

## Pub/Sub to BigQuery – Implementation Summary

### 1. Pub/Sub Topic and Subscription

- A Pub/Sub topic named 'sainathbigquery\_events' was created.
- A subscription named 'sainathbigquery-events-sub' was created for the topic.
- The subscription is active and able to receive messages.
- Messages published to the topic are successfully delivered to the subscription.

### 2. Publishing Messages to Pub/Sub

- User event messages are published in JSON format.
- Each message contains event type and user information.
- Example events include user login actions.
- Messages are successfully accepted by Pub/Sub.

### 3. Cloud Function Deployment

- A Cloud Function named 'sainathfunctionapp' was deployed in the asia-south1 region.
- The function is configured with a Pub/Sub trigger.
- It runs automatically whenever a message is published to the topic.

### 4. Message Processing in Cloud Function

- The Cloud Function decodes the Pub/Sub message.
- JSON data is extracted from the message payload.
- A timestamp is generated during processing.
- The processed data is prepared for storage in BigQuery.

The screenshot shows the configuration of a Pub/Sub subscription named 'sainath-event...'. At the top, there are buttons for Edit, Create snapshot, Replay messages, Purge messages, and Show info pane. Below this, the subscription details are listed:

Subscription name	projects/mazenet-001/subscriptions/sainath-events-sub
Subscription state	active
Topic name	projects/mazenet-001/topics/sainath-events
Tags	-

Below the details, there are tabs for Metrics, Details, and Messages. The Messages tab is selected, showing a list of published messages. One message is highlighted with a blue border:

Publish time	Attribute keys	Message body	Ack
Dec 23, 2025, 9:57:15 AM	-	{event:\TestEvent,\name:\Sainath,\age:22,\role:\admin}	Deadline exceeded
Dec 23, 2025, 10:09:50 AM	-	{event: User_Created, user: sal, age: 23, role: data}	Deadline exceeded
Dec 23, 2025, 10:15:41 AM	-	{event: User_Created, user: Aarya, age: 30, role: admin}	Deadline exceeded

### 5. BigQuery Dataset and Table

- A BigQuery dataset named 'sainatthevents' was created.
- A table named 'user\_events' was created inside the dataset.
- Table schema includes event, user, and timestamp fields.

The screenshot shows the Google Cloud BigQuery Studio interface. On the left, the navigation pane is open with sections like Overview, Studio, Pipelines & Integration, Governance, and Settings. The main area displays the schema for a table named 'user\_events' in a dataset called 'sainathevents'. The schema includes three fields: 'event' (STRING, NULLABLE), 'user' (STRING, NULLABLE), and 'ts' (TIMESTAMP, NULLABLE). There are also tabs for Details, Preview, Table Explorer, Insights, Lineage, and Data Prof.

## 6. Data Insertion into BigQuery

- The Cloud Function inserts processed records into the BigQuery table.
- Multiple records are stored successfully.
- Each record contains event name, user name, and timestamp.

The screenshot shows the Google Cloud Pub/Sub Subscriptions interface. The left sidebar lists Topics, Subscriptions, Snapshots, and Schemas. The main area shows a subscription named 'sainathbigque...' with the following details: Subscription name: projects/mazenet-001/subscriptions/sainathbigquery-events-sub, Subscription state: active, Topic name: projects/mazenet-001/topics/sainathbigquery\_events, and Tags: -. Below this, the 'Messages' tab is selected, showing a single message with the following details: Publish time: Dec 24, 2025, 11:01:27 AM, Attribute keys: -, Message body: {"event": "login", "user": "sainath"}. There are also tabs for Metrics and Details.

## 7. End-to-End Data Flow

- Events are published to Pub/Sub.
- Pub/Sub triggers the Cloud Function.
- The Cloud Function processes the data.
- BigQuery stores the final records for analysis.

sainathfunctionapp Region: asia-south1 URL: <https://sainathfunctionapp-988388160376.asia-south1.run.app> Scaling: Auto (Min: 0)

Observability Revisions Source Triggers Networking Security YAML

Metrics Logs Severity Default Filter Search all fields and values

	Severity	Timestamp	Summary
Logs	>	2025-12-24 10:58:48.199 IST	Cloud Run ReplaceService sainathfunctionapp (@type: type.googleapis.com/google.cloud...
SLOs	>	2025-12-24 11:01:29.469 IST	POST 200 130 B 690 ms APIs-Google; (+https://developers.goo... https://sainathfunc...
Errors	>	2025-12-24 11:01:30.169 IST	Bigquery Insert Succeeded {'event': 'login', 'user': 'sainath', 'ts': '2025-12-24T05:31:2...
	No newer entries found matching current filter.		

## Conclusion

This implementation demonstrates a real-time event processing system using Google Cloud Pub/Sub, Cloud Functions, and BigQuery. The solution is scalable, reliable, and suitable for real-time data analytics.