# **E-Commerce Analytics Hub with Predictive Inventory (AWS)**

#### Problem Statement (Focused & Scoped for 1 Week)

E-commerce businesses struggle with:

- 1. **Delayed stockout detection** Traditional analytics take hours/days to process, missing real-time sales trends.
- 2. Manual inventory forecasting Teams rely on spreadsheets, leading to overstocking or stockouts.
- 3. High AWS costs Complex pipelines can exceed free-tier limits if not optimized.

#### **Goal**: Build a **real-time analytics pipeline** that:

- ✓ Processes live sales data
- ✓ Predicts stockouts using ML
- √ Runs entirely on AWS Free Tier
- ✓ Delivers insights in <5 min latency

#### **Solution (1-Week MVP Approach)**

#### 1. Data Ingestion (Kinesis - Free Tier)

- Simulate real-time sales data (Python script → Kinesis)
- Free Tier: 1 shard @ 1MB/s (enough for demo)

### 2. ETL (Glue PySpark - Serverless & Free Tier)

- Deduplicate, clean, and aggregate sales data
- Feature engineering (rolling sales averages, product trends)
- Cost Saver: Use Glue Bookmarks to avoid reprocessing

#### 3. Predictive Inventory (Redshift ML - Free Tier)

- Train a simple demand-forecasting model (ARIMA or Linear Regression)
- Predict stockouts based on sales velocity
- Free Tier: Redshift Serverless (up to 8 hours/day)

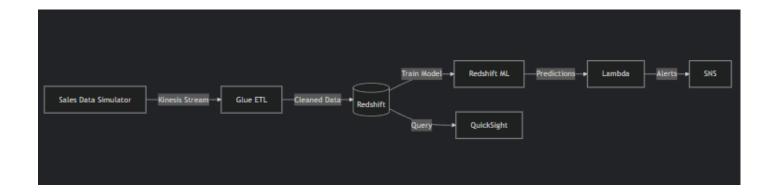
#### 4. Serverless Alerting (Lambda + SNS - Free Tier)

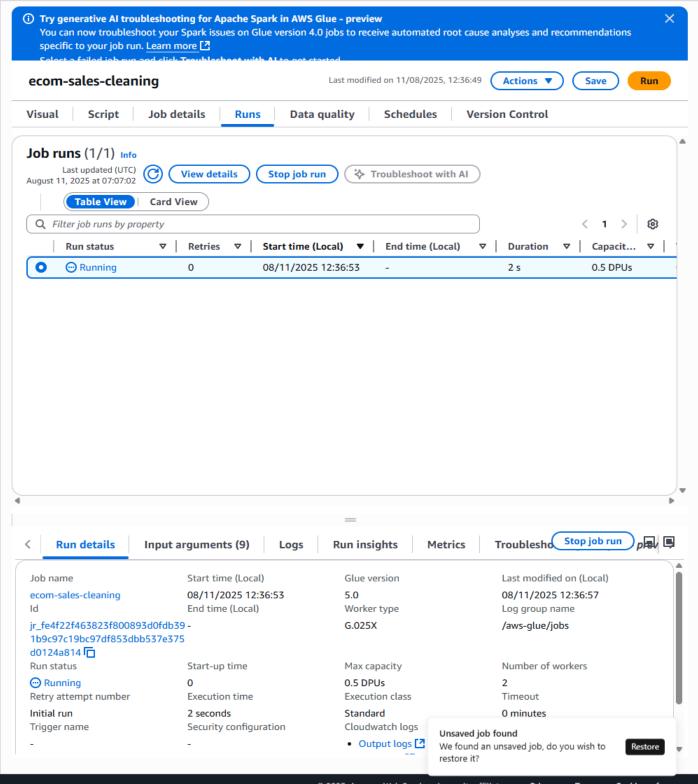
- Trigger alerts when stockout risk >80%
- Send email/SMS via SNS (Free Tier: 1M requests/month)

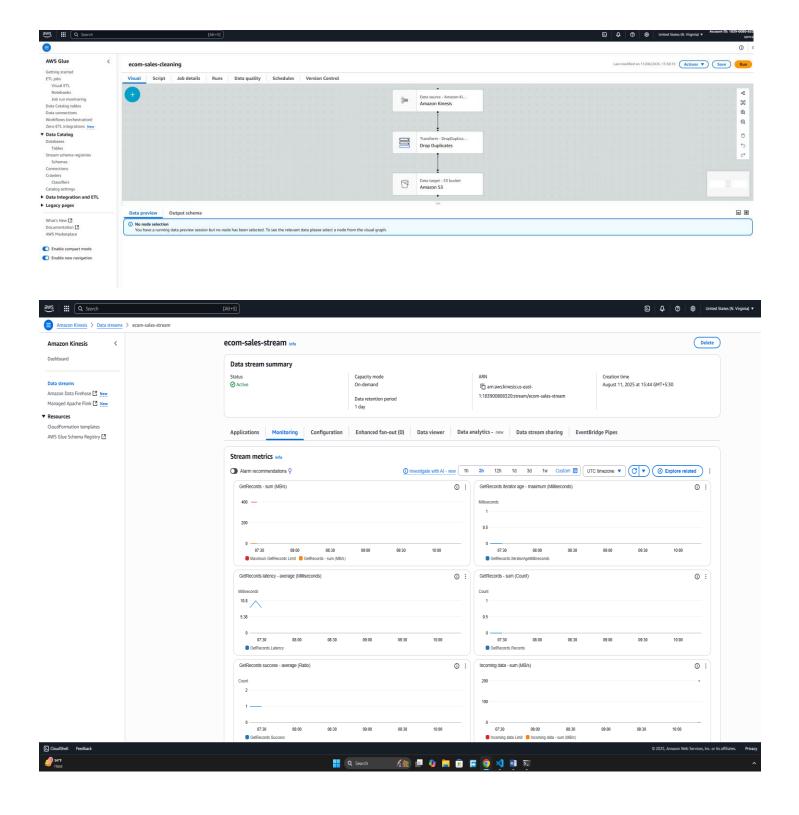
## 5. Dashboard (QuickSight - Free Tier)

- Visualize real-time sales vs. predictions
- Highlight at-risk products

```
Repository Structure (1-Week MVP)
                                                            © Copy ± Download
ecom-stockout-predictor/
   **data-simulator/**
   - **glue-et1/**
    — sales-cleaning.py # Glue PySpark job (dedupe, aggregate)
    feature-engineering.py # Rolling averages, trend features
   **redshift-ml/**
    — train-model.sql # Redshift ML training script
   predict-stockouts.sql # Daily predictions
   **lambda-alerts/**
   **terraform/**
                      # Infrastructure-as-Code (optional)
   └─ main.tf
                      # AWS setup (Kinesis, Glue, Redshift)
   **quicksight-dash/**
                      # JSON export of dashboard
   └─ stockout-dashboard.json
   **README.md**
                      # Setup guide, Free Tier limits
```









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Getting started ETL jobs

Visual ETL

Notebooks

Job run monitoring

Data Catalog tables

Data connections

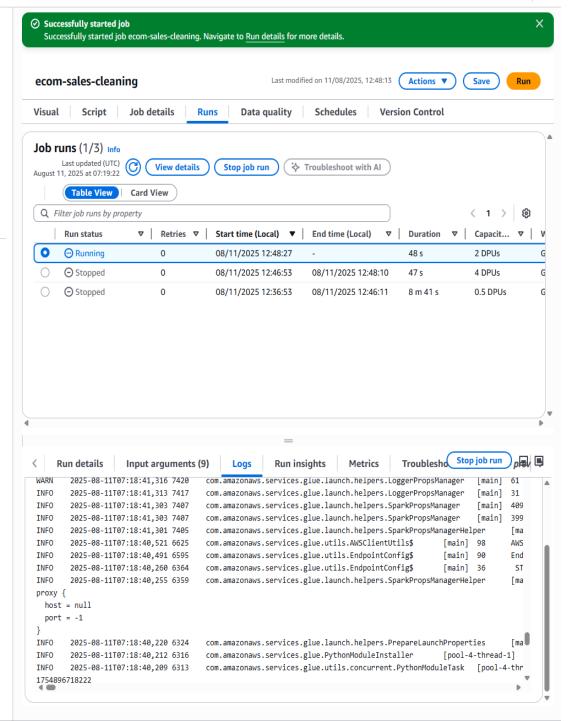
Workflows (orchestration)

Zero-ETL integrations New

- Data Catalog
- Data Integration and ETL
- Legacy pages

What's New [7] Documentation [2] AWS Marketplace

- Enable compact mode
- Enable new navigation



**∑.** CloudShell

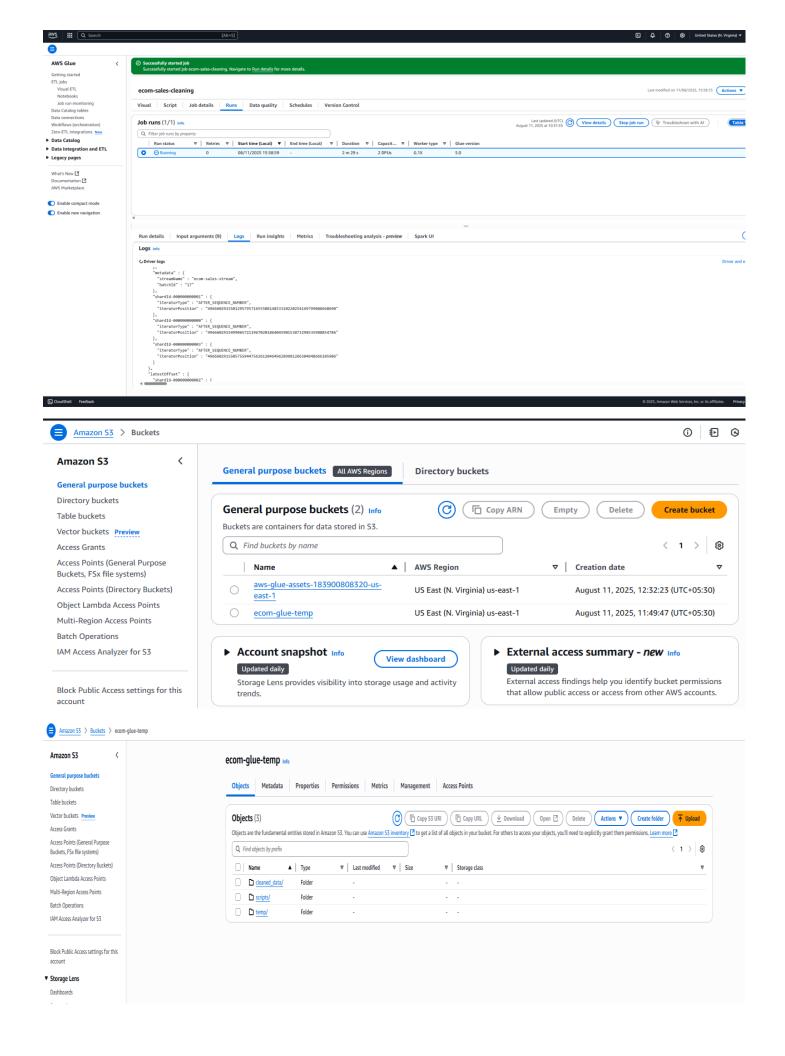
Feedback

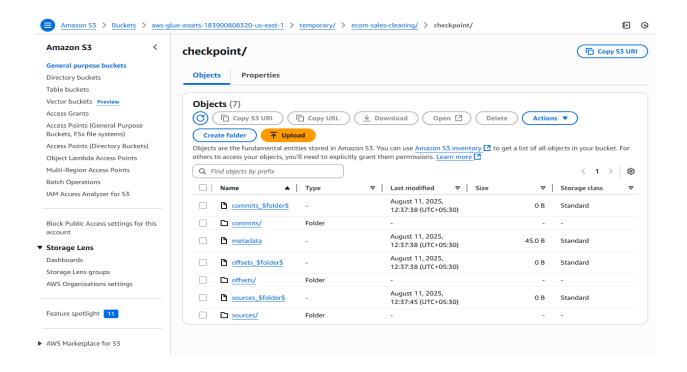
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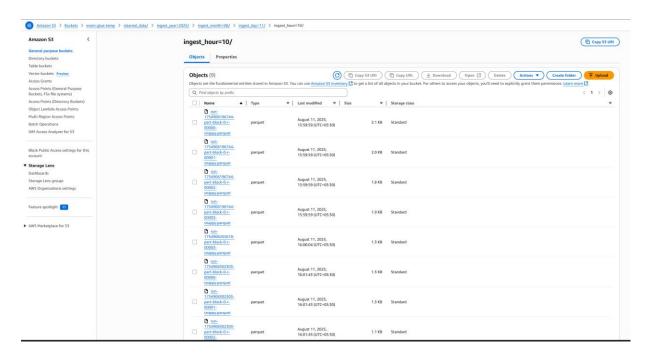
Privacy

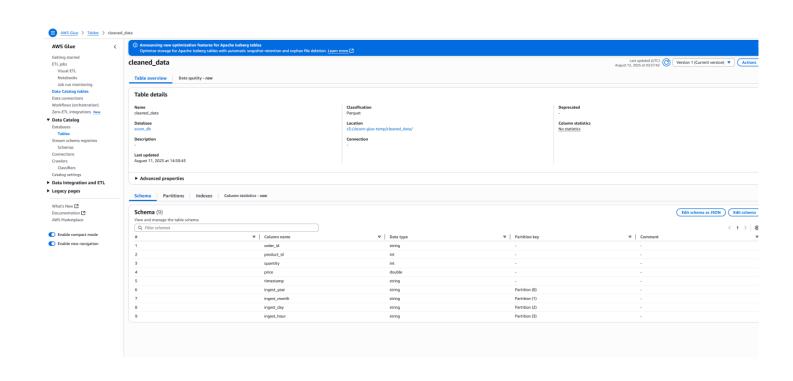
Terms

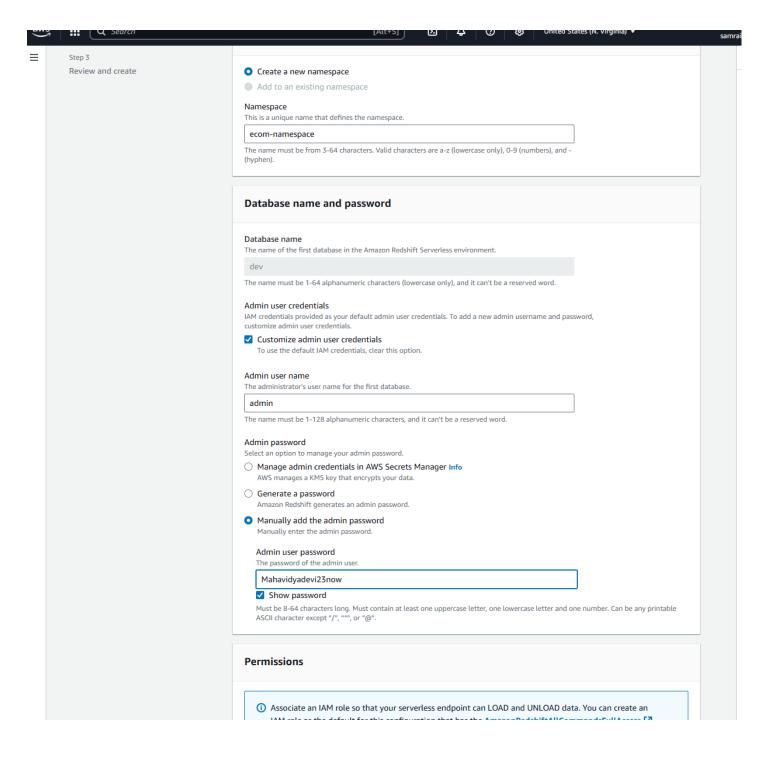
Cookie preferences

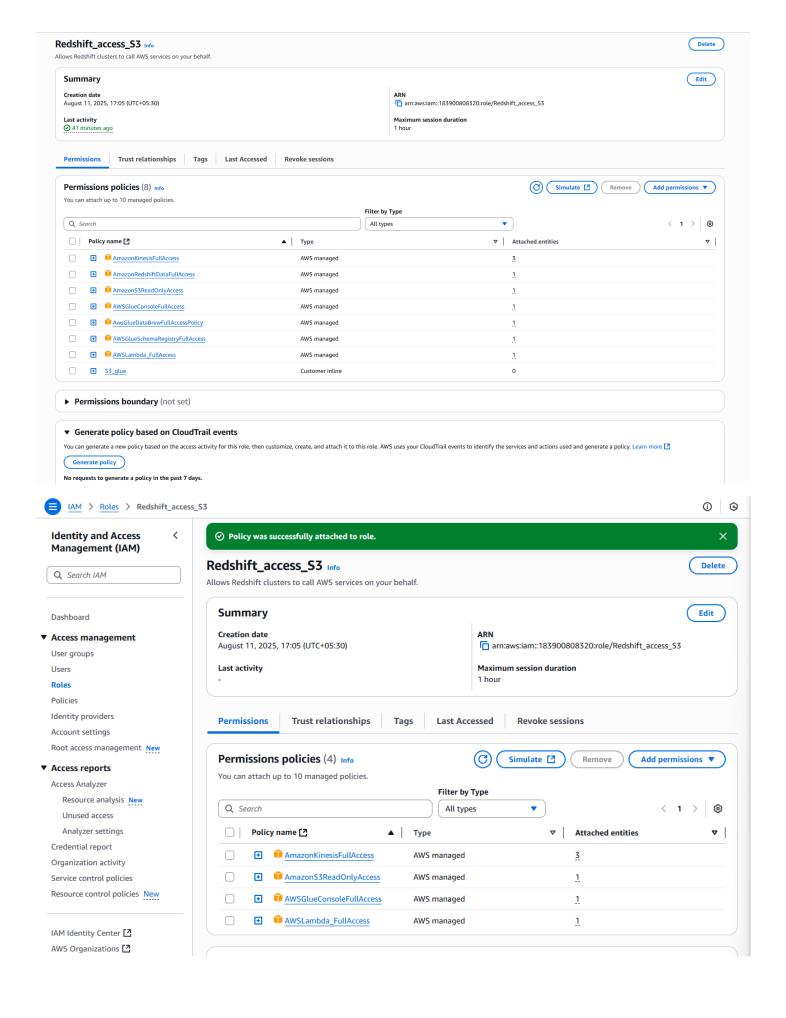


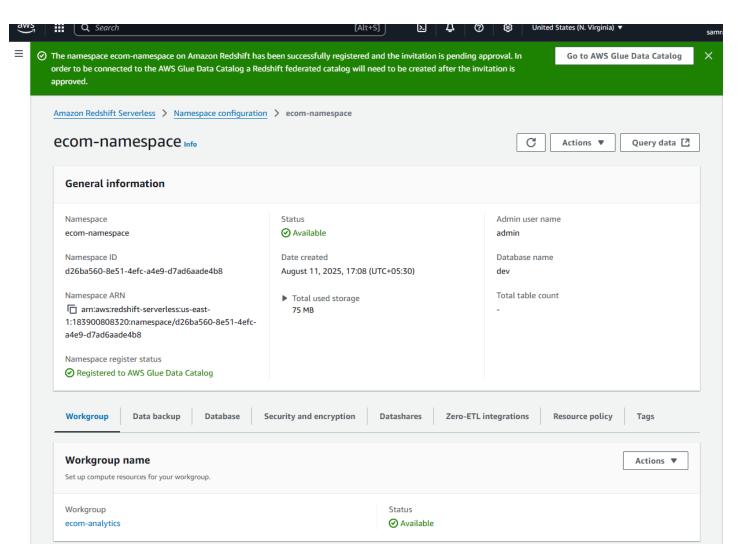




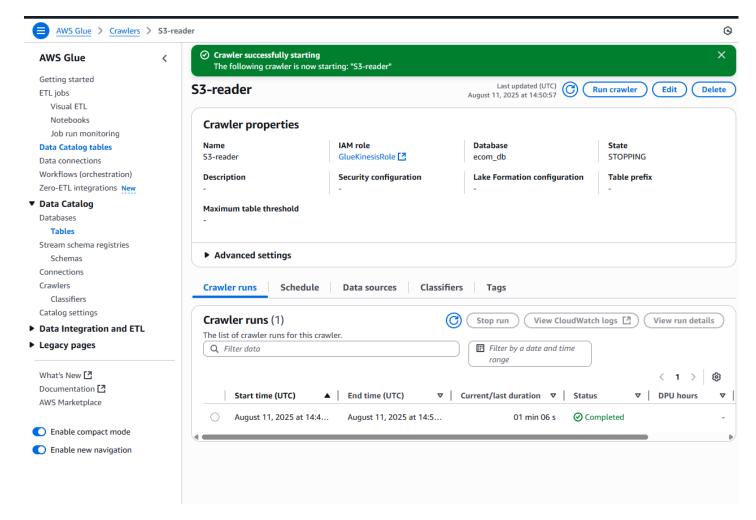






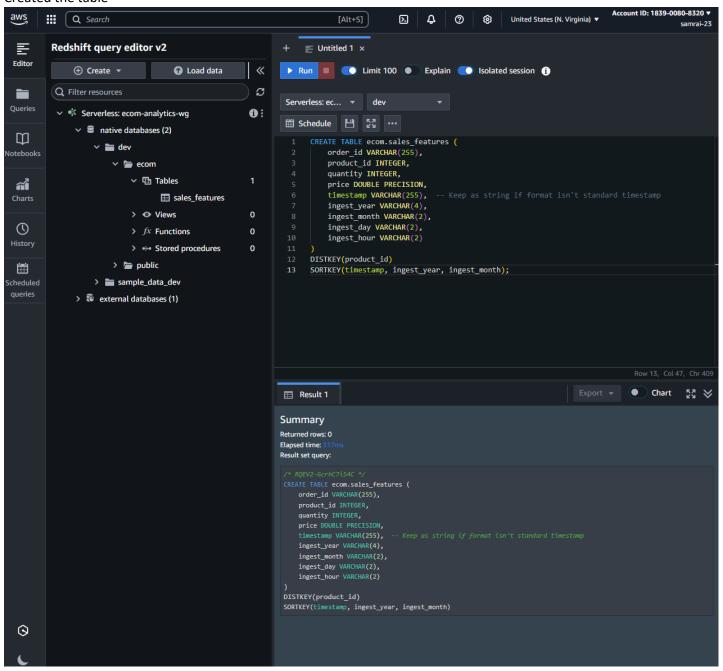


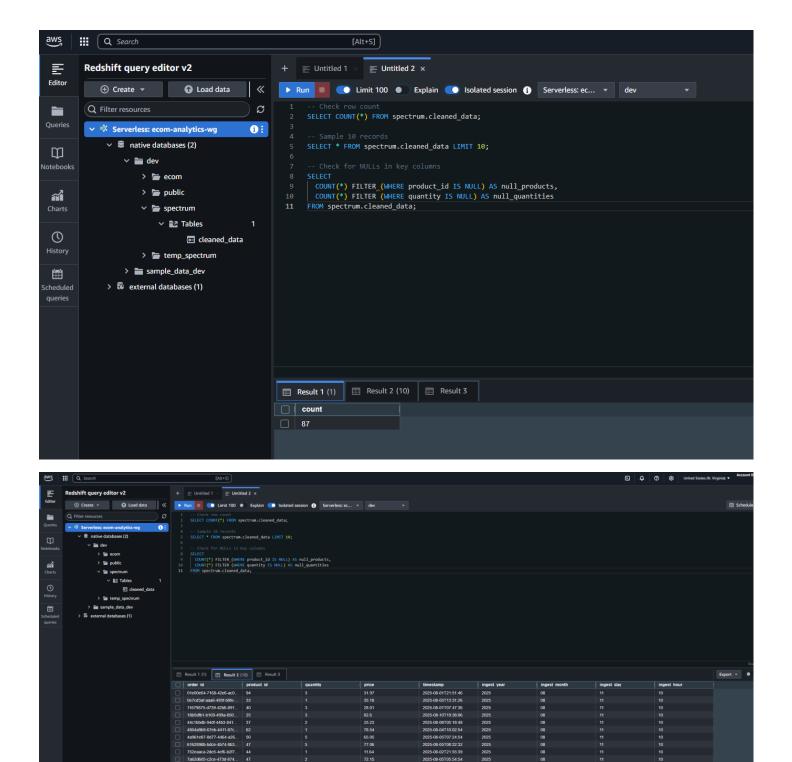
Used a crawler to read the schema



Saved it to ecom\_db database and deleted crawler

#### Created the table





6162898b-bdce-4b74-8b3. 752eaaca-2de5-4ef6-b2f7. 7a62d605-c2ce-473d-874.

