

## Case Study

Industry: Healthcare Insurance

# Transforming Healthcare Data Infrastructure



## Quick Stats

### Verticals Served

Data

Cloud

DevOps

### Technology Stack

**AWS CDK, CodeBuild, Kafka (MSK),  
Snowflake, AWS Integration Services**

### Fixed or Ongoing Project

**Ongoing Project**

### Team Size

**9**

### Project Build

**Started from Scratch**

## Background

Blue Cross of Idaho (BCI) is a healthcare insurance company that provides a range of health coverage solutions and relies heavily on data to drive business insights and improve operational efficiency.

### Phase 1:

BCI needed an enterprise solution that would integrate and ingest data from multiple Clinical Data Environments (CDEs, CCD, ADT) via APIs and queuing services into Snowflake using a robust CI/CD pipeline.

### Phase 2:

BCI centralized its organizational data in S3 buckets acting as a data lake, and the next step involved migrating this data to Snowflake using AWS integration services to enable advanced analytics and reporting.

## Key Results

### End-to-End Data Visibility

From ingestion to reporting, healthcare teams gained full transparency into their data

### Streamlined Patient Insights

Real-time access to admissions, discharges, and clinical data enabled better care coordination

### Scalable Infrastructure Built to Grow

Future-ready architecture designed to evolve with BCI's needs

# The Challenge

## Phase 1:

Data came in raw without field information across multiple data sources - ADT and CCD, making it difficult to unify and access real-time healthcare information. The lack of a standardized pipeline for ingesting and managing data from APIs and queuing services led to inconsistent data handling. Critical patient-related data must be reliably exchanged and analyzed between healthcare systems, such as admissions, discharges, and transfers.

## Phase 2:

The existing S3 data lake had become overcrowded and disorganized, leading to difficulties in managing and querying data effectively. Lack of visibility and structure in stored data hindered analytics and business intelligence efforts. Poor organization and performance of the S3-based system caused delayed insights and reduced usability of data across departments, and there was a growing need for a more readable and structured data environment to support better decision-making.

# The Process

## Phase 1: Connecting External APIs to Snowflake

We used an agile approach, working closely with business teams to identify data sources and needs. The solution pulled data via AWS AppFlow, stored it in S3, processed it with AWS Glue, streamed it through Kafka, and loaded it into Snowflake. Each stage was tested for reliability, and CI/CD pipelines ensured consistent deployments. To address inconsistent API formats, we implemented flexible transformation logic.

## Phase 2: Migrating S3 Data to Snowflake

We cleaned and migrated disorganized CMS data from S3 into Snowflake. Using AWS Lambda and Glue, we transformed files, added context from CMS docs, and loaded structured data into Snowflake. Reusable components and sample-based testing improved efficiency. Infrastructure-as-code enabled quick, repeatable deployments. To manage S3's volume and variety, we introduced tagging, partitioning, and a layered Snowflake structure for improved organization and accessibility.

# Results & Impact

### ✓ Automated, End-to-End Data Flow

Phase 1 streamlined the entire data pipeline, replacing manual processes with automation. Real-time data flow now supports seamless sharing of critical healthcare information, including admissions, discharges, transfers, and patient health records.

### ✓ Improved Visibility and Access

Phase 2 focused on migrating disorganized data from S3 into Snowflake. With clean, centralized storage, teams now have easier access to structured data, supporting faster insights and more confident decision-making across the organization.



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