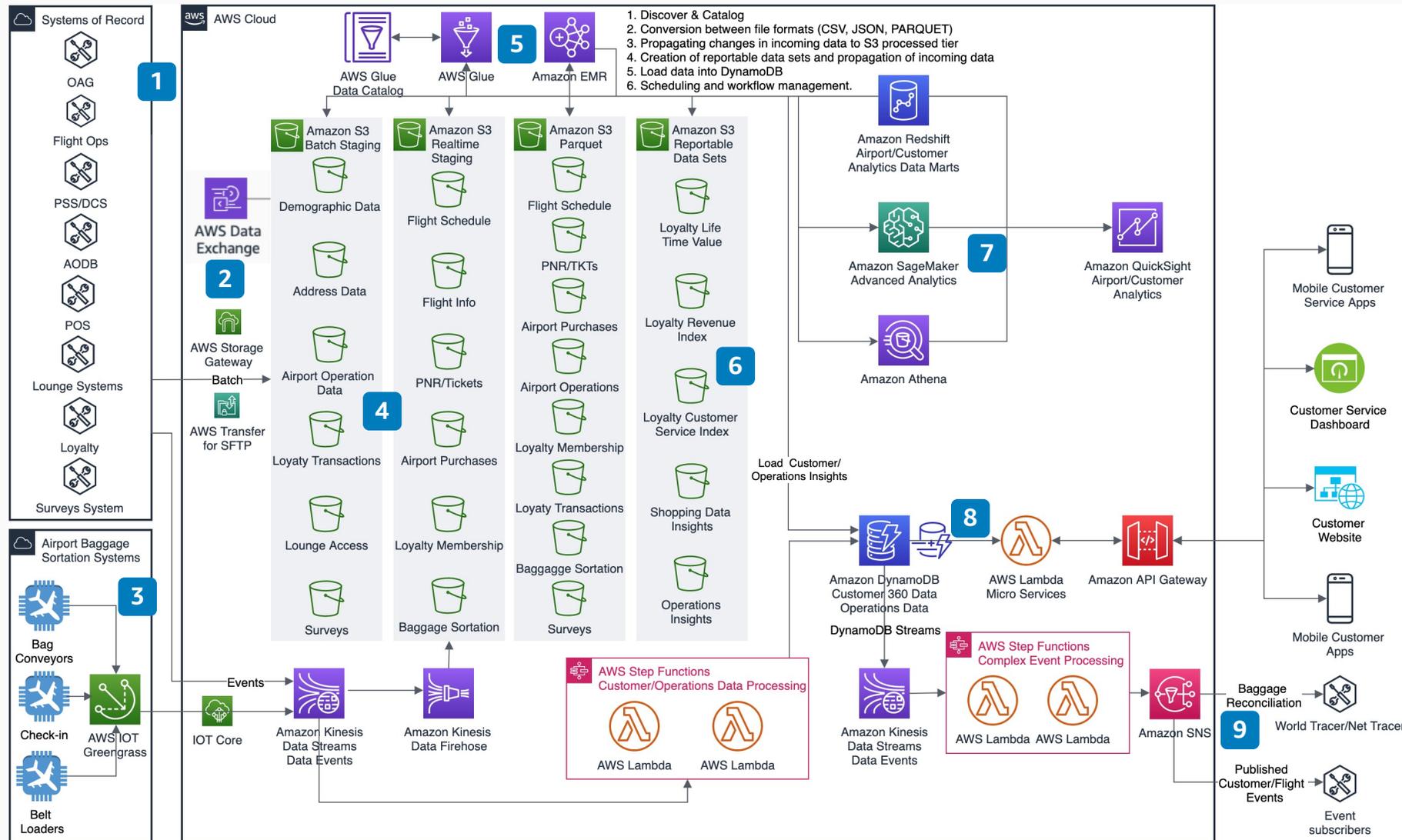# Airport Data Platform for Enhanced Traveler Experience

Build a data platform for airports that can create an enhanced customer experience by collaborating with airlines, vendors, and lounge providers using open data standards, purpose-built databases, and extensible serverless architecture.

Systems of Record
- OAG
- Flight Ops
- PSS/DCS
- AODB
- POS
- Lounge Systems
- Loyalty
- Surveys System

Airport Baggage Sortation Systems
- Bag Conveyors
- Check-in
- Belt Loaders

AWS IOT Greengrass

IOT Core

AWS Cloud

AWS Data Exchange

AWS Storage Gateway — Batch

AWS Transfer for SFTP

AWS Glue Data Catalog — AWS Glue — Amazon EMR

1. Discover & Catalog
2. Conversion between file formats (CSV, JSON, PARQUET)
3. Propagating changes in incoming data to S3 processed tier
4. Creation of reportable data sets and propagation of incoming data
5. Load data into DynamoDB
6. Scheduling and workflow management.

Amazon S3 Batch Staging
- Demographic Data
- Address Data
- Airport Operation Data
- Loyaty Transactions
- Lounge Access
- Surveys

Amazon S3 Realtime Staging
- Flight Schedule
- Flight Info
- PNR/Tickets
- Airport Purchases
- Loyalty Membership
- Baggage Sortation

Amazon S3 Parquet
- Flight Schedule
- PNR/TKTs
- Airport Purchases
- Airport Operations
- Loyalty Membership
- Loyaty Transactions
- Baggagge Sortation
- Surveys

Amazon S3 Reportable Data Sets
- Loyalty Life Time Value
- Loyalty Revenue Index
- Loyalty Customer Service Index
- Shopping Data Insights
- Operations Insights

Amazon Redshift Airport/Customer Analytics Data Marts

Amazon SageMaker Advanced Analytics

Amazon Athena

Amazon QuickSight Airport/Customer Analytics

Load Customer/Operations Insights

Amazon DynamoDB Customer 360 Data Operations Data

DynamoDB Streams

AWS Lambda Micro Services

Amazon API Gateway

Events

Amazon Kinesis Data Streams Data Events

Amazon Kinesis Data Firehose

AWS Step Functions Customer/Operations Data Processing
- AWS Lambda
- AWS Lambda

Amazon Kinesis Data Streams Data Events

AWS Step Functions Complex Event Processing
- AWS Lambda
- AWS Lambda

Amazon SNS

Baggage Reconciliation — World Tracer/Net Tracer

Published Customer/Flight Events — Event subscribers

Mobile Customer Service Apps

Customer Service Dashboard

Customer Website

Mobile Customer Apps

Steps

1. Build a data platform with schedules, real-time flight information, traveler check-ins, loyalty transactions, lounge usage, transactions in the airport, and loyalty.

2. Leverage **AWS Data Exchange** to make the data collection from public sources for demographic and address data.

3. Optionally, enhance the baggage system with RFID based sortation and tracking. If not, leverage the bar code scanners and baggage sortation events.

4. Provide Staging for ingesting all batch and real-time data using cost effective storage classes in **Amazon S3**.

5. Use open standards to build the data lake using the same data as the operational data platform. Use a read pattern schema to make the raw data and curated data readily available for all user roles seamlessly.

6. Build all reportable data sets in **Amazon S3** and leverage **Amazon Redshift** and **Amazon Athena** for analytics. Optionally, build data marts in **Amazon Redshift** for heavily used analytics. For ad-hoc requirements, publish the data catalog and use **Amazon Athena** for analysis directly using the data lake.

7. Use **Amazon SageMaker** to provide standard AI/ML models for operational analytics. Customers can also use **Amazon SageMaker** to build their own models on top of the data.

8. Use purpose-built databases like **Amazon DynamoDB** and serverless architecture to deliver microservices and events for operational data store. Build a real-time operational dashboards and customer applications leveraging these microservices.

9. Publish flight and customer events to customers and down stream systems for baggage reconciliation and ground transportation.

AWS Reference Architecture

Get Started with AWS