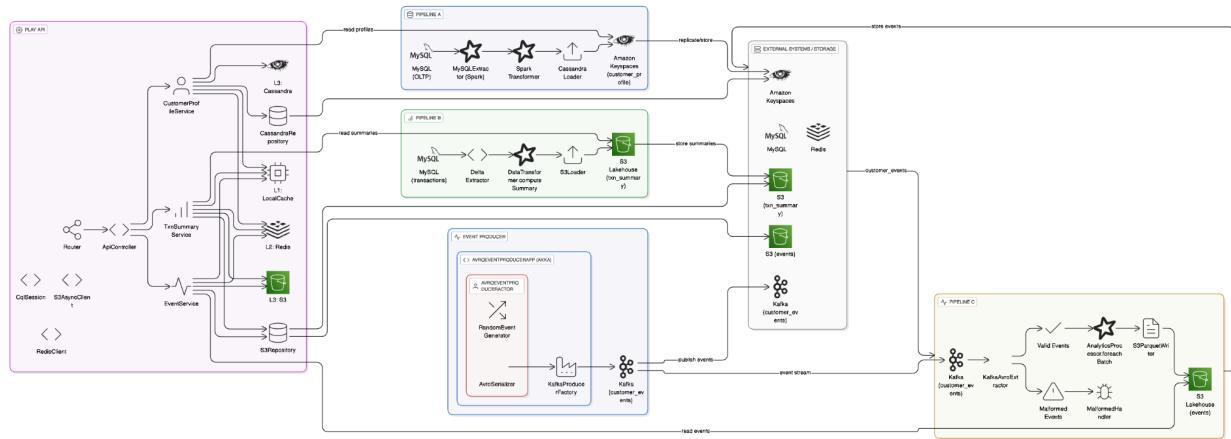


Customer Data Engineering

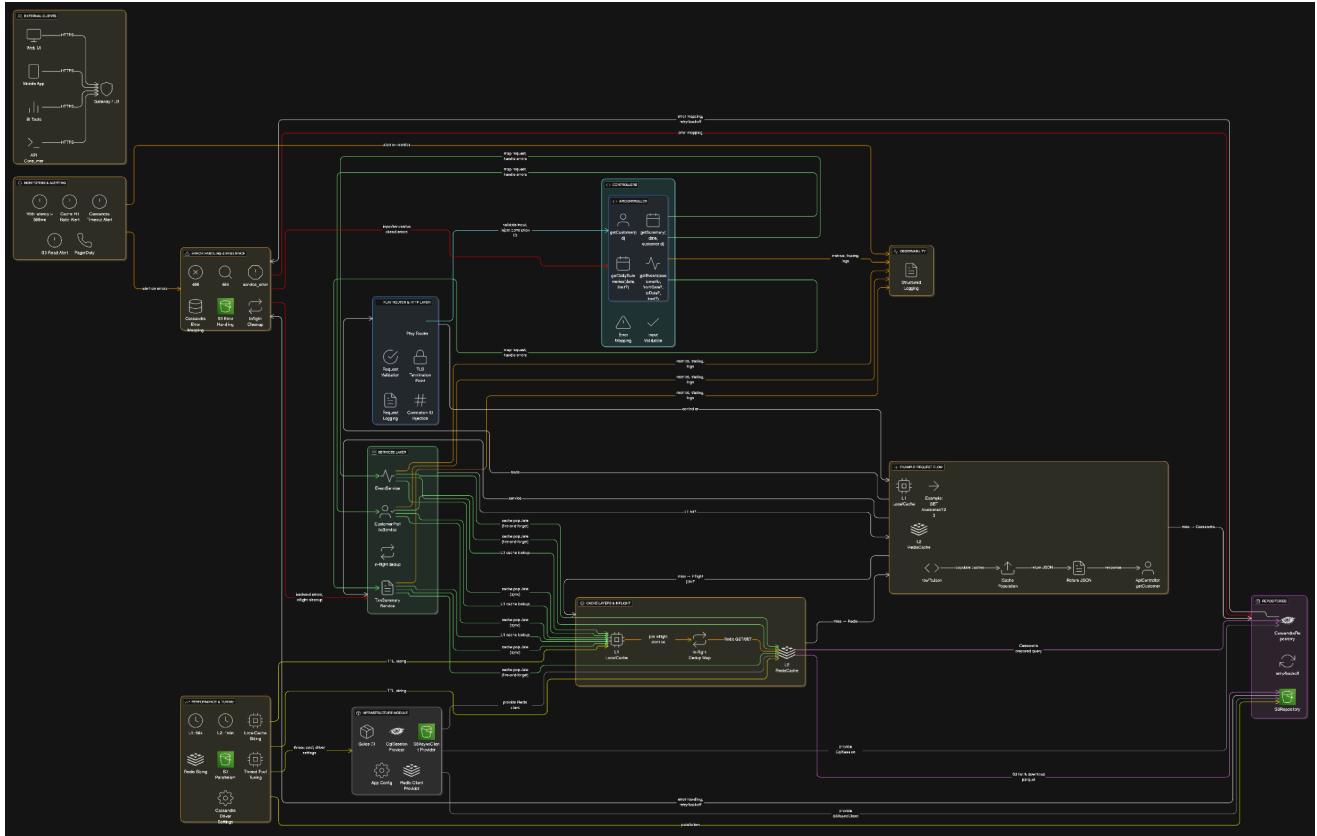
Owner: Sanjeev Kumar V

Date: Dec 12, 2025

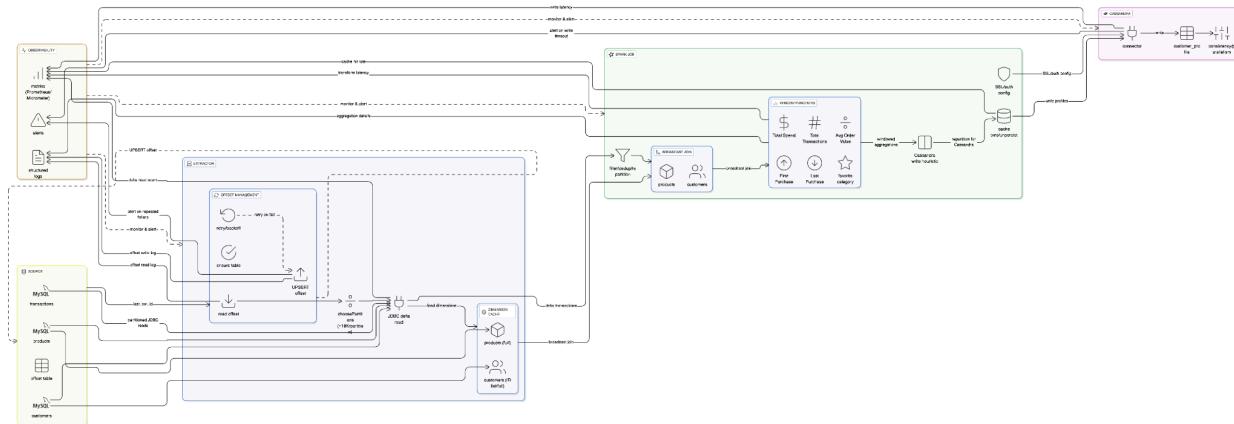
System Architecture:



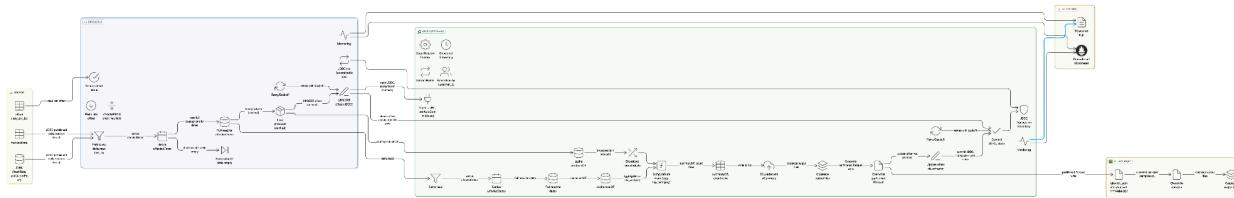
Play API Architecture



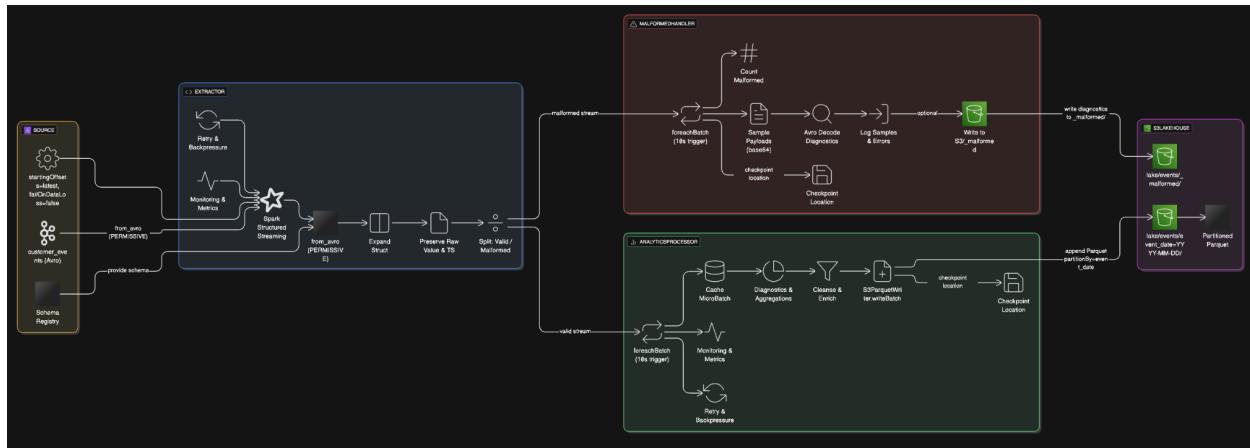
Pipeline A Architecture:



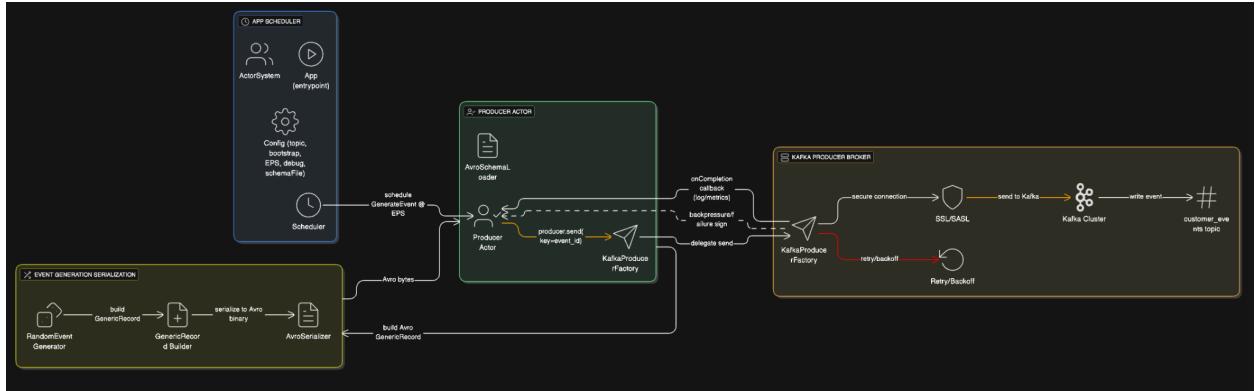
Pipeline B Architecture:



Pipeline C Architecture:



Producer Architecture:



DATA DICTIONARY

MySQL - Source System

Table: customers

This table stores all customer master data.

Field	Type	Description
customer_id	INT (PK)	Unique customer identifier
name	VARCHAR(100)	Customer full name
email	VARCHAR(150), UNIQUE	Customer email (unique across DB)
gender	ENUM('M','F','O')	Gender of the customer
signup_date	DATE	Date when customer account was created

Table: products

Stores details of all products purchased in transactions.

Field	Type	Description
product_id	INT (PK)	Unique product identifier
name	VARCHAR(150)	Product name

category	VARCHAR(50)	Product category (Electronics, Grocery, Sports...)
price	DECIMAL(10,2)	Unit price of the product

Table: **transactions**

This is the core **fact table** for Pipelines A & B (profiles + daily summaries).

Field	Type	Description
txn_id	BIGINT (PK)	Unique transaction ID
customer_id	INT (FK)	FK → customers.customer_id
product_id	INT (FK)	FK → products.product_id
qty	INT	Number of items purchased
amount	DECIMAL(10,2)	Total amount of transaction (qty × price)
txn_timestamp	TIMESTAMP	Purchase timestamp

Offset Tracking Tables (Used by Pipelines A & B)

Table: **profile_offsets**

Used by **Pipeline A (MySQL → Cassandra)** to ensure incremental processing.

Field	Type	Description
source	VARCHAR(128)	Identifier for the pipeline source (e.g., "transactions")
last_txn_id	BIGINT	Last processed txn_id for profile updates

Table: **txn_summary_offsets**

Used by **Pipeline B (MySQL → S3 Daily Summaries)** for incremental loads.

Field	Type	Description

source	VARCHAR(128)	Identifier for the pipeline source
last_txnid	BIGINT	Last processed txnid for summary generation

Kafka Event Schema (Pipeline C Input)

(Event Producer → Kafka → Pipeline C → S3)

Field	Type	Description
event_id	STRING	Unique event UUID
customer_id	INT	Customer who performed the event
event_type	STRING	Behaviour type: WISHLIST, LIKE, CART_ADD.
product_id	INT NULL	Optional product reference
event_timestamp	STRING	ISO timestamp assigned at event creation

Cassandra Table (Pipeline A Output)

Keyspaces Table: `customer_profile`

Stores aggregated customer analytics.

Column	Type	Description
customer_id	INT (PK)	Unique ID
name	TEXT	Customer name
email	TEXT	Email
gender	TEXT	Gender
total_spend	DECIMAL	SUM(amount)
total_transactions	INT	COUNT(*)
avg_order_value	DECIMAL	total_spend / total_transactions
first_purchase	TIMESTAMP	MIN(txn_timestamp)

last_purchase	TIMESTAMP	MAX(txn_timestamp)
favorite_category	TEXT	Category with highest frequency

S3 Daily Summary Schema (Pipeline B Output)

Partition folder: `lake/txn_summary/date=YYYY-MM-DD/*.parquet`

Column	Type	Description
date	STRING	Partition key
customer_id	INT	Customer ID
total_amount	DOUBLE	Daily spend
total_items	INT	Total quantity
distinct_products	INT	Count of unique products
top_category	STRING	Most purchased category

2.6 S3 Events Schema (Pipeline C Output)

Partition folder: `lake/events/event_date=YYYY-MM-DD/*.parquet`

Column	Type	Description
event_id	STRING	Event identifier
customer_id	INT	Customer
event_type	STRING	Behaviour
product_id	INT	Nullable
event_timestamp	BINARY (INT96)	Original event timestamp
ingestion_timestamp	BINARY (INT96)	Ingestion time recorded by Spark

Pipeline-quality checks report

Pipeline A – MySQL → Cassandra (Customer Profile ETL)

1. Input Data Quality Checks

Check Type	Description
Primary Key Integrity	Ensures customer_id is not null and unique.
Email Format Validation	Rejects invalid or malformed email addresses.
Gender Enum Validation	Only accepts M, F, O.
Date Validation	Ensures signup_date is a valid ISO date.

2. Schema & Transformation Quality Checks

Check	Description
Column completeness	Ensures all required fields exist before transformation.
Type consistency	Converts MySQL types → Cassandra compatible types (e.g., VARCHAR → VARCHAR, DATE → DATE).
Null handling	Replaces unexpected nulls with defaults/logging warnings.

3. Offset / Incremental Load Checks

Check	Description
Offset table validation (profile_offsets)	Reads last processed txn_id before each run.
Monotonicity check	Ensures new txn_id > stored offset.
Duplicate prevention	Avoids re-processing already consumed rows.

4. Write Quality Checks (Cassandra)

Check	Description
Consistency level validation	Ensures write acknowledgements success.
Timeout handling	Retries on Cassandra ReadTimeout, WriteTimeout, Unavailable errors.
Row-level validation after write	Optional: read-back check (configurable).

Pipeline B – MySQL → S3 Lakehouse (Daily Transaction Summary)

1. Input Data Quality Checks

Check Type	Description
Primary key validation	Ensures <code>txn_id</code> exists and is unique.
Foreign key integrity	Valid <code>customer_id</code> and <code>product_id</code> reference.
Amount and Quantity check	Must be positive numeric values.
Timestamp validity	Ensures <code>txn_timestamp</code> is a valid UTC timestamp.

2. Aggregation Quality Checks

Check	Description
Group-by consistency	Ensures summaries are calculated correctly per customer per day.
Total amounts validation	No negative totals; amounts match $\text{sum}(\text{qty} * \text{price})$.

Distinct product count check	Ensures distinct count uses correct product_id.
------------------------------	---

3. Offset Checks (`txn_summary_offsets`)

Check	Description
Last processed txn_id validation	Ensures incremental summary updates.
No missing transactions	Detects gaps in txn_id sequence.

4. Write Quality Checks (S3 Parquet)

Check	Description
Partition validation	Must write to: lake/txn_summary/date=YYYY-MM-DD/
Schema consistency	Enforces Parquet schema: {customer_id, total_amount, total_items, distinct_products, top_category}
Atomic batch writes	Uses temporary files + rename for safe writes.
File-level validation	Validates Parquet file is readable after write.

Pipeline C – Kafka Avro → S3 Events Lake (Valid + Malformed Streams)

1. Kafka Input Quality Checks

Check	Description
Avro schema validation	Deserializes using schema registry with PERMISSIVE mode.
Required field checks	Ensures event_id & event_type must exist.
Event timestamp validation	Parses event timestamp or falls back to Kafka timestamp.

Malformed event detection	Missing keys → automatically routed to <code>malformed</code> stream.
---------------------------	---

2. Transformation Quality Checks

Check	Description
Product ID correction	Invalid product_id (<0) → null.
Timestamp normalization	Converts string timestamp → Spark timestamp.
Partition column generation	Adds <code>event_date</code> for partitioning.
Lineage metadata	Adds <code>ingestion_timestamp</code> .

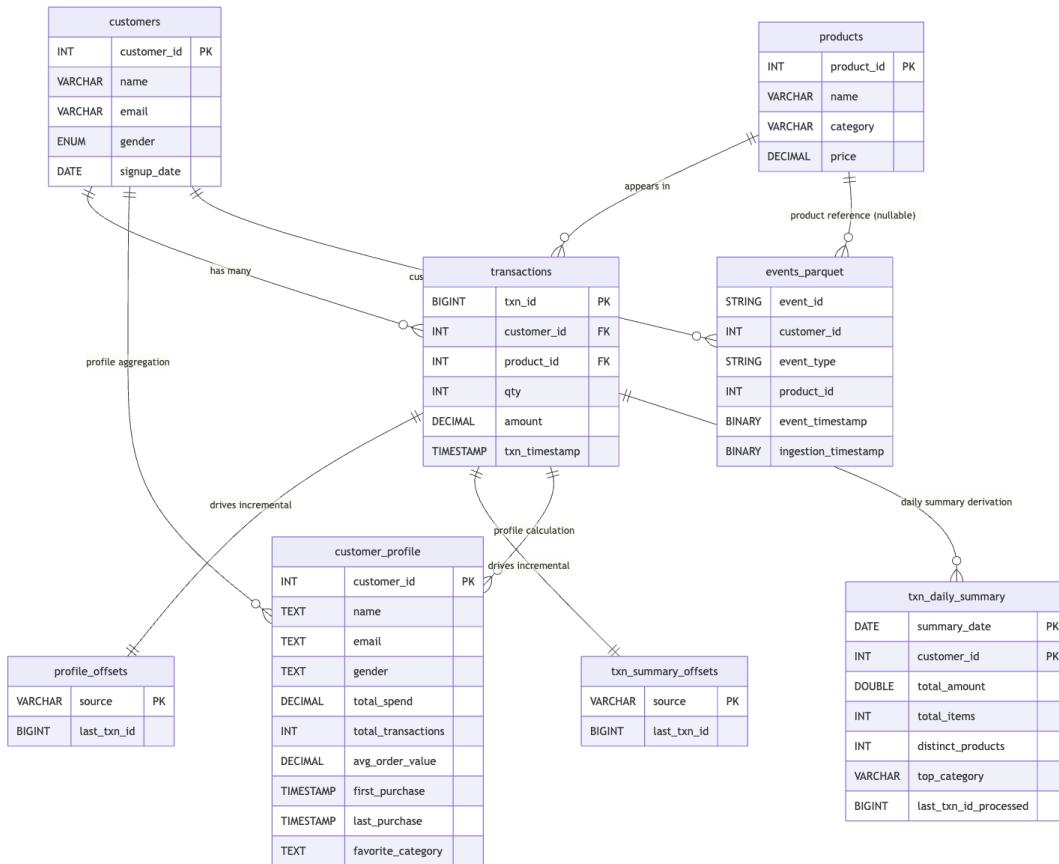
3. Malformed Events Checks

Check	Description
Sample logging	Logs up to 5 Base64 samples.
Avro decode attempt	Logs decoding failures for analysis.
Count mismatch detection	Alerts if malformed ratio exceeds threshold.

4. Write Quality Checks (S3 Parquet)

Check	Description
Partitioning validation	Writes to: <code>lake/events/event_date=YYYY-MM-DD/</code>
Schema consistency	Ensures event schema is stable across writes.
Exactly-once semantics	Achieved via streaming checkpoints.

Fail-safe writes	Writes via <code>foreachBatch</code> with exception handling.
------------------	---



SQL / DataFrame

Completed Queries: 7

Completed Queries (7)

Page:

1 Pages. Jump to . Show items in a page.

ID	Description	Submitted	Duration	Job IDs	Sub Execution IDs
16	id = 4b78e16e-d9a3-495d-98a4-45bbdb113ba8 runId = a12a1d35-d35f-4a96-aa42-96e4... +details	2025/12/12 16:18:00	3 s		
15	id = 4b78e16e-d9a3-495d-98a4-45bbdb113ba8 runId = a12a1d35-d35f-4a96-aa42-96e4... +details	2025/12/12 16:17:00	4 s		
14	id = 4b78e16e-d9a3-495d-98a4-45bbdb113ba8 runId = a12a1d35-d35f-4a96-aa42-96e4... +details	2025/12/12 16:16:00	3 s		
8	id = 4b78e16e-d9a3-495d-98a4-45bbdb113ba8 runId = a12a1d35-d35f-4a96-aa42-96e4... +details	2025/12/12 16:15:00	27 s	[33][34][35][36][37][38][39][40][41][42][43][44][45][46]	[9][10][11][12][13] +details
7	id = 4b78e16e-d9a3-495d-98a4-45bbdb113ba8 runId = a12a1d35-d35f-4a96-aa42-96e4... +details	2025/12/12 16:14:00	3 s		
6	id = 4b78e16e-d9a3-495d-98a4-45bbdb113ba8 runId = a12a1d35-d35f-4a96-aa42-96e4... +details	2025/12/12 16:13:11	3 s		
0	id = 4b78e16e-d9a3-495d-98a4-45bbdb113ba8 runId = a12a1d35-d35f-4a96-aa42-96e4... +details	2025/12/12 16:12:30	41 s	[7][8][9][10][11][12][13][14][15][16][17][18][19][20][21][22]	[1][2][3][4][5] +details

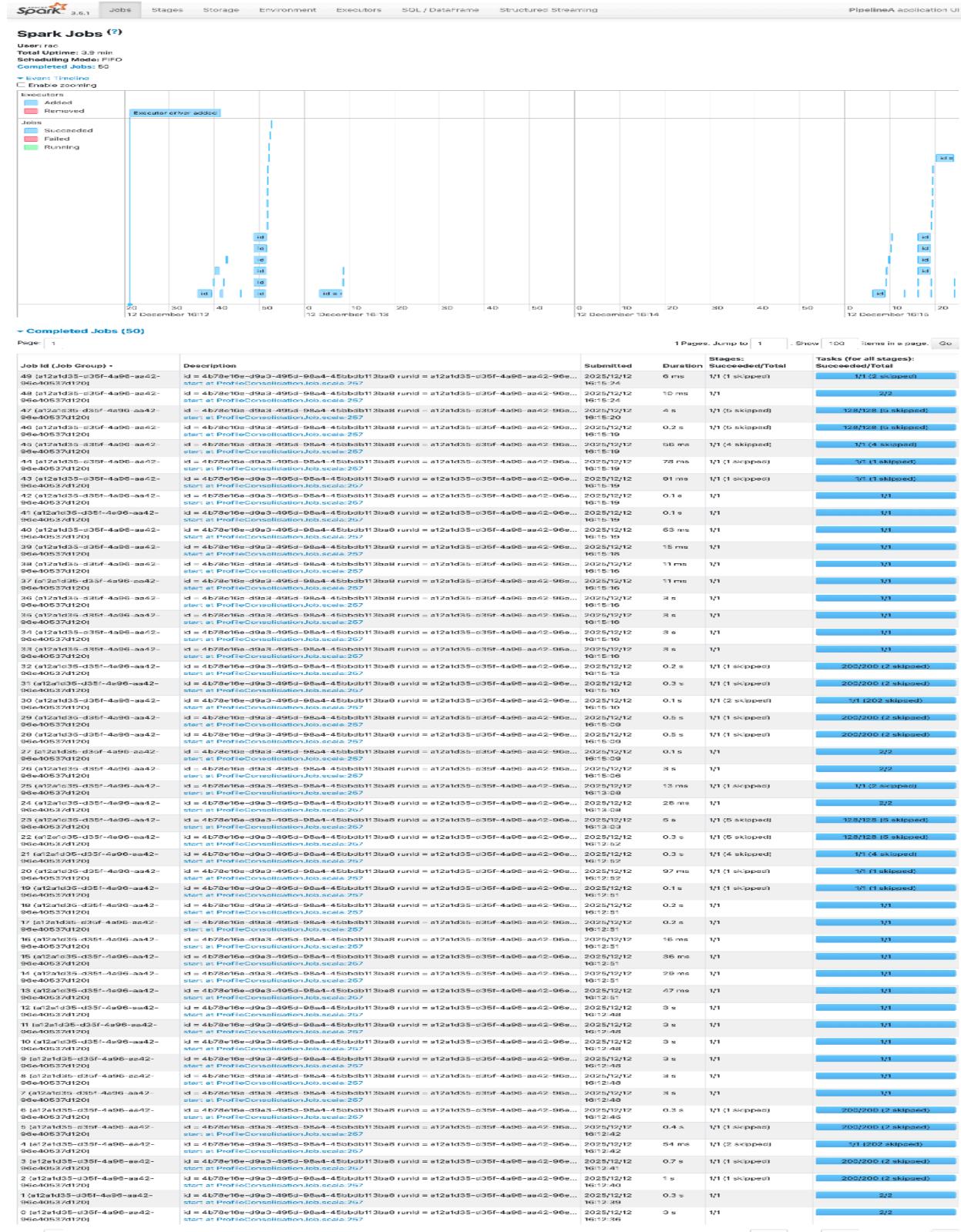
Page:

1 Pages. Jump to . Show items in a page.

Storage

RDDs

ID	RDD Name	Storage Level	Cached Partitions	Fraction Cached	Size in Memory	Size on Disk
44	(*1) Scan JDBCRelation(products) [numPartitions=1] [product_id#0,category#2] PushedFilters: Disk Memory Deserialized 1x Replicated [], ReadSchema: struct<product_id:int,category:string>	Disk Memory Deserialized 1x Replicated	1	100.00%	2.0 KiB	0.0 B



Stages for All Jobs										PipelineA application UI			
Completed Stages: 50		Skipped Stages: 40		Completed Stages (50)		1 Pages Jump to 1 Show 100 Items in a page Go							
Page: 1	Submitted	Duration	Tasks: Succeeded/Total	Input	Output	Shuffle Read	Shuffle Write						
Stage Id	Description												
95	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:24	3 ms	1/1								118.0 kB	
93	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:24	8 ms	2/2		6.7 kB						118.0 kB	
92	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:20	4 ms	128/128		167.1 kB						26.7 kB	
95	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:19	0.1 ms	128/128								26.7 kB	
93	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:19	51 ms	1/1								83.2 kB	24.7 kB
76	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:19	26 ms	1/1								83.6 kB	26.9 kB
95	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:19	86 ms	1/1								98.4 kB	56.3 kB
71	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:19	0.1 ms	1/1		64.6 kB						63.8 kB	
70	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:19	0.1 ms	1/1		64.6 kB						98.4 kB	
93	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:19	50 ms	1/1								10.5 kB	
98	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:16	19 ms	1/1								10.3 kB	
97	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:16	8 ms	1/1								2.0 kB	
88	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:16	10 ms	1/1								2.0 kB	
55	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:16	3 ms	1/1		10.3 kB							
84	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:16	3 ms	1/1		64.6 kB						63.8 kB	
63	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:16	3 ms	1/1									
82	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:16	3 ms	1/1									
81	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:13	0.2 ms	200/200		32.5 kB							
99	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:10	0.8 ms	200/200		82.0 kB							
57	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:10	0.1 ms	1/1								11.3 kB	
54	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:09	0.6 ms	200/200		82.0 kB						11.3 kB	
52	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:09	0.5 ms	200/200								9.5 kB	
50	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:09	0.1 ms	2/2		6.7 kB						9.5 kB	
49	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:08	3 ms	2/2									
48	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:08	7 ms	1/1								118.0 kB	
48	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:08	19 ms	2/2		6.5 kB						118.0 kB	
45	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:15:08	5 ms	128/128		185.7 kB							
39	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:12:02	0.2 ms	128/128								24.7 kB	
33	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:12:02	0.3 ms	1/1								81.0 kB	24.7 kB
28	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:12:02	89 ms	1/1								96.7 kB	24.9 kB
26	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:12:01	0.1 ms	1/1								61.8 kB	26.3 kB
24	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:12:01	0.2 ms	128/128		62.6 kB						95.7 kB	
28	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:12:01	0.2 ms	1/1								62.6 kB	81.8 kB
22	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:12:01	10 ms	1/1								10.2 kB	
21	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:12:01	30 ms	1/1								10.2 kB	
20	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:12:01	22 ms	1/1								2.0 kB	
19	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:12:01	41 ms	1/1								2.0 kB	
18	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:12:01	3 ms	1/1								2.0 kB	
17	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:12:01	3 ms	1/1								18.2 kB	
16	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:12:01	3 ms	1/1								62.6 kB	
15	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:12:01	3 ms	1/1								12.3 kB	
14	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:12:01	3 ms	1/1								11.3 kB	
13	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:12:01	3 ms	1/1								11.3 kB	
12	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:12:01	0.2 ms	200/200		82.0 kB							
10	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:12:01	0.4 ms	200/200		82.0 kB							
9	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:12:01	51 ms	1/1								11.3 kB	
5	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:12:01	0.7 ms	200/200		82.0 kB						11.3 kB	
3	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:12:01	1 ms	200/200								8.3 kB	
1	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:12:01	0.8 ms	2/2		6.5 kB						9.3 kB	
0	Id = 4b78e19c-d9b5-495d-98a4-45bbdb13ba8 runid = e12a1d35-d35f-4a98-aef2-96ea.. +details	2025/12/12 16:12:01	3 ms	2/2									

Apache Spark 3.5.1 Jobs Stages Storage Environment Executors SQL / DataFrame Structured Streaming Pipeline B - Incremental Daily T... application UI

Spark Jobs (39)

User: rac
Total Uptime: 4.9 min
Scheduling Mode: FIFO
Completed Jobs: 39

Event Timeline
Enable zooming

Executors
Added
Removed

Jobs
Succeeded
Failed
Running

Executor driver added

Jobs

12 December 16:24 12 December 16:25 12 December 16:26 12 December 16:27

id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39

Completed Jobs (39)

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Job Id (Job Group) *	Description	Submitted	Duration	Stages: Succeeded/Total	Tasks (for all stages): Succeeded/total
38 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:28:07	3 s	1/1	1/1
37 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:27:06	3 s	1/1	1/1
36 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:26:07	3 s	1/1	1/1
35 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:25:37	2 s	1/1	1/1
34 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:34	15 s	1/1 (2 skipped)	1/1 (201 skipped)
33 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:26	28 ms	1/1 (2 skipped)	1/1 (201 skipped)
32 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:23	2 s	1/2	200/201
31 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:23	1 s	1/1 (1 skipped)	200/200 (1 skipped)
30 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:23	22 ms	1/1	1/1
29 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:18	5 ms	1/1 (3 skipped)	1/1 (202 skipped)
28 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:18	33 ms	1/1 (2 skipped)	1/1 (201 skipped)
27 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:18	34 ms	1/1 (2 skipped)	1/1 (201 skipped)
26 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:15	2 s	1/2	200/201
25 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:15	1 s	1/1 (1 skipped)	200/200 (1 skipped)
24 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:15	15 ms	1/1	1/1
23 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:15	10 ms	1/1 (3 skipped)	1/1 (202 skipped)
22 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:15	41 ms	1/1 (2 skipped)	1/1 (201 skipped)
21 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:15	60 ms	1/1 (2 skipped)	1/1 (201 skipped)
20 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:13	2 s	1/2	200/201
19 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:12	1 s	1/1 (1 skipped)	200/200 (1 skipped)
18 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:12	0.5 s	1/1	1/1
17 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:11	0.7 s	1/1 (1 skipped)	200/200 (1 skipped)
16 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:11	0.5 s	1/1 (1 skipped)	200/200 (1 skipped)
15 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:11	0.1 s	1/1	1/1
14 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:11	9 ms	1/1 (1 skipped)	1/1 (1 skipped)
13 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:11	13 ms	1/1	1/1
12 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:11	11 ms	1/1 (1 skipped)	1/1 (1 skipped)
11 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:11	19 ms	1/1	1/1
10 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:11	12 ms	1/1 (1 skipped)	1/1 (1 skipped)
9 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:11	15 ms	1/1	1/1
8 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:08	3 s	1/1	1/1
7 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:06	16 ms	1/1 (1 skipped)	1/1 (1 skipped)
6 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:06	44 ms	1/1	1/1
5 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:03	3 s	1/1	1/1
4 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:24:00	32 ms	1/1 (1 skipped)	1/1 (1 skipped)
3 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:23:57	3 s	1/1	1/1
2 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:23:57	82 ms	1/1 (1 skipped)	1/1 (1 skipped)
1 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:23:54	3 s	1/1	1/1
0 (450b8ce8-43a3-4712-b445-3d0bdffdbaa06)	Id = 8c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdffdbaa06 start at PipelineBJob.scala:187	2025/12/12 16:23:50	3 s	1/1	1/1

Stages for All Jobs

Completed Stages: 40

Skipped Stages: 27

- Completed Stages (40)

Stage Id	Description	Submitted	Duration	Tasks: Succeeded/Total	Input	Output	Shuffle Read	Shuffle Write
66	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:29:06	3 s	1/1				
65	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:28:07	3 s	1/1				
64	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:27:06	3 s	1/1				
63	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:26:07	3 s	1/1				
82	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:25:37	2 s	1/1				
81	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:34	16 s	1/1		19.0 KiB	111.2 KiB	
58	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:26	26 ms	1/1			97.8 KiB	
55	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:23	1 s	200/200	203.0 KiB			97.8 KiB
54	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:23	1 s	200/200	203.0 KiB			111.2 KiB
52	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:23	17 ms	1/1	13.5 KiB			
51	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:18	2 ms	1/1			59.0 B	
47	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:18	30 ms	1/1			78.7 KiB	59.0 B
44	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:18	31 ms	1/1			78.7 KiB	
41	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:15	1 s	200/200	203.0 KiB			78.7 KiB
40	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:15	1 s	200/200	203.0 KiB			78.7 KiB
38	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:15	11 ms	1/1	13.5 KiB			
37	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:15	7 ms	1/1			59.0 B	
33	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:15	38 ms	1/1			78.7 KiB	59.0 B
30	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:15	56 ms	1/1			78.7 KiB	
27	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:13	1 s	200/200	203.0 KiB			78.7 KiB
26	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:12	1 s	200/200	203.0 KiB			78.7 KiB
25	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:12	30 ms	1/1	13.5 KiB			
24	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:11	0.2 s	200/200	203.0 KiB			
23	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:11	0.5 s	200/200				58.5 KiB
21	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:11	0.1 s	1/1	35.7 KiB			58.5 KiB
20	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:11	4 ms	1/1			59.0 B	
18	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:11	9 ms	1/1	13.5 KiB			59.0 B
17	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:11	6 ms	1/1			59.0 B	
15	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:11	12 ms	1/1	35.7 KiB			59.0 B
14	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:11	6 ms	1/1			59.0 B	
12	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:11	9 ms	1/1	13.5 KiB			59.0 B
11	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:08	3 s	1/1				
10	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:06	10 ms	1/1			59.0 B	
8	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:06	33 ms	1/1	35.7 KiB			59.0 B
7	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:03	3 s	1/1				
6	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:24:00	20 ms	1/1			59.0 B	
4	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:23:57	3 s	1/1				59.0 B
3	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:23:57	60 ms	1/1			177.0 B	
1	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:23:54	3 s	1/1				177.0 B
0	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0... start at PipelineJob.scala:187	2025/12/12 16:23:50	3 s	1/1				

Page: 1 1 Pages. Jump to 1 . Show 100 items in a page. Go

- Skipped Stages (27)

Done 1 Page 1 Items to 1 Show 100 Items in a page Go

Storage

▼ RDDs

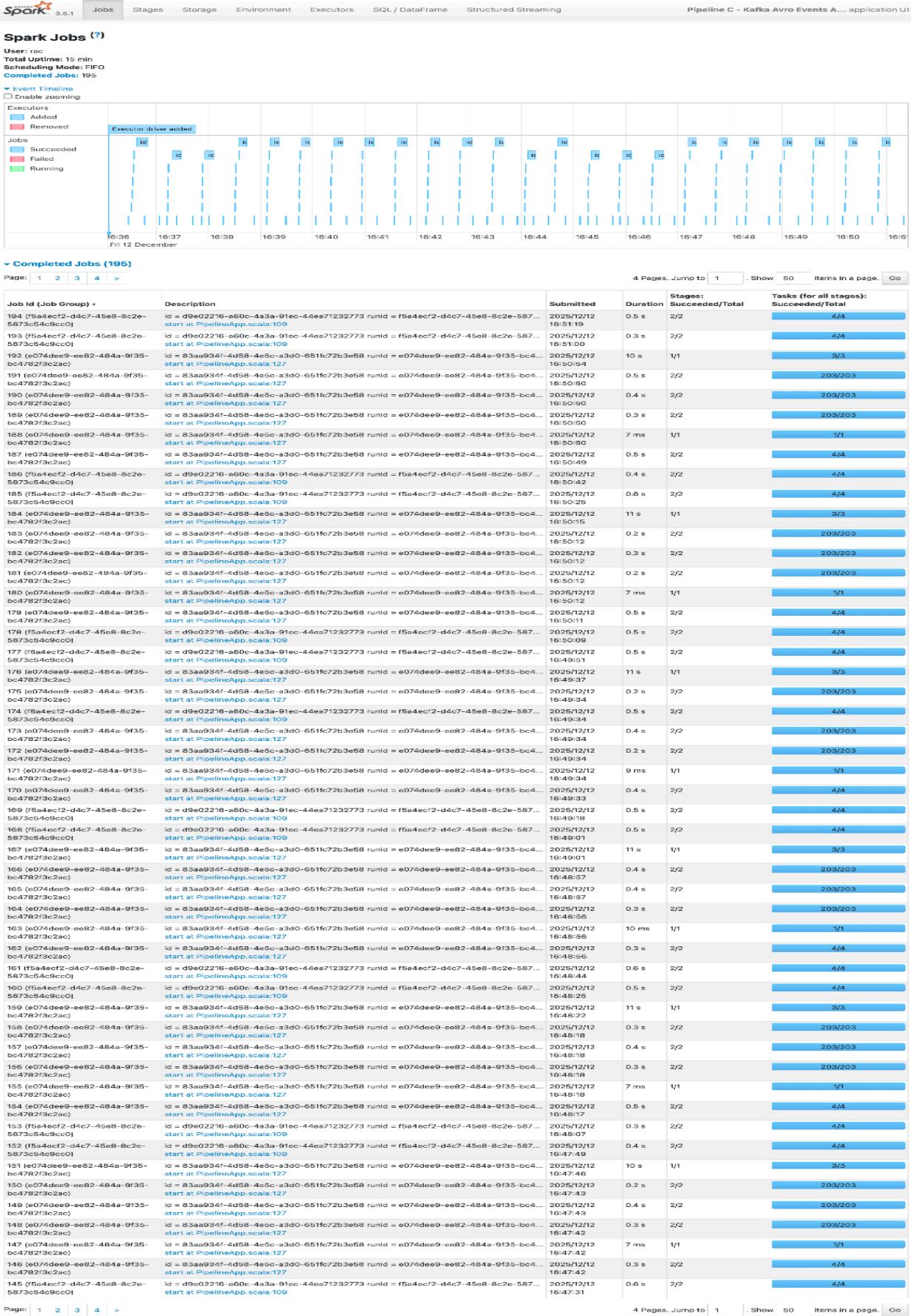
ID	RDD Name	Storage Level	Cached Partitions	Fraction Cached	Size in Memory	Size on Disk
22	*(1) Project [txn_id#55L, customer_id#56, product_id#57, qty#58, amount#59, txn_timestamp#60, cast(txn_timestamp#60 as date) AS date#67] ++ *(1) Scan JDBCRelation((SELECT txn_id, customer_id, product_id, qty, amount, txn_timestamp FROM transactions WHERE DATE(txn_timestamp) IN ('2025-12-11','2025-12-12','2025-12-10')) AS tx_full) [numPartitions=1] [txn_id#55L,customer_id#56,product_id#57,qty#58,amount#59,txn_timestamp#60] PushedFilters: [], ReadSchema: struct<txn_id:bigring, customer_id:int, product_id:int, qty:int, amount:decimal(10,2), txn_timestamp :t1...	Disk Memory Deserialized 1x Replicated	1	100.00%	35.7 KiB	0.0 B
34	*(1) Scan JDBCRelation(products) [numPartitions=1] [product_id#297,name#298,category#299,price#300] PushedFilters: [], ReadSchema: struct<product_id:int,name:string,category:string,price:decimal(10,2)>	Disk Memory Deserialized 1x Replicated	1	100.00%	13.5 KiB	0.0 B
66	AdaptiveSparkPlan isFinalPlan=false +- Exchange hashpartitioning(customer_id#56, 200), REPARTITION_BY_COL, [plan_id=203] +- Project [txn_id#55L, customer_id#56, product_id#57, qty#58, amount#59, txn_timestamp#60, cast(txn_timestamp#60 as date) AS date#434] +- Filter isnotnull(product_id#57) +- InMemoryTableScan [amount#59, customer_id#56, product_id#57, qty#58, txn_id#55L, txin_timestamp#60], [isnotnull(product_id#57)] +- InMemoryRelation [txn_id#55L, customer_id#56, product_id#57, qty#58, amount#59, txin_timestamp#60, date#67], StorageLevel(disk, memory, deserialized, 1 replicas) +- *(1) Project [txn_id#55L, customer_id#56, product_id#57, qty#58, amount#59, txin_timestamp#60, cast(txn_timestamp#60 as date) AS date#67] +- *(1) Scan JDBCRelation((SELECT txn_id, customer_id, product_id, qty, amount, txn_timestamp FROM transactions WHERE DATE(txn_timestamp) IN ('2025-12-11','2025-12-12','2025-12-10')) AS tx_full) [numPartitions=1] [txn...	Disk Memory Deserialized 1x Replicated	200	100.00%	203.0 KiB	0.0 B

SQL / DataFrame

Completed Queries: 7

▼ Completed Queries (7)

Page:	1	1 Pages. Jump to	1	. Show	100	items in a page.	Go
ID	Description	Submitted	Duration	Job IDs	Sub Execution IDs		
21	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdfdbaa06 batch = 6 +details	2025/12/12 16:30:00	10 s	[22]		+details	
19	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdfdbaa06 batch = 5 +details	2025/12/12 16:29:00	9 s	[20]		+details	
17	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdfdbaa06 batch = 4 +details	2025/12/12 16:28:00	11 s	[18]		+details	
15	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdfdbaa06 batch = 3 +details	2025/12/12 16:27:00	9 s	[16]		+details	
13	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdfdbaa06 batch = 2 +details	2025/12/12 16:26:00	10 s	[14]		+details	
11	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdfdbaa06 batch = 1 +details	2025/12/12 16:25:31	9 s	[12]		+details	
0	id = 6c4dc180-b837-41fc-9890-d0e75ad52e55 runid = 450b8ce8-43a3-4712-b445-3d0bdfdbaa06 batch = 0 +details	2025/12/12 16:23:44	1.8 min	[1][2][3][4][5][6][7][8][9][10]		+details	



Storage

• RDDs

ID	RDD Name	Storage Level	Cached Partitions	Fraction Cached	Size in Memory	Size on Disk
1853	*(1) Scan ExistingRDD[event_id#28, customer_id#29, event_type#30, product_id#40, event_timestamp#57, event_date#72, ingestion_timestamp#80]	Disk Memory Deserialized 1x Replicated	3	100.00%	25.1 KiB	0.0 B

SQL / DataFrame

Completed Queries: 84

• Completed Queries (84)

ID	Description	Submitted	Duration	Job IDs	Sub Execution IDs
301	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 93 +details	2025/12/12 16:53:08	0.6 s	[302]	+details
299	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 92 +details	2025/12/12 16:52:51	0.6 s	[300]	+details
292	id = 83aa934f-4d58-4e5c-a3d0-651fc72b3e58 runid = e074dee9-ee82-484a-9f35-bc4782f3c2ac batch = 81 +details	2025/12/12 16:52:41	20 s	[293][294][295][296][297][298]	+details
290	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 91 +details	2025/12/12 16:52:32	0.6 s	[291]	+details
288	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 60 +details	2025/12/12 16:52:12	0.4 s	[289]	+details
281	id = 83aa934f-4d58-4e5c-a3d0-651fc72b3e58 runid = e074dee9-ee82-484a-9f35-bc4782f3c2ac batch = 60 +details	2025/12/12 16:52:04	21 s	[282][283][284][285][286][287]	+details
279	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 89 +details	2025/12/12 16:51:54	0.3 s	[280]	+details
277	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 88 +details	2025/12/12 16:51:35	0.6 s	[278]	+details
270	id = 83aa934f-4d58-4e5c-a3d0-651fc72b3e58 runid = e074dee9-ee82-484a-9f35-bc4782f3c2ac batch = 49 +details	2025/12/12 16:51:26	20 s	[271][272][273][274][275][276]	+details
268	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 87 +details	2025/12/12 16:51:19	0.5 s	[269]	+details
266	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 86 +details	2025/12/12 16:51:00	0.3 s	[267]	+details
259	id = 83aa934f-4d58-4e5c-a3d0-651fc72b3e58 runid = e074dee9-ee82-484a-9f35-bc4782f3c2ac batch = 48 +details	2025/12/12 16:50:49	19 s	[260][261][262][263][264][265]	+details
257	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 85 +details	2025/12/12 16:50:42	0.5 s	[258]	+details
255	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 84 +details	2025/12/12 16:50:25	0.6 s	[256]	+details
248	id = 83aa934f-4d58-4e5c-a3d0-651fc72b3e58 runid = e074dee9-ee82-484a-9f35-bc4782f3c2ac batch = 47 +details	2025/12/12 16:50:11	19 s	[249][250][251][252][253][254]	+details
246	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 83 +details	2025/12/12 16:50:09	0.5 s	[247]	+details
244	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 82 +details	2025/12/12 16:49:51	0.6 s	[245]	+details
240	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 81 +details	2025/12/12 16:49:34	0.6 s	[241]	+details
235	id = 83aa934f-4d58-4e5c-a3d0-651fc72b3e58 runid = e074dee9-ee82-484a-9f35-bc4782f3c2ac batch = 78 +details	2025/12/12 16:49:33	20 s	[236][237][238][239][242][243]	+details
233	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 80 +details	2025/12/12 16:49:18	0.6 s	[234]	+details
231	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 79 +details	2025/12/12 16:49:01	0.6 s	[232]	+details
224	id = 83aa934f-4d58-4e5c-a3d0-651fc72b3e58 runid = e074dee9-ee82-484a-9f35-bc4782f3c2ac batch = 45 +details	2025/12/12 16:48:56	20 s	[225][226][227][228][229][230]	+details
222	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 76 +details	2025/12/12 16:48:43	1 s	[223]	+details
220	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 77 +details	2025/12/12 16:48:25	0.5 s	[221]	+details
213	id = 83aa934f-4d58-4e5c-a3d0-651fc72b3e58 runid = e074dee9-ee82-484a-9f35-bc4782f3c2ac batch = 44 +details	2025/12/12 16:48:17	21 s	[214][215][216][217][218][219]	+details
211	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 76 +details	2025/12/12 16:48:07	0.3 s	[212]	+details
209	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 75 +details	2025/12/12 16:47:49	0.4 s	[210]	+details
202	id = 83aa934f-4d58-4e5c-a3d0-651fc72b3e58 runid = e074dee9-ee82-484a-9f35-bc4782f3c2ac batch = 43 +details	2025/12/12 16:47:42	19 s	[203][204][205][206][207][208]	+details
200	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 74 +details	2025/12/12 16:47:31	0.6 s	[201]	+details
198	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 73 +details	2025/12/12 16:47:13	0.4 s	[199]	+details
191	id = 83aa934f-4d58-4e5c-a3d0-651fc72b3e58 runid = e074dee9-ee82-484a-9f35-bc4782f3c2ac batch = 42 +details	2025/12/12 16:47:06	19 s	[192][193][194][195][196][197]	+details
189	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 72 +details	2025/12/12 16:46:55	0.5 s	[190]	+details
187	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 71 +details	2025/12/12 16:46:38	0.3 s	[188]	+details
180	id = 83aa934f-4d58-4e5c-a3d0-651fc72b3e58 runid = e074dee9-ee82-484a-9f35-bc4782f3c2ac batch = 49 +details	2025/12/12 16:46:28	20 s	[181][182][183][184][185][186]	+details
178	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 70 +details	2025/12/12 16:46:19	0.3 s	[179]	+details
176	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 40 +details	2025/12/12 16:46:02	0.5 s	[177]	+details
169	id = 83aa934f-4d58-4e5c-a3d0-651fc72b3e58 runid = e074dee9-ee82-484a-9f35-bc4782f3c2ac batch = 68 +details	2025/12/12 16:45:51	20 s	[170][171][172][173][174][175]	+details
167	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 67 +details	2025/12/12 16:45:44	0.3 s	[168]	+details
165	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 67 +details	2025/12/12 16:45:25	0.6 s	[166]	+details
158	id = 83aa934f-4d58-4e5c-a3d0-651fc72b3e58 runid = e074dee9-ee82-484a-9f35-bc4782f3c2ac batch = 36 +details	2025/12/12 16:45:15	19 s	[159][160][161][162][163][164]	+details
156	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 66 +details	2025/12/12 16:45:06	0.6 s	[157]	+details
154	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 65 +details	2025/12/12 16:44:49	0.3 s	[155]	+details
147	id = 83aa934f-4d58-4e5c-a3d0-651fc72b3e58 runid = e074dee9-ee82-484a-9f35-bc4782f3c2ac batch = 38 +details	2025/12/12 16:44:37	20 s	[148][149][150][151][152][153]	+details
145	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 64 +details	2025/12/12 16:44:30	0.6 s	[146]	+details
143	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 63 +details	2025/12/12 16:44:13	0.6 s	[144]	+details
136	id = 83aa934f-4d58-4e5c-a3d0-651fc72b3e58 runid = e074dee9-ee82-484a-9f35-bc4782f3c2ac batch = 37 +details	2025/12/12 16:44:03	18 s	[137][138][139][140][141][142]	+details
134	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 62 +details	2025/12/12 16:43:54	0.6 s	[135]	+details
132	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 61 +details	2025/12/12 16:43:37	0.3 s	[133]	+details
125	id = 83aa934f-4d58-4e5c-a3d0-651fc72b3e58 runid = e074dee9-ee82-484a-9f35-bc4782f3c2ac batch = 36 +details	2025/12/12 16:43:25	19 s	[126][127][128][129][130][131]	+details
123	id = d9e02216-a60c-4a3a-91ec-44ea71232773 runid = f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0 batch = 60 +details	2025/12/12 16:43:20	0.4 s	[124]	+details

Streaming Query

Active Streaming Queries (2)

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Name	Status	ID	Run ID	Start Time	Duration	Avg Input/sec	Avg Process/sec	Latest Batch
<no name>	RUNNING	83aa934f-4d58-4e5c-a3d0-651fc72b3e58	e074dee9-ee82-484a-9f35-bc4782f3c2ac	2025/12/12 16:36:18	18 minutes 1 second	9.62	9.91	52
<no name>	RUNNING	d9e02216-a60c-4a3a-91ec-44ea71232773	f5a4ecf2-d4c7-45e8-8c2e-5873c54c9cc0	2025/12/12 16:36:13	18 minutes 6 seconds	9.81	10.06	96

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akka-event-gen main

Current File ▾ ▶ ⚡ ⚡ ⚡ ⚡ ⚡ ⚡ Trial: 2 days

Project ▾

- akka-event-gen ~Desktop/ScalaTraining/Phase2Projects/akka-eve...
- src
 - main
 - resources
 - scala
 - test
 - target
 - .gitignore
 - build.sbt
- External Libraries
- Scratches and Consoles

Search Everywhere Double ⌂

Go to File ⌘%O

Recent Files ⌘E

Navigation Bar ⌘↑

Drop files here to open them

Terminal Local +

```
rac@PTPMR107 akka-event-gen % sbt clean run
[info] welcome to sbt 1.11.7 (Homebrew Java 11.0.29)
[info] loading global plugins from /Users/rac/.sbt/1.0/plugins
[info] loading project definition from /Users/rac/Desktop/ScalaTraining/Phase2Projects/akka-event-gen/project
[info] loading settings for project root from build.sbt...
[info] set current project to akka-event-gen (in build file:/Users/rac/Desktop/ScalaTraining/Phase2Projects/akka-event-gen/)
[success] Total time: 0 s, completed Dec 12, 2025, 4:35:41 PM
[info] compiling 7 Scala sources to /Users/rac/Desktop/ScalaTraining/Phase2Projects/akka-event-gen/target/scala-2.12/classes ...
[info] running events.AvroEventProducerApp
```

...location -- zsh ...306-u admin -p -- zsh -- zsh ...eeper.properties ..._rver1.properties ..._rver2.properties ..._rver3.properties ..._Projects -- zsh

```
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42821154-ad05-4387-8b17-2b2c2d749ff3
8099-1a00-4a00-9300-75a511c37fc0
188e7769-3553-4f5b-9b94-852c1eeeb8134
1877-1a00-4a00-9300-75a511c37fc0
34a0b113-9375-43b0-93d2d27489b
7857e819-f112-4db7-8297-b3e4b2fae95d
4794a4f7-749c-492a-adcf-3f2995e4a91af
82e4c15b-e3c7-48e4-9364-38233ab1t334
2fc4ddfb-3f6c-4381-a78-673894ab0862
1204897dd-176a-4f5e-b083-cde4a13e2ad
184a4622-6b02-4698-8c8c-bf64240ea0d2
504-1a00-4a00-9300-75a511c37fc0
136184d40-6081-458a-94d3-3-1ddc4c9435d4
ceaf11732-98d6-47f1-9390-f194158722dc
3000-1a00-4a00-9300-75a511c37fc0
111226f2-42cd-4499-1f7b-ecf227835dc5
7334a79c-b16d-4d89-956d-f88e87922d6
1204897dd-176a-4f5e-b083-cde4a13e2ad
c8a212d9-9280-4401-930-22a32a45e52b2
608-1a00-4a00-9300-75a511c37fc0
3763dcb9-76d7-422a-8d8b-5e5d804a6e8e
6e85fb91-ac58-4933-8611-19578009d9ab
7110ff12-3c36-4cd6-99c1-1edee7d5ae4c
d05a2882-cecc-4aceb-4cb5-c-e2258a4a75c
5e4e553a-ae6b-4ef5-863e-22a16235d5851
d05a2882-cecc-4aceb-4cb5-c-e2258a4a75c
4df1aca8-9d9d-479a-374f-4d4ebab1f1c9
e3b0a962-2c8b-4337-1b7b-94d6c6613164
8941652a-6e25-42d1-be34-1ab3b3b764e9b
bf74d45a-f9c1-4a88-8d84-162334bd6d4
4000-1a00-4a00-9300-75a511c37fc0
7110ff12-3c36-4cd6-99c1-1edee7d5ae4c
cdff16c0-213f-4376-8a81-1-4f793f1ae9e
c111226f2-42cd-4499-1f7b-ecf227835dc5
94f7134d-1e2a-43c3-81e9-1bd8bf4695742
604a-1a00-4a00-9300-75a511c37fc0
*CP-processed a total of 401777 messages
rac@PTPMR107 ~ %
```

Explanation of partitioning logic

Overview

All three pipelines use partitioning to balance parallelism, reduce network shuffle, and make downstream storage/querying efficient. Partitioning happens at three places:

- (1) how JDBC reads from MySQL are partitioned,
- (2) how Spark repartitions data for groupBy/joins and downstream writes, and
- (3) how final data is partitioned in storage (Cassandra partition key or S3 hive-style date partitions).

Pipeline A — MySQL → Spark → Cassandra (Customer profiles)

Partitioning steps & heuristics

1. JDBC partitioning (extractor.readDeltaTransactions / readTransactionsForDates)

- Uses `option("partitionColumn", "txn_id")` together with Spark `lowerBound/upperBound` and `numPartitions`.
- `choosePartitions(minId, maxId, cfg)` computes `numPartitions` with the heuristic `~10K rows / partition`:

```
val approxPerPartition = 10000L
val p = Math.max(2, Math.min(cfg, (span / approxPerPartition + 1).toInt))
```

- Purpose: parallelize JDBC reads across multiple connections/threads while avoiding too many tiny partitions.

2. Spark repartition for aggregation

- Pre-aggregation: transactions are `.repartition($"customer_id")` before joins/aggregations. That collocates rows for each customer on the same partition and reduces shuffle during `groupBy(customer_id)`.
- After aggregation, before writing to Cassandra, code computes `repartitions`:

```
val repartitions = Math.max(8, Math.min(writeParallelism, Math.max(1, affectedCountHint * 4)))
```

- This caps/limits the number of output partitions to balance parallel Cassandra writes vs too many small SSTable writes.

3. Cassandra partitioning (storage layout)

- Cassandra table `customer_profile` uses `customer_id` as the partition key (single row per customer). This enables very fast point lookups (API reads).
- Write strategy: repartition by `customer_id` attempts to align Spark partitions to Cassandra partitioning so each Spark task drives writes for a subset of customers.

Pipeline B — MySQL → Spark Structured Streaming (ForeachBatch) → S3 (Daily summaries)

Partitioning steps & heuristics

1. JDBC partitioning for delta
 - Same `txn_id` partitioning heuristic via `choosePartitions` when reading delta ranges. This parallelizes `readDeltaTransactions`.
2. Derive affected dates
 - The pipeline reads only `affectedDates` (`distinct to_date(txn_timestamp)` from `delta`) and then reads the full transactions for those dates using `readTransactionsForDates(dates)`. This minimizes the scope of re-computation.
3. Spark repartition & aggregation
 - Preprocess transactions with `.repartition($"customer_id")` in the transformer to colocate per-customer rows for the daily summary aggregations.
4. S3 partitioning
 - Final writes to S3 use `partitionBy("date")` and `SaveMode.Overwrite` for idempotent writes of the affected date partition:

```
.partitionBy("date")
.parquet(lakeBase)
```

- The `S3Loader.writeSummary` coalesces output files (`coalesce(coalesceNum)`) prior to write to control number/size of files per partition.

Pipeline C — Kafka Avro → Spark Structured Streaming → S3 (Events)

Partitioning steps & heuristics

1. Kafka partitioning (Producer behavior)
 - Your `AvroEventProducerActor` sets the Kafka message key to `eventId`:

```
val record = new ProducerRecord[String, Array[Byte]](topic, eventId,
bytes)
```

- This means events are partitioned by `eventId` hashing. If you need ordering per customer, you'd want to key by `customer_id` instead.
2. Spark streaming partitioning & processing

- Incoming Kafka stream is handled by Spark Structured Streaming. There is no explicit repartitioning in the extractor code beyond usual streaming micro-batch partitioning, but:
 - `from_avro` expands records.
 - `event_date = to_date(event_timestamp)` is added and used as partition column for final writes.

3. S3 partitioning

- Final writes use `partitionBy("event_date")` and append mode for streaming:

```
df.write.mode("append").partitionBy("event_date").parquet(basePath)
```

- Malformed records are handled by a separate `malformed` stream and can be written to a dedicated malformed path.

Screenshots:

Amazon S3 < lake/

Objects (2)

Name	Type	Last modified	Size	Storage class
events/	Folder	-	-	-
txns_summary/	Folder	-	-	-

Amazon S3 < lake/ > txns_summary/

Objects (999+)

Name	Type	Last modified	Size	Storage class
date=2024-12-11/	Folder	-	-	-
date=2024-12-12/	Folder	-	-	-
date=2024-12-21/	Folder	-	-	-
date=2024-12-22/	Folder	-	-	-
date=2024-12-23/	Folder	-	-	-
date=2024-12-25/	Folder	-	-	-
date=2024-12-27/	Folder	-	-	-
date=2024-12-28/	Folder	-	-	-
date=2024-12-29/	Folder	-	-	-
date=2025-12-08/	Folder	-	-	-
date=2025-12-09/	Folder	-	-	-
date=2025-12-10/	Folder	-	-	-
date=2025-12-11/	Folder	-	-	-
date=2025-12-12/	Folder	-	-	-

Amazon S3 < lake/ > events/

Objects (7)

Name	Type	Last modified	Size	Storage class
_checkpoints/	Folder	-	-	-
_spark_metadata/	Folder	-	-	-
_SUCCESS	Folder	December 12, 2025, 17:43:59 (UTC+05:30)	0 B	Standard
event_date=2025-12-09/	Folder	-	-	-
event_date=2025-12-10/	Folder	-	-	-
event_date=2025-12-11/	Folder	-	-	-
event_date=2025-12-12/	Folder	-	-	-

AWS | Search [Option+S] Account ID: 8069-8551-3100 ▾ sanjeev

Amazon S3 > Buckets > sanjeev-scala-s3 > lake/ > events/ > event_date=2025-12-12/

Amazon S3

- Buckets**
 - General purpose buckets
 - Directory buckets
 - Table buckets
 - Vector buckets [New](#)
- Access management and security**
 - Access Points
 - Access Points for FSx
 - Access Grants
 - IAM Access Analyzer
- Storage management and insights**
 - Storage Lens
 - Batch Operations
- Account and organization settings
- AWS Marketplace for S3

event_date=2025-12-12/

Objects (279)

Name	Type	Last modified	Size	Storage class
part-00000-0083e89e-1461-46d4-a96e-f0cf72c82e39.c000.snappy.parquet	parquet	December 12, 2025, 17:21:08 (UTC+05:30)	8.2 KB	Standard
part-00000-0364698c-e26a-4a9c-b618-1b4042a9bb2c.c000.snappy.parquet	parquet	December 12, 2025, 16:47:55 (UTC+05:30)	7.8 KB	Standard
part-00000-03e8a15b-f5c4-4245-875c-c21562b307f5.c000.snappy.parquet	parquet	December 12, 2025, 17:16:05 (UTC+05:30)	39.9 KB	Standard
part-00000-05259e41-4287-4999-872f-b51580bf97c.c000.snappy.parquet	parquet	December 12, 2025, 17:18:00 (UTC+05:30)	8.1 KB	Standard

[Copy S3 URI](#)

AWS | Search [Option+S] Account ID: 8069-8551-3100 ▾ sanjeev

Amazon Keyspaces > CQL editor

Amazon Keyspaces

- Dashboard
- Keyspaces
- Tables
- CQL editor**
- Configuration

Getting started exercise

Getting started resources [New](#)

Code samples [New](#)

Documentation [New](#)

Execution time: 33 ms

Table view JSON view

Records returned (5000)

customer_id	avg_order_value	email	favorite_category	first_purchase	gender	last_purcha
2549	20841.68	customer_2549@example.com	Toys	2020-08-16 04:38:54.0+0000	O	2025-12-11
4581	21920.68	customer_4581@example.com	Health	2020-07-05 05:45:34.0+0000	M	2024-10-01
2316	28885.88	customer_2316@example.com	Electronics	2020-03-26 05:20:31.0+0000	M	2024-10-19
2093	20439.44	customer_2093@example.com	Beauty	2020-05-21 00:41:55.0+0000	O	2024-07-22
899	23593.73	customer_899@example.com	Sports	2020-05-08 14:14:16.0+0000	O	2025-12-10
867	22986.93	customer_867@example.com	Grocery	2020-06-27 22:12:38.0+0000	M	2025-12-10
117	31507.66	customer_117@example.com	Beauty	2020-03-28 20:08:03.0+0000	M	2024-04-06
2992	32454.97	customer_2992@example.com	Home	2020-01-13 12:32:59.0+0000	F	2025-12-08
4529	25867.24	customer_4529@example.com	Grocery	2020-10-24 13:29:09.0+0000	O	2024-06-29
4046	20673.37	customer_4046@example.com	Grocery	2020-04-02 03:00:06.0+0000	O	2025-12-09

Download results to CSV

Home Workspaces API Network

file-handle New Import

REST API basics: CRUD, test & variable / Customer Profile

GET {{base_url}}/customer/4561

Customer Profile

Daily summary

events

Daily summary

Query Params

Key	Value	Description
Key	Value	Description

Body Cookies Headers (9) Test Results (1/1)

200 OK 254 ms 692 B Save Response

{ } JSON Preview Visualize

```
1 {
2   "status": "success",
3   "message": "Customer profile retrieved successfully",
4   "data": [
5     {
6       "customer_id": 4561,
7       "avg_order_value": 27720.72,
8       "email": "customer_4561@example.com",
9       "favorite_category": "Grocery",
10      "first_purchase": "2020-04-16T13:43:12Z",
11      "gender": "F",
12      "last_purchase": "2024-11-09T02:56:37Z",
13      "name": "Customer_4561",
14      "total_spend": 304927.92,
15      "total_transactions": 11
16    }
17 }
```

Save Share

REST API basics: CRUD, test & variable / Daily summary

GET {{base_url}}/summary/2025-12-10

Daily summary

events

Daily summary

Pre-request

1 Use JavaScript to write tests, visualize response, and more. ⌘P to Ask AI

Post-response

Body Cookies Headers (9) Test Results

200 OK 1.18 s 12.82 KB Save Response

{ } JSON Preview Visualize

```
1 {
2   "status": "success",
3   "message": "Daily transaction summaries retrieved successfully",
4   "data": [
5     {
6       "summaries": [
7         {
8           "date": "2025-12-10",
9           "customer_id": 2142,
10          "total_amount": 38143.2,
11          "total_items": 8,
12          "distinct_products": 1,
13          "top_category": "Electronics"
14        },
15        {
16           "date": "2025-12-10",
17           "customer_id": 1088,
18         }
19       ]
20     }
21   ]
22 }
```

Save Share

Home Workspaces API Network

file-handle New Import

REST API basics: CRUD, test & variable / Daily summary

GET {{base_url}}/summary/2025-12-10

Daily summary

events

Daily summary

Pre-request

1 Use JavaScript to write tests, visualize response, and more. ⌘P to Ask AI

Post-response

Body Cookies Headers (9) Test Results

200 OK 1.18 s 12.82 KB Save Response

{ } JSON Preview Visualize

```
1 {
2   "status": "success",
3   "message": "Daily transaction summaries retrieved successfully",
4   "data": [
5     {
6       "summaries": [
7         {
8           "date": "2025-12-10",
9           "customer_id": 2142,
10          "total_amount": 38143.2,
11          "total_items": 8,
12          "distinct_products": 1,
13          "top_category": "Electronics"
14        },
15        {
16           "date": "2025-12-10",
17           "customer_id": 1088,
18         }
19       ]
20     }
21   ]
22 }
```

Save Share

Home Workspaces API Network

file-handle New Import

GET Customer | GET Daily summar | GET events | GET events | GET Daily summar | REST API b... | Performance | + | No environment | Upgrade

file-handle Collections Environments History Flows

REST API basics: CRUD, test & variable / events

GET {{base_url}} /events/1166?limit=10

Docs Params Authorization Headers (6) Body Scripts Settings Cookies

none form-data x-www-form-urlencoded raw binary GraphQL

This request does not have a body

Body Cookies Headers (9) Test Results

200 OK 5 ms 2.72 KB Save Response

{ JSON Preview Visualize }

```
1 {
  "status": "success",
  "message": "Customer events retrieved successfully",
  "data": {
    "events": [
      {
        "date": "2025-12-10",
        "event_id": "8849b88b-7336-46bd-9668-8c81ea01b2b1",
        "customer_id": 1166,
        "event_type": "WISHLIST",
        "product_id": 58,
        "event_timestamp_hex": "2025-12-09T18:50:45.929804Z",
        "ingestion_timestamp_hex": "2025-12-09T18:51:09.789Z"
      },
      {
        "date": "2025-12-11",
        "event_id": "d4b27a2-fcde-406b-a727-aaaae6c3c1d11",
        "customer_id": 1166,
        "event_type": "WISHLIST",
        "product_id": 4,
        "event_timestamp_hex": "2025-12-11T04:45:06.317456Z",
        "ingestion_timestamp_hex": "2025-12-11T04:45:41.484Z"
      }
    ]
  }
}
```

Cloud View Find and replace Console Terminal Runner Start Proxy Cookies Vault Trash

Home Workspaces API Network

file-handle New Import

GET Customer | GET Daily summar | GET events | GET events | GET Daily summar | REST API b... | Performance | + | No environment | Upgrade

file-handle Collections Environments History Flows

REST API basics: CRUD, test & variable / events

GET {{base_url}} /events/1166?fromDate=2025-12-11&toDate=2025-12-11&limit=50

Docs Params Authorization Headers (6) Body Scripts Settings Cookies

none form-data x-www-form-urlencoded raw binary GraphQL

This request does not have a body

Body Cookies Headers (9) Test Results

200 OK 3.32 s 11.92 KB Save Response

{ JSON Preview Visualize }

```
1 {
  "status": "success",
  "message": "Customer events retrieved successfully",
  "data": {
    "events": [
      {
        "date": "2025-12-11",
        "event_id": "d4b27a2-fcde-406b-a727-aaaae6c3c1d11",
        "customer_id": 1166,
        "event_type": "WISHLIST",
        "product_id": 4,
        "event_timestamp_hex": "2025-12-11T04:45:06.317456Z",
        "ingestion_timestamp_hex": "2025-12-11T04:45:41.484Z"
      }
    ]
  }
}
```

Cloud View Find and replace Console Terminal Runner Start Proxy Cookies Vault Trash

Performance Report of api calls - Dec 13, 2025 (#1)

[Open in Postman](#)

Postman collection: REST API basics: CRUD, test & variable Copy 2

Report exported on: Dec 13, 2025, 12:34:05 (GMT+5:30)

Test setup

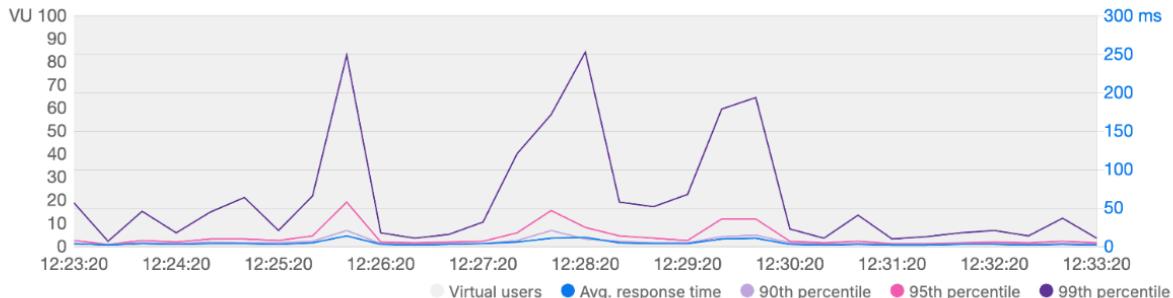
Virtual users	Start time	Load profile
100 VU	Dec 13, 12:23:25 (GMT+5:30)	Fixed
Duration	End time	Environment
10 minutes	Dec 13, 12:33:31 (GMT+5:30)	-

1. Summary

Total requests sent	Throughput	Average response time	Error rate
207,265	341.92 requests/second	4 ms	0.00 %

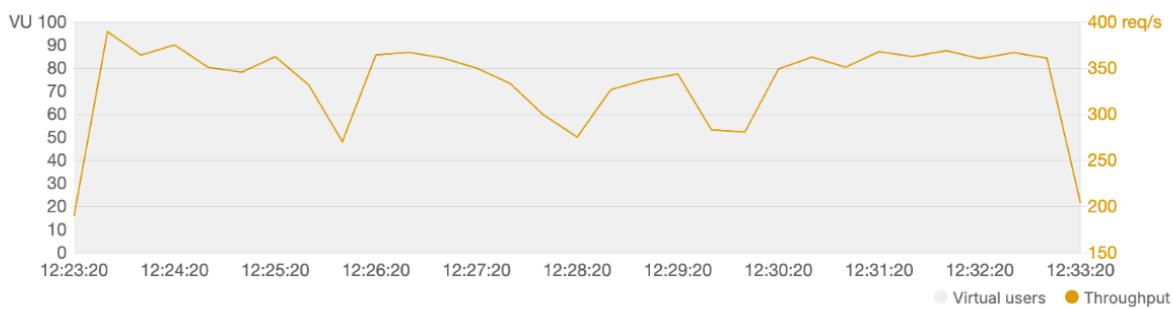
1.1 Response time

Response time trends during the test duration.



1.2 Throughput

Rate of requests sent per second during the test duration.



1.3 Requests with slowest response times

Top 5 slowest requests based on their average response times.

Request	Resp. time (Avg ms)	90th (ms)	95th (ms)	99th (ms)	Min (ms)	Max (ms)
<code>GET Customer Profile</code> <code>{{base_url}}/customer/456</code>	5	5	11	72	1	1,949
<code>GET Daily summary</code> <code>{{base_url}}/summary/2025-12-10</code>	5	6	10	59	1	1,879
<code>GET events</code> <code>{{base_url}}/events/1166?limit=100</code>	4	5	10	58	1	864
<code>GET Daily summary</code> <code>{{base_url}}/summary/2025-12-10/3156</code>	4	4	8	42	1	724

2. Metrics for each request

The requests are shown in the order they were sent by virtual users.

Request	Total requests	Requests/s	Min (ms)	Avg (ms)	90th (ms)	Max (ms)	Error %
<code>GET Customer Profile</code> <code>{{base_url}}/customer/456</code>	51,818	85.48	1	5	5	1,949	0
<code>GET Daily summary</code> <code>{{base_url}}/summary/2025-12-10</code>	51,818	85.48	1	5	6	1,879	0
<code>GET events</code> <code>{{base_url}}/events/1166?limit=100</code>	51,815	85.48	1	4	5	864	0
<code>GET Daily summary</code> <code>{{base_url}}/summary/2025-12-10/3156</code>	51,814	85.48	1	4	4	724	0

Sample JSON responses

1. Customer Profile API

GET /customer/:id

Sample Success Response

```
{  
  "status": "success",  
  "message": "Customer profile retrieved successfully",  
  "data": {  
    "customer_id": 456,  
    "name": "Customer_456",  
    "email": "customer_456@example.com",  
    "gender": "M",  
    "total_spend": 143949.5,  
    "total_transactions": 6,  
    "avg_order_value": 23991.58,  
    "first_purchase": "2022-03-07T06:30:00Z",  
    "last_purchase": "2024-05-18T18:17:40Z",  
    "favorite_category": "Grocery"  
  }  
}
```

Sample Not-Found Response

```
{  
  "status": "error",  
  "message": "not-found",  
  "data": {}
```

```
}
```

2. Daily Summary API

GET /summary/:date/:customerId

Sample Success Response

```
{
  "status": "success",
  "message": "Daily transaction summary retrieved successfully",
  "data": {
    "summary": {
      "date": "2025-12-10",
      "customer_id": 3156,
      "total_amount": 12895.28,
      "total_items": 2,
      "distinct_products": 1,
      "top_category": "Electronics"
    }
  }
}
```

Sample Not-Found Response

```
{
  "status": "error",
  "message": "not-found",
  "data": {}
}
```

Sample Invalid Date Response

```
{  
  "status": "error",  
  "message": "invalid_date_format",  
  "data": {}  
}
```

3. Events API

GET /events/:customerId?fromDate=&toDate=&limit=

Sample Success Response

```
{  
  "status": "success",  
  "message": "Customer events retrieved successfully",  
  "data": {  
    "events": [  
      {  
        "date": "2025-12-09",  
        "event_id": "dd4b27a2-fcde-406b-a727-aeee6c3c1d11"  
        "customer_id": 2942,  
        "event_type": "CART_ADD",  
        "product_id": 491,  
        "event_timestamp": "2025-12-09T18:18:50.850395Z",  
        "ingestion_timestamp": "2025-12-09T18:18:59.149Z"  
      }  
    ]  
  }
```

```
}
```

Sample Invalid fromDate Response

```
{
  "status": "error",
  "message": "invalid_fromDate_format",
  "data": {}
}
```

Sample Invalid toDate Response

```
{
  "status": "error",
  "message": "invalid_toDate_format",
  "data": {}
}
```

Sample Invalid Limit Response

```
{
  "status": "error",
  "message": "invalid_limit",
  "data": {}
}
```

Sample Customer Not Found Response

```
{
  "status": "error",
  "message": "not-found",
  "data": {}
}
```

4. Daily Summaries API

GET /summary/:date

Sample Success Response

```
{  
  "status": "success",  
  "message": "Daily transaction summaries retrieved successfully",  
  "data": {  
    "summaries": [  
      {  
        "date": "2025-12-10",  
        "customer_id": 1088,  
        "total_amount": 57714.9,  
        "total_items": 6,  
        "distinct_products": 1,  
        "top_category": "Sports"  
      },  
      {  
        "date": "2025-12-10",  
        "customer_id": 3156,  
        "total_amount": 12895.28,  
        "total_items": 2,  
        "distinct_products": 1,  
        "top_category": "Electronics"  
      }  
    ]  
  }  
}
```

Sample Not-Found Response

```
{  
  "status": "error",  
  "message": "not-found",  
  "data": {}  
}
```

Sample Invalid Date Response

```
{  
  "status": "error",  
  "message": "invalid_date_format",  
  "data": {}  
}
```