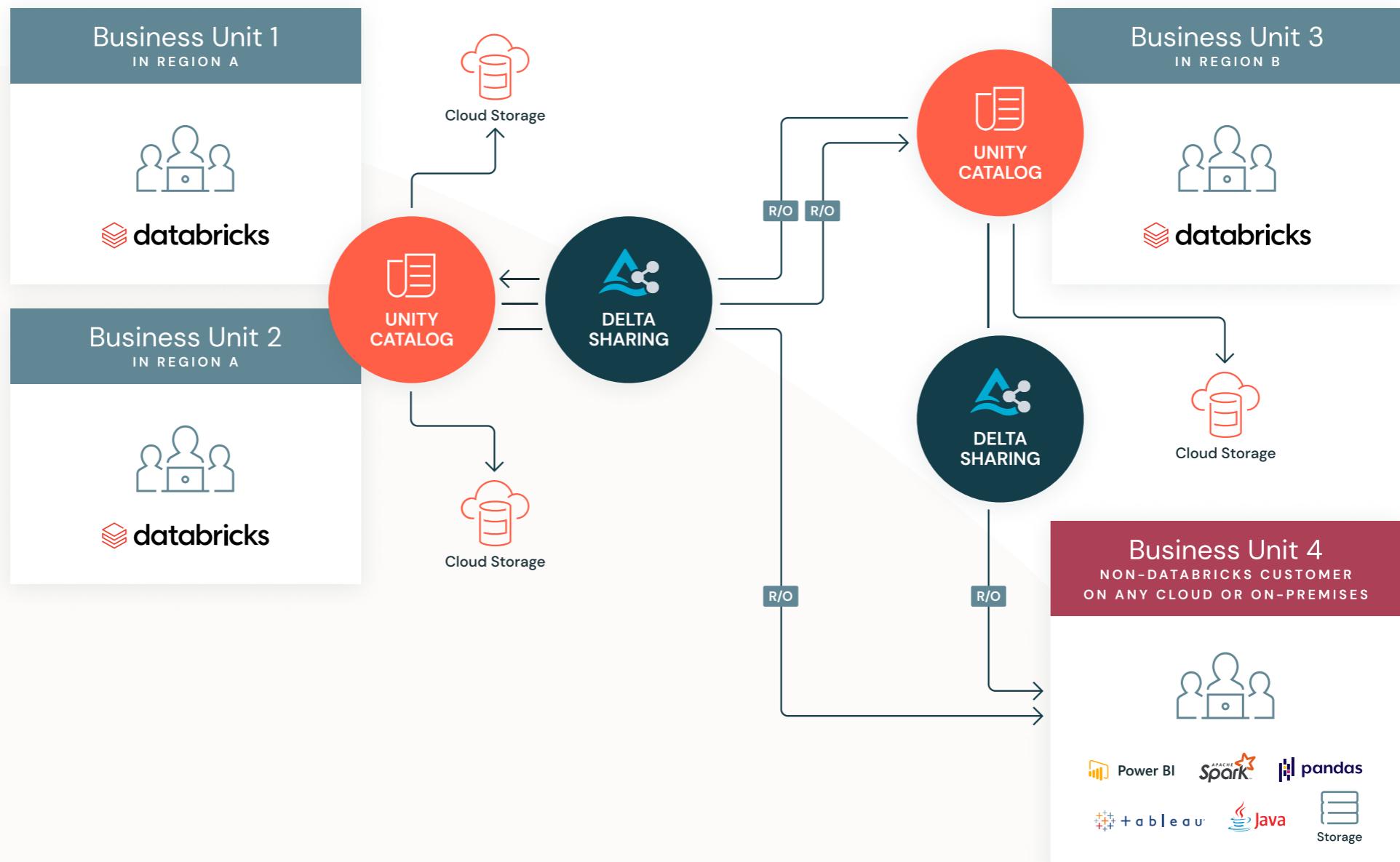
On top of the location of data consumer residency, the complexity of data arises as a consideration. The traditional approach to sharing the data using APIs is inflexible and imposes additional development cycles on both ends of the exchange in order to implement both the provider pipelines and consumer pipelines. With Delta Sharing, this problem can be abstracted. Data can be shared as soon as it lands in the Delta table and when the shares and grants are defined. There are no implementation costs on the provider side. On the consumer side, data simply needs to be ingested and transformed into expected schema for the downstream processes.

This in effect means that you can form much more agile data exchange patterns with your partners and suppliers and attain value out of your combined data much quicker than ever before.

Internal data sharing with Delta Sharing

Internal data sharing is becoming an increasingly important consideration for any modern organization, particularly where data describing the same concepts have been produced in different ways and in different data silos across the organization. In this situation it is important to design systems and platforms that allow governed and intentional federation of data and processes, and at the same time allow easy and seamless integration of said data and processes.

Architectural design patterns such as Data Mesh have emerged to address these specific challenges and considerations. Data Mesh architecture assumes a federated design and dissemination of ownership and responsibility to business units or divisions. This, in fact, has several advantages, chief among them that data is owned by the parts of the organization closest to the source of the data. Data residence is naturally enforced since data sits within the geo-locality where it has been generated. Finally, data volumes and data variety are kept in control due to the localization within a data domain (or data node). On the other hand, the architecture promotes exchange of data between different data domains when that data is needed to deliver outcomes and better insights.



Unity Catalog addresses this specific need of consolidated data access control across different data domains within an organization that are using the Lakehouse on Databricks. In addition, Unity Catalog adds a set of simple and easy-to-use declarative APIs to govern and control data exchange patterns between the data domains in the Data Mesh.

To make matters even more complicated, organizations can grow through mergers and acquisitions. In such cases we cannot assume that organizations that are being acquired have followed the same set of rules and standards to define their platforms and to produce their data. Furthermore, we cannot even assume that they have used the same cloud providers, nor can we assume the complexity of their data models. Delta Sharing can simplify and accelerate the efforts of unification and assimilation of newly acquired organizations and their data and their processes. Individual organizations can be treated as new data domains in the overarching mesh. Only selected data sources can be exchanged between the different platforms. This enables teams to move freely between the organizations that are merging without losing their data — if anything, they are empowered to drive insights of higher quality by combining the data of both.

With Unity Catalog and Delta Sharing, the Lakehouse architecture seamlessly combines with the Data Mesh architecture to deliver more power than ever before, pushing the boundaries of what's possible and simplifying activities that were deemed daunting not so long ago.

Chapter 4

How Delta Sharing Works

Delta Sharing is designed to be simple, scalable, nonproprietary and cost-effective for organizations that are serious about getting more from their data. Delta Sharing is natively integrated with Unity Catalog, which enables customers to add fine-grained governance and security controls, making it easy and safe to share data internally or externally.

Delta Sharing is a simple REST protocol that securely grants temporary access to part of a cloud data set. It leverages modern cloud storage systems — such as AWS S3, Azure ADLS or Google's GCS — to reliably grant read-only access to large data sets. Here's how it works for data providers and data recipients.

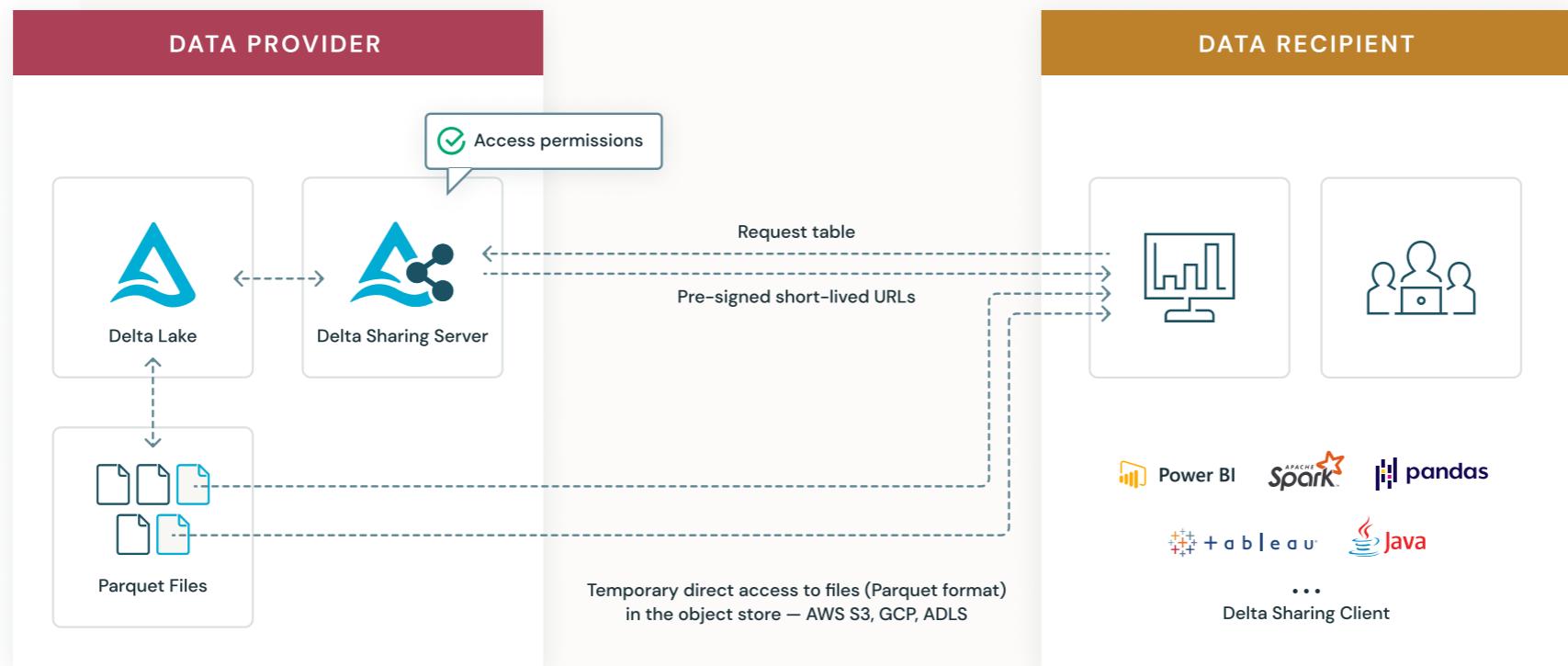


Figure 7

Data providers

The data provider shares existing tables or parts thereof (such as specific table versions or partitions) stored on the cloud data lake in Delta Lake format. The provider decides what data they want to share and runs a sharing server in front of it that implements the Delta Sharing protocol and manages access for recipients. To manage shares and recipients, you can use SQL commands or the Unity Catalog CLI or the intuitive user interface.

Data recipients

The data recipient only needs one of the many Delta Sharing clients that support the protocol. Databricks has released open source connectors for pandas, Apache Spark, Java and Python, and is working with partners on many more.

The data exchange

The Delta Sharing data exchange follows three efficient steps:

1. The recipient's client authenticates to the sharing server and asks to query a specific table. The client can also provide filters on the data (for example, "country=US") as a hint to read just a subset of the data.
2. The server verifies whether the client is allowed to access the data, logs the request, and then determines which data to send back. This will be a subset of the data objects in cloud storage systems that make up the table.
3. To allow temporary access to the data, the server generates short-lived presigned URLs that allow the client to read these Parquet files directly from the cloud provider so that the read-only access can happen in parallel at massive bandwidth, without streaming through the sharing server.

Chapter 5

Extending Delta Sharing to Privacy-Safe Data Cleanrooms

As we discussed earlier, today the demand for external data to make data-driven innovations is greater than ever. At the same time, there is growing concern among organizations around data privacy. As a result, more and more organizations are exploring ways to share and collaborate on data with their partners and customers in a secure, governed and privacy-centric way, and this is where “data cleanrooms” come into the picture.

What is a data cleanroom?

A data cleanroom provides a secure, governed and privacy-safe environment, where participants can bring their sensitive data, which might include PII (personally identifiable information), and perform joint analysis on private data. Participants have full control of the data and can decide which participants can perform what analysis on their data without exposing any sensitive data such as PII.

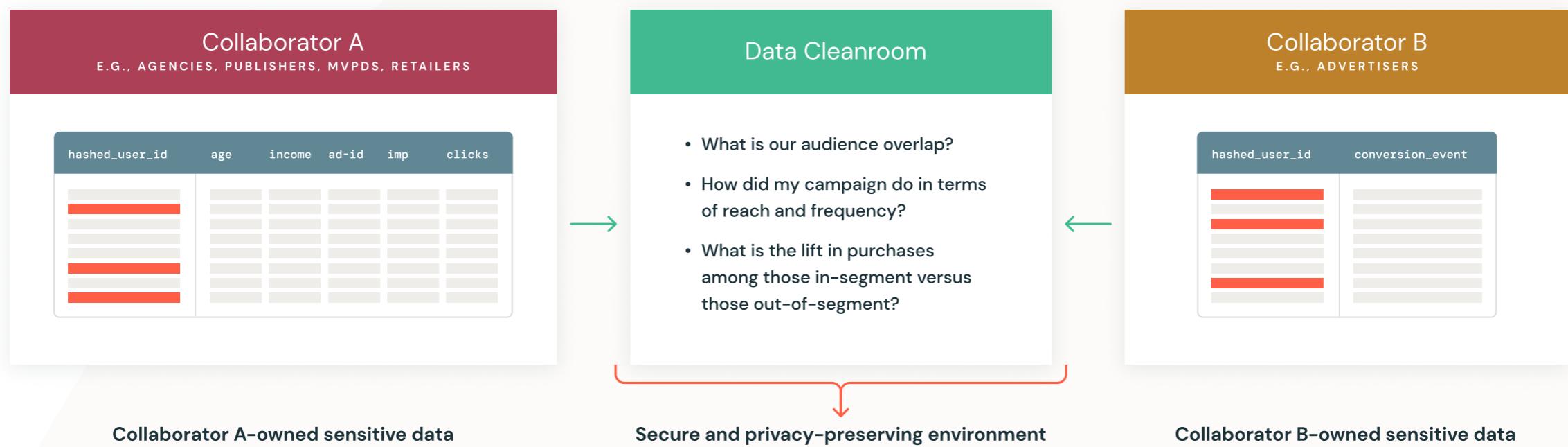
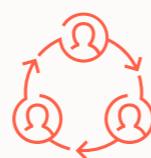


Figure 8: Privacy-safe data cleanroom

A data cleanroom is not a new concept. Google first introduced the idea back in 2017 when they announced Ads Data Hub, which allows advertisers to gain impression-level insights about cross-device media campaigns in a more secure, privacy-safe environment. However, in the last few years, the concept of cleanrooms has gained popularity again. IDC predicts that by 2024, 65% of G2000 Enterprises will form data-sharing partnerships with external stakeholders via data cleanrooms to increase interdependence — while safeguarding data privacy. There are various compelling reasons driving this demand:



Privacy-first world. Stringent data privacy regulations such as GDPR and CCPA, along with sweeping changes in third-party measurement, have transformed how organizations collect, use and share data. For example, Apple's [App Tracking Transparency Framework](#) (ATT) provides users of Apple devices the freedom and flexibility to easily opt out of app tracking. Google also plans to [phase out support for third-party cookies in Chrome](#) by late 2023. As these privacy laws and practices evolve, the demand for data cleanrooms is likely to rise as the industry moves to new identifiers that are PII based, such as UID 2.0, and organizations try to find new ways to share and join data with customers and partners in a privacy-centric way.



Collaboration in a fragmented ecosystem.

Today, consumers have more options than ever before when it comes to where, when and how they engage with content. As a result, the digital footprint of consumers is fragmented across different platforms, necessitating that companies collaborate with their partners to create a unified view of their customers' needs and requirements. To facilitate collaboration across organizations, cleanrooms provide a secure and private way to combine their data with other data to unlock new insights or capabilities.



New ways to monetize data. Most organizations are looking to monetize their data in one form or another. With today's privacy laws, companies will try to find any possible advantages to monetize their data without the risk of breaking privacy rules. This creates an opportunity for data vendors or publishers to join data for big data analytics without having direct access to the data.

Shortcomings of existing data cleanrooms

As organizations explore various cleanroom solutions, there are some glaring shortcomings in the existing solutions, which don't realize the full potential of the "cleanrooms" concept and meet their business requirements.

First, the existing data cleanroom vendors require participants to move their data into the vendor proprietary platforms, which results in lock-in and additional data storage cost to the participants.

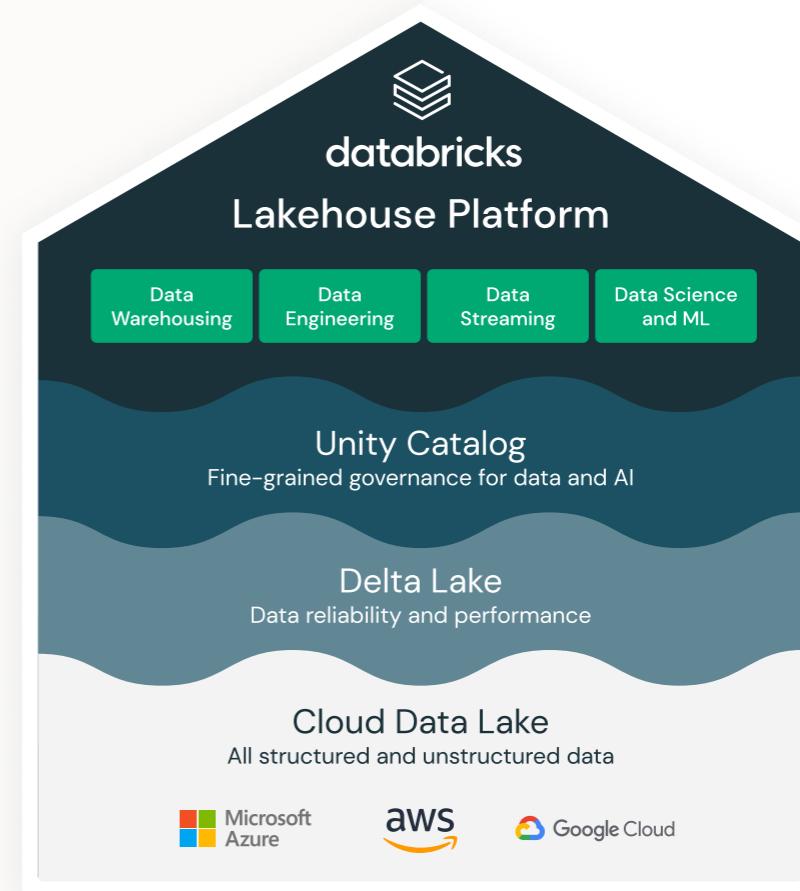
Second, most of the existing solutions are not scalable to expand collaboration beyond two participants at a time. For example, an advertiser might want to get a detailed view of their ad performance across different platforms, which requires analysis on the aggregated data from multiple data publishers. With collaboration limited to just two participants, organizations get partial insights on one cleanroom platform and end up moving their data to another cleanroom vendor to aggregate the data, incurring operational overhead of collating partial insights.

Finally, existing cleanroom solutions don't provide much flexibility to run any arbitrary analysis and are pretty much restricted to SQL. First, while SQL is great, and absolutely needed for cleanrooms, there are times when you require complex computations such as machine learning, integration with APIs or, otherwise, where SQL just won't cut it.

Building a flexible cleanroom with Databricks Lakehouse Platform

Databricks Lakehouse Platform provides a comprehensive set of tools to build, serve and deploy a scalable and flexible data cleanroom based on your data privacy and governance requirements. With Delta Sharing, cleanroom participants can securely share data from their data lakes with other participants without any data replication. Your data stays with you and you are not locked into any platform. With Unity Catalog, you can enable fine-grained access controls on the data and meet your privacy requirements. Integrated multiparty code and job approvals allow participants to have full control over what queries can be executed on their data and instill trust among participants. All the queries are executed on a Databricks-hosted privacy-safe compute, and participants never get access to the raw data, which ensures data privacy. Participants can leverage open source or third-party differential privacy frameworks, making your cleanroom future-proof.

Cleanrooms on the Databricks Lakehouse Platform are easily scalable to multiple participants. It is easy to get started and guide participants through common use cases using predefined templates (e.g., jobs, workflows, dashboards), reducing time to insights. Participants are not restricted to SQL and benefit from the flexibility to run any complex computations and workloads in any language – SQL, R, Scala, Python – on the aggregated data.



New possibilities with Delta Sharing

Data sharing has a key role to play in business processes across the enterprise, from product development and internal operations to customer experience and compliance. But most businesses have been slow to move forward because of incompatibility between systems, complexity and security concerns.

Data-driven organizations need an open — and secure — approach to data sharing.

Delta Sharing answers this need without imposing restrictions or additional costs. It's the first-ever open protocol, an open standard for sharing a data set securely. With Delta Sharing, organizations can easily share existing large-scale data sets, based on open source formats like Apache Parquet and Delta Lake, without moving data.

Now you can share data from where it lives. Get started with Delta Sharing by exploring the resources below.

Resources

[Delta Sharing on Databricks →](#)

[Learn about Unity Catalog →](#)

[Learn about the vision for Delta Sharing →](#)

[Learn about open source Delta Sharing →](#)

[AWS Documentation →](#)

[Azure Documentation →](#)

About the Authors



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About Databricks

Databricks is the data and AI company. More than 7,000 organizations worldwide — including Comcast, Condé Nast, H&M and over 40% of the Fortune 500 — rely on the Databricks Lakehouse Platform to unify their data, analytics and AI. Databricks is headquartered in San Francisco, with offices around the globe. Founded by the original creators of Apache Spark™, Delta Lake and MLflow, Databricks is on a mission to help data teams solve the world's toughest problems. To learn more, follow Databricks on [Twitter](#), [LinkedIn](#) and [Facebook](#).

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