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re:Invent
NOV. 28 – DEC. 2, 2022 | LAS VEGAS, NV

DAT328

Enabling operational analytics with Amazon Aurora and Amazon Redshift

Neeraja Rentachintala

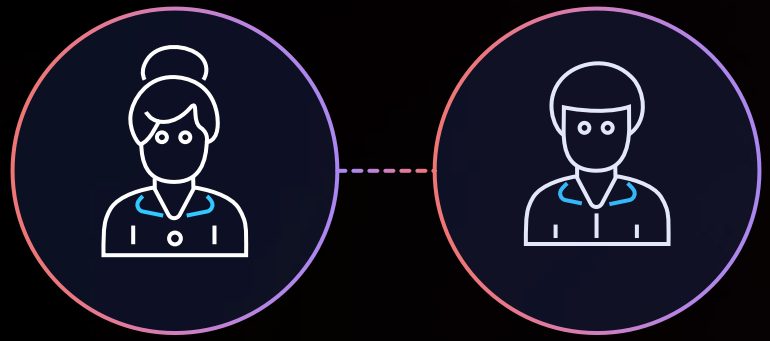
Senior Manager, Product Management
Amazon Redshift

Adam Levin

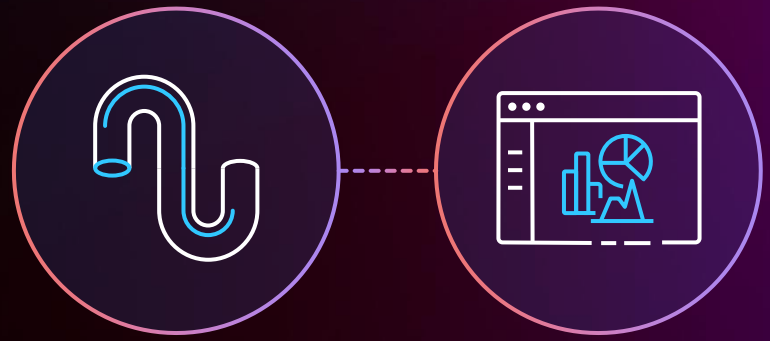
Senior Product Manager
Amazon Aurora

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Are you a **data engineer** or **data analyst?**



Do you worry about data pipelines or analytics on **operational data?**

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Agenda

- Challenges and opportunities with operational analytics
- Simplifying operational analytics with Amazon Aurora and Amazon Redshift
- Use cases
- Demo
- How it works
- Call to action

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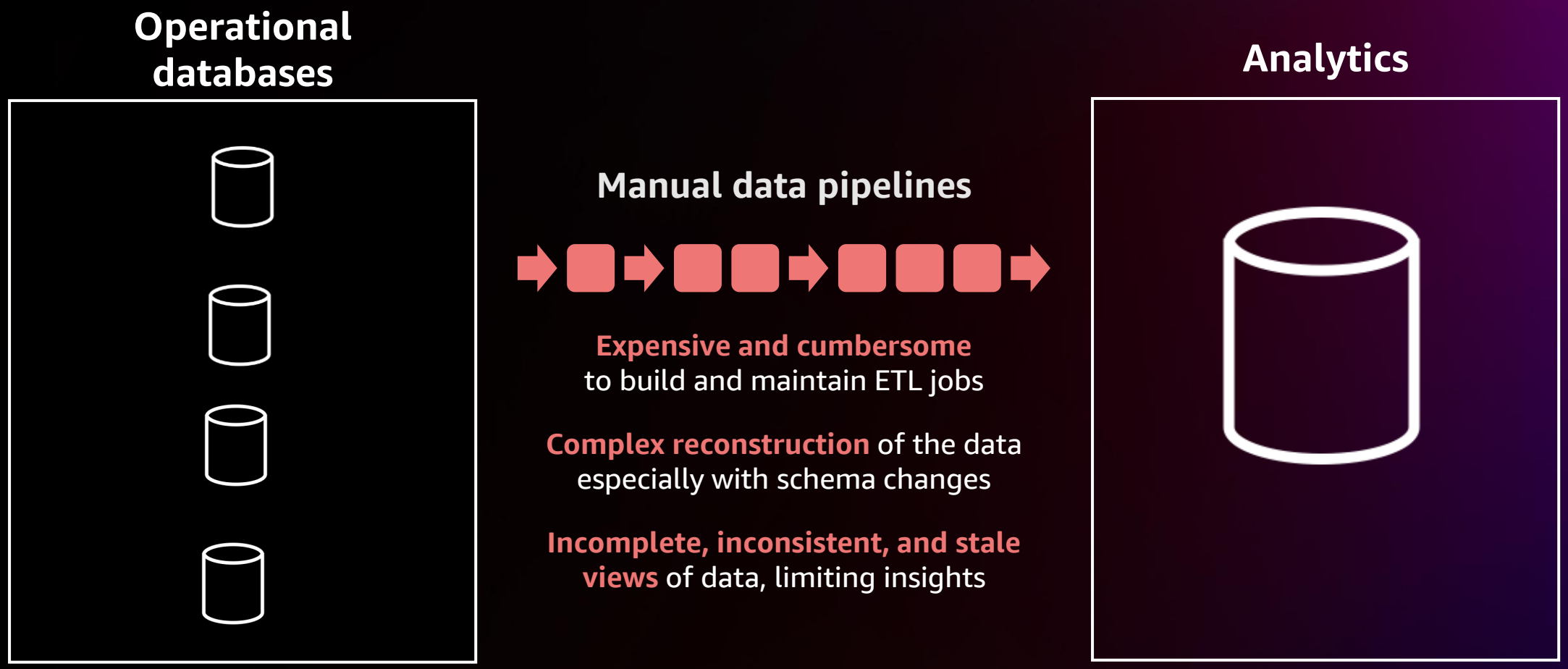
Real-time insights on operational data are critical for modern enterprises

- Personalization
- Fraud detection
- Churn prevention
- Gaming leader boards
- Location optimization
- Inventory optimization
- Customer relationship management
- Scoring
- Internet of Things (IoT)
- Anomaly monitoring
- Sales operations
- Marketing optimization
- Product insights
- More…

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Existing operational analytics solutions are hard

SEPARATE SYSTEMS REQUIRE COMPLEX DATA MANAGEMENT PIPELINES



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Existing operational analytics solutions are hard

SINGLE SYSTEMS THAT PROCESS TRANSACTIONS AND ANALYTICS IN THE SAME DATABASE ARE LIMITING

- Not scalable
- Expensive
- Cannot analyze transactional data across multiple operational databases or join with data warehouse data



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AWS offers purpose-built databases to meet your demands

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Amazon Redshift



Easy, secure, and reliable

Focus on getting from data to insights in seconds without worrying about infrastructure



Analyze all your data

Get insights running real-time and predictive analytics on complex, scaled data across your operational databases, data lake, and data warehouse



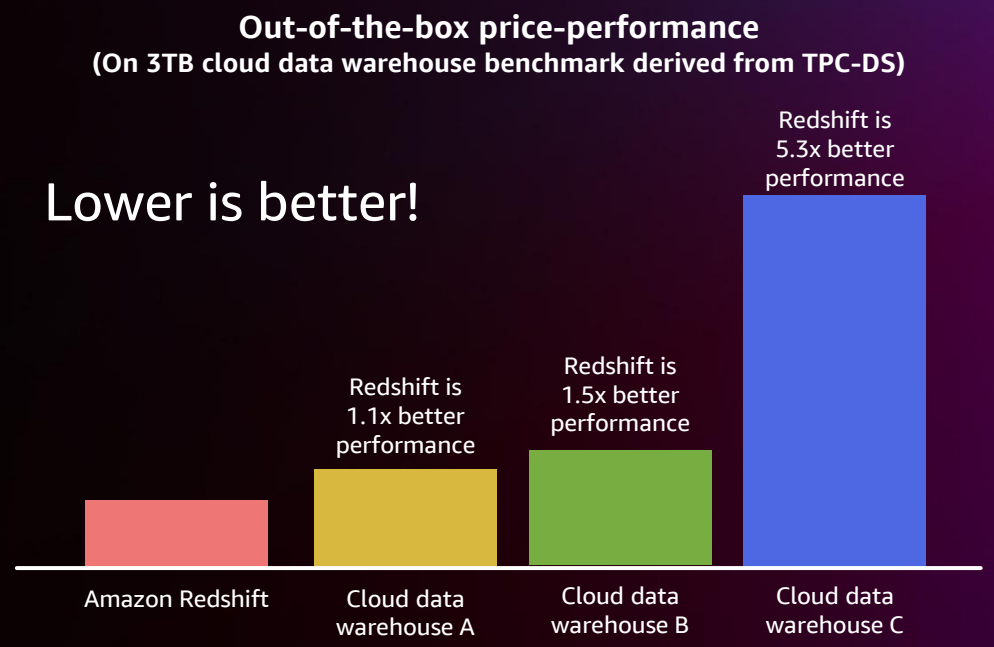
Best price performance at any scale

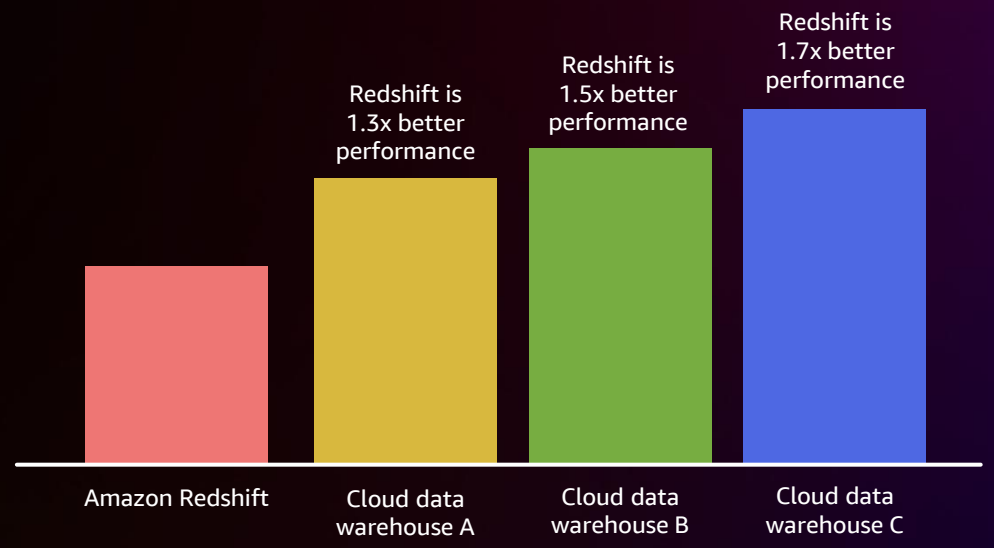
Gain up to 5x better price performance than other cloud data warehouses, and dynamically scale to improve query speed for complex and critical workloads

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Up to 5X better price performance





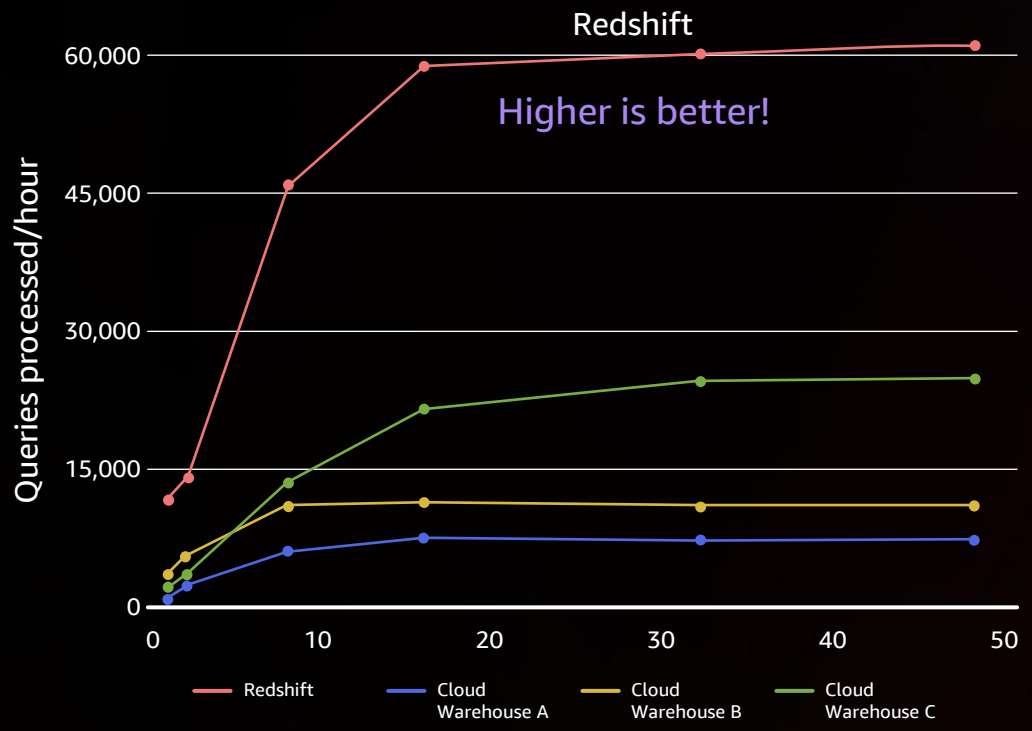
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Price-performance at scale with Amazon Redshift

7x better price-performance!

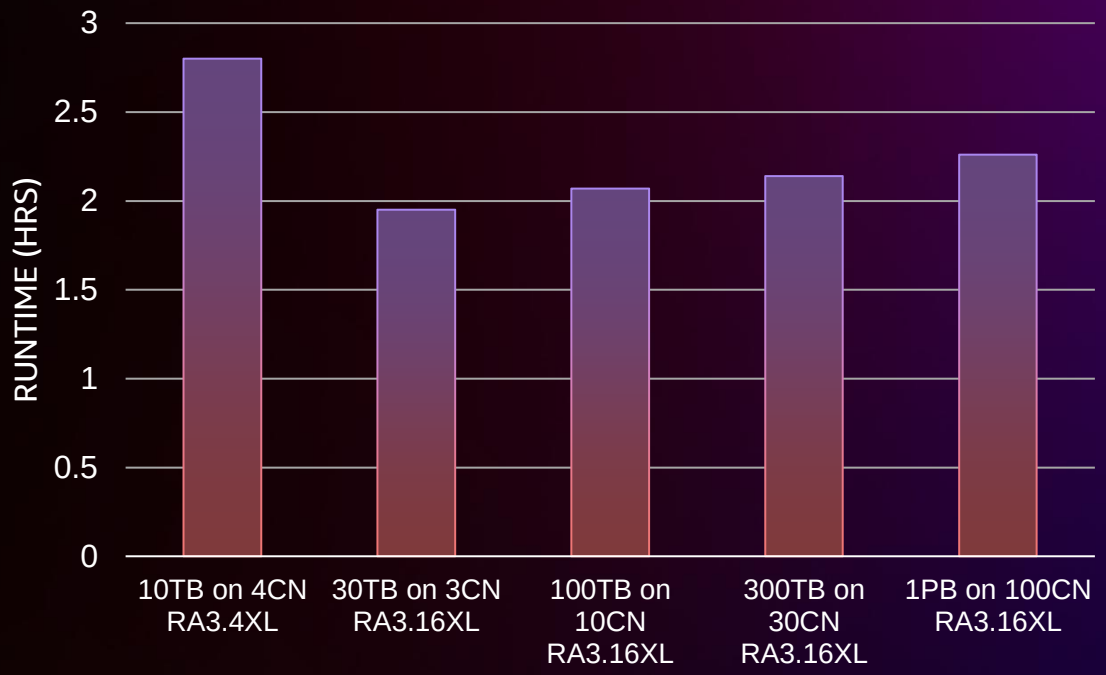
Query throughput for short queries

(On 10GB cloud data warehouse benchmark derived from TPC-DS)



Linear scalability

(On cloud data warehouse benchmark derived from TPC-DS)



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Tens of thousands of customers collectively analyze exabytes of data every day on Amazon Redshift

Amazon Redshift | Analyze all your data with the best price-performance cloud data warehouse










Media & entertainment









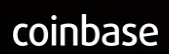









Financial & professional services



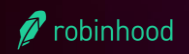
















Healthcare



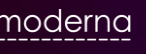






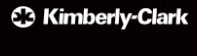






Consumer services


















Web and technology

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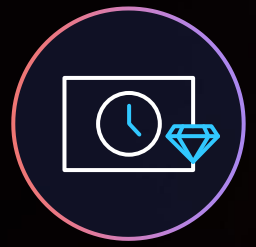
Amazon Aurora

DESIGNED FOR UNPARALLELED HIGH PERFORMANCE AND AVAILABILITY AT GLOBAL SCALE WITH FULL MYSQL AND POSTGRESQL COMPATIBILITY AT 1/10TH THE COST OF COMMERCIAL DATABASES



Performance & scalability

- 5x throughput of standard MySQL and 3x of standard PostgreSQL
- Scale out up to 15 read replicas
- Decoupled storage and compute enabling cost optimization
- Fast database cloning
- Distributed, dynamically scaling storage subsystem



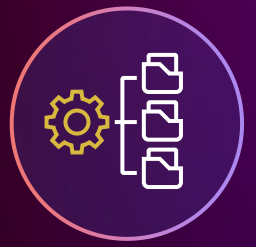
Availability & durability

- 6 copies of data across 3 AZs (customers pay for 1)
- Automatic, continuous, incremental backups with point-in-time recovery (PITR)
- Fault-tolerant, self-healing, auto-scaling storage
- Global Database for disaster recovery



Highly secure

- Network isolation
- Encryption at rest/in transit
- Supports multiple secure authentication mechanisms and audit controls



Fully managed

- Automates time-consuming management of administration tasks like hardware provisioning, database setup, patching, and backups
- Serverless configuration options

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Aurora is the fastest-growing service in AWS history

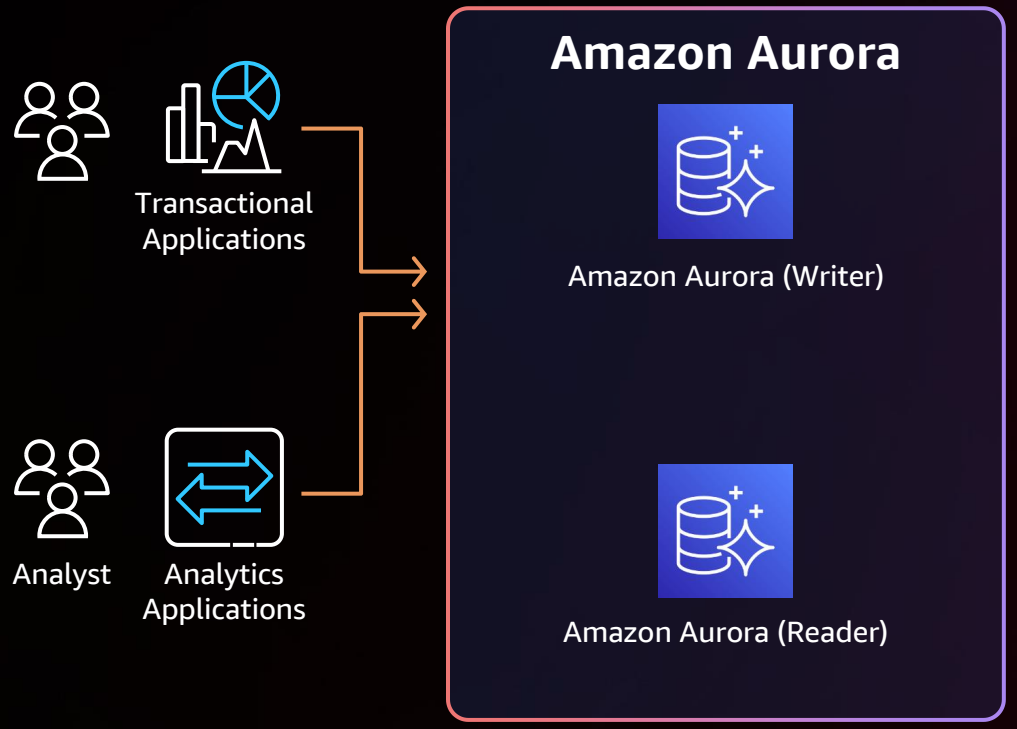
AURORA IS USED BY 955 OF THE TOP 1,000 AWS **CUSTOMERS**



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Transactional analytics



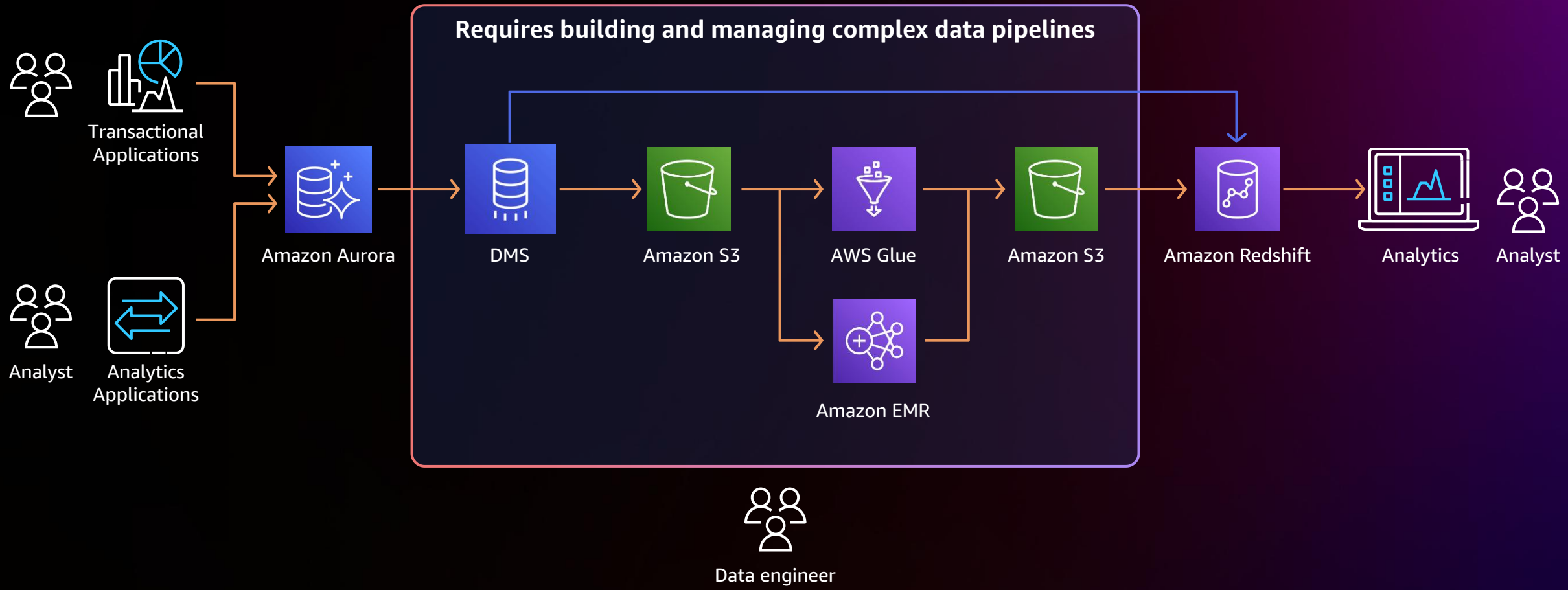
Considerations:

Performance at scale

Gain insight from multiple Aurora databases

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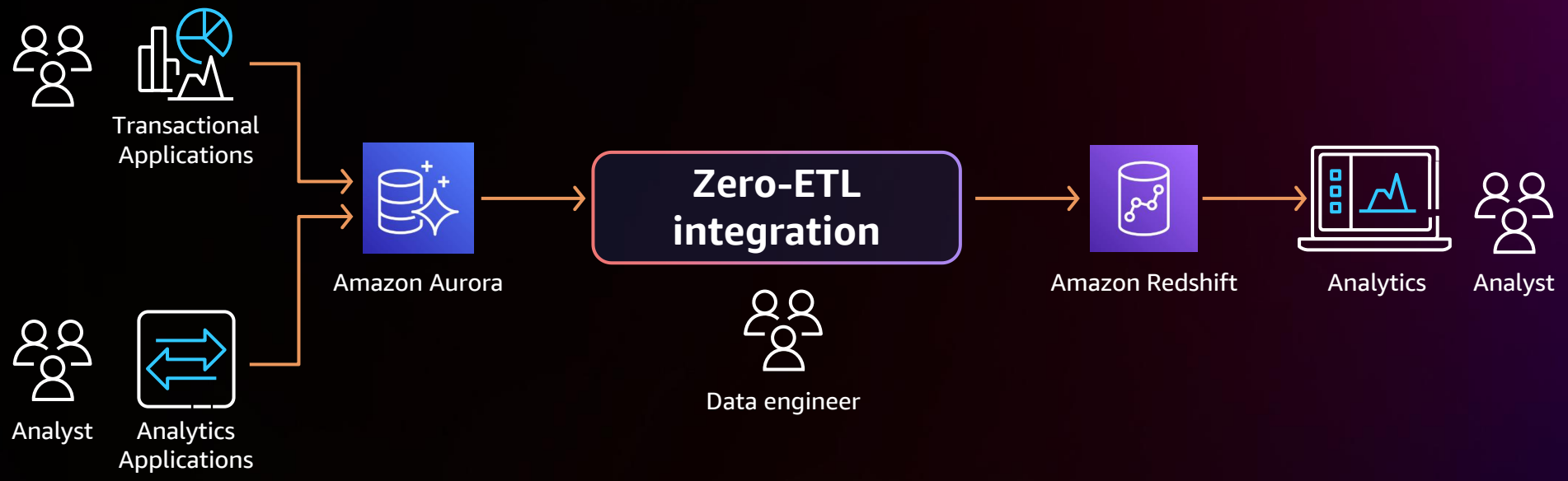
Transaction analytics at scale



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Introducing: Amazon Aurora zero-ETL integration with Amazon Redshift

An **easy** and **secure** way to enable **near real-time analytics** on **petabytes of transactional data**



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Benefits

FOCUS ON GETTING FROM TRANSACTIONAL DATA TO INSIGHTS IN SECONDS WITHOUT DATA PIPELINES



Easy and reliable

Eliminates the need for customers to build and maintain complex ETL pipelines



Low-latency data integration

Run near real-time analytics and machine learning using Amazon Redshift on petabytes of transactional data from Amazon Aurora



Unified insights

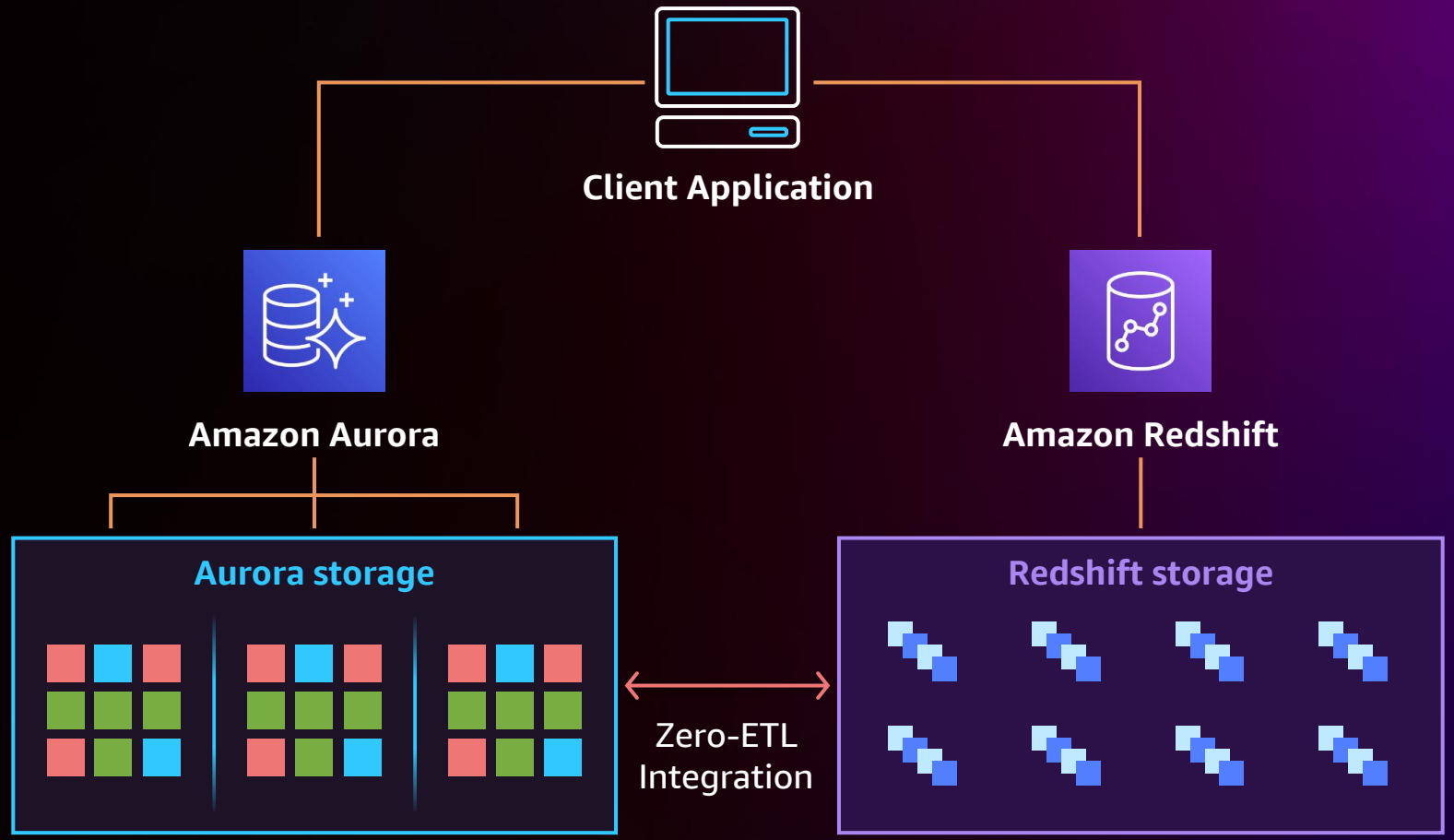
Derive insights using advanced analytics in Amazon Redshift from data consolidated from multiple database clusters

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Designed for simplicity and performance

- Easy creation of Redshift integration target
- Automated data seeding and continuous replication at storage layer
- Run analytics alongside ingestion
- Monitor progress, lag, and performance from Redshift system tables and Amazon CloudWatch

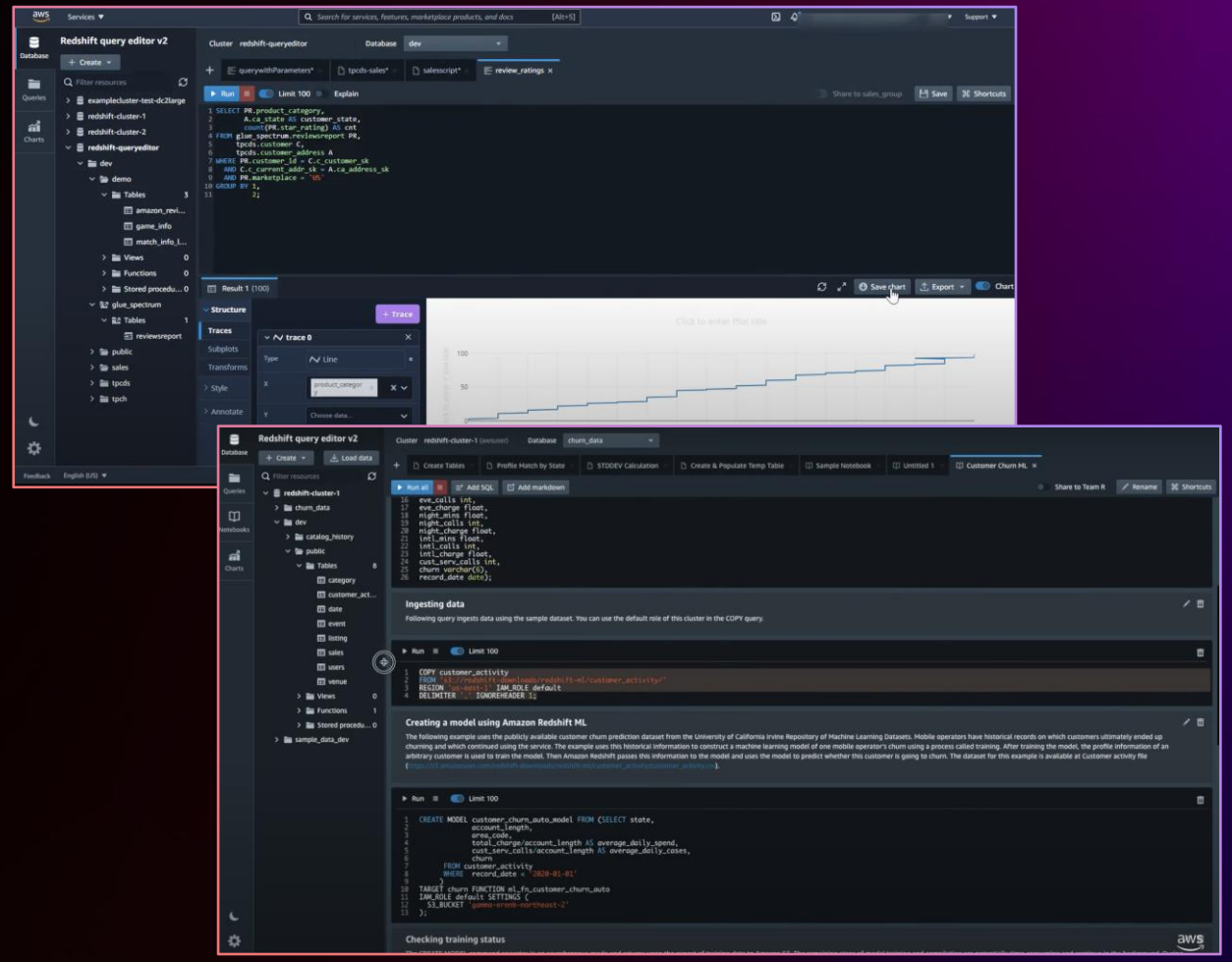


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Leverage all Amazon Redshift's analytics power and tool integrations

All Amazon Redshift SQL functionality applies:

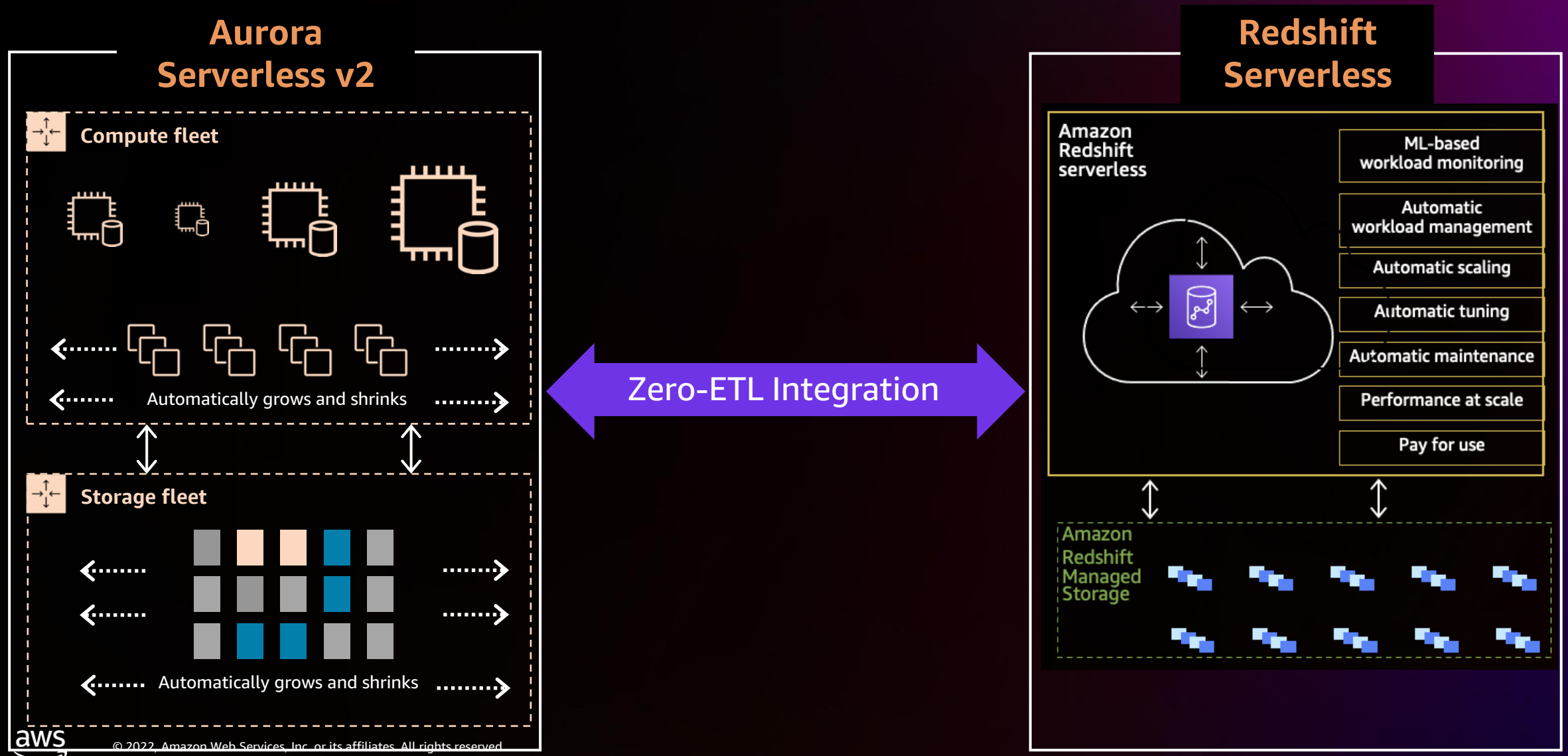
- Granular access controls and robust security
- Data lake queries
- Complex joins
- Federated query
- Semi-structured data
- Durability and transactional guarantees
- Data sharing
- JDBC/ODBC and Data API
- Machine learning functions
- And more



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End-to-End Serverless

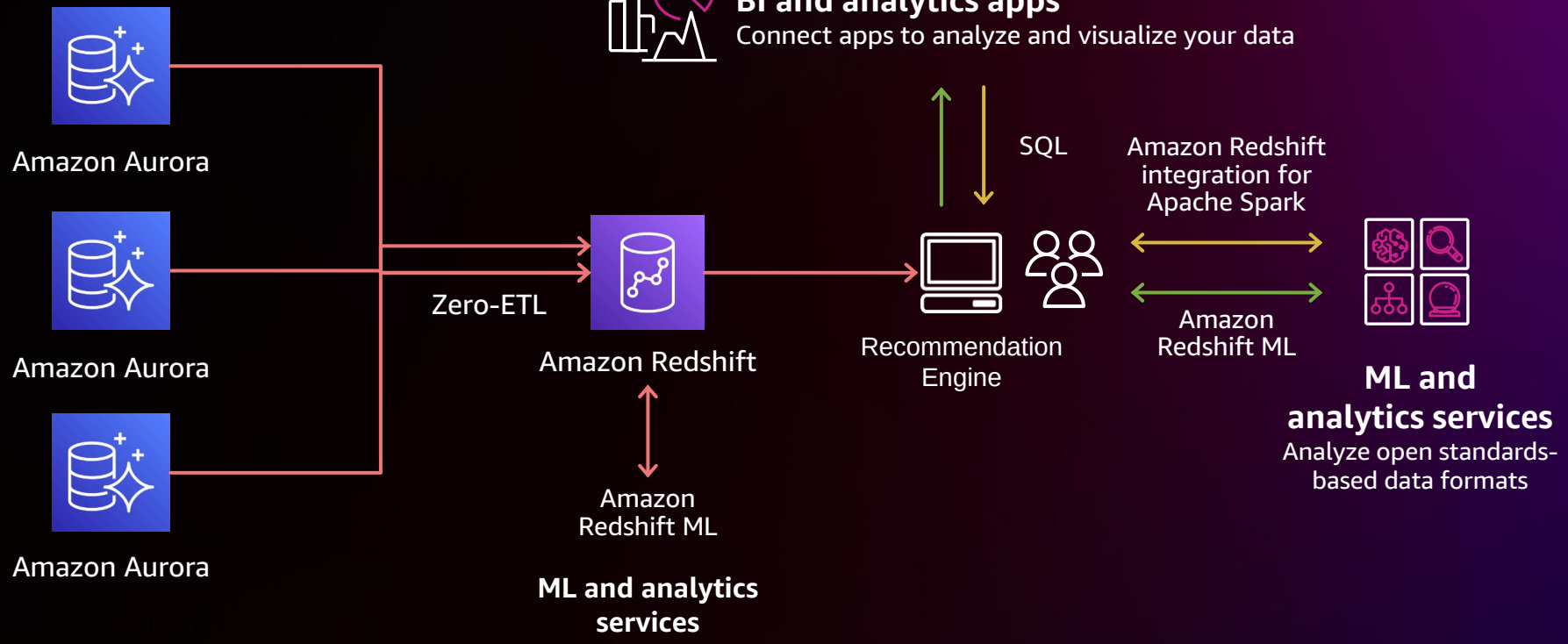
SIMPLIFIED ANALYTICS WITHOUT WORRYING ABOUT MANAGING INFRASTRUCTURE



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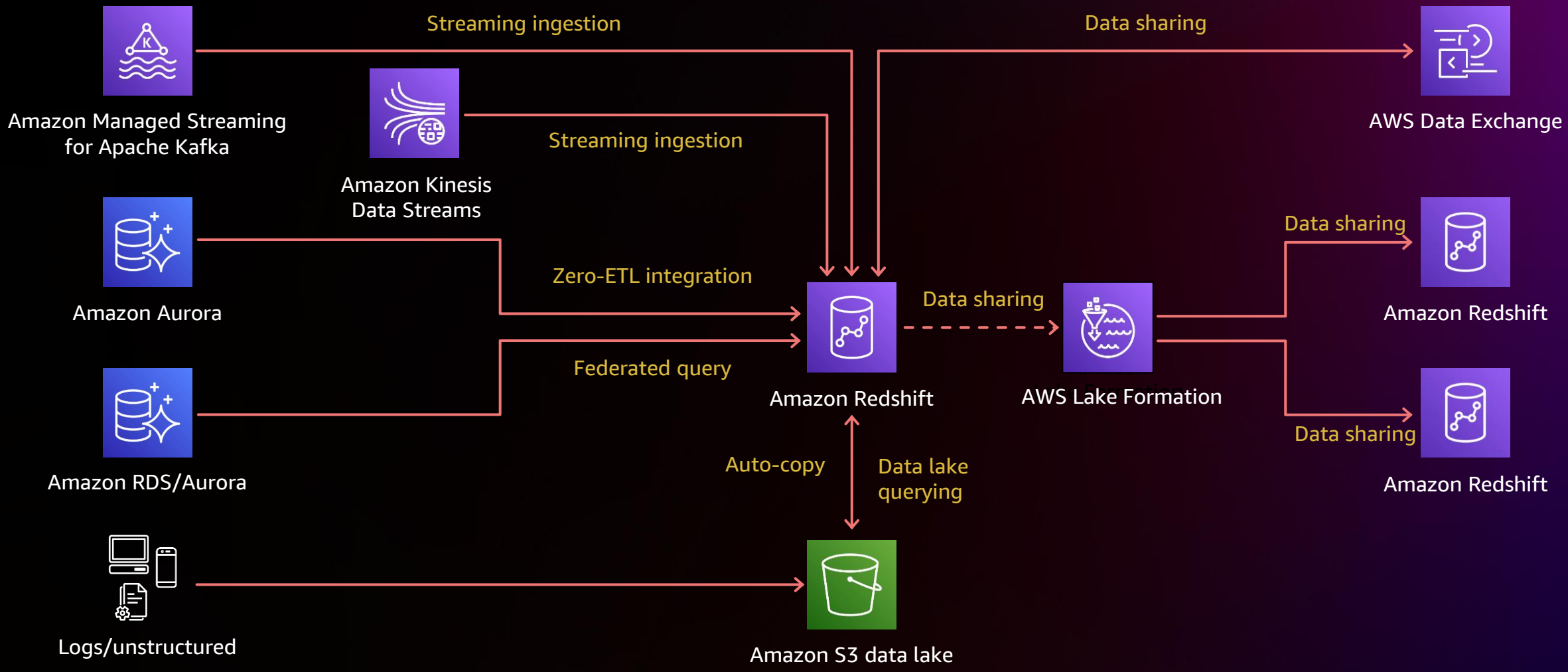
Operational analytics across many databases

- 74 Amazon Aurora databases
- 200K-300K daily transaction
- <10 seconds lag
- 200TB
- 30B rows on largest table
- 70+ columns



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Analyze and share near real-time data



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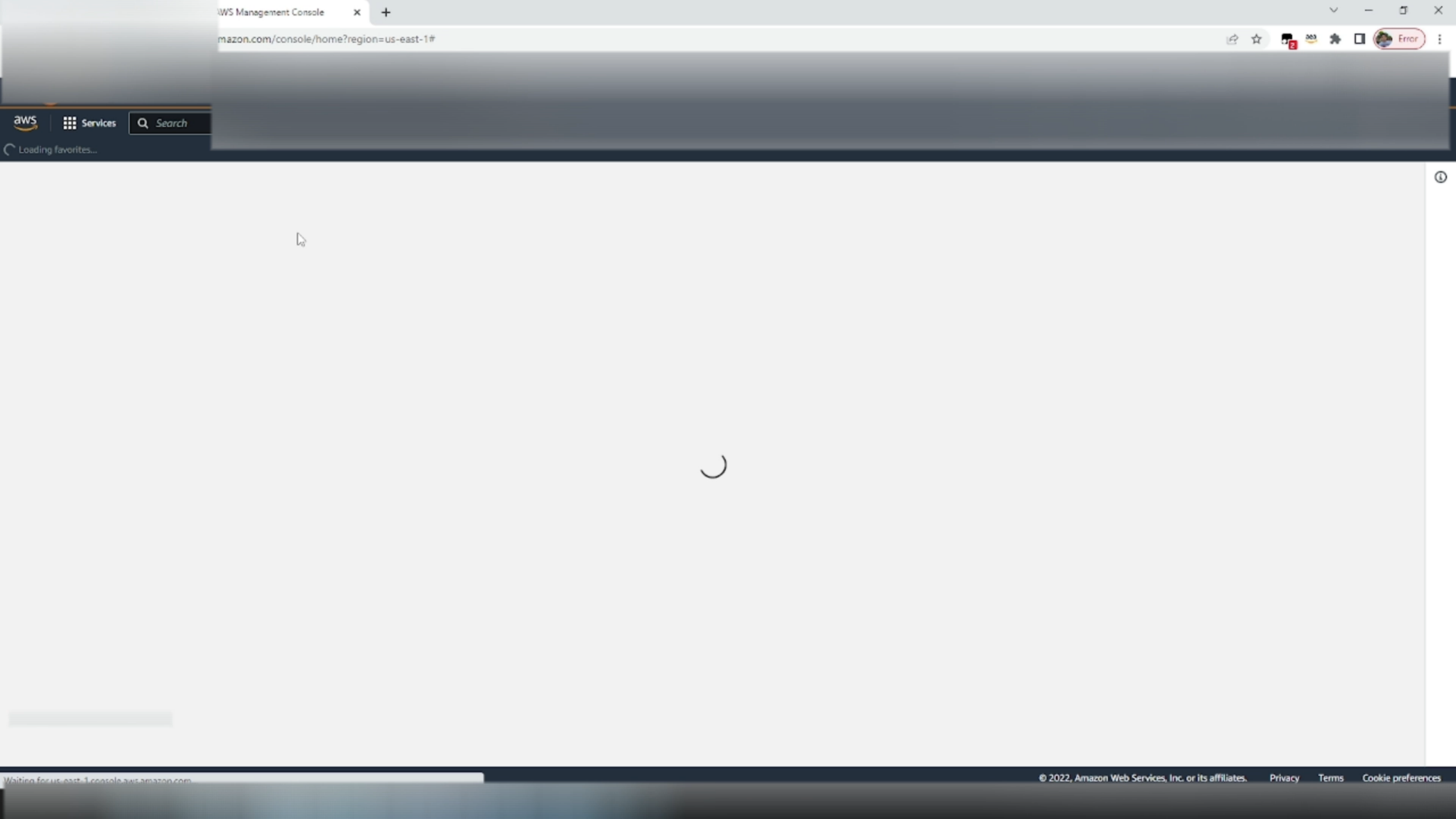
WS Management Console

mazon.com/console/home?region=us-east-1#

Error

aws | Services | Search

Loading favorites...



Waiting for us-east-1.console.aws.amazon.com...

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Adobe empowers everyone, from individuals and small businesses to government agencies and global brands, to create and deliver exceptional digital experiences.

"Adobe's mission is to change the world through digital experiences, and in today's world, that means having analytics that can deliver both deep and real-time insights," said Jack Lull, principal scientist for Adobe Acrobat Sign. "As an Amazon Aurora customer, we are excited for Amazon Aurora support for zero-ETL integration with Amazon Redshift, which ***will provide our growing Acrobat Sign customer base with new insights and faster analytics performance as their usage increases****—all without the need for ongoing maintenance for our own teams."*

—Jack Lull
Principal Scientist
Adobe Acrobat Sign

Adobe

Qlik helps enterprises around the world move faster, work smarter, and lead the way forward with an end-to-end solution for getting value out of data.

"Today, Qlik's Data Integration delivers real-time, analytics-ready data into streaming and cloud platforms such as data warehouses and data lakes. By capturing transactional data seconds after it is written and replicating it in the data warehouse, Amazon Aurora zero-ETL integration with Amazon Redshift meets the ***growing customer need for real-time availability of transactional data for analytics workloads****. We look forward to integrating with the new capability to enhance the value we bring to our customers to enable time-sensitive insights"*

—Itamar Ankorion
Senior vice president for Technology Alliances
Qlik

Qlik

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How it works

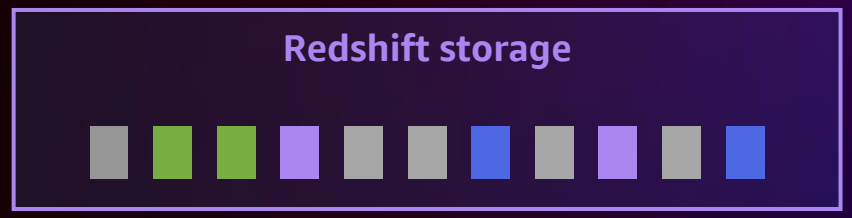


Amazon Aurora MySQL



Amazon Redshift



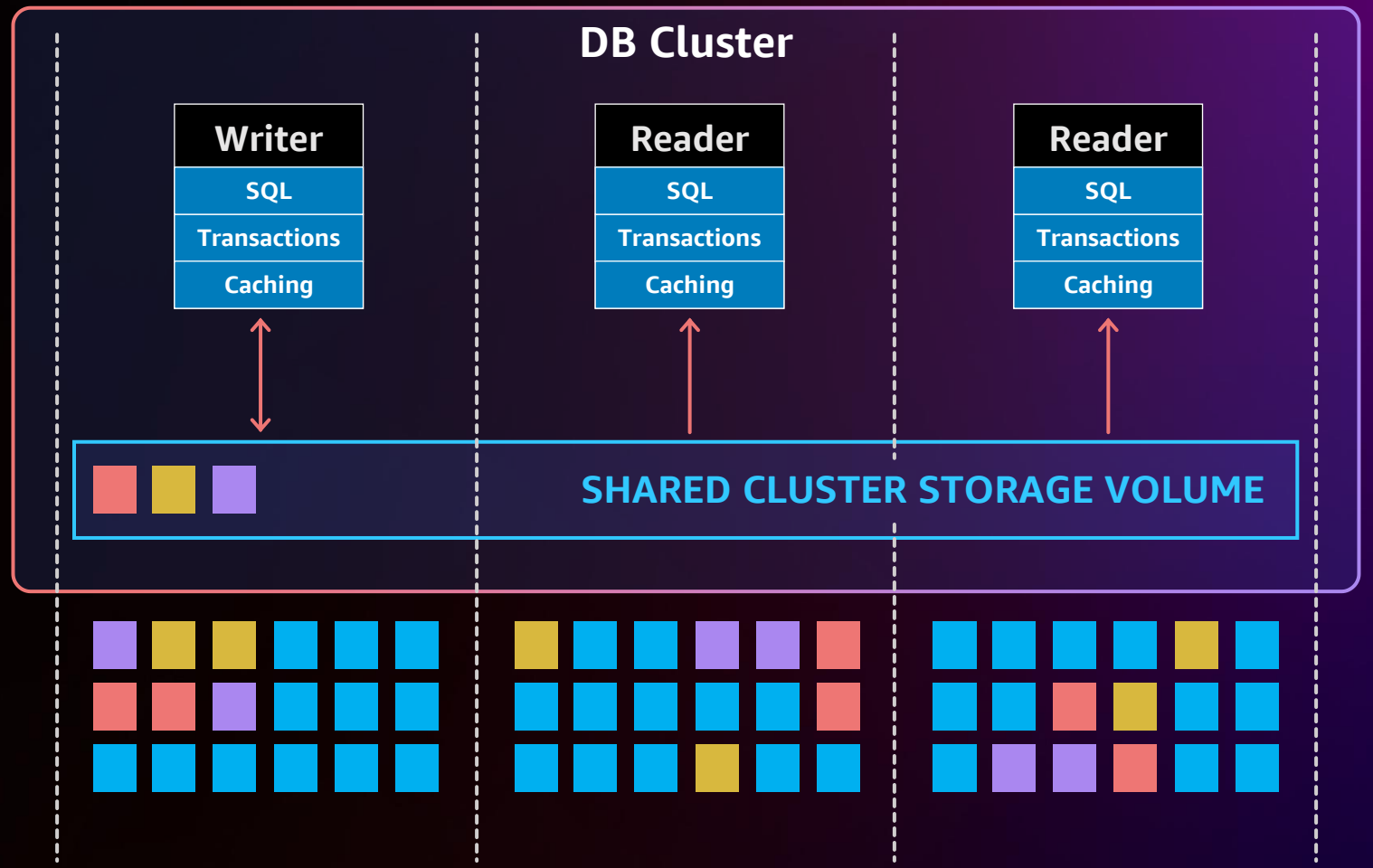


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Amazon Aurora storage

- Purpose-built log-structured distributed storage
- Storage volume is striped across hundreds of storage nodes
- Storage nodes with locally attached SSDs
- Continuous backup to Amazon S3



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Amazon Redshift managed storage

PETABYTE SCALE HIGH-PERFORMANCE STORAGE



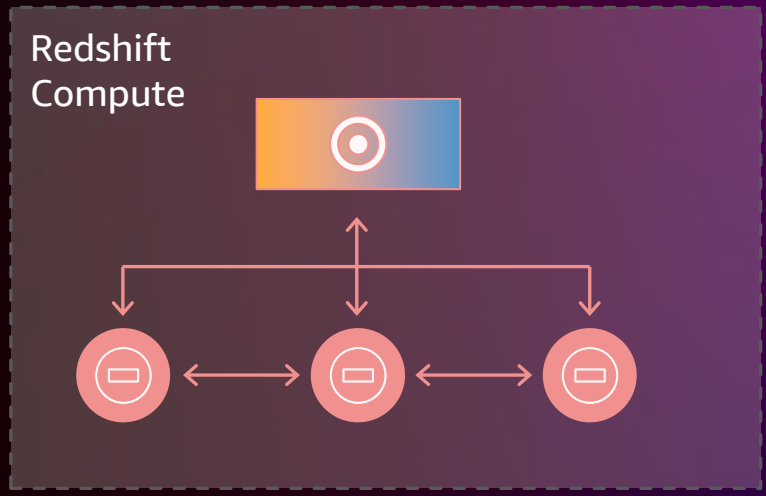
Managed storage



Large high-speed cache



High-bandwidth networking





Redshift managed storage

Allows scaling compute and storage independently

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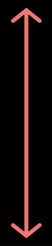
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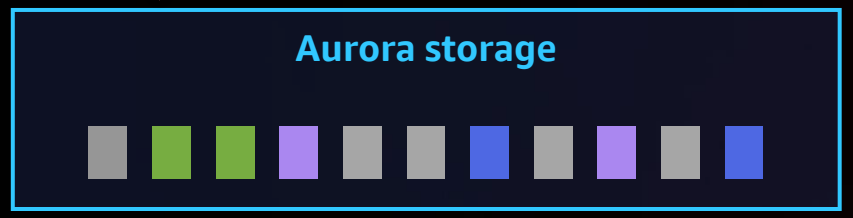
Ready, set, go…



Amazon Aurora MySQL

Transaction log

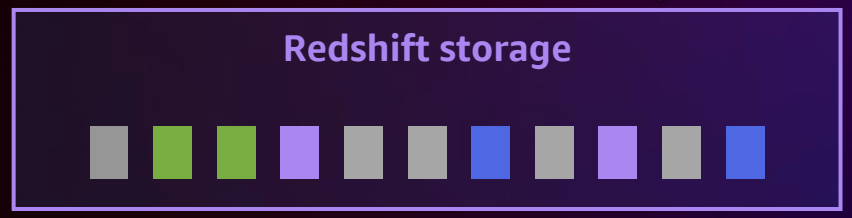






Amazon Redshift

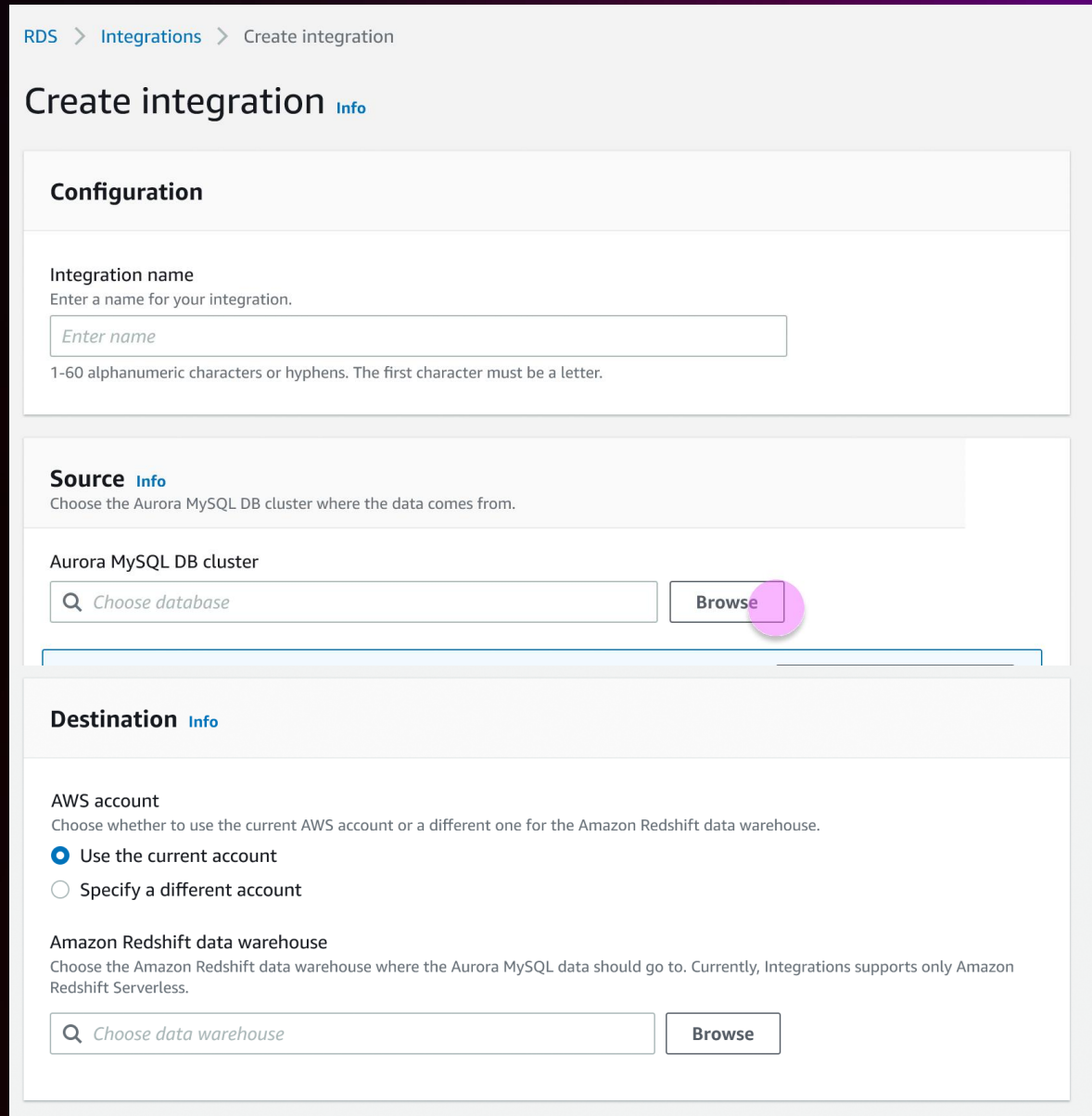




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Create integration



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Integration at the storage layer



Amazon Aurora MySQL

Transaction log

Change data capture (CDC) log

Aurora storage



Amazon Redshift

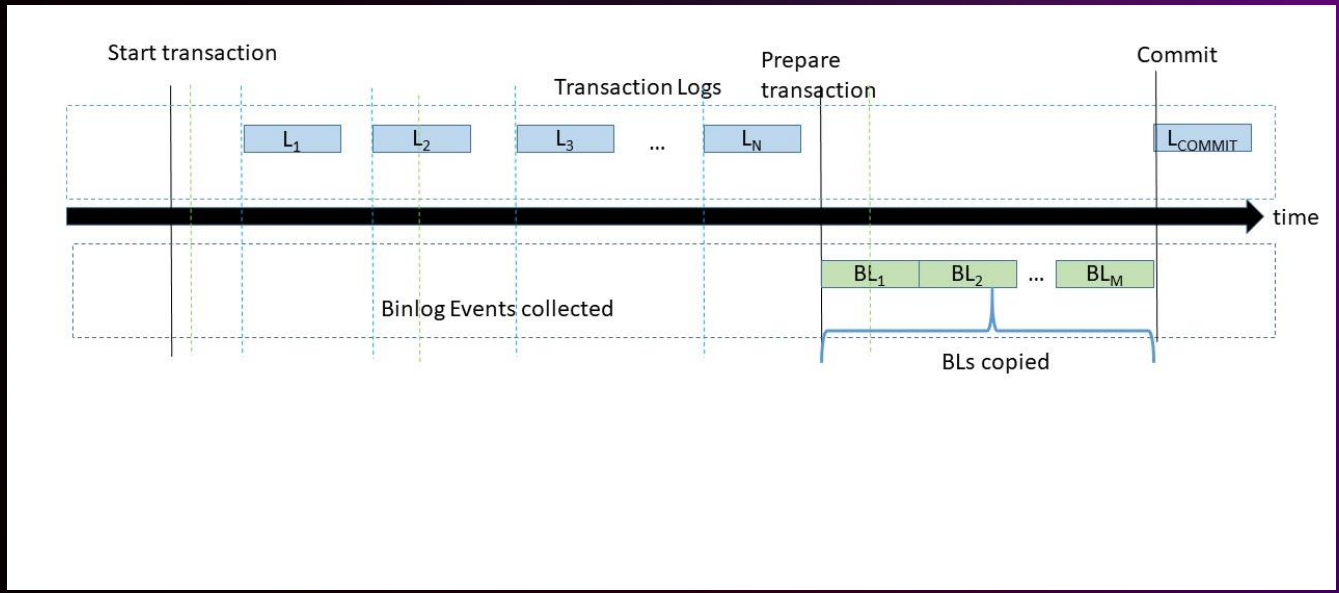
Redshift storage

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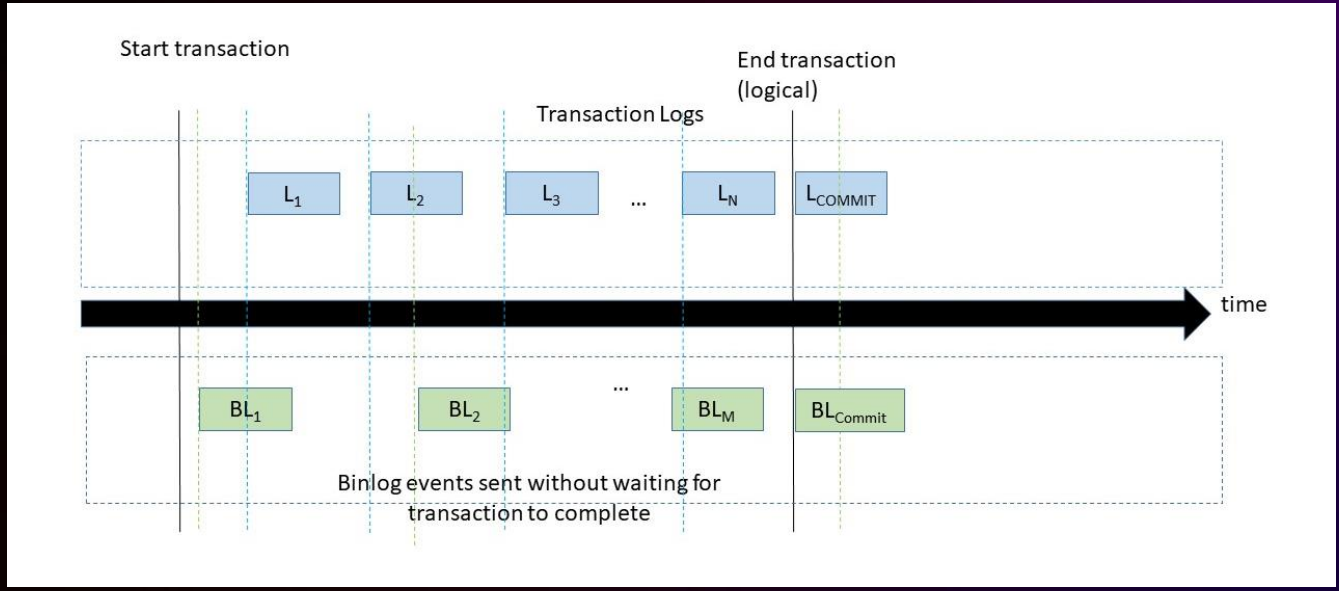
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Change data capture

Binlog

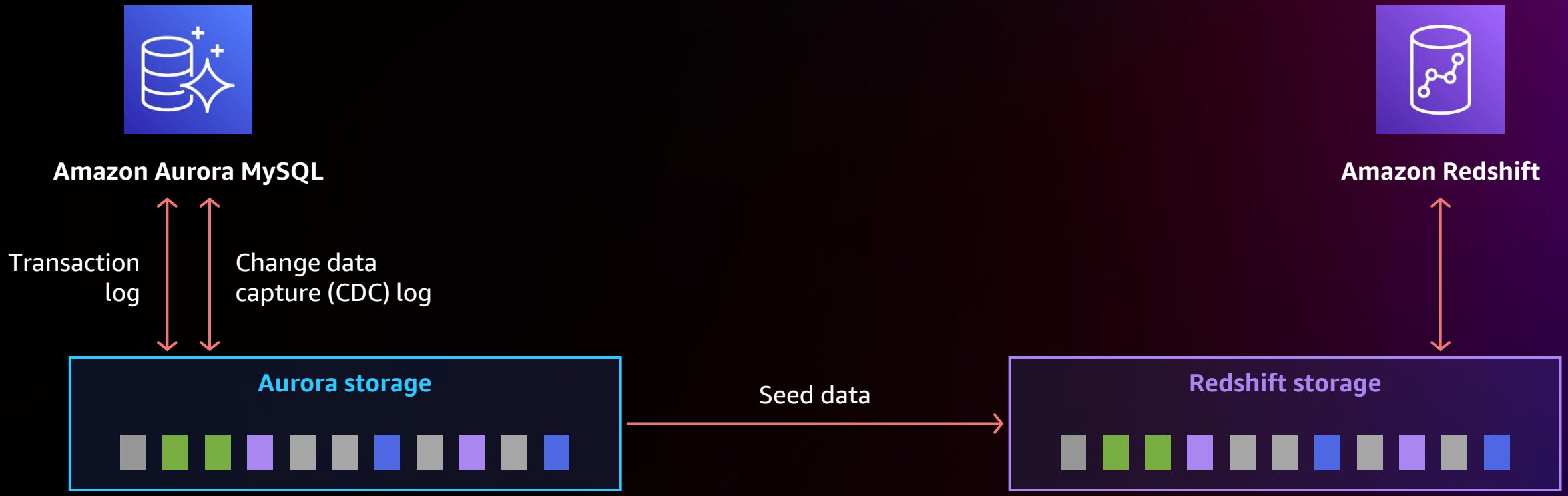


Enhanced Binlog



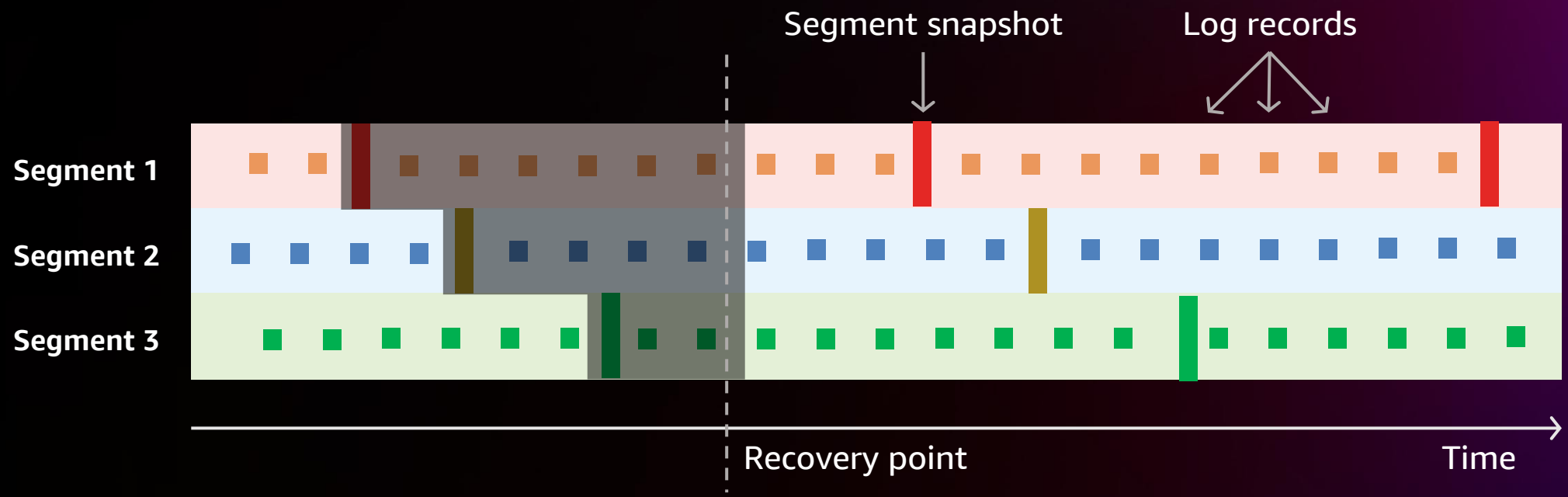
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Integration at the storage layer



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Cluster export for seed data

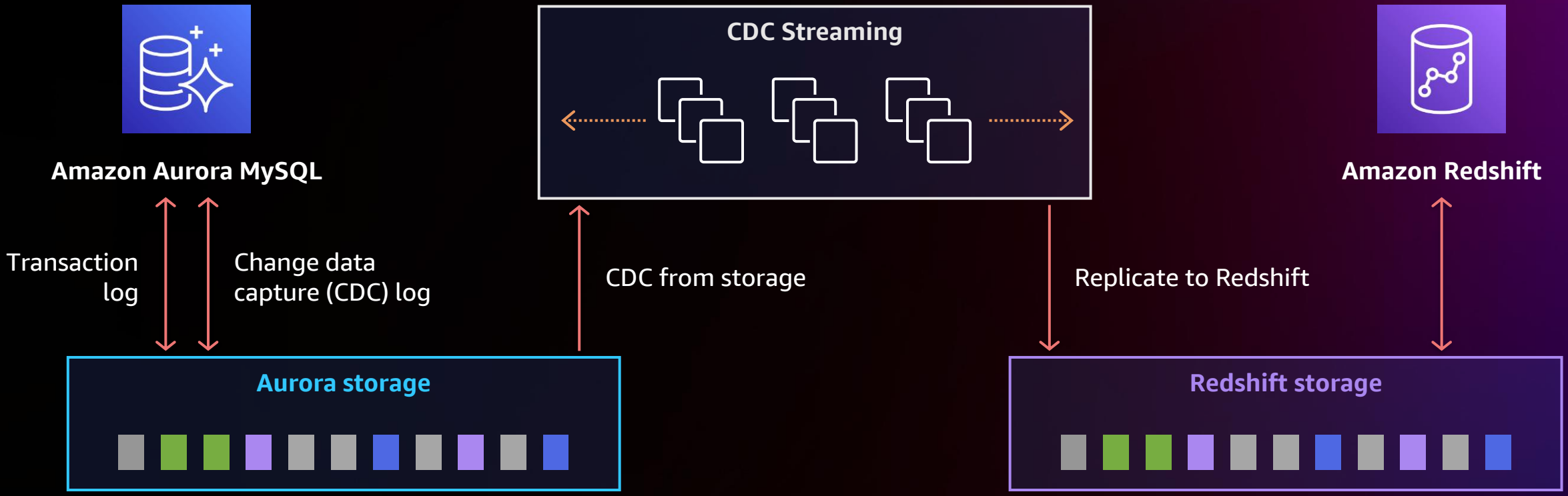


- Backup is performed in the background by storage nodes
- No performance or availability impact
- Snapshot of each segment is taken in parallel

- **Recent 10x performance improvements for snapshot export**

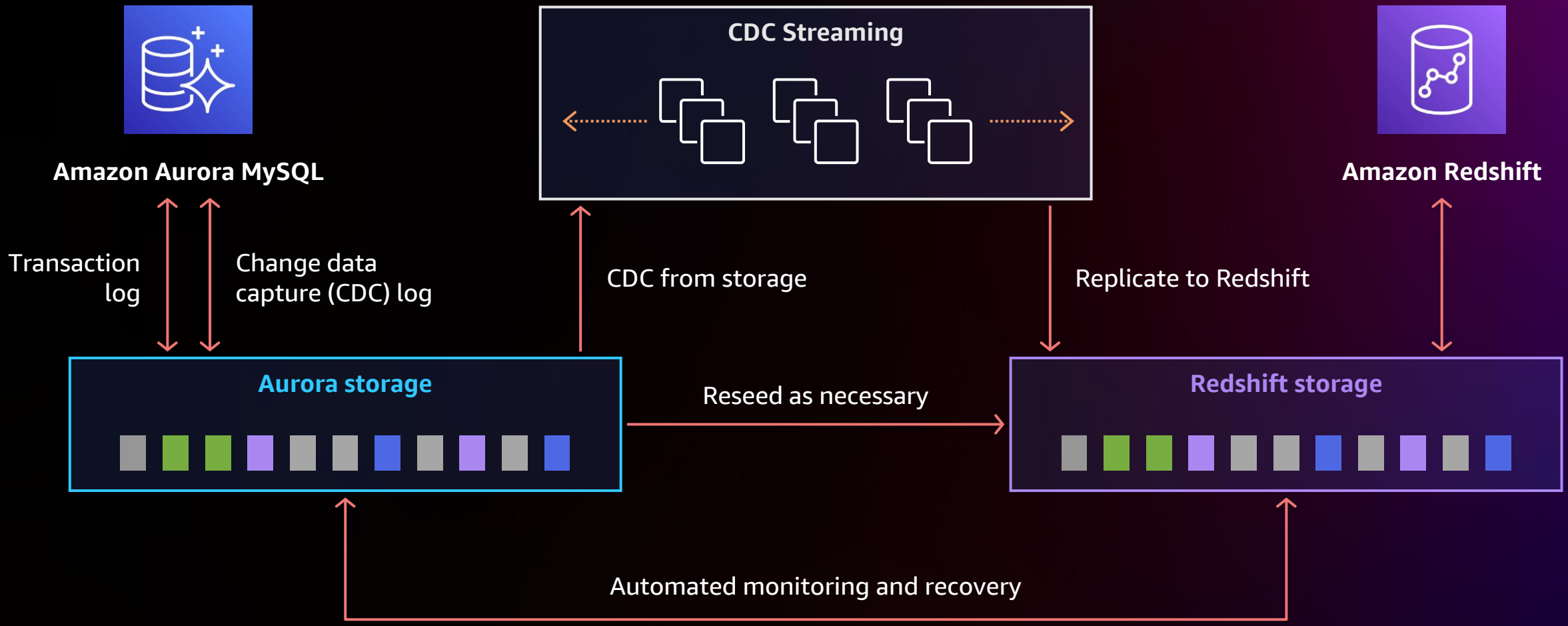
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Integration at the storage layer



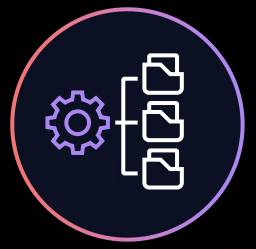
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Integration at the storage layer



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Amazon Aurora Zero-ETL to Amazon Redshift



A **fully managed** Amazon Aurora capability that enables Amazon Aurora customers to use Amazon Redshift for **near real-time analytics** on **petabytes** of **transactional data**



Data available in Amazon Redshift within **seconds of transactional data being written** into Amazon Aurora



With **near real-time** access to transactional data, customers can leverage **Amazon Redshift's analytics** and **machine learning capabilities** to derive insights from **transactional data**

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Call to action

Sign up to try out the limited preview at:

https://pages.awscloud.com/AmazonAurora-zeroETL-AmazonRedshift-Preview.html

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Thank you!

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