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PRT248

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Data integration at scale: Strategies to unlock SAP and mainframe

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Scale

DATA INTEGRATION TO CLOUD CONSIDERATIONS

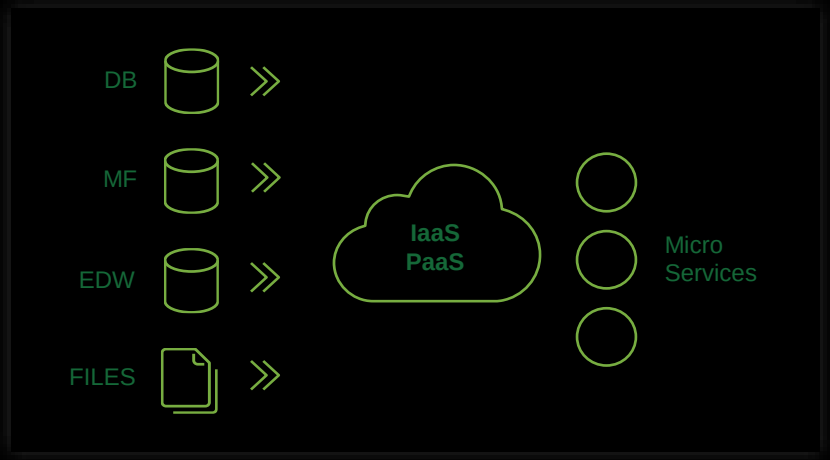
- Systems
  - Throughput
  - Low latency
  - Availability
  - Non disruptive
- Data Engineering
  - Diverse use cases
  - Transformation for business fit
  - Governance & regulatory
  - Limited resources and expertise

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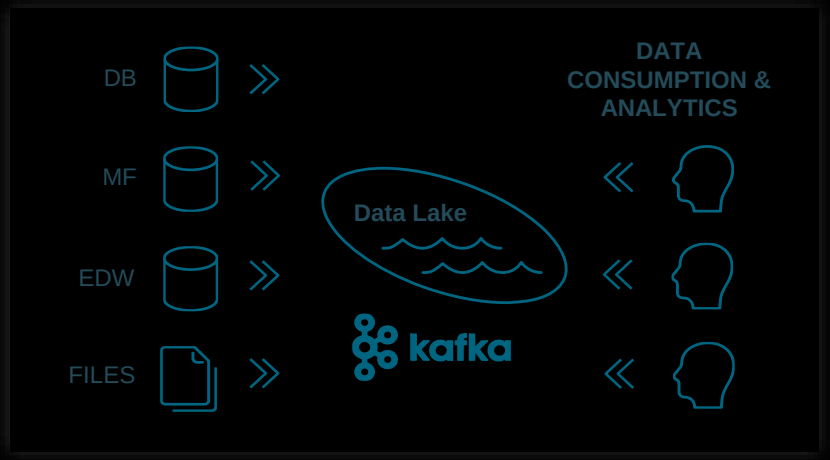
Cloud Data Integration Drivers



Cloud App Development



Data Warehouse Modernization



Next Generation Data Lakes

Qlik Data Integration



Data Movement & Streaming



Data Warehouse Automation



Data Transformation



Application Automation



Cloud Data Integration Drivers



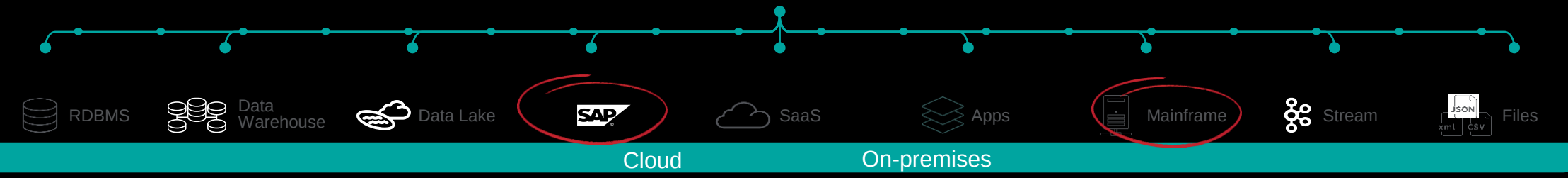
Qlik Data Integration

Data Movement & Streaming

Data Warehouse Automation

Data Transformation

Application Automation



Business-Critical Transaction Processing



- Mainframes host critical core IT for: 92 of the world's top 100 banks; 23 of the 25 top airlines; 10 of the world's top 10 insurers; and 71 percent of Fortune 500 companies.
- Mainframes run 30 billion transactions per day and handle 90 percent of all credit card transactions.
- Mainframes host more transactions daily than Google (1.3 million/second on CICS vs. 68,542/second on Google), including 55 percent of all enterprise transactions.



- SAP used by 400,000 businesses in 180 countries
- 77% of all worldwide business transactions touch an SAP system

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Source: SAP; Share.org

Cloud Data Integration at Scale:

Mainframe

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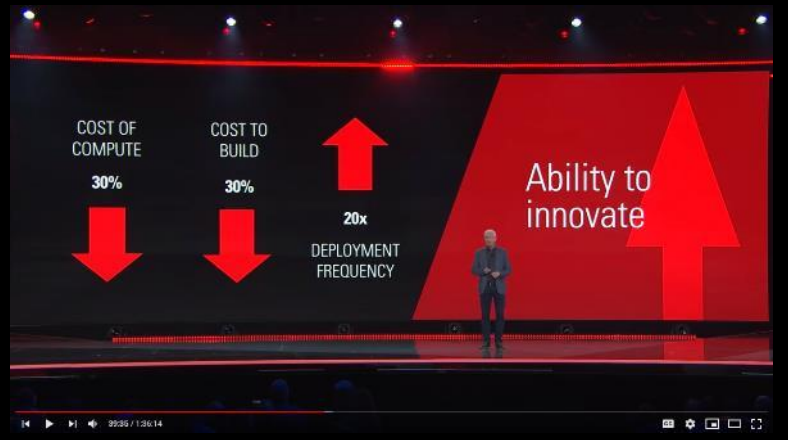
An Excellent Example

Agenda

- Company background and Our history with Mainframe
- Our Enterprise Technology Strategy
- The Data Replication Platform: DRaaS

Background

- One of the world's largest investment management companies, About $6.7 trillion in global assets under management, More than 30 million investors across 19 Global locations.
- Vanguard by the numbers: https://thevanguardgroup.sharepoint.com/sites/AboutUs/SitePages/vanguard-by-the-numbers.aspx



Vanguard Mainstage Presentation from AWS re:Invent

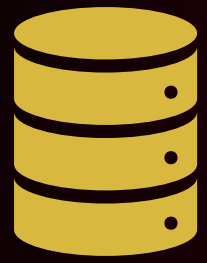
Enterprise Technology Strategy



Cloud based industry-leading agility

NWoW, Product Teams

Speed, Reliability, Lower Cost



Data is a competitive differentiator

Modern Cloud Analytics Services and Databases

Build more innovative products, and personalize client experiences

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Cloud Modernization Strategy

5 Milestones of the Strangler Fig Pattern

M0 — Starting point – Architecture and Products

- Refactor the Monolith. Microservices Pattern, Database per Service Pattern
- Iterative approach, Realize value early.

M1 — Reads in the cloud

- CDC replication supporting DynamoDB, PostgreSQL and S3

M2 — Reads & Writes in the cloud

- Writes enable continual incremental migration

M3 — Strangle the legacy services

- . Reduce MIPs on the mainframe.

M4 — Deprecate the legacy services

- AWS Database is Gold Copy

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Mainframe Replication Statistics

Database Replication	Transactions
Average Daily Volume (Total)	**400 million+**
Average Daily Volume (Insert)	180 million+
Average Daily Volume (Update)	120 million+
Average Daily Volume (Delete)	100 million+
Replication Resources	**Count**
Qlik Replicate Servers	18
Qlik Replicate Tasks	394
Qlik Replicate S3 Target Endpoints	70
Qlik Replicate Kinesis Target Endpoints	180
Qlik Replicate PostgreSQL Target Endpoints	50

Note: No outages or downtime in the past 2 years.

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DRaaS: Data Replication as a Service

Golden Path Platforms

Platform Objectives



DevOps



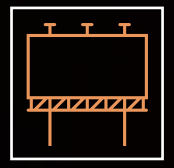
Low Latency



High Availability



Data Quality



Observability



Multi Region

Business Objectives

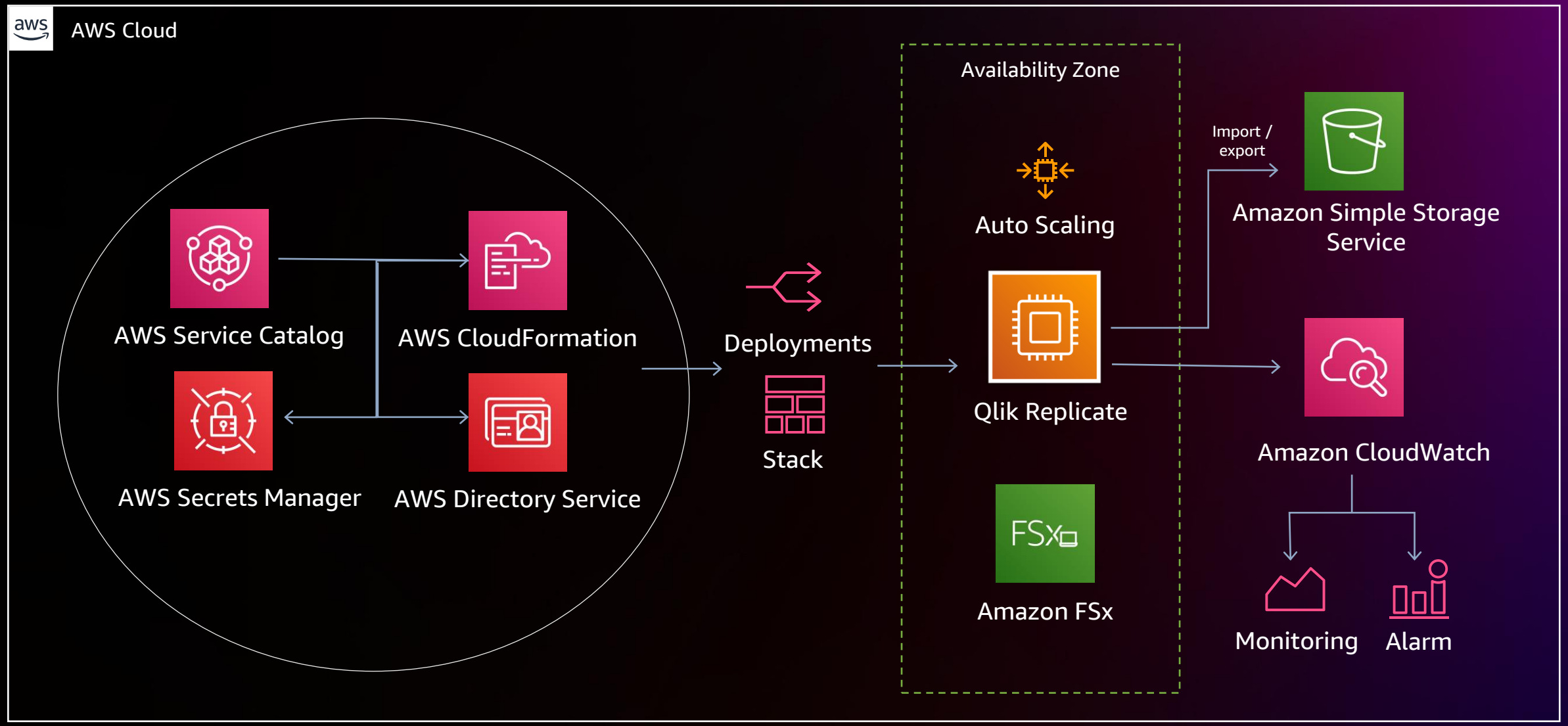
- Read Replicas for Microservices
- Data Analytics Modernization
- Portfolio Modernization
- Speed to Market

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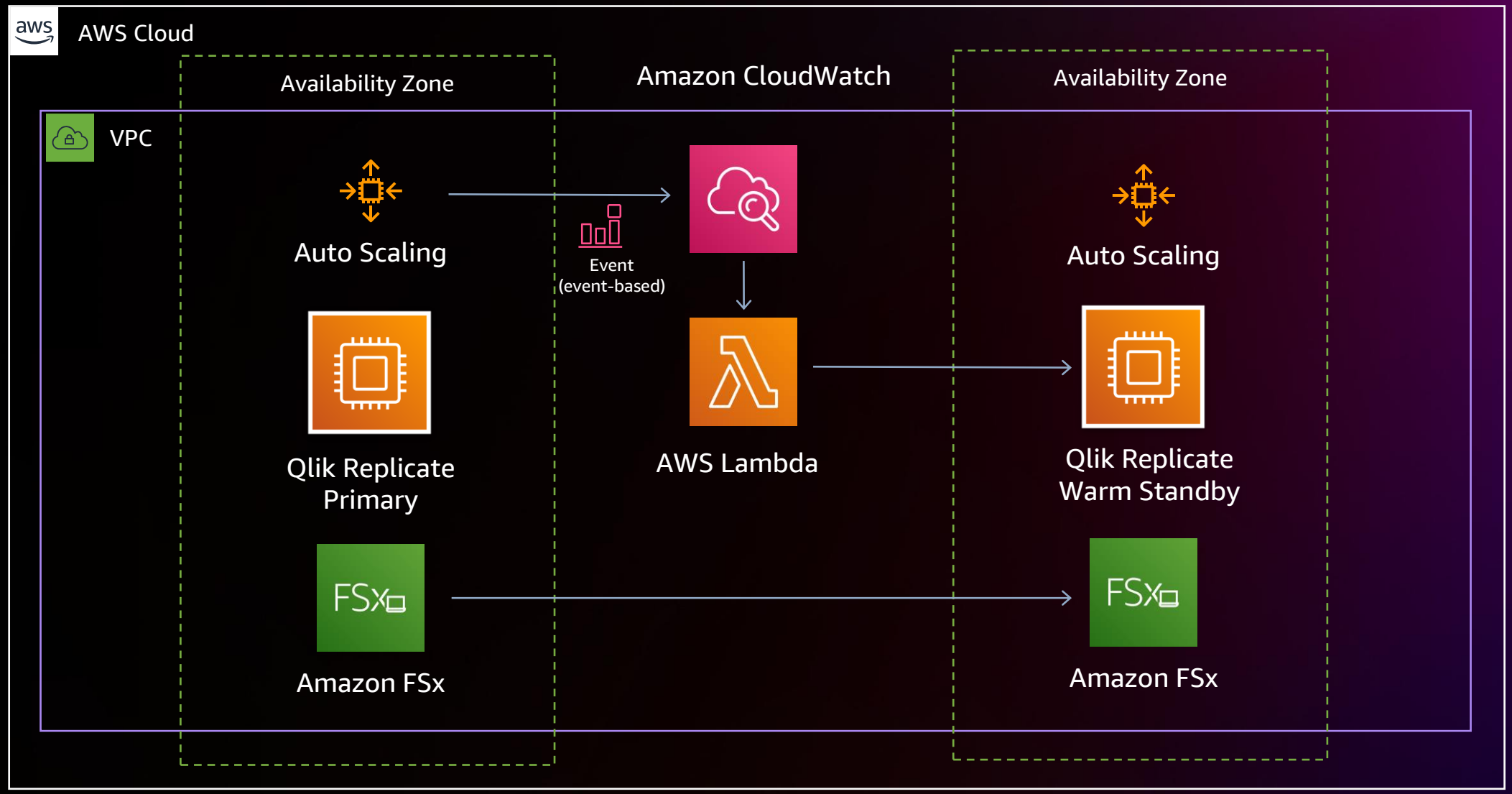
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DRaaS: Infrastructure Automation



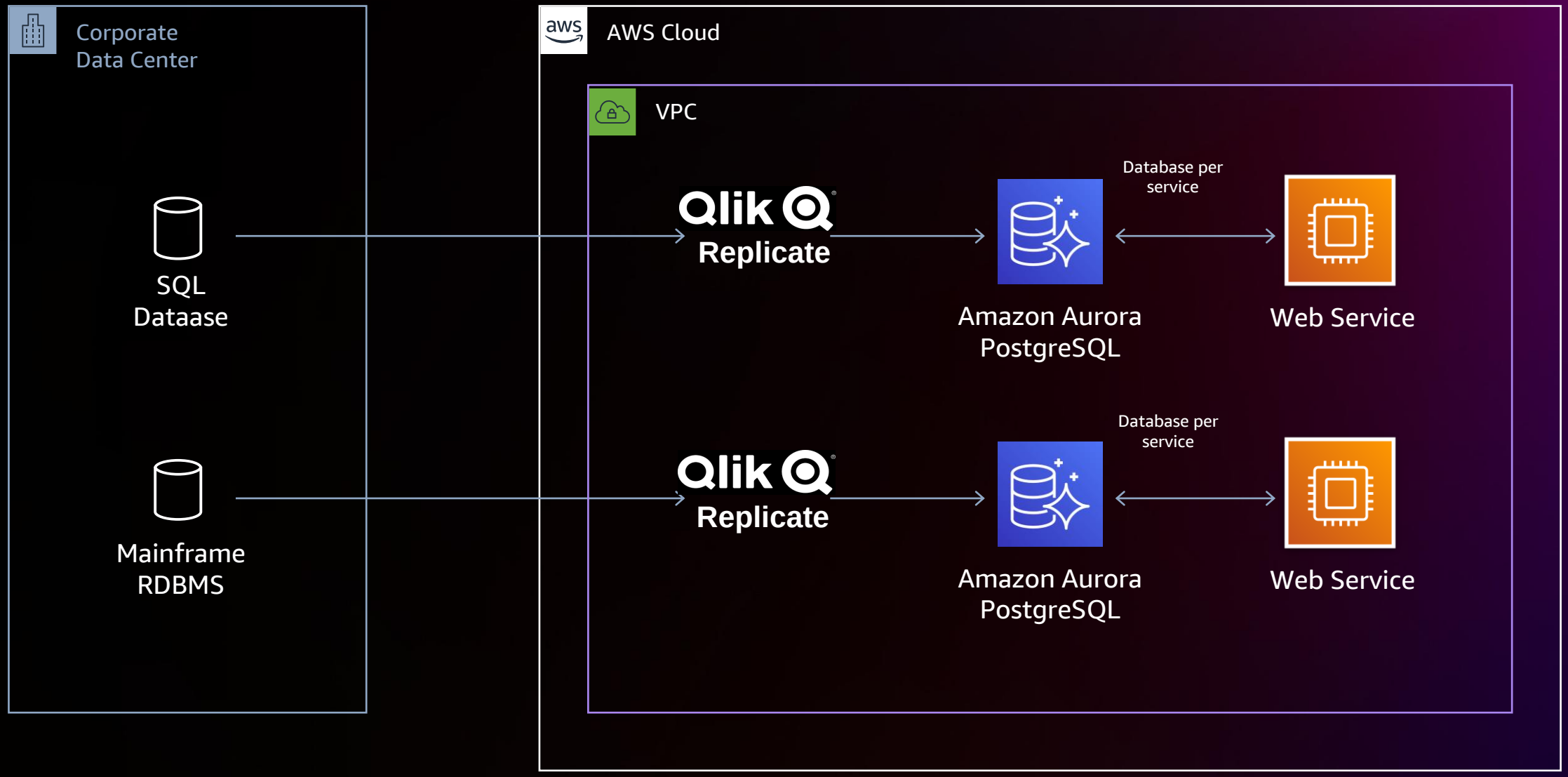
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DRaaS: Availability Infrastructure



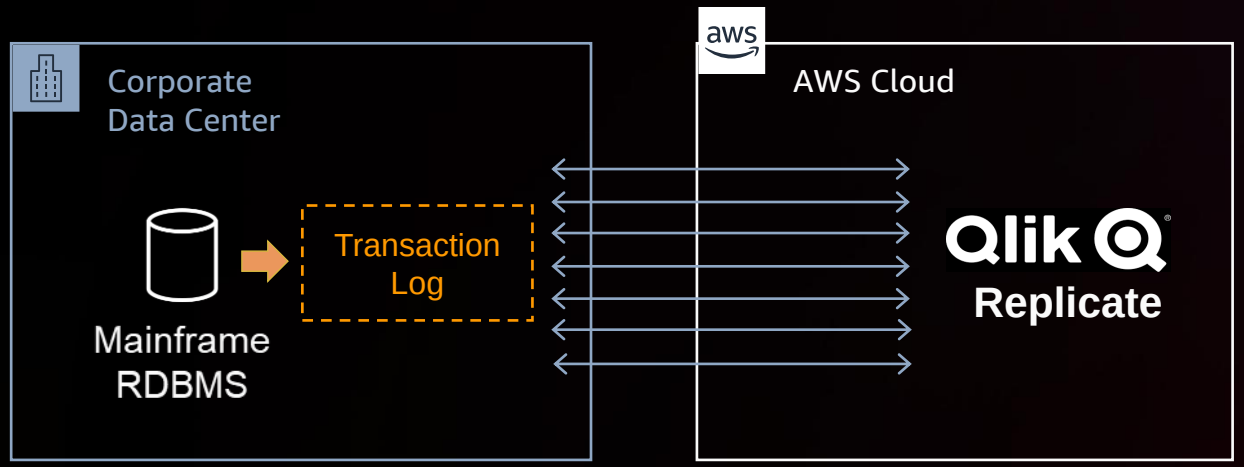
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DRaaS: On-Prem RDBMS → RDS



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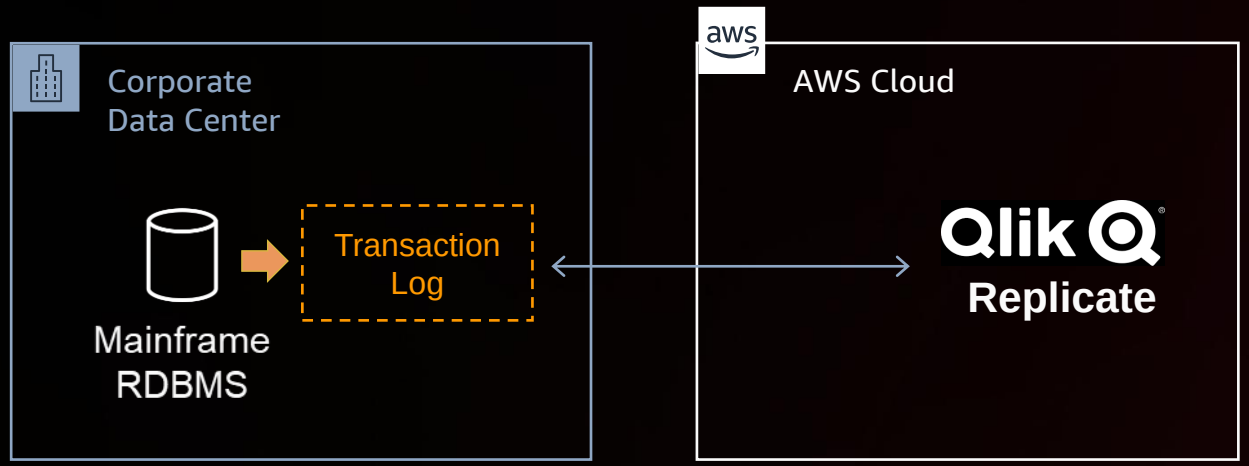
Task-Based CDC (Depreciated)



Each task has a connection to the DB

- CPU and MIPS intensive on mainframe

Log Streaming



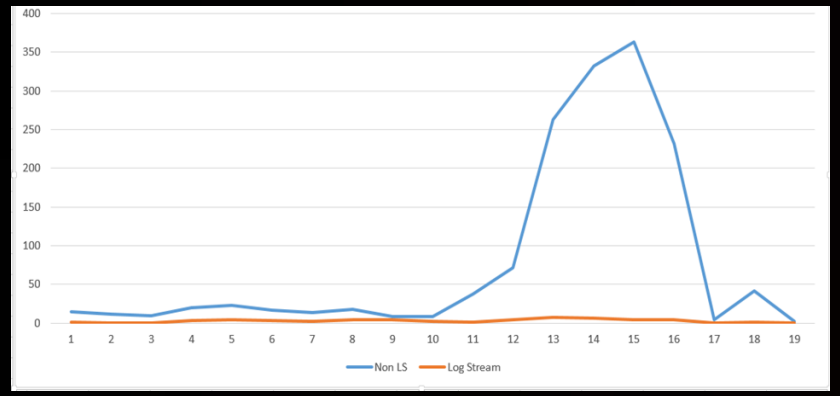
Single connection to DB

Lower CPU and MIPS usage

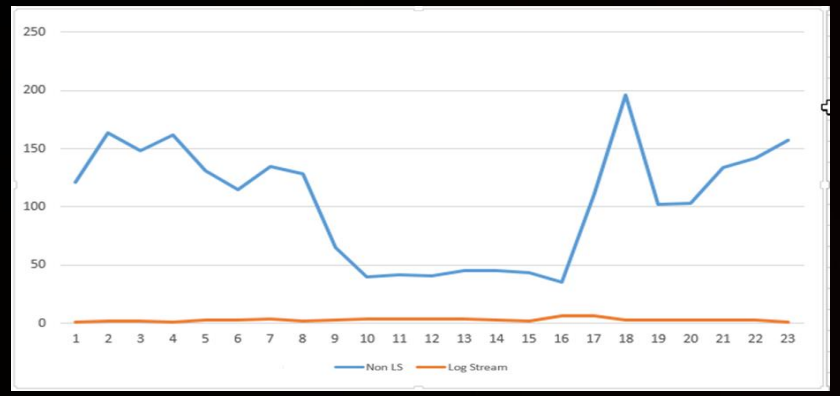
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MIPS: Log Stream vs Non-LS

Line of Business A



Line of Business B



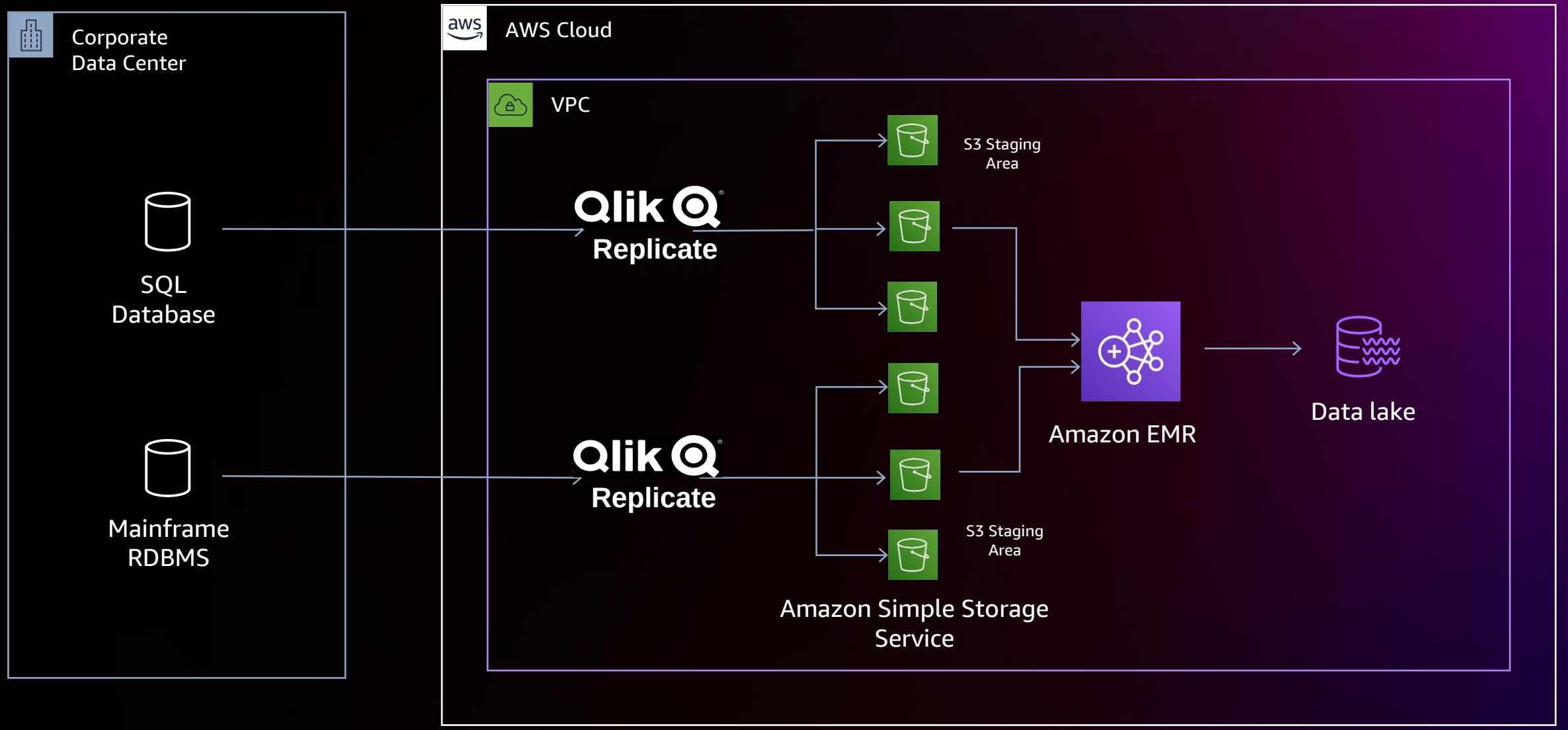
50 to 70% MIPs Reduction

Enabled:

- Enterprise Scalability
- Product Team Autonomy
- Cost Optimization

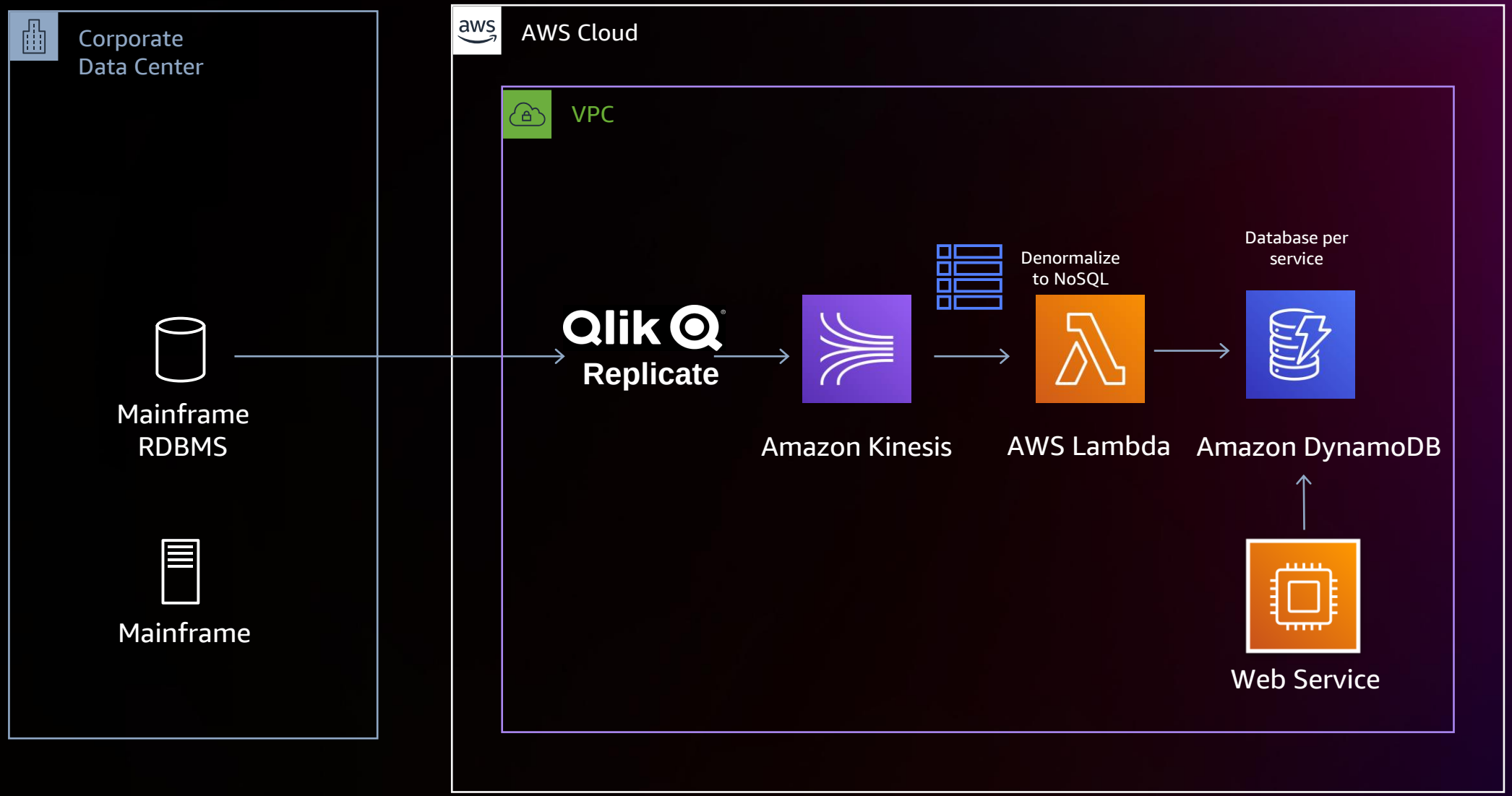
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DRaaS: On-Prem RDBMS → S3 for Analytics



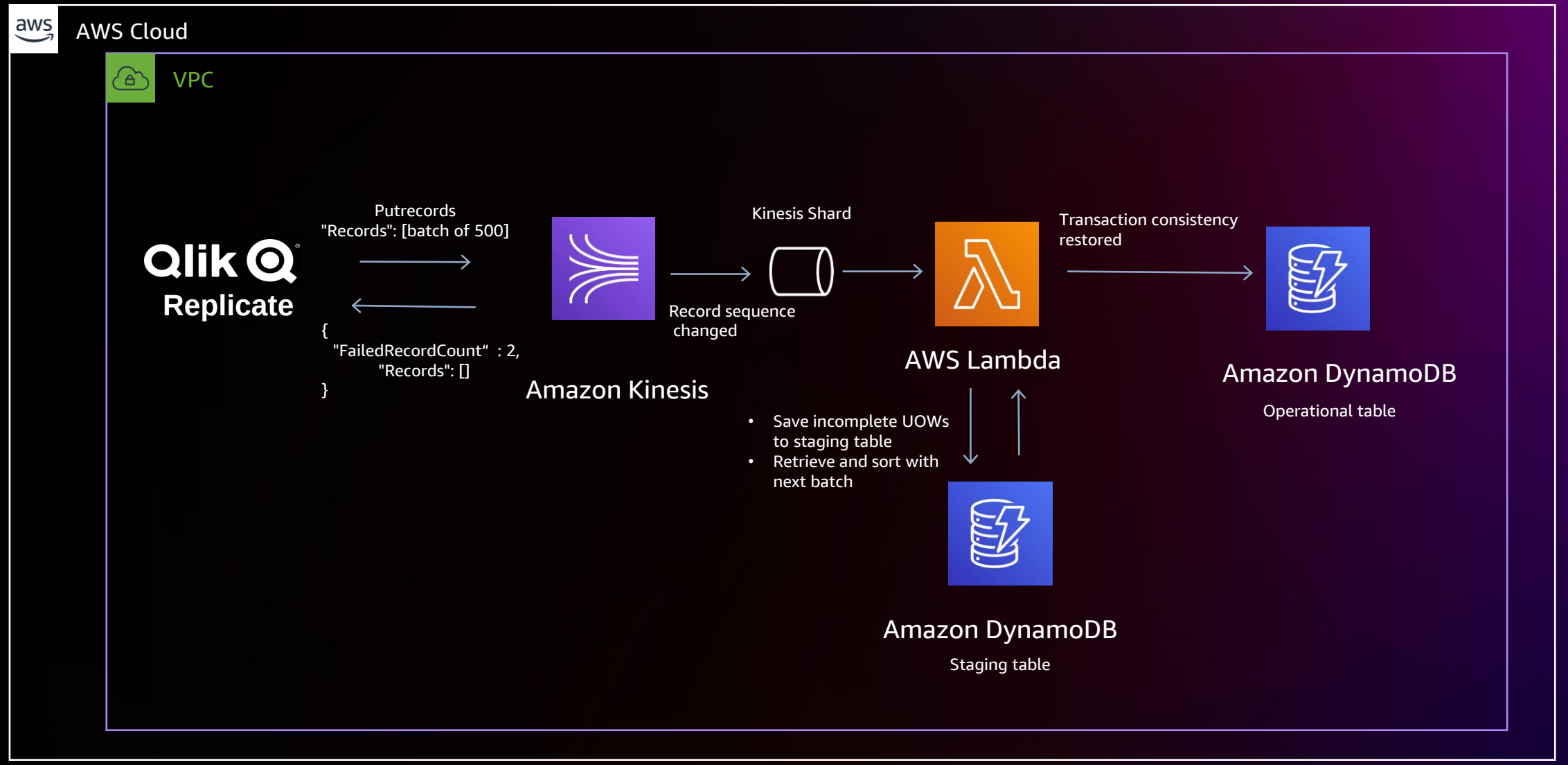
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DRaaS: On-Prem RDBMS → DynamoDB



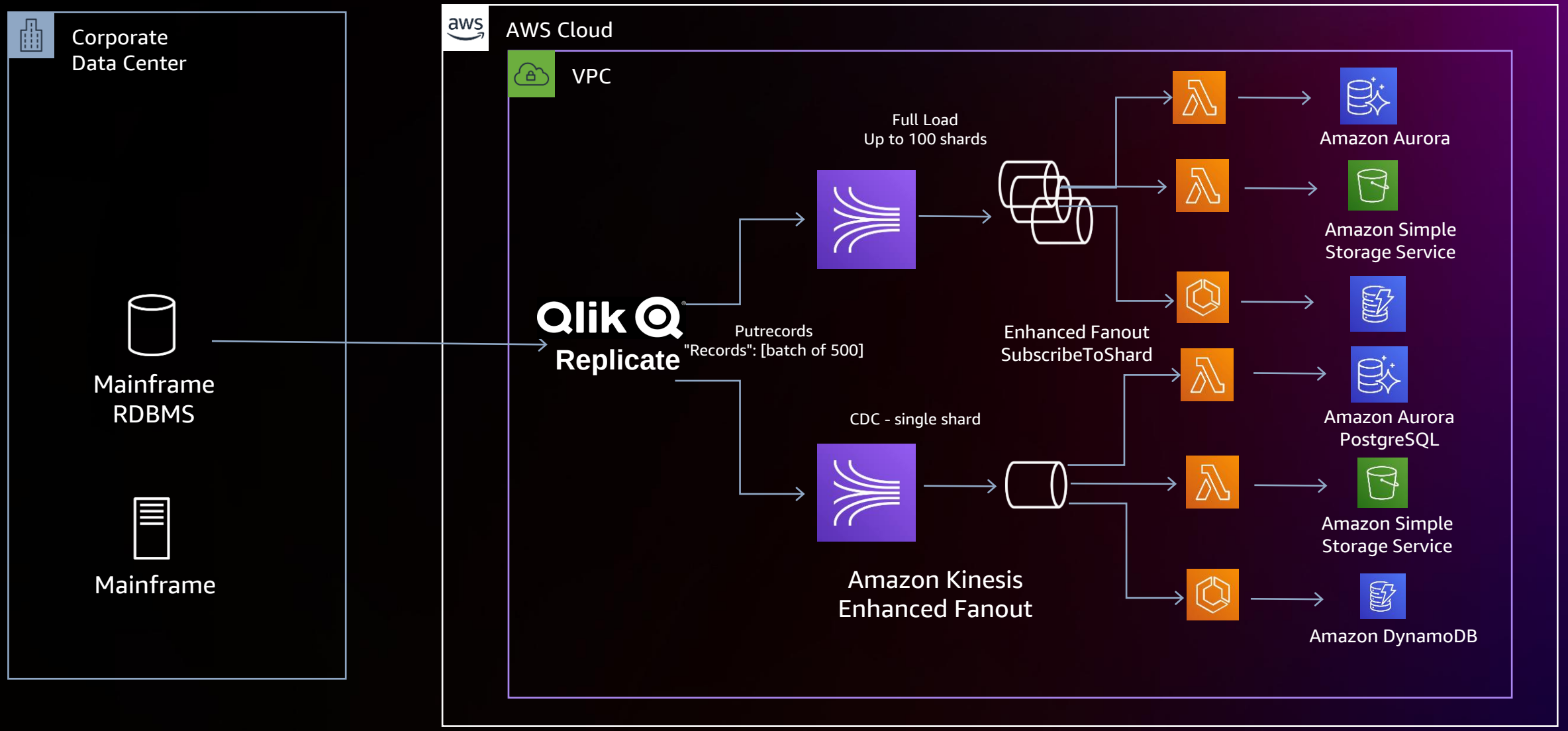
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DRaaS: Transaction Integrity for Kinesis



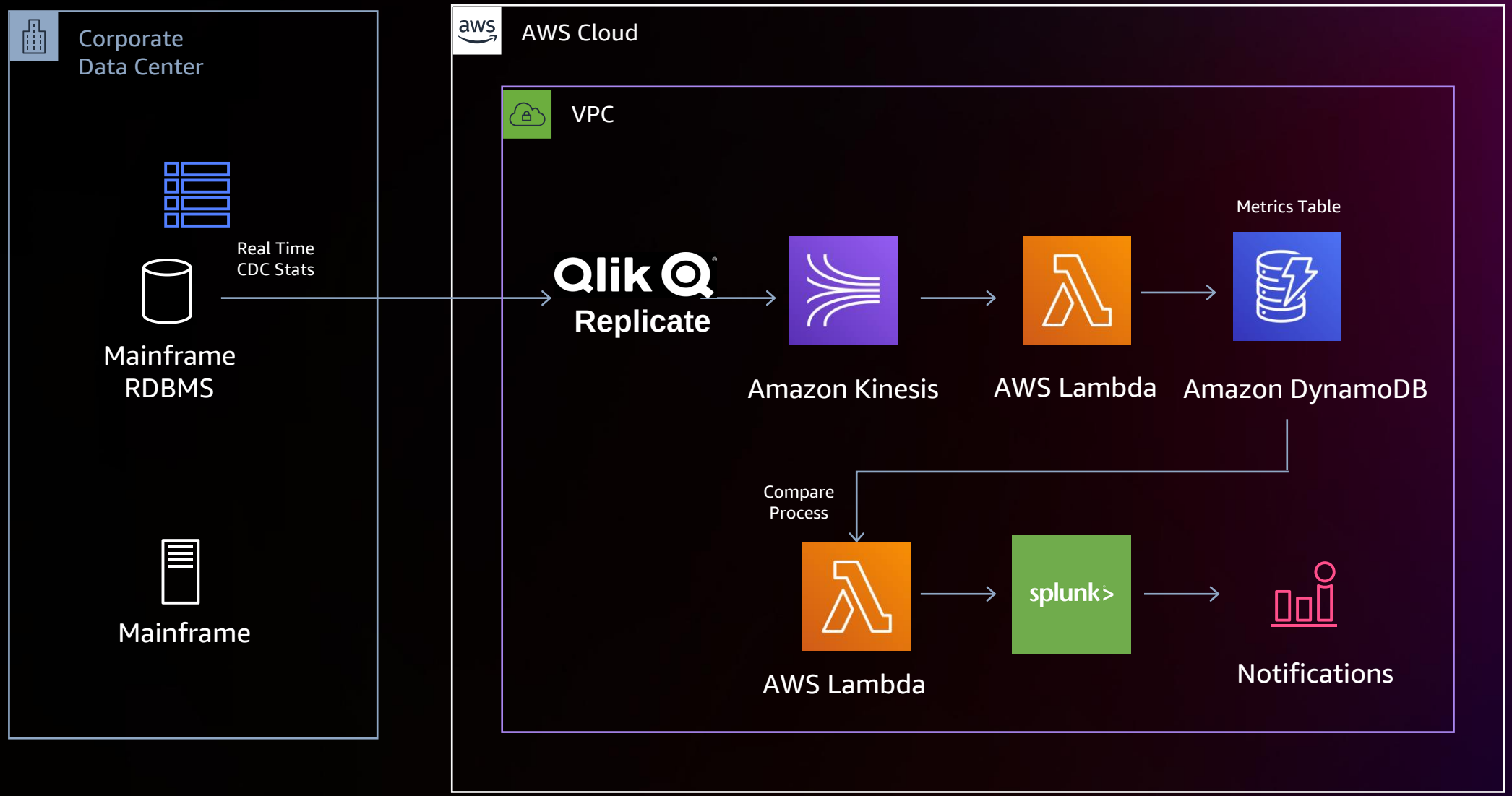
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DRaaS: Kinesis Enhanced Fanout



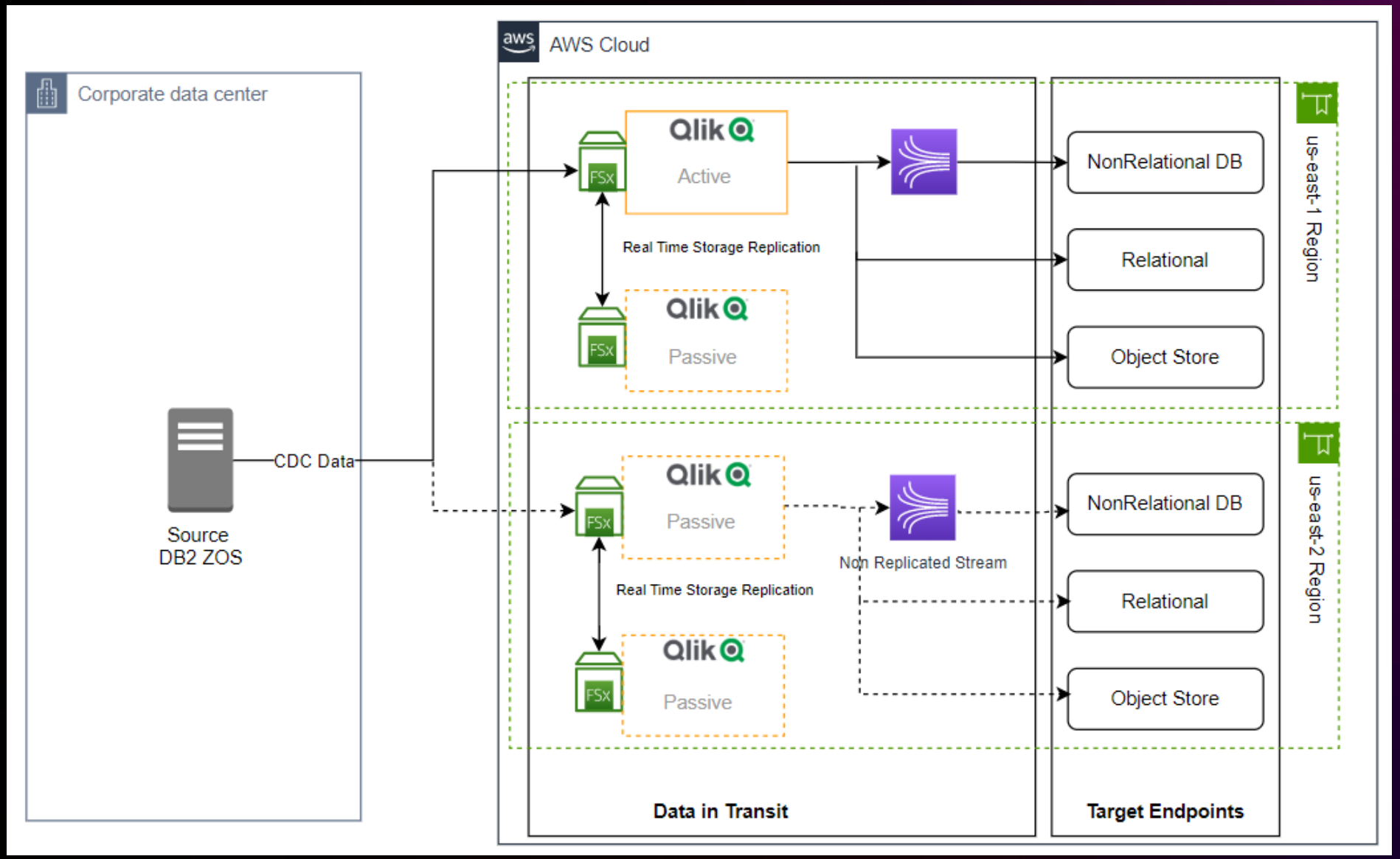
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DRaaS: Data Quality



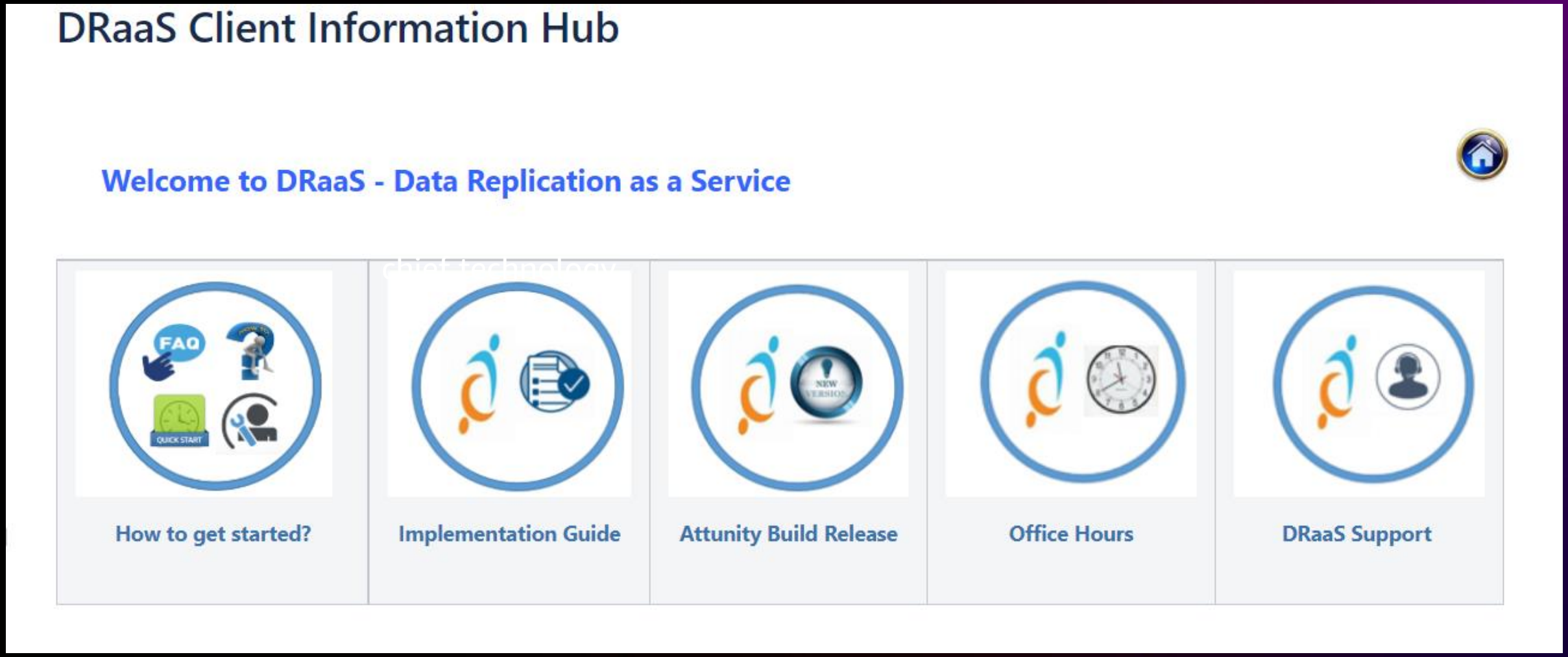
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Multi-Region Architecture



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DRaaS Client Information Hub



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The DRaaS Team

Randy Tongue – Project Manager

Rajeev Tyagi - Architect

Preethi Bheema Rao - Engineer

Brendan Connelly - Engineer

Arun Kumar Manivannan - Engineer

Mackenzie Miller-Emmons – Technical Lead

Pranathi Yerragudi - Architect

Raghu Boppanna - Architect

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Cloud Data Integration at Scale:

SAP

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What does your SAP data do for you?

Many Businesses Runs on SAP

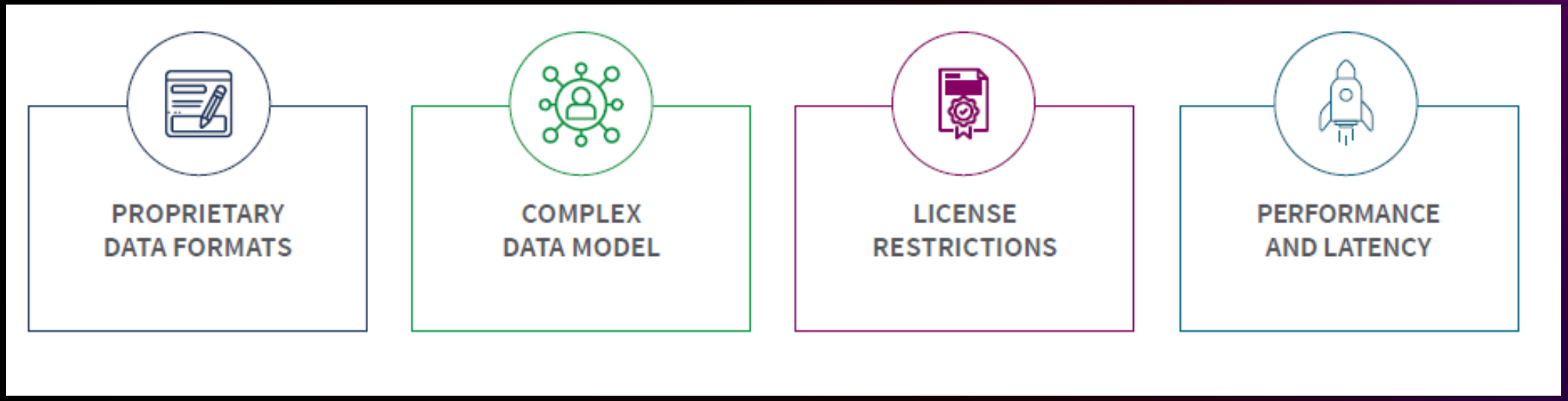
- Processes Orders and Revenue
- Controls and Moves Inventory
- Pays Vendors and Employees
- Maintains Company Financials / GL

SAP Data is the lifeblood for many enterprises

Qlik

SAP Data Challenges

Leveraging and integrating SAP data is not easy



Data formats that make it incomprehensive to most

10s of thousands of tables with intricate relationships

Complex licensing that can become time consuming and costly

Built for transactional performance not real-time analytics

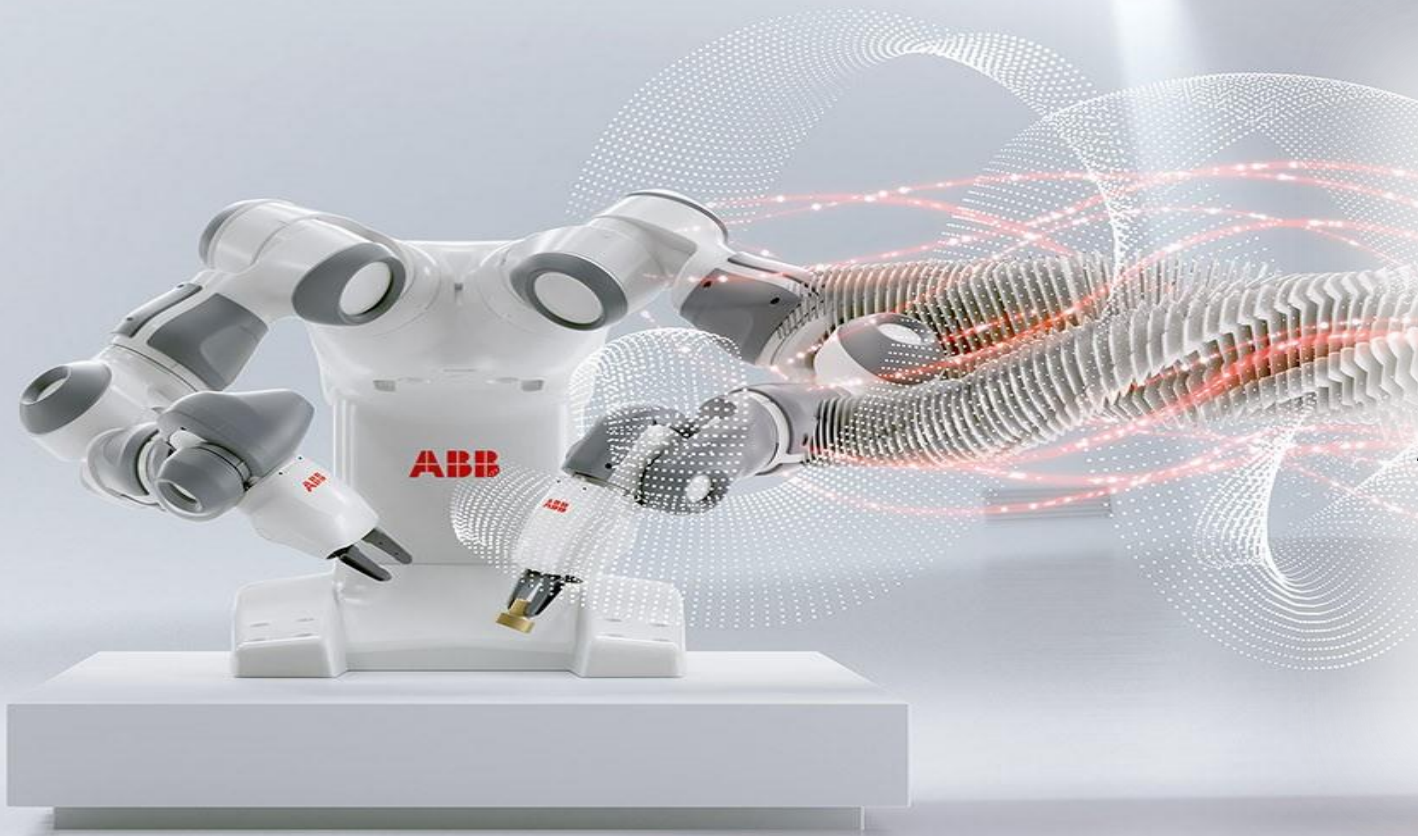
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SAP Data Integration at Scale

A Qlik success story with ABB



"We have made massive strides in improving our daily orders and revenue process. Previously, orders and revenue were available once a month after month close. Now, anyone from the Division President to the sales force can access this information daily through an application on their computer or phone. This means we can act with speed and agility to address gaps in the market"

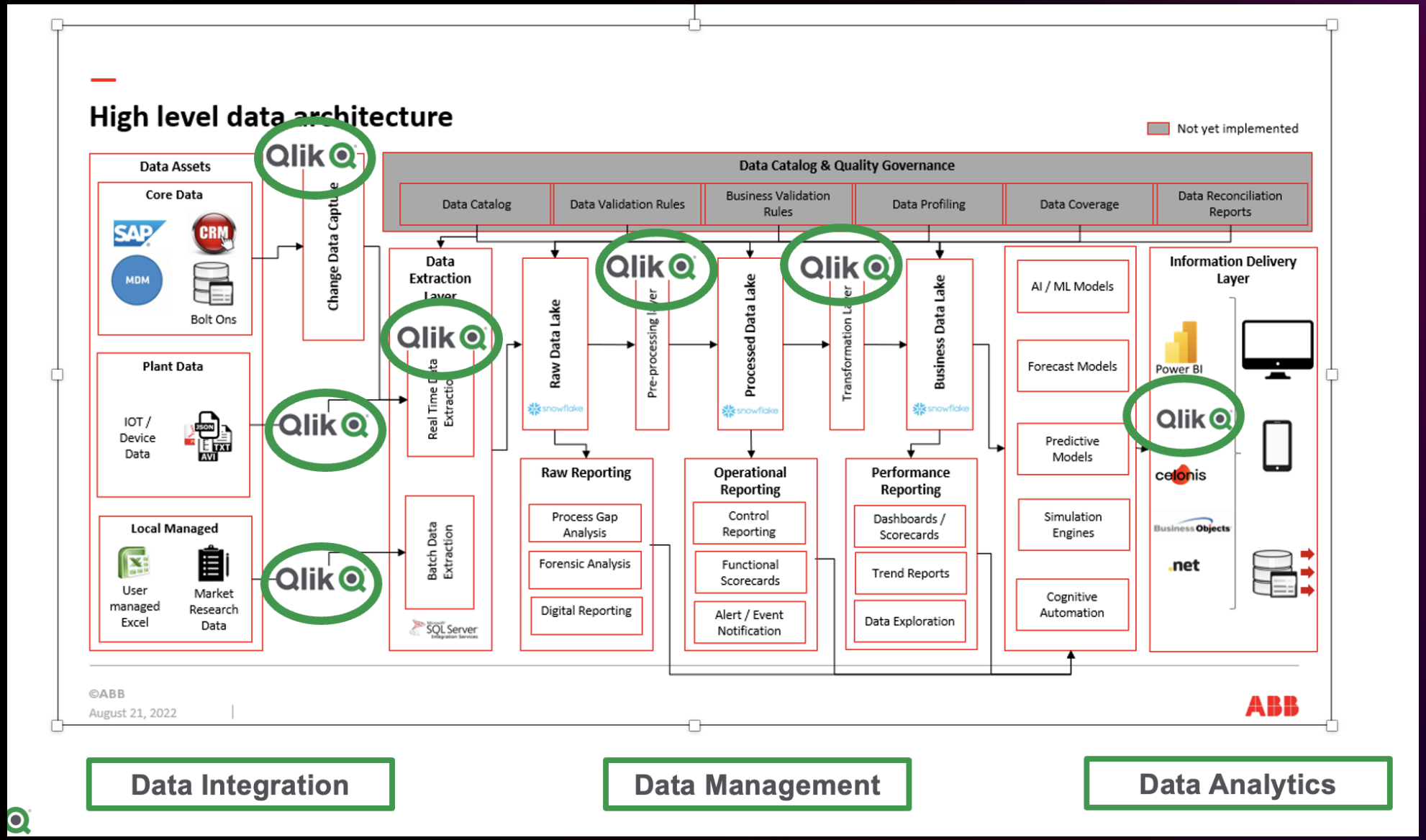
- ABB CFO

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Where Qlik fits within an SAP Architecture



Data Integration | **Data Management** | **Data Analytics**

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Do you know…?

- First 100% cloud-based data lake & data warehouse in ABB
- 37 SAP systems feeding data into data lake every 2 minutes ,24/7, 365 days around the globe
- 550 tables(average) from each SAP systems are being loaded
- 10 years of history available in data lake, some cases all the way up to 20 years
- 63TBs of data
- The largest table(controlling document item) in data lake has 2.3 billion records
- 250 million records get processed per day
- 7000 common data attributes available for data analysis
- 2 seconds query response time over 80m transactions



Babu Kuttala
Chief Data and Analytics Officer, ABB

©ABB

ABB

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Qlik helps you maximize the value of your SAP data

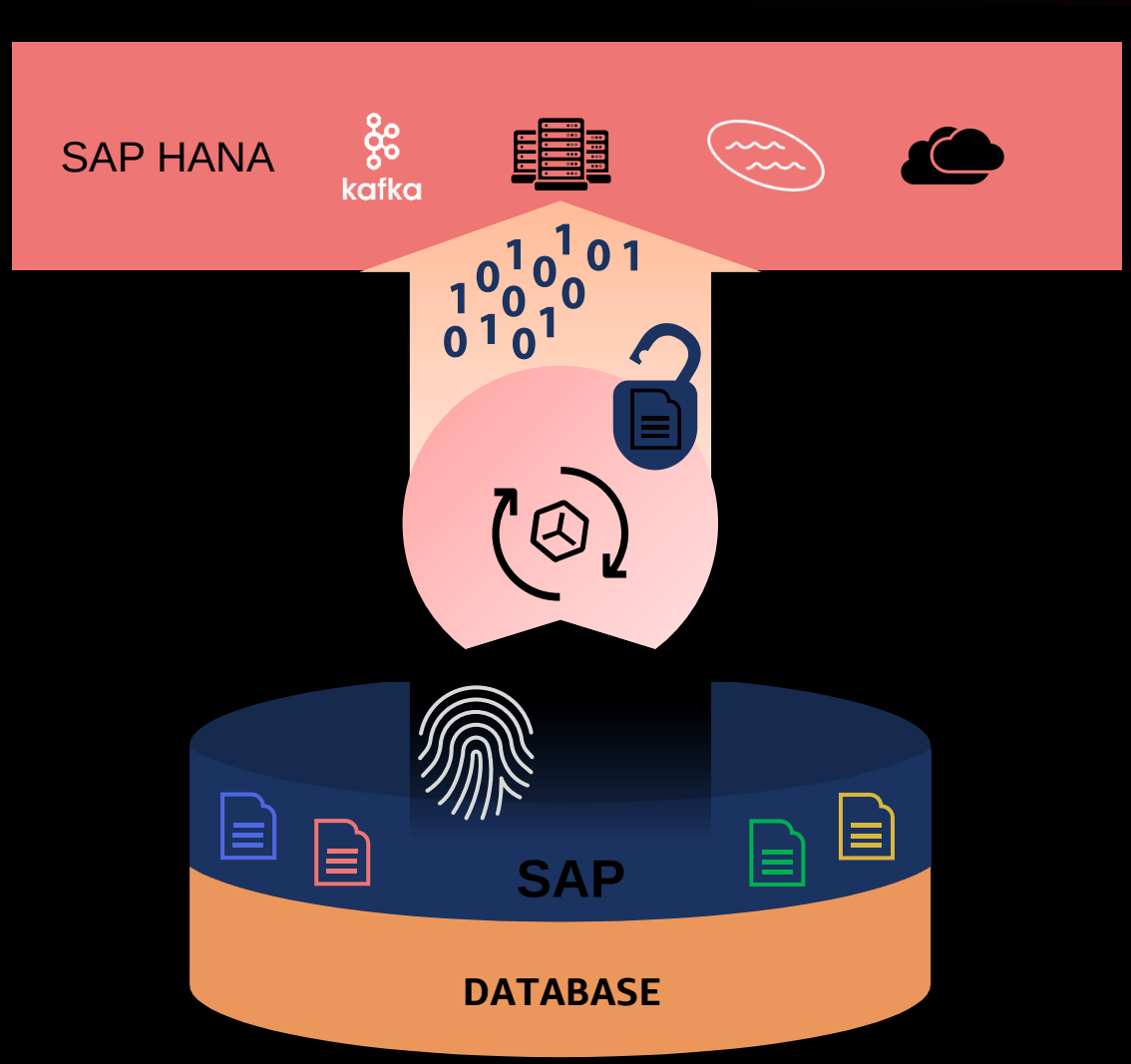
- **Make SAP data accessible and understandable**
  - Deliver live production SAP data to diverse platforms
- **Uncover more insights within your SAP data**
  - One-of-a-kind analytics
- **Streamline SAP test data management**
  - Easily define, copy and synchronize multiple data subsets for testing environments

Closing the gap between data and action

Qlik

Make SAP data accessible and understandable

Qlik Data Integration delivers real-time data to the cloud

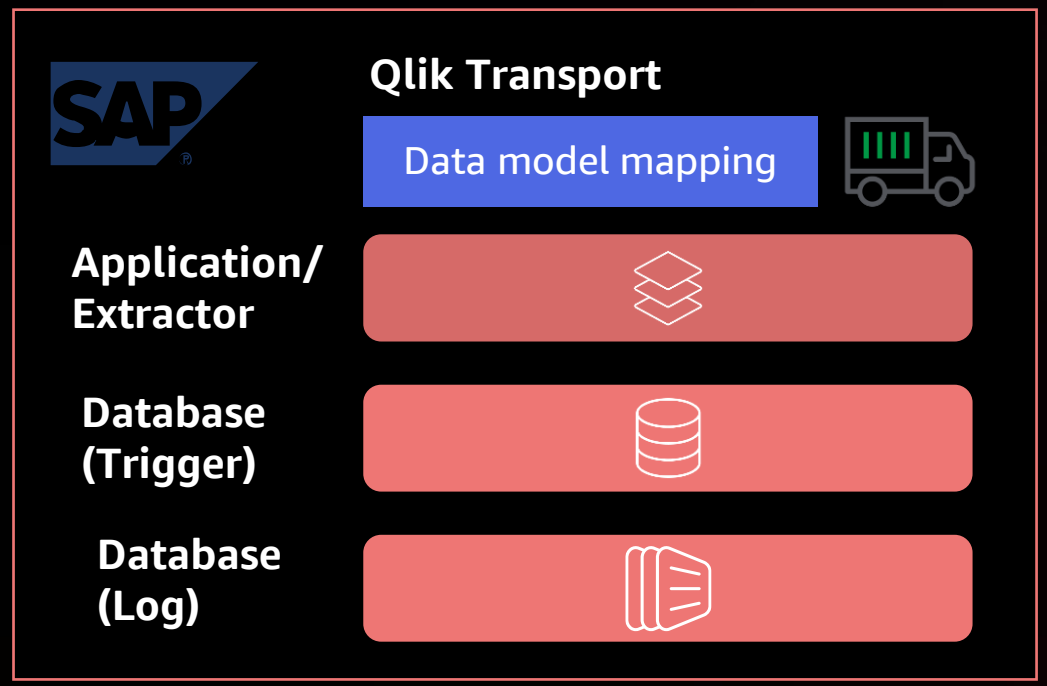


- Real-time data replication
  - Simplified mapping of complex SAP data model
  - Decode the proprietary source structures
  - All core and industry-specific SAP modules
  - Integrate real-time with all major targets
- Automate the data warehouse and data lake lifecycle
- Move external data into SAP HANA

Over 200 enterprises use Qlik
for SAP data movement

Real-time SAP Data Replication

With Qlik Data Integration

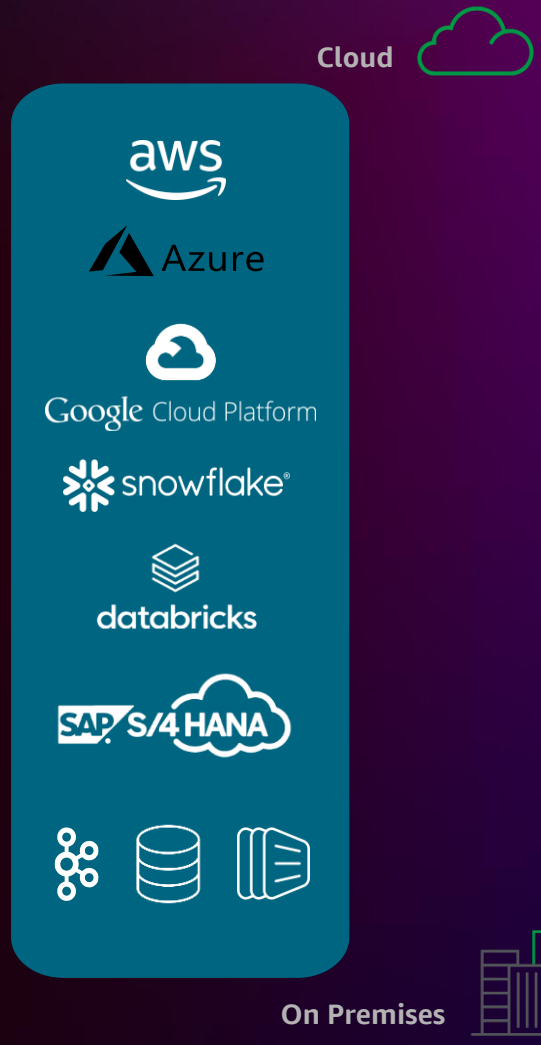


- Native SAP ABAP solution
- Decodes proprietary SAP source structures
- Simplifies complex SAP data model mapping
- Propagates SAP metadata

CDC or Batch



- Supports all core and industry-specific SAP modules
- Log-based, query or application-level SAP integration
- Delivers real-time data to AWS
- Reassembles critical relationships in target (with Qlik Compose)



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Qlik and SAP

Why SAP ODP/ODQ?



Operational Data Provisioning /Queue framework (from SAP)



Supports CDS/HANA Views (various SAP BW objects)



Compression and Improved Performance



Greater visibility *(what's extracted and where)*



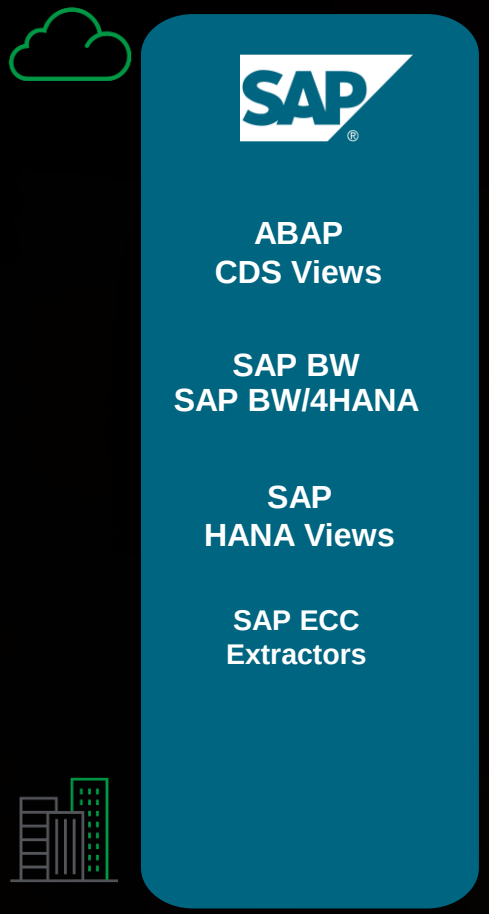
Supports Runtime Scenarios

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Moving SAP Data with ODP



ODP BASED CDC*



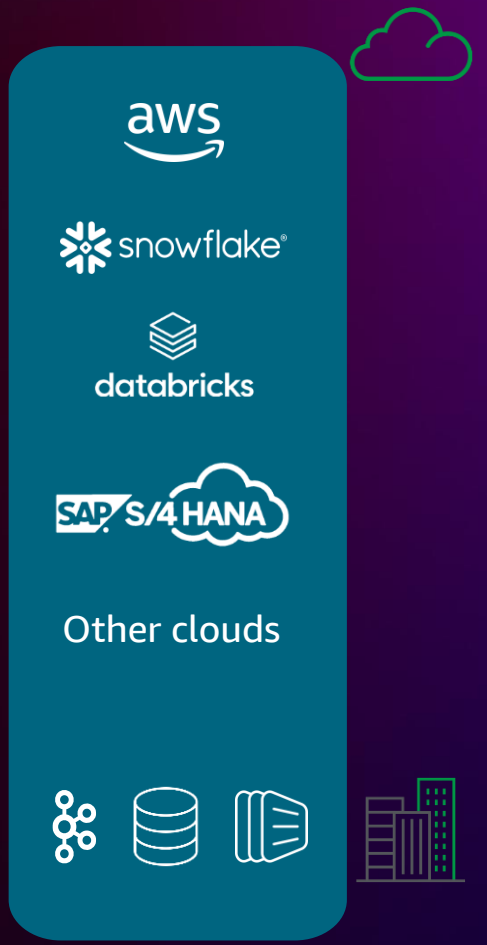
Real-time
CDC stream
or batch
(full load)

Qlik Replicate

- Target schema creation
- SAP data type preservation
- Automated Batch to CDC transition
- Filtering
- Transformations
- Scheduling (API)

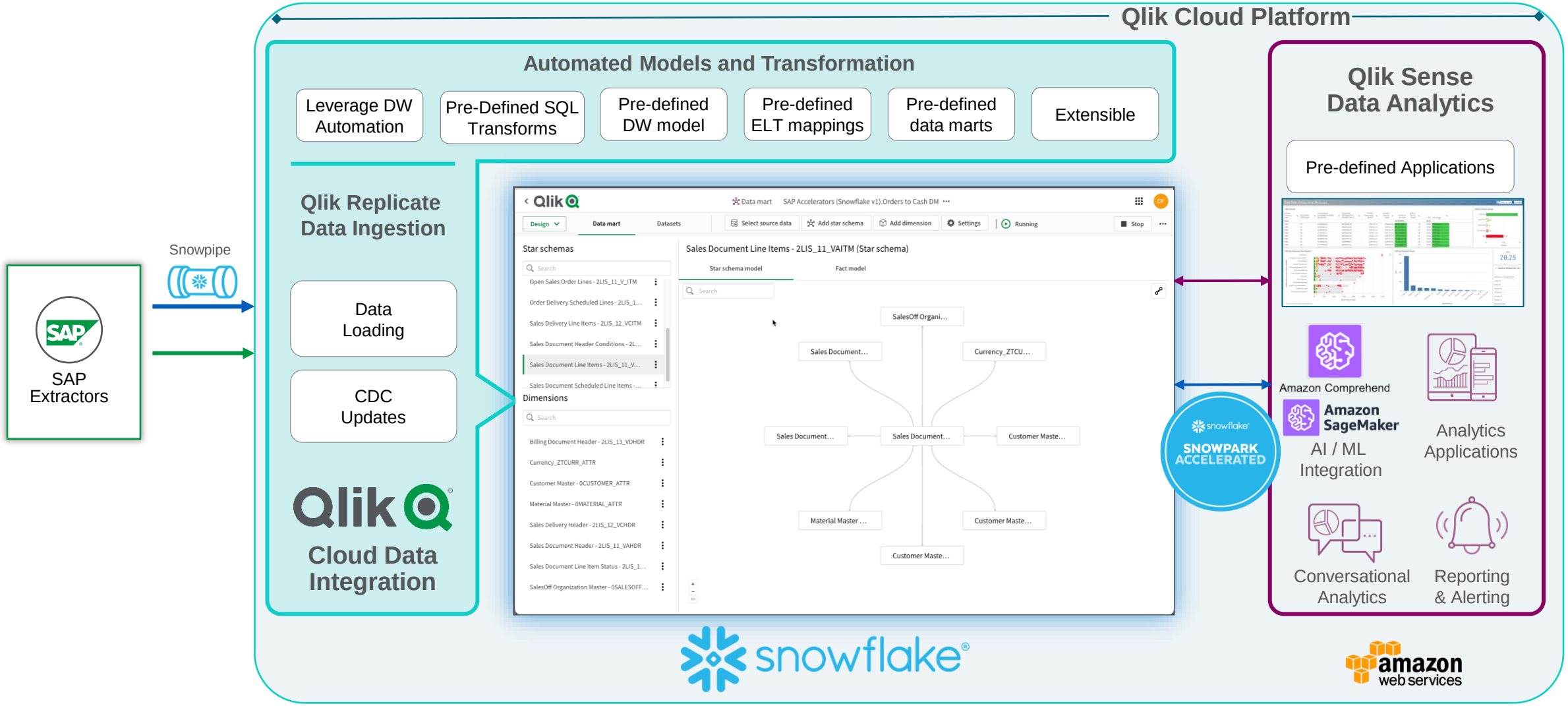


Real-time
CDC stream
or batch
(full load)



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Automating the Analytics Data Pipeline



Qlik SAP Solution Accelerators

Pre-configured content and templates

Order-to-Cash
Optimize sales order fulfillment, billings, and working capital

Financials
Manage and control your P&L, operating costs, and assets & liabilities

Inventory Management
Track inventory levels, movement, and costs



SAP Data **Extractors**

Replication Tasks

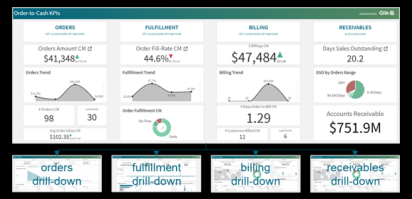
Business Data Models for SAP

Analytics App Templates

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Qlik Solution Accelerator for SAP Order 2 Cash

Putting it all together

prebuilt **extractors** ready to use	prebuilt **replication** tasks	prebuilt **data warehouse models**	**catalog** ready data-marts	prebuilt template **apps**
SAP ERP				
Extractor Queue	Qlik Transport	Sales Order Management	Accessible SAP Data	Prebuilt Qlik App
2LIS_11_VAITM (Sales Item Extractor)	Replicate Tasks	Shipment & Distribution	Documented KPI catalog	Prebuilt Power BI Apps
2LIS_11_VDITM (Billing Document)		Billing		Ready for Alerting
Sales Order Status (2LIS_11_VASTI)		Accounts Receivables		Ready for AI/ML

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Cloud Data Integration at Scale:

Final Thoughts

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Scale

DATA INTEGRATION TO CLOUD CONSIDERATIONS

- Systems
  - Throughput
  - Low latency
  - Availability
  - Non disruptive
- Data Engineering
  - Diverse use cases
  - Transformation for business fit
  - Governance & regulatory
  - Limited resources and expertise

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Scale

DATA INTEGRATION TO CLOUD CONSIDERATIONS

- Systems
  - Real-time, log-based CDC
  - Extract once, deliver many
  - Read from buffers
  - Transactional units of work
  - Point-to-point delivery
  - Non disruptive
- Data Engineering
  - Universal sources/targets
  - Automation – ingestion, warehouse, lakes
  - Catalog and governance
  - Solution accelerators
  - Comprehensive end-to-end solution
  - Open and agile

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Please complete the session survey in the **mobile app**

Thank you!

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Learn more at the Qlik booth #3528
in the Data & Analytics neighborhood

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