Introduction to AWS Lake Formation

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Agenda

- Why did we build AWS Lake Formation?
- What is AWS Lake Formation?
- How does AWS Lake Formation help you?

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There is more data than people think

Data	Data platforms need to	
grows	live for	scale
>10x	15	1,000x
every 5 years	years	

* IDC, Data Age 20215: The Evolution of Data to Life-Critical Don't Focus on Big Data, Focus on the Data That's Big, April 2017.

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Data Scientists

Business Users

Analysts

Applications

Secure

Real time

Flexible

Scalable

There are **more people** accessing data

And **more requirements** for making data available

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A data lake is a centralized repository that allows you to store all your structured and unstructured data at any scale

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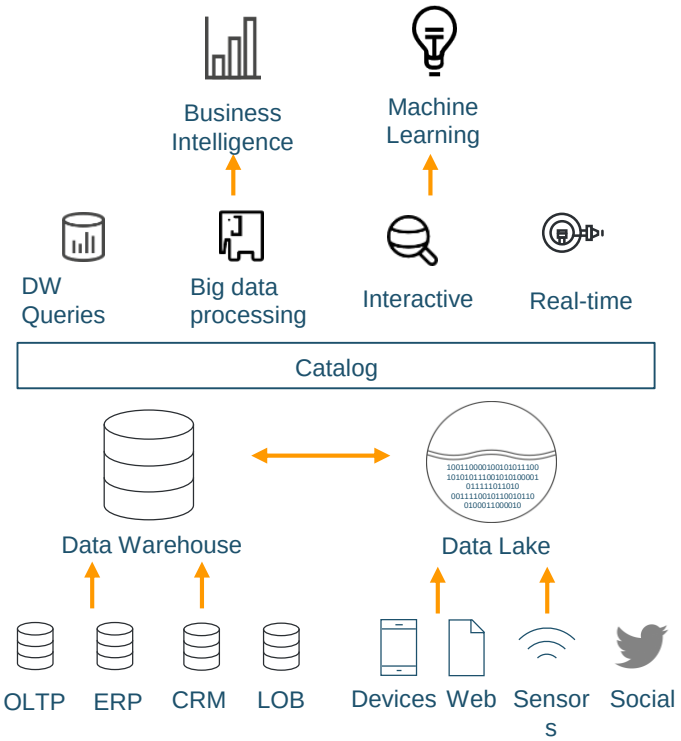
Why data lakes?



Data Lakes provide:

Relational and non-relational data

Scale-out to EBs

Diverse set of analytics and machine learning tools

Work on data without any data movement

Designed for low cost storage and analytics

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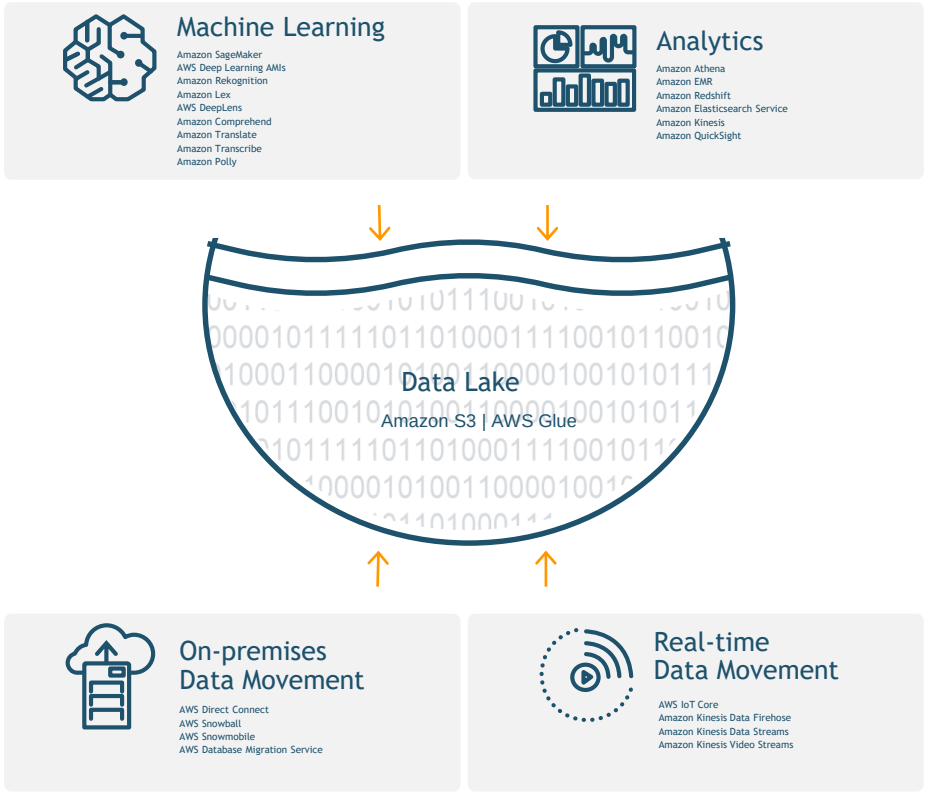

Any **analytic workload**, any scale, at the lowest possible cost

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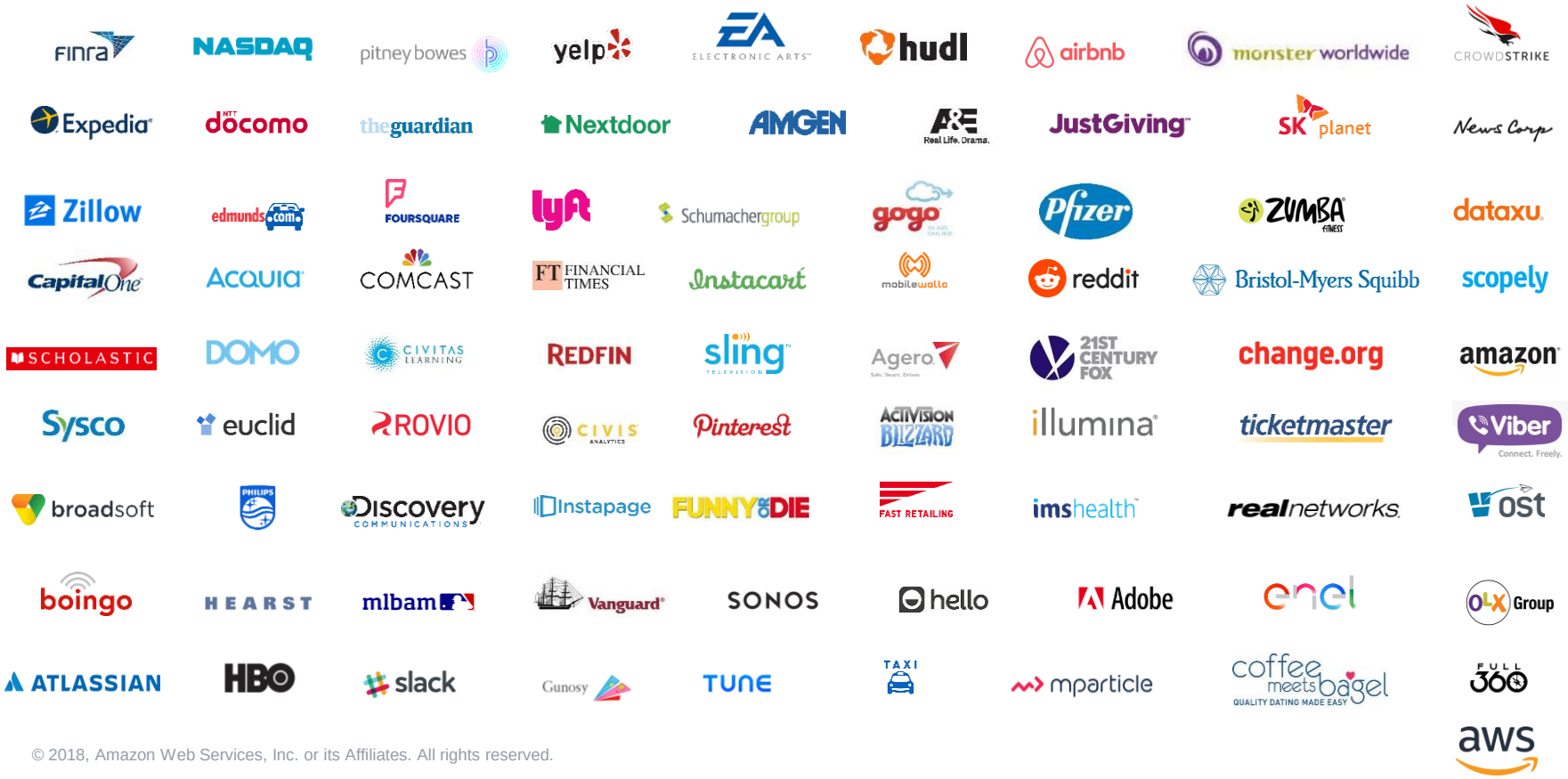
More data lakes & analytics on AWS than anywhere else



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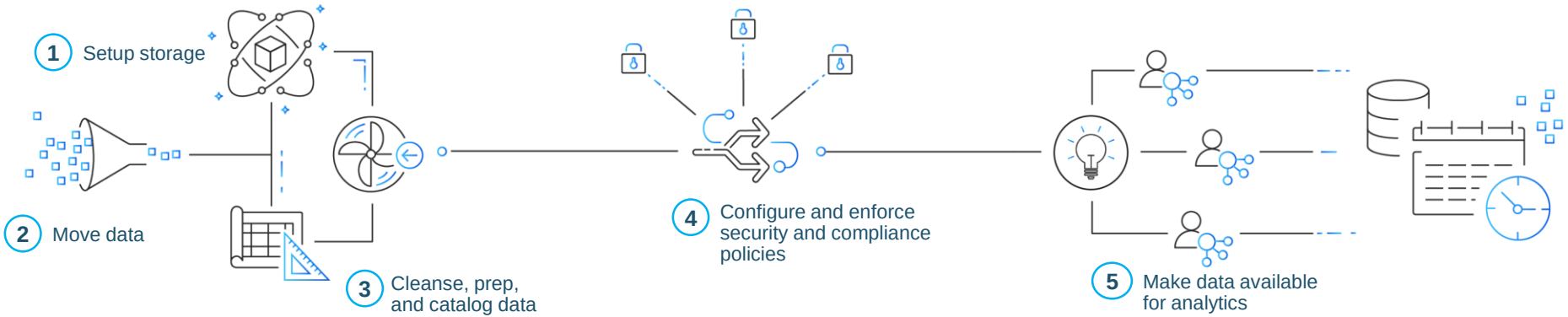
Typical steps of building a data lake



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Building data lakes can still take months

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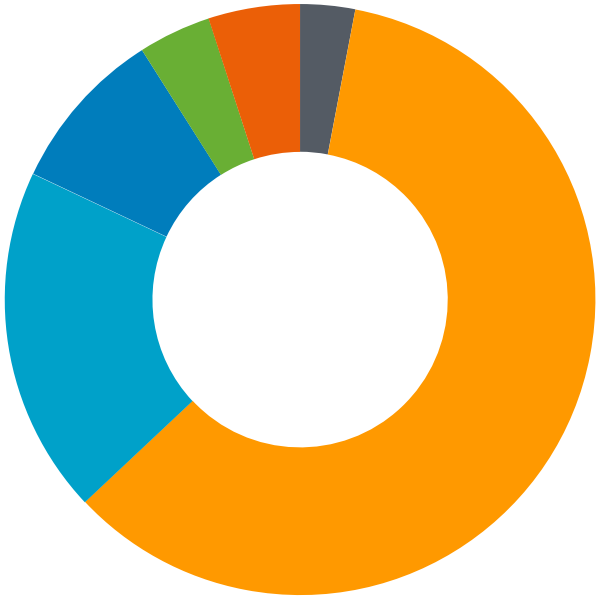
Data preparation accounts for ~80% of the work



- Building training sets
- Cleaning and organizing data
- Collecting data sets
- Mining data for patterns
- Refining algorithms
- Other

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Sample of steps requ

Configure access from analytics services

Rinse and repeat for other:

- data sets, users, and end-services

And more:

- manage and monitor ETL jobs
- update metadata catalog as data changes
- update policies across services as users and permissions change
- manually maintain cleansing scripts
- create audit processes for compliance
- …

Manual | Error-prone | Time consuming

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AWS Lake Formation

Build a secure data lake in days

Identify, ingest, clean, and transform data

Enforce security policies across multiple services

Gain and manage new insights

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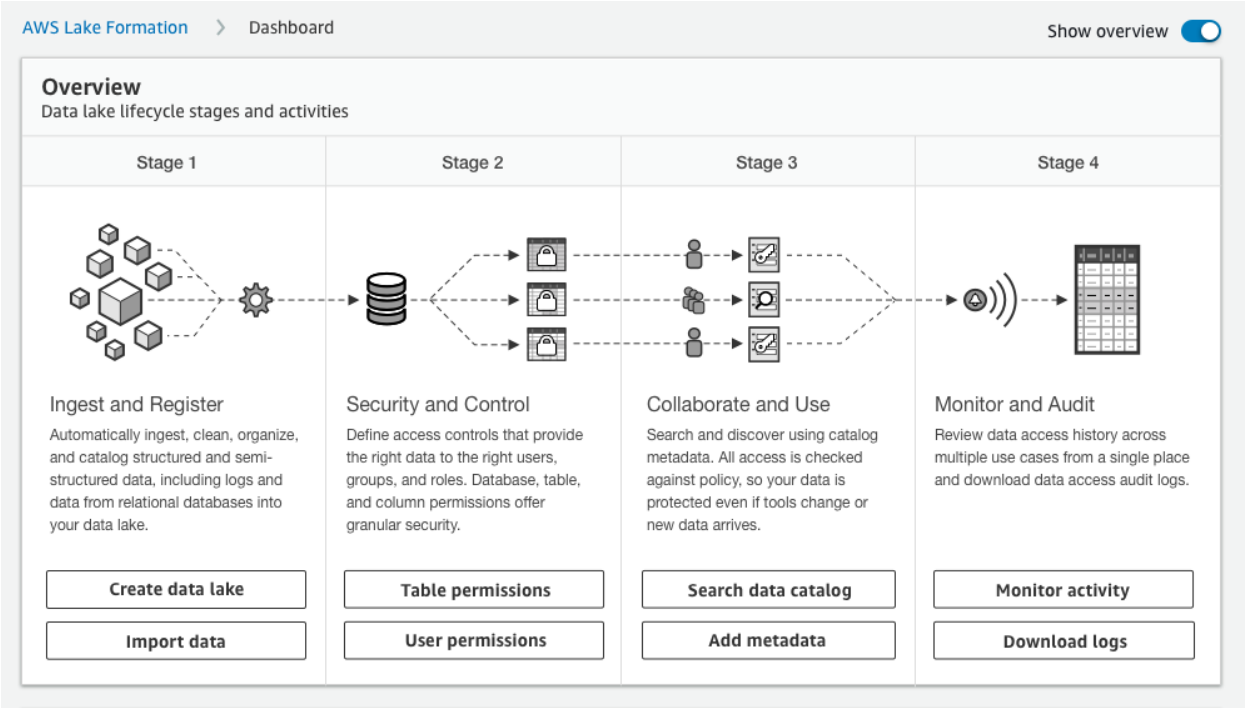
How it works



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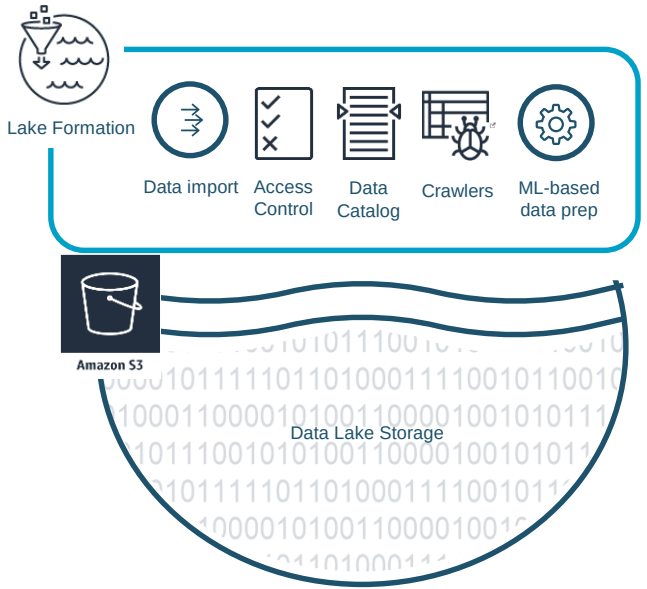
Register existing data or import new

Amazon S3 forms the storage layer for Lake Formation

Register existing S3 buckets that contain your data

Ask Lake Formation to create required S3 buckets and import data into them

Data is stored in your account. You have direct access to it. No lock-in.



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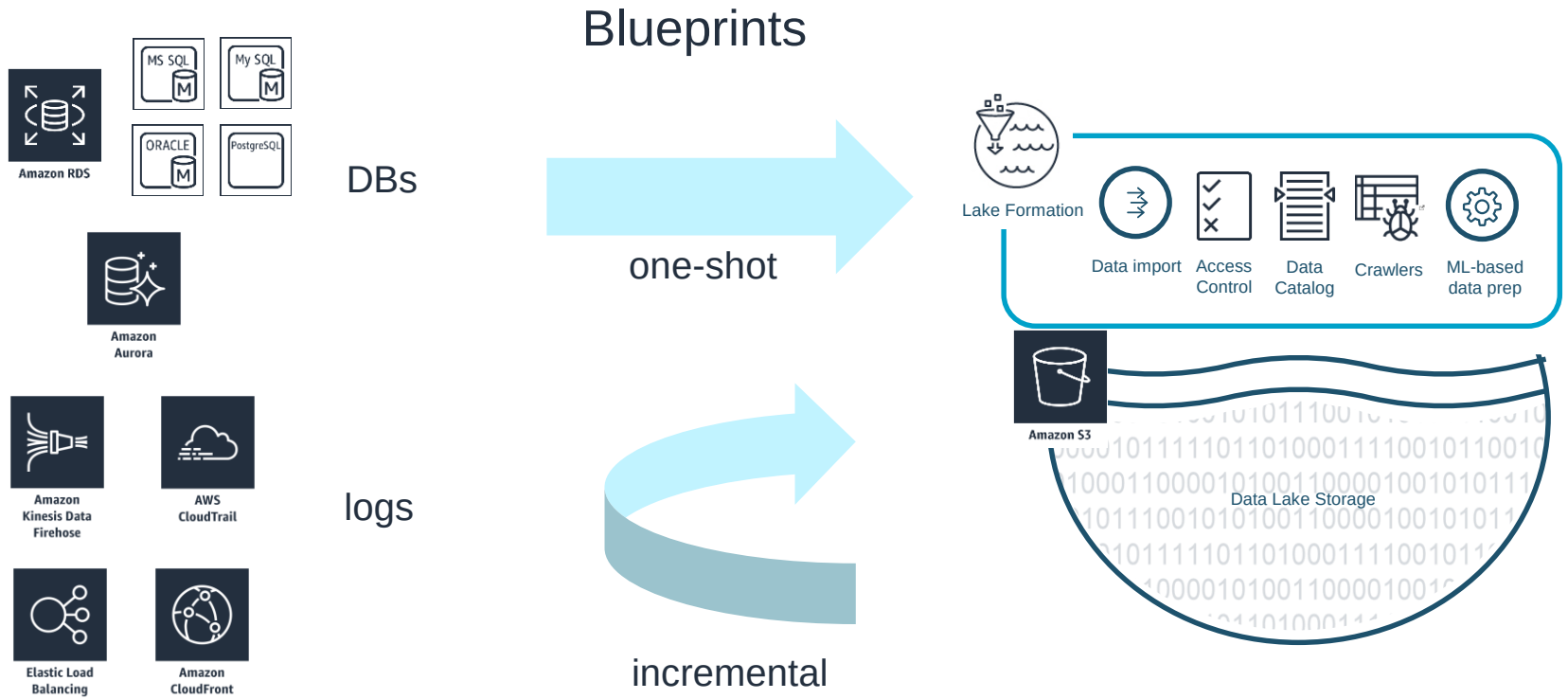
Easily load data to your data lake



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With blueprints

You

1. Point us to the source
2. Tell us the location to load to in your data lake
3. Specify how often you want to load the data

Blueprints

1. Discover the source table(s) schema
2. Automatically convert to the target data format
3. Automatically partition the data based on the partitioning schema
4. Keep track of data that was already processed
5. You can customize any of the above

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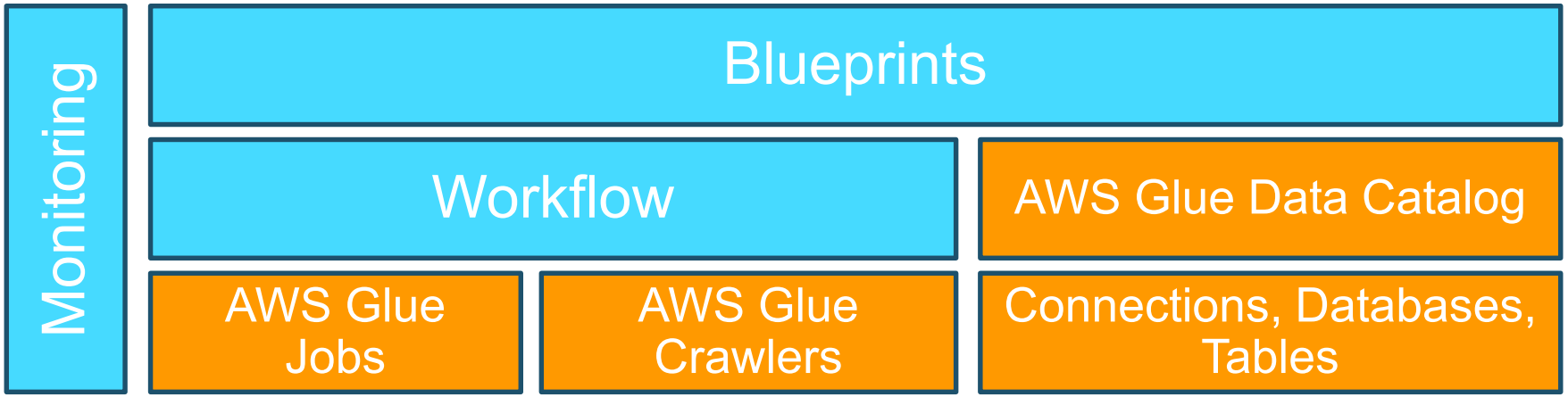
Blueprints build on AWS Glue



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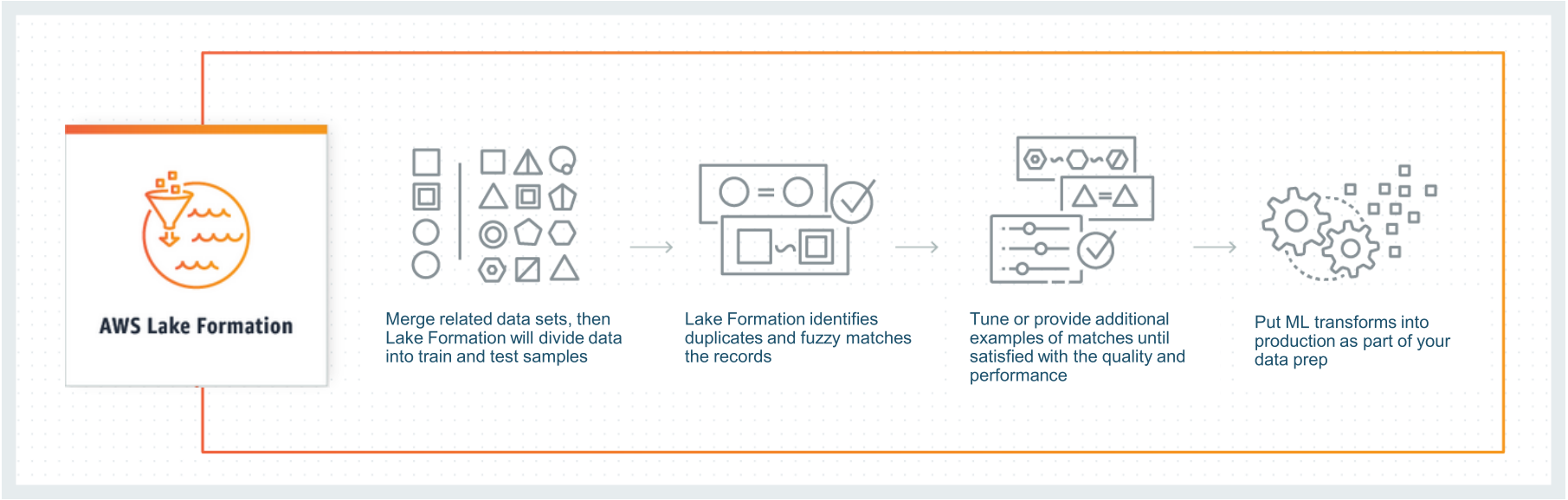
Easily de-duplicate your data with ML transforms



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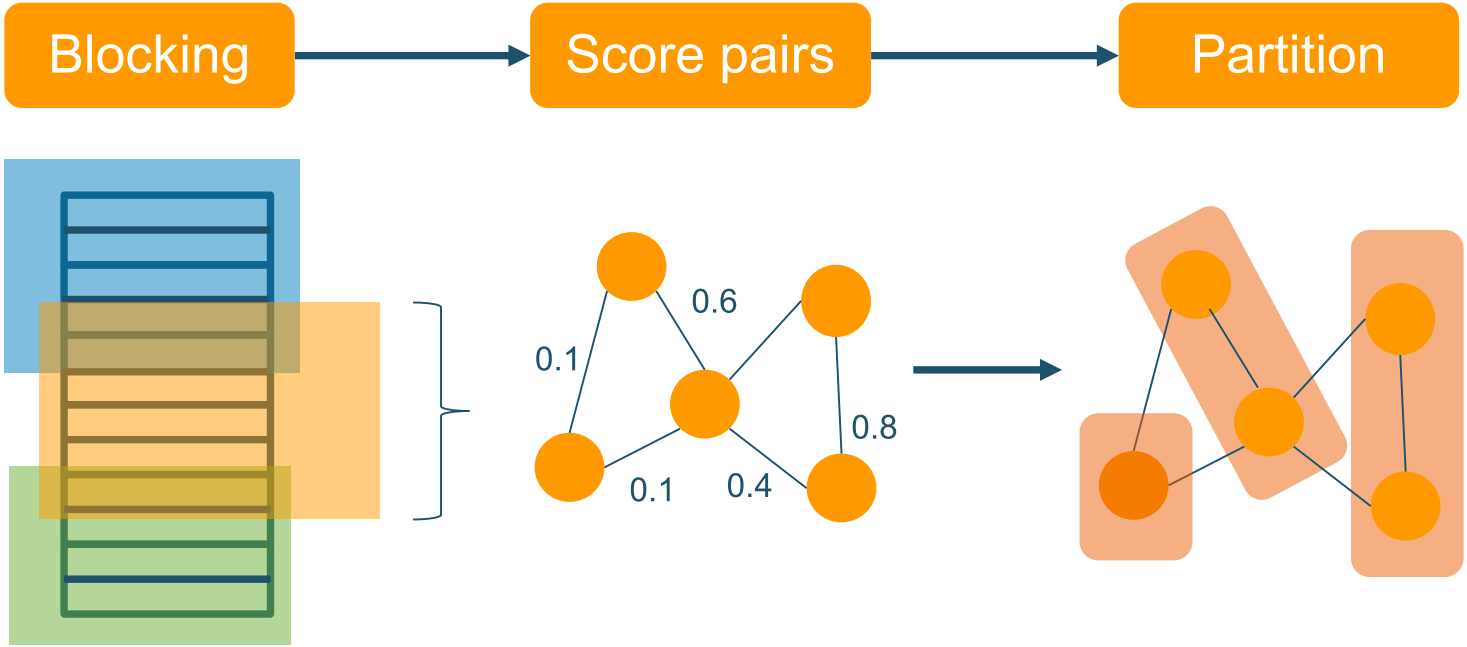
Fuzzy de-duplication – under the hood

Naïve: look at all pairs, N^2 – state-of-the-art:



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Fuzzy de-duplication – Innovations

Intersection Dynamic Blocking (VLDB 2008)

parallelizable & performant blocks on dynamic mix of columns

400M+ rows
7.5B+ candidate pairs
2.5 hours

SuperPart

partitions based on customer-provided ground-truth

gives confidence of grouping

effective without tuning knobs

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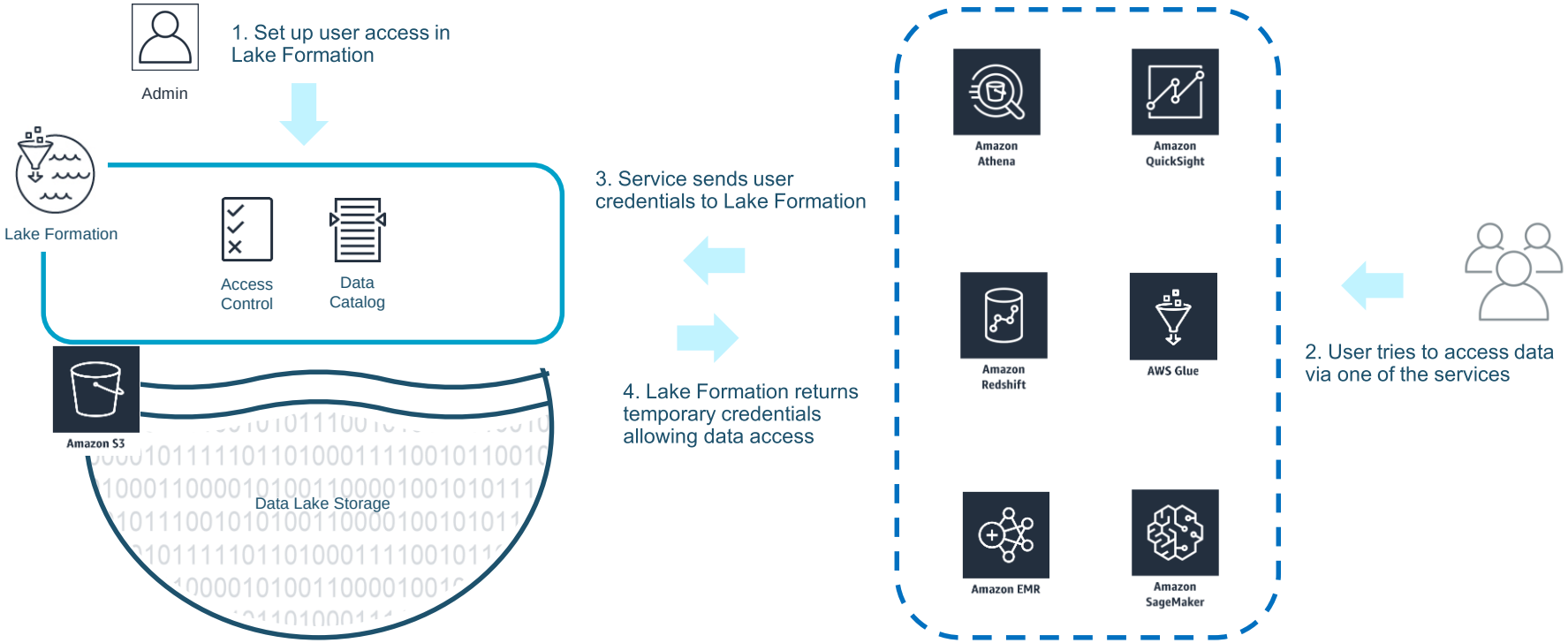
Secure once, access in multiple ways



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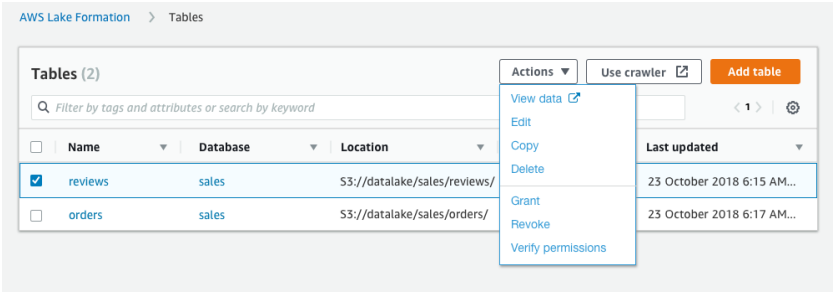
Security permissions in Lake Formation

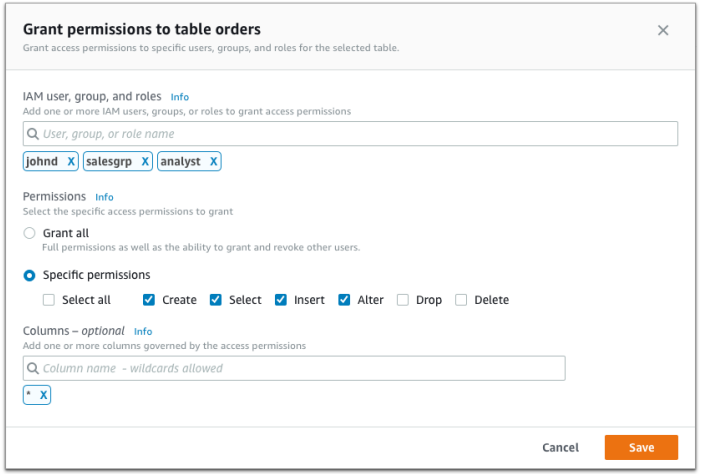
Control data access with simple grant and revoke permissions

Specify permissions on tables and columns rather than on buckets and objects

Easily view policies granted to a particular user

Audit all data access at one place





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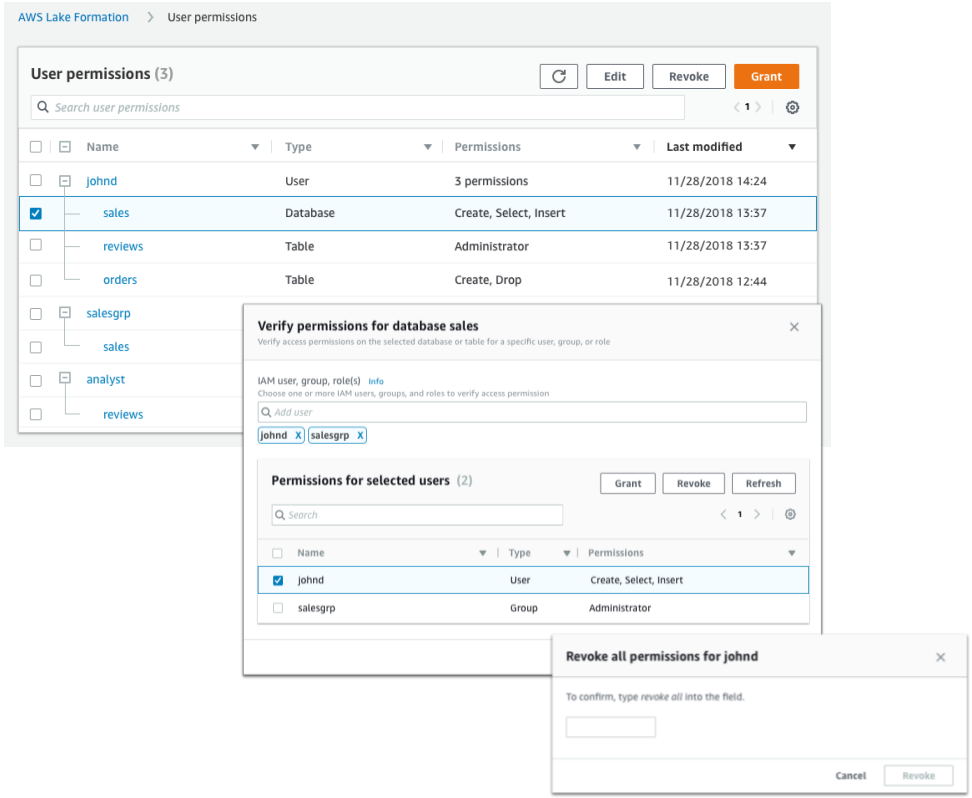
Security permissions in Lake Formation

Search and view permissions granted to a user, role, or group in one place

Verify permissions granted to a user

Easily revoke policies for a user



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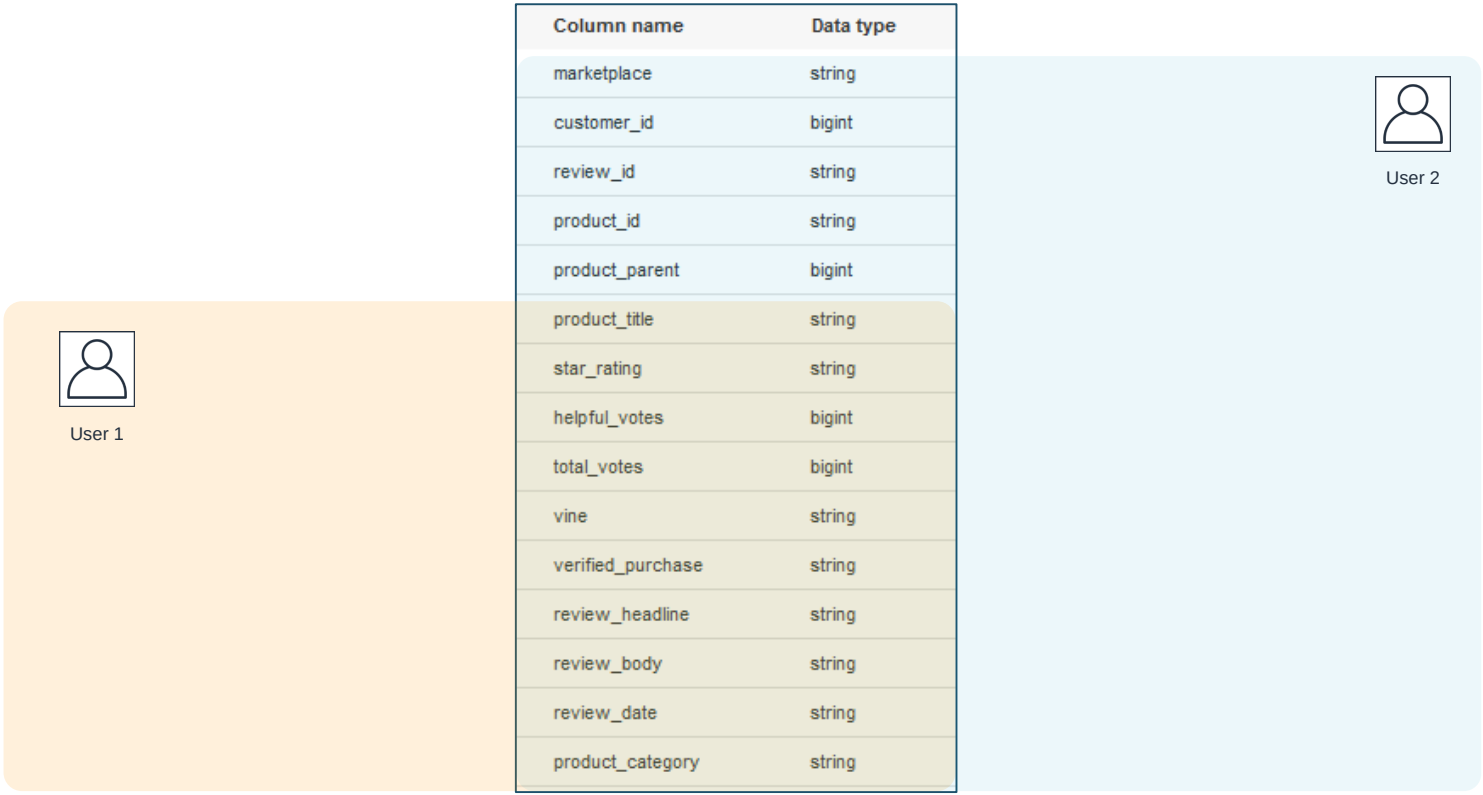
Grant table and column-level permissions



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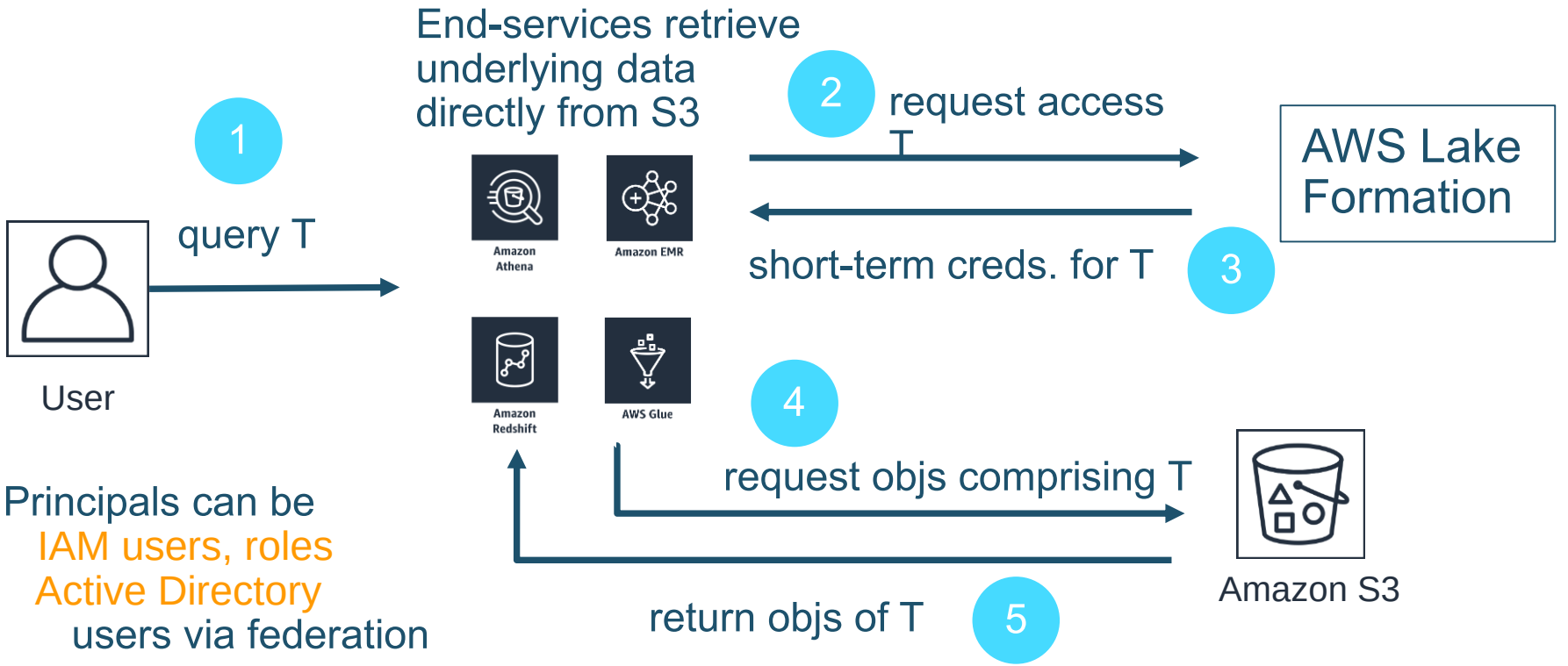
Security – deep dive



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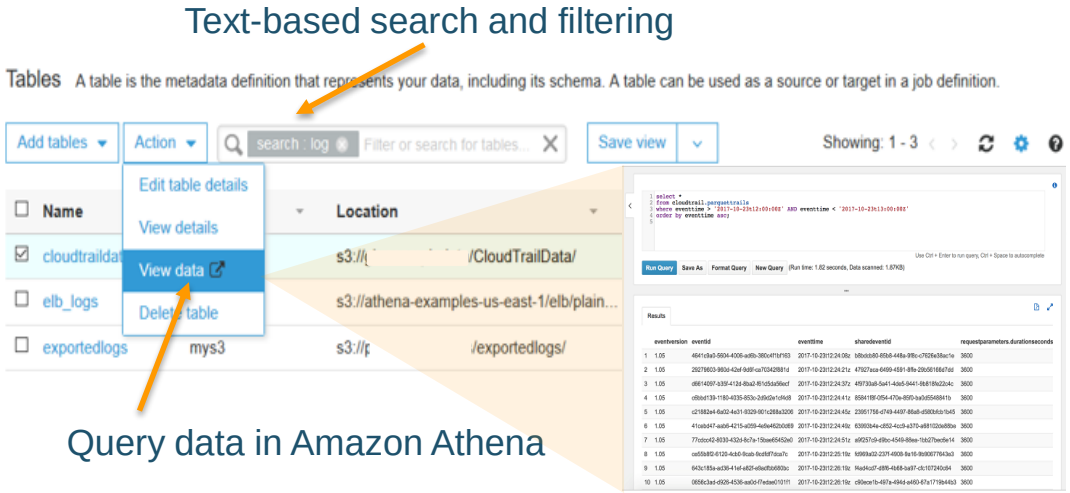
Search and collaborate across multiple users

Text-based, faceted search across all metadata

Add attributes like Data owners, stewards, and other as table properties

Add data sensitivity level, column definitions, and others as column properties



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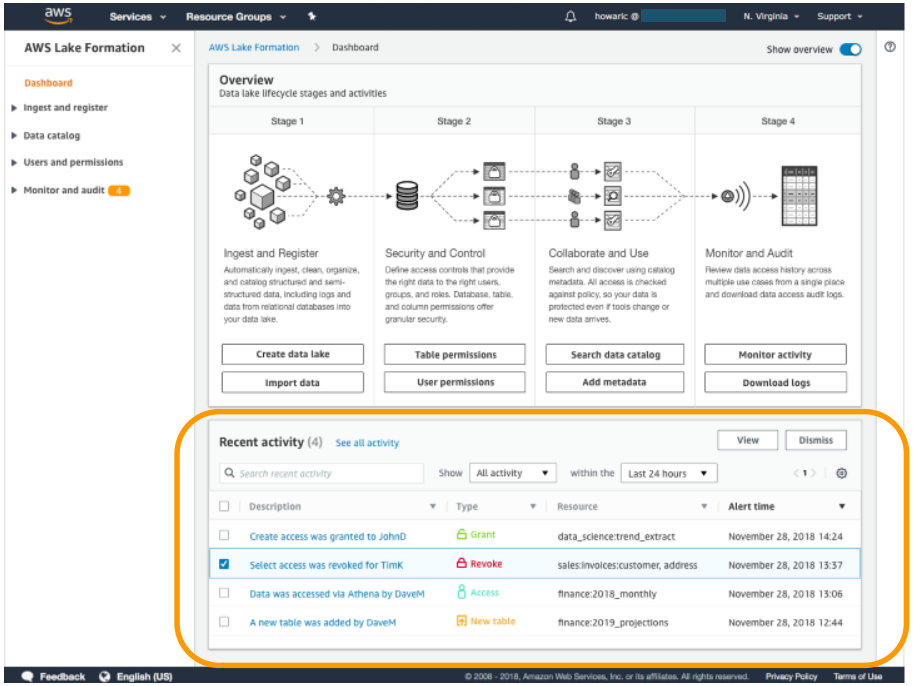
Audit and monitor in real time

See detailed alerts in the console

Download audit logs for further analytics

Data ingest and catalog notifications also published to Amazon CloudWatch events



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Example: a data lake in 3 easy steps

1. Use blueprints to ingest data
2. Grant permissions to securely share data
3. Query the data (Amazon Athena)

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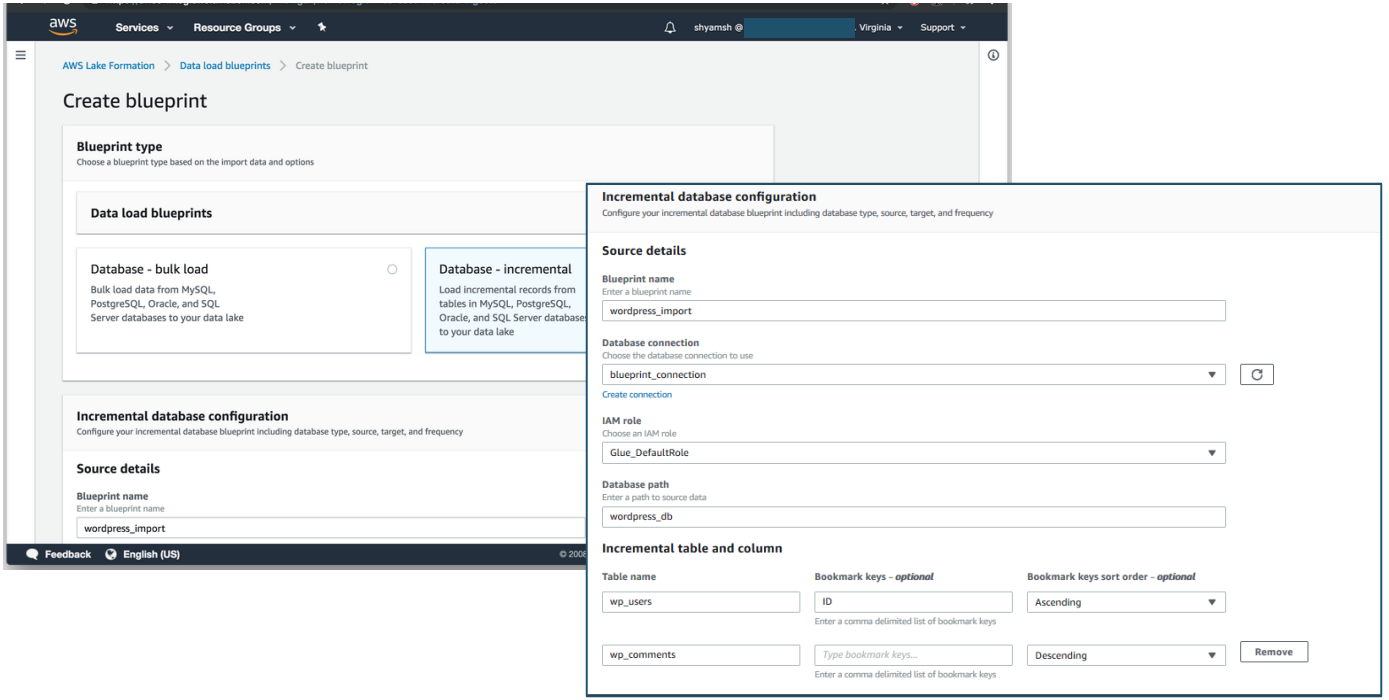
Step 1: Blueprints to ingest data



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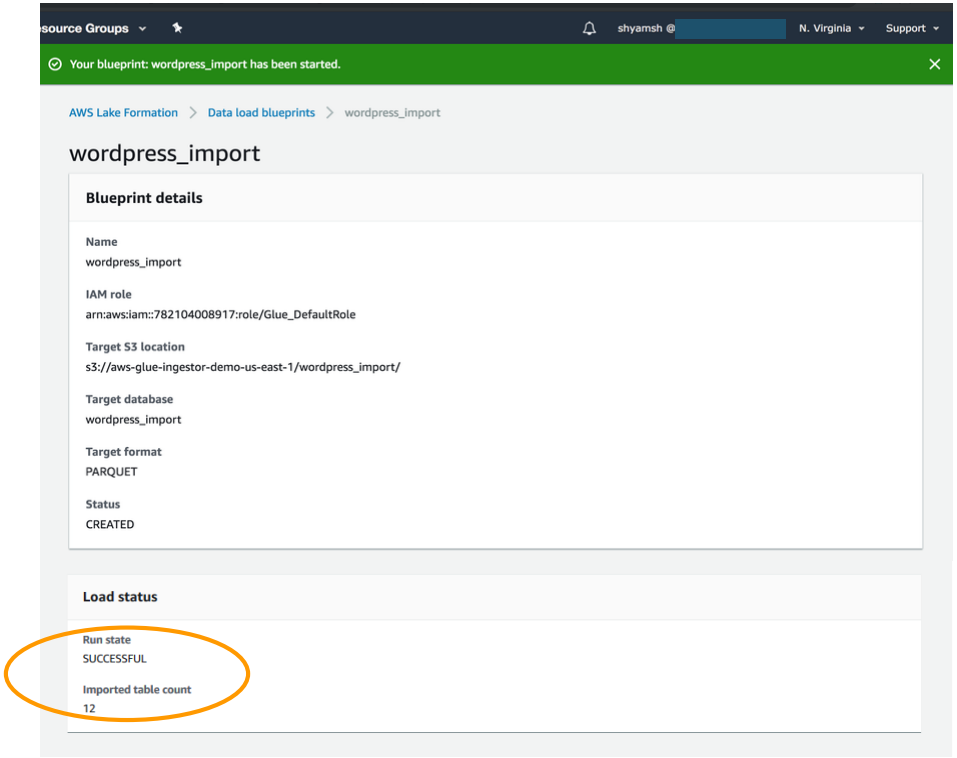
Monitor the import



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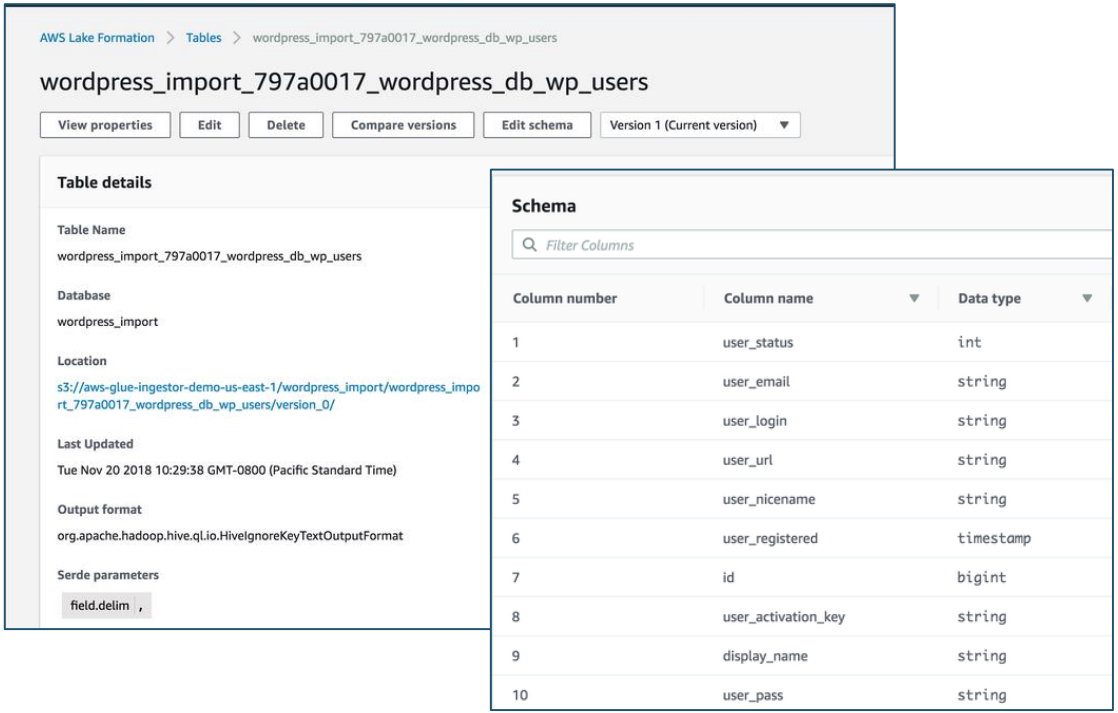
Imported data as table in the data lake



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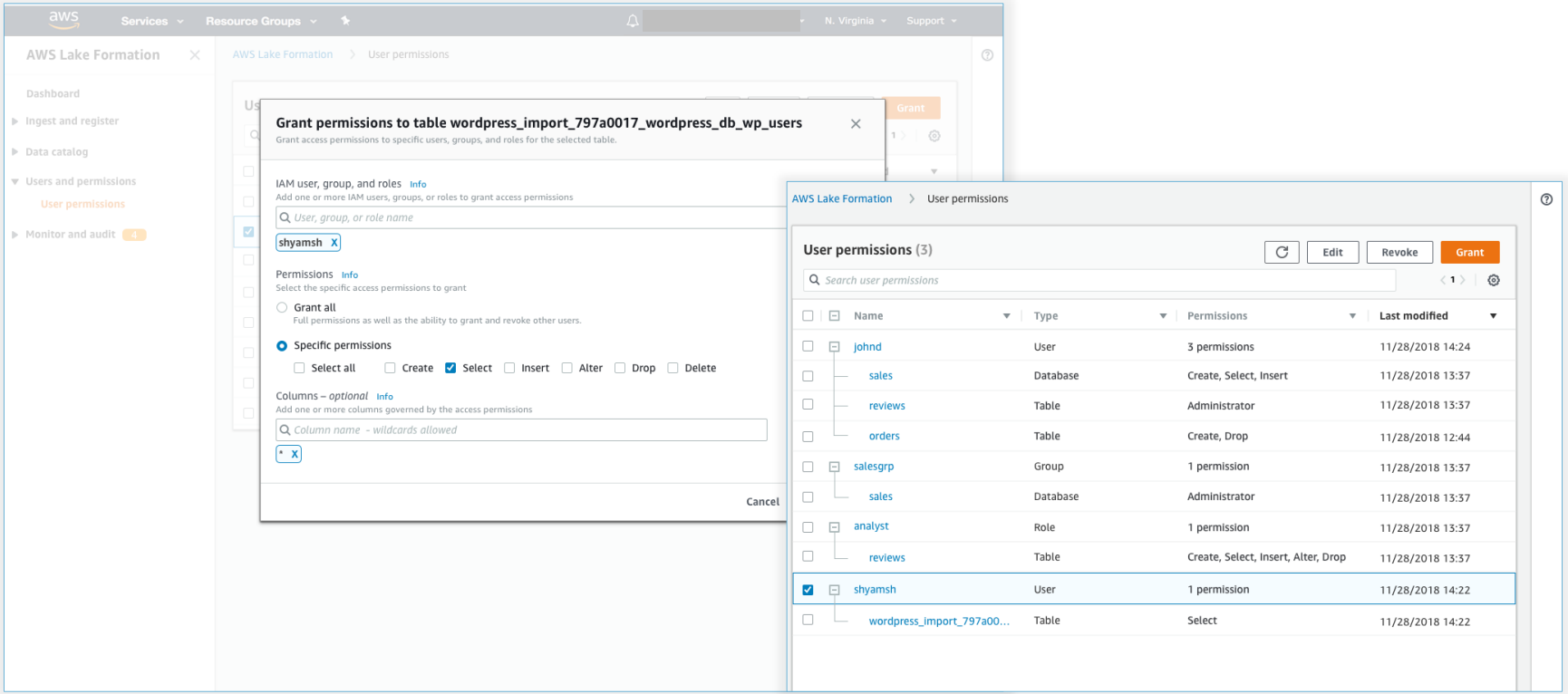
Step 2: Grant permissions to securely share data



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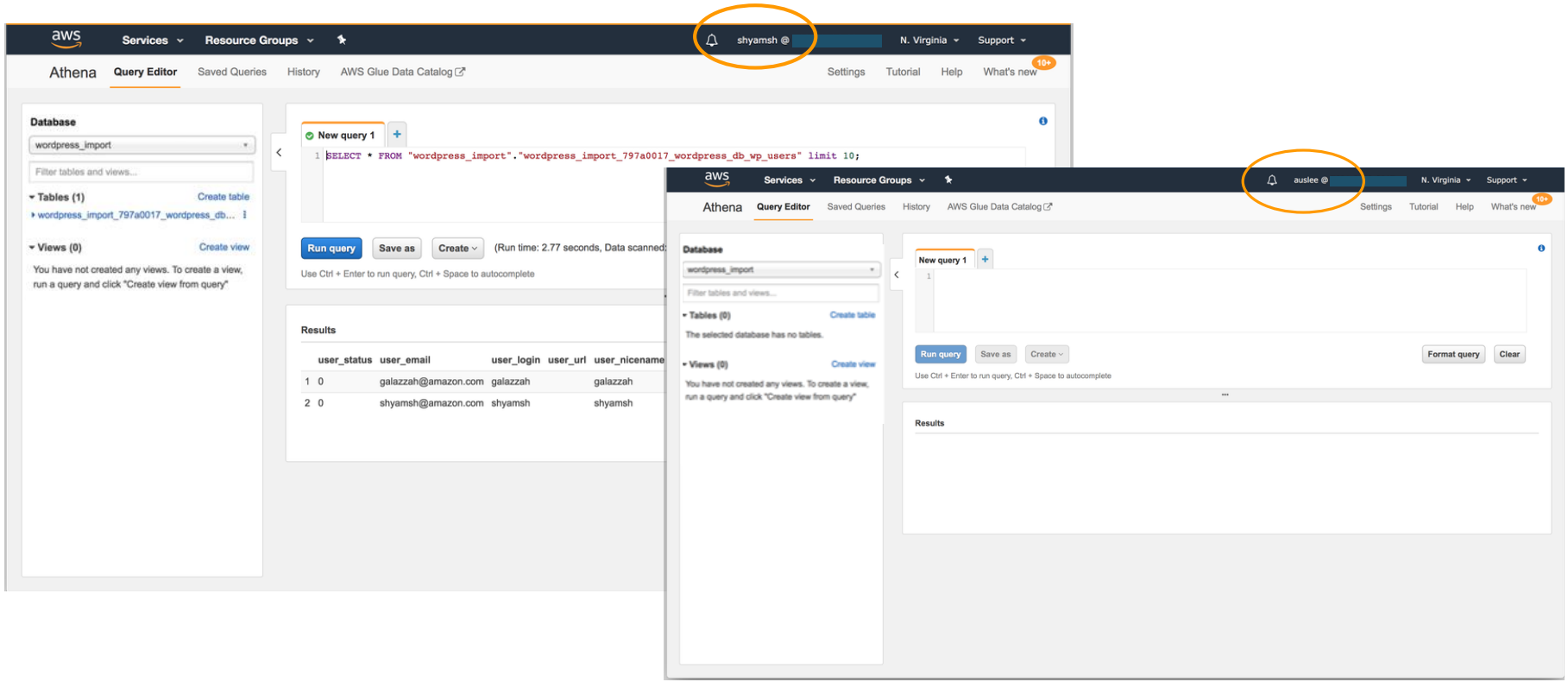
Step 3: Run query in Amazon Athena



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AWS Lake Formation Pricing

No additional charges – Only pay for the underlying services used.

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Customer interest

"We are very excited about the launch of AWS Lake Formation, which provides a **central point of control** to easily load, clean, secure, and catalog data from thousands of clients to our AWS-based data lake, **dramatically reducing our operational load**. … Additionally, AWS Lake Formation will be **HIPAA compliant** from day one …"

Aaron Symanski, CTO, Change Healthcare

"I can't wait for my team to get our hands on AWS Lake Formation. With an enterprise-ready option like Lake Formation, we will be able to **spend more time deriving value from our data** rather than doing the heavy lifting involved in manually setting up and managing our data lake."

Joshua Couch, VP Engineering, Fender Digital

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Join the preview: https://pages.awscloud.com/lake-formation-preview.html

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