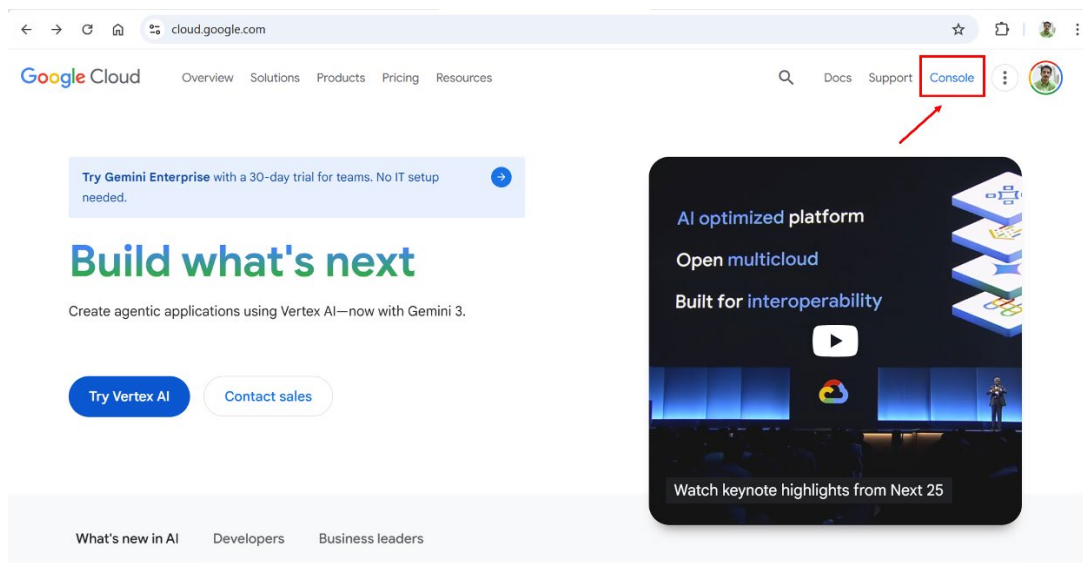


## CLOUD COMPUTING LABORATORY

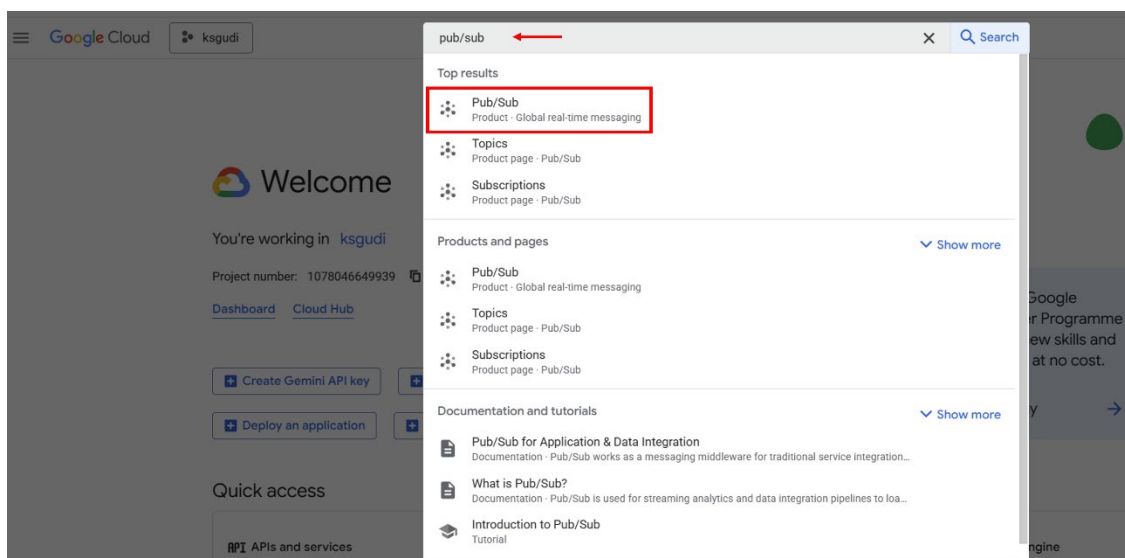
### Experiment – 7:

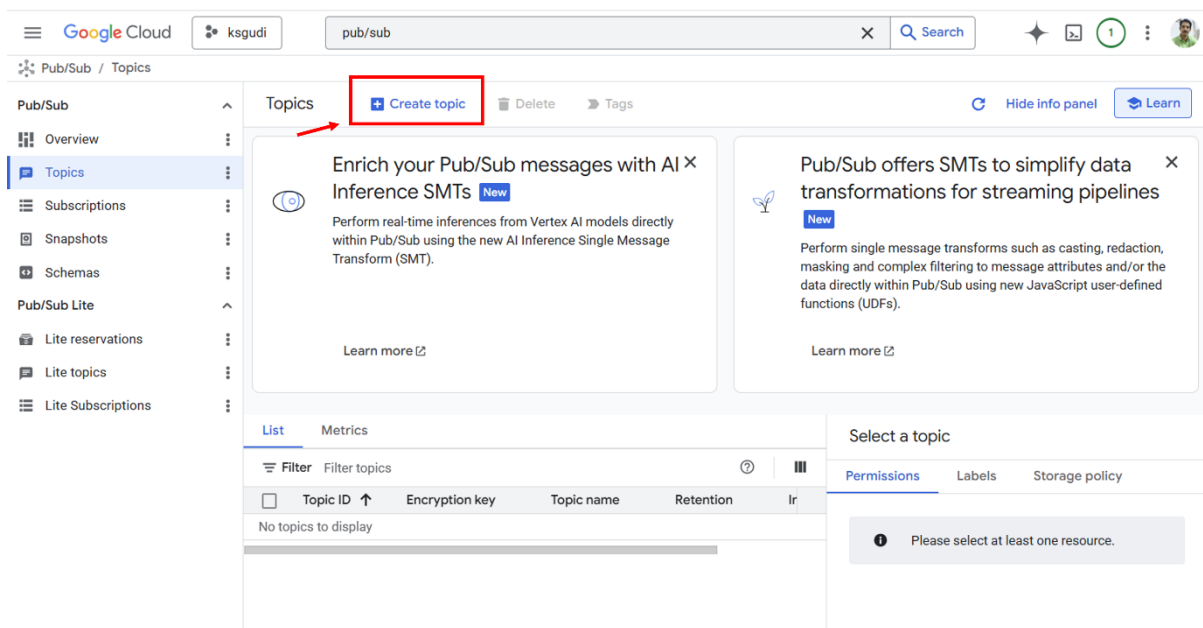
*Experiment how Google Cloud Pub/Sub facilitate real-time messaging and communication between distributed applications.*

**Step 1:** From the Google Cloud homepage, click on **Console** to open the Google Cloud Console.

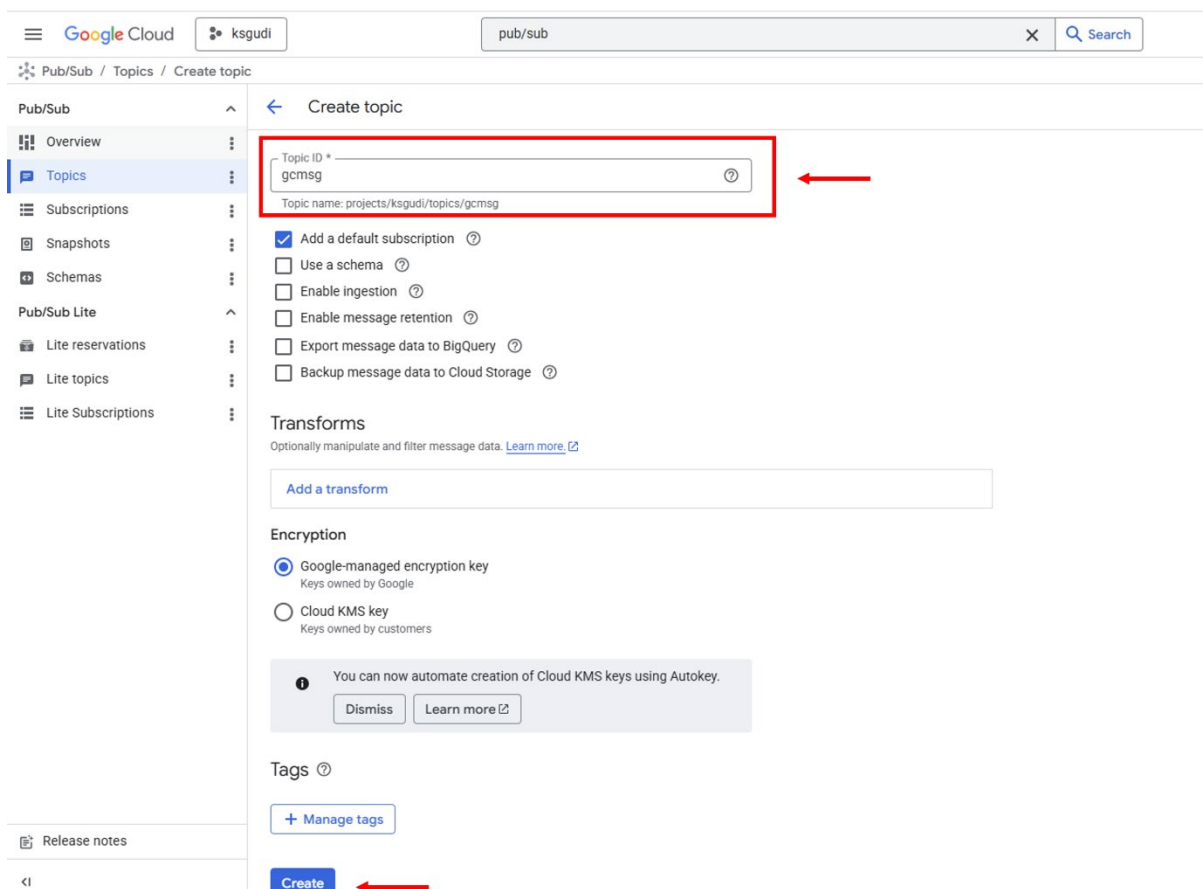


**Step 2:** Open **Google Cloud Console**, search for **Pub/Sub** in the search bar, and select the Pub/Sub service.



**Step 3: Navigate to Topics from the left panel and click on Create Topic.**

The screenshot shows the Google Cloud Pub/Sub Topics page. The left sidebar contains navigation options: Overview, Topics (highlighted), Subscriptions, Snapshots, Schemas, Pub/Sub Lite, Lite reservations, Lite topics, and Lite Subscriptions. The main content area is titled 'Topics' and features a '+ Create topic' button highlighted with a red box and an arrow. Below this, there are two informational cards: 'Enrich your Pub/Sub messages with AI Inference SMTs' and 'Pub/Sub offers SMTs to simplify data transformations for streaming pipelines'. At the bottom, there is a table with columns for Topic ID, Encryption key, Topic name, Retention, and Ir, and a 'Select a topic' panel on the right with tabs for Permissions, Labels, and Storage policy.

**Step 4: Enter a Topic ID (e.g., gcmsg) and click Create to create a new topic.**

The screenshot shows the 'Create topic' page in Google Cloud Pub/Sub. The left sidebar is the same as in Step 3. The main content area is titled 'Create topic' and features a 'Topic ID' input field containing 'gcmsg', highlighted with a red box and an arrow. Below the input field, there are several checkboxes: 'Add a default subscription' (checked), 'Use a schema', 'Enable ingestion', 'Enable message retention', 'Export message data to BigQuery', and 'Backup message data to Cloud Storage'. There is also a 'Transforms' section with an 'Add a transform' button, an 'Encryption' section with radio buttons for 'Google-managed encryption key' (selected) and 'Cloud KMS key', and a 'Tags' section with a '+ Manage tags' button. At the bottom, there is a 'Create' button highlighted with a red arrow.

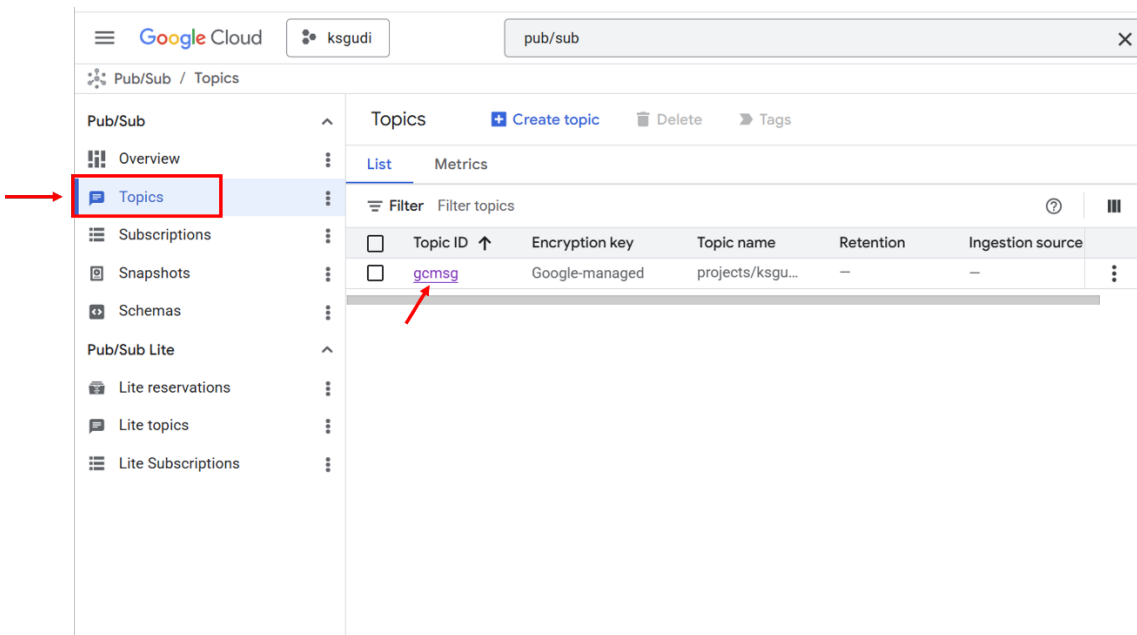
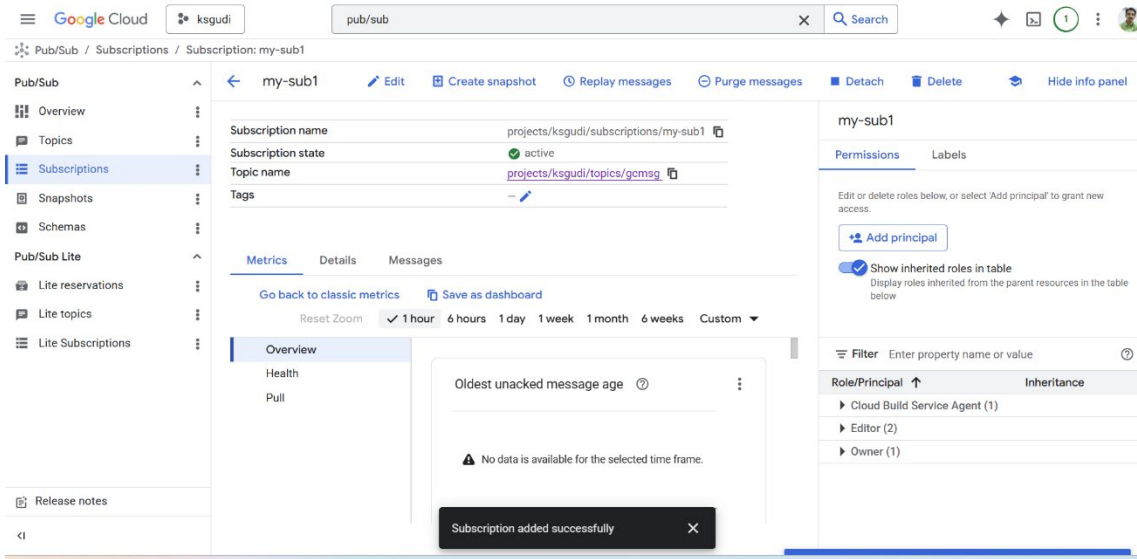
**Step 5:** Once the topic is created, click on **Create Subscription** to add a subscription to the topic.

The screenshot shows the Google Cloud console interface for a Pub/Sub topic named 'gcmsg'. The left sidebar contains navigation options like Overview, Topics, Subscriptions, Snapshots, Schemas, and Pub/Sub Lite. The main content area displays the topic details, including the topic name 'projects/ksgudi/topics/gcmsg' and tags. Below this, there are two export options: 'Export to BigQuery' and 'Export to Cloud Storage'. At the bottom, there is a 'Subscriptions' section with a 'Create subscription' button highlighted in a red box and a red arrow pointing to it. A table below shows one existing subscription with ID 'gcmsg-sub' and name 'projects/ksgudi/subscriptions/gcmsg-sub'.

**Step 6:** Provide a **Subscription ID** (e.g., my-sub), choose **Delivery Type** as **Pull**, and create the subscription.

The screenshot shows the 'Add subscription to topic' form in the Google Cloud console. The form is titled 'Add subscription to topic' and includes a description: 'A subscription directs messages on a topic to subscribers. Messages can be pushed to subscribers immediately, or subscribers can pull messages as needed.' The 'Subscription ID' field is highlighted with a red box and a red arrow pointing to it, with the value 'my-sub1' entered. Below this, the 'Subscription name' is shown as 'projects/ksgudi/subscriptions/my-sub1'. The 'Topic name' is 'projects/ksgudi/topics/gcmsg'. The 'Delivery type' is set to 'Pull' (selected with a radio button). Other options include 'Push', 'Write to BigQuery', and 'Write to Cloud Storage'. The 'Message retention duration' is set to 10 minutes.

**Step 7:** After successful creation, verify that the subscription is listed under the topic.



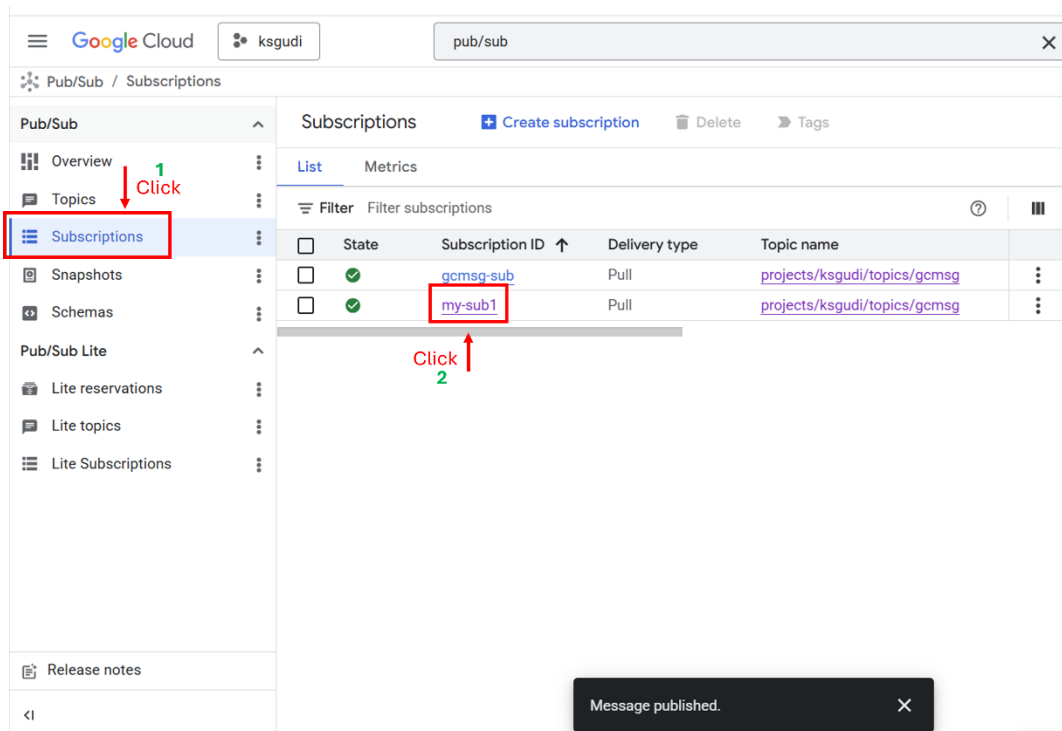
Step 8: Go to the **Messages** tab of the topic and click on **Publish Message**.

The screenshot shows the Google Cloud Pub/Sub console for a topic named 'gcmmsg'. The left sidebar contains navigation options like Overview, Topics, Subscriptions, Snapshots, Schemas, and Pub/Sub Lite. The main content area shows the topic details, including the topic name 'projects/ksgudi/topics/gcmmsg' and tags. Below this, there are tabs for Subscriptions, Snapshots, Metrics, Details, and Messages. The 'Messages' tab is highlighted with a red box and a red arrow labeled '1 Click'. Under the Messages tab, there are instructions for publishing a message. A 'Publish message' button is highlighted with a red arrow labeled '2 Click'.

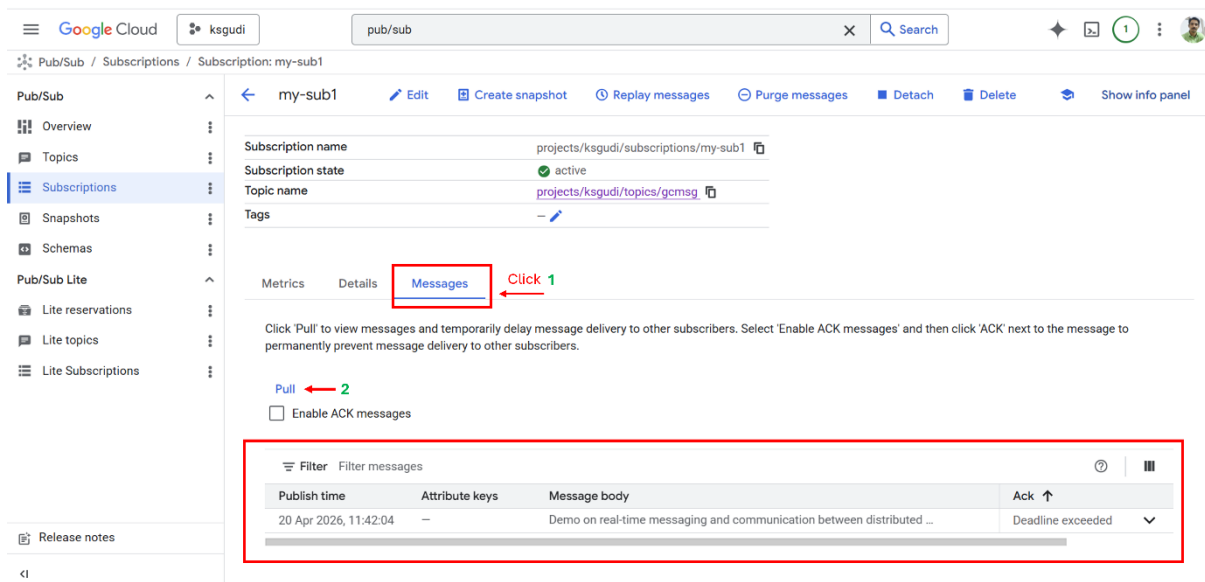
Step 9: Enter the **message content** and click **Publish** to send the message.

The screenshot shows the 'Publish message' dialog in the Google Cloud Pub/Sub console. The dialog has fields for 'Topic name' (projects/ksgudi/topics/gcmmsg), 'Publish count' (Number of messages: 1, Message interval: 1), and 'Message body'. The 'Message body' field contains the text 'Demo on real-time messaging and communication between distributed applications.' and is highlighted with a red arrow labeled '1'. At the bottom of the dialog, there is a 'Publish' button highlighted with a red arrow labeled '2' and a 'Cancel' button.

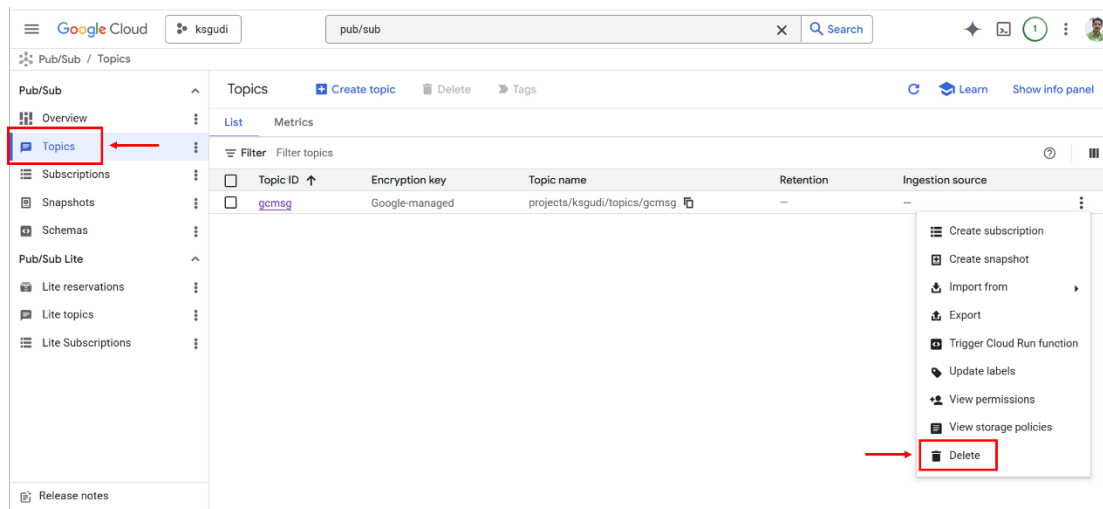
**Step 10:** Navigate to **Subscriptions**, select the created subscription, and open the **Messages** tab.



**Step 11:** Click on **Pull** to receive messages published to the topic and verify the message.



**Step 12:** To delete a topic, go to **Topics**, select the topic, and click **Delete**.



**Step 13:** To delete a subscription, go to **Subscriptions**, select the subscription, and click **Delete**.

