Triggering from Pub/Sub push

You can use Pub/Sub to push messages to the endpoint of your Cloud Run service, which are subsequently delivered to containers as HTTP requests. You should process the message and then return a response when finished.

Leveraging service accounts and IAM permissions, you can securely and privately use Pub/Sub with Cloud Run, without having to expose your Cloud Run service publicly. Only the Pub/Sub subscription that you have set up is able to invoke your service.

Possible use cases include:

- Transforming data after receiving an event upon a file upload to a Cloud Storage bucket (https://cloud.google.com/storage/docs/pubsub-notifications).
- Processing your Stackdriver logs with Cloud Run by exporting them to Pub/Sub (https://cloud.google.com/logging/docs/export/configure_export_v2#errors_exporting_logs_to_cloud_pubsub)
- Publishing (https://cloud.google.com/pubsub/docs/publisher) and processing your own custom events from your Cloud Run services.

This page shows how to enable your service to securely process messages pushed from a Pub/Sub subscription in the same Google Cloud project.

To integrate your service with Pub/Sub,

- Create a Pub/Sub topic.
- Add code in your Cloud Run service to respond to the Pub/Sub messages sent to the topic you created.
- Create a service account with the required permissions.
- Create a Pub/Sub subscription and associate it with the service account. This subscription will send to your service any message that is published to the topic.

Before you start

If you haven't done so already, set up your environment as described in the setup page for Cloud Run (https://cloud.google.com/run/docs/setup) or the setup page for Cloud Run for Anthos on Google Cloud (https://cloud.google.com/run/docs/gke/setup). You'll need to use the gcloud command line and a Google Cloud project to deploy your Cloud Run service to.

Creating a Pub/Sub topic

Requests to your service are triggered by messages published to a Pub/Sub topic, so you'll need to create a topic:

CONSOLE COMMAND LINE

1. Visit the Pub/Sub topics page in the Cloud Console.

   PUB/SUB TOPICS PAGE (HTTPS://CONSOLE.CLOUD.GOOGLE.COM/CLOUDPUBSUB/TOPICLIST)

2. Click **Create a topic**.
3. Enter a unique **Name** for your topic, for example, MyTopic.

Adding code to handle messages from Pub/Sub

Your service must extract the message from the request and return an expected success code. The following snippets for selected languages (you can use any language) show how to do this for a simple *Hello World* message:

NODE.JS PYTHON GO JAVA

run/pubsub/app.js (https://github.com/GoogleCloudPlatform/nodejs-docs-samples/blob/master/run/pubsub/app.js)

HUB.COM/GOOGLECLOUDPLATFORM/NODEJS-DOCS-SAMPLES/BLOB/MASTER/RUN/PUBSUB/APP.JS)

FEEDBACK (#)

```
app.post('/', (req, res) => {
  if (!req.body) {
    const msg = 'no Pub/Sub message received';
    console.error(`error: ${msg}`);
    res.status(400).send(`Bad Request: ${msg}`);
    return;
  }
  if (!req.body.message) {
    const msg = 'invalid Pub/Sub message format';
    console.error(`error: ${msg}`);
    res.status(400).send(`Bad Request: ${msg}`);
    return;
  }

  const pubSubMessage = req.body.message;
  const name = pubSubMessage.data
    ? Buffer.from(pubSubMessage.data, 'base64')
        .toString()
        .trim()
    : 'World';

  console.log(`Hello ${name}!`);
  res.status(204).send();
});
```

You must code the service to return an accurate HTTP response code. Success codes, such as HTTP `200` or `204`, acknowledge complete processing of the Pub/Sub message. Error codes, such as HTTP `400` or `500`, indicate the message will be retried, as described in Receiving messages using Push (https://cloud.google.com/pubsub/docs/push).

Create a service account for the subscription

You need to create a service account to associate with your Pub/Sub subscription, and give it the permission to invoke your Cloud Run service. Pub/Sub messages pushed to your Cloud Run service will carry the identity of this service account.

You can use an existing service account to represent the Pub/Sub subscription identity, or you can create a new one.

To create a new service account and give it permission to invoke the Cloud Run service:

CONSOLE   COMMAND LINE

1. Visit the *Create service account key* page in the Cloud Console.

   CREATE SERVICE ACCOUNT PAGE (HTTPS://CONSOLE.CLOUD.GOOGLE.COM/APIS/CREDENTIALS/

2. From the *Service account list*, select **New service account**.
3. In the *Service account name* field, enter the name you want to use for the service account.
4. Click **Create**.
5. Copy the service account email to use in the following steps.
6. Click **Continue** if prompted to specify permissions.
7. Visit the *Cloud Run Services* page in the Cloud Console.

   GO TO THE SERVICES PAGE (HTTPS://CONSOLE.CLOUD.GOOGLE.COM/RUN)

8. Select your service in the displayed list.
9. If necessary, click the **Show Info Panel**/**Hide Info Panel** toggle in the far right of the page to show information.
10. Locate the *Permissions* tab, and in that tab, click **Add Member**.
11. Paste your service account email into the **New members** field.
12. From the Role dropdown menu, select **Cloud Run** > **Cloud Run Invoker**.
13. Click **Save**.

Validating service accounts (Cloud Run for Anthos on Google Cloud)

If you are using Cloud Run for Anthos on Google Cloud, you must verify the identity within the container. See the IAP sample code (https://cloud.google.com/iap/docs/authentication-howto#authenticating_from_a_service_account) that demonstrates this.

Create a push subscription and associate it with the service account

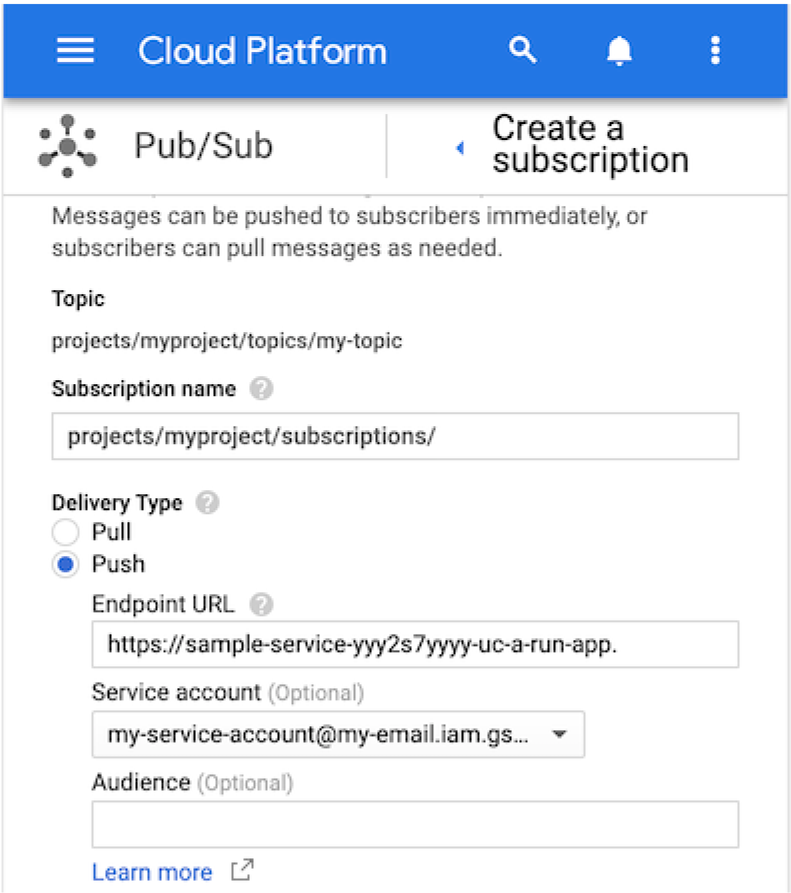
You must subscribe your service to receive messages sent to a topic, and you must associate the subscription with the service account (#create-service-account) you created for your service. You can use either the Cloud Console or the gcloud command line:

CONSOLE COMMAND LINE

1. Go to the Pub/Sub topics page.

   PUB/SUB TOPICS PAGE (HTTPS://CONSOLE.CLOUD.GOOGLE.COM/CLOUDPUBSUB/TOPICLIST)

2. Click the topic you want to subscribe to.
3. Click **Create Subscription** to display the subscription form:

   Messages can be pushed to subscribers immediately, or subscribers can pull messages as needed.

   Topic
   projects/myproject/topics/my-topic

   Subscription name
   projects/myproject/subscriptions/

   Delivery Type
   ○ Pull
   ● Push

   Endpoint URL
   https://sample-service-yyy2s7yyyy-uc-a-run-app.

   Service account (Optional)
   my-service-account@my-email.iam.gs...

   Audience (Optional)

   In the form,

   a. Specify the **push** delivery type.

   b. For Endpoints URL, specify your service's URL, which is displayed in the service detail page (https://cloud.google.com/run/docs/managing/services).

   c. In the *Service Account* dropdown, *select the service account that you created with the required permissions* (#create-service-account).

   d. Set subscription expiration and acknowledgement deadline as desired.

   e. Click **Create**.

4. The subscription is complete. Messages posted to the topic will now be pushed into your service.

What's next

- See the Cloud Run tutorial for Pub/Sub (https://cloud.google.com/run/docs/tutorials/pubsub) for a complete sample application.
- See the Cloud Run tutorial for Cloud Storage (https://cloud.google.com/run/docs/tutorials/image-processing) for a sample using Pub/Sub to drive asynchronous image processing.
- See the Pub/Sub documentation (https://cloud.google.com/pubsub/docs) for more details on Pub/Sub.

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