

This tutorial shows how to write, deploy, and call a Cloud Run service from a [Pub/Sub push subscription](/pubsub/docs/push-subscription) (/pubsub/docs/push).

You can use this tutorial with Cloud Run (fully managed) or Cloud Run for Anthos on Google Cloud.

- Write, build, and deploy a service to Cloud Run or Cloud Run for Anthos on Google Cloud
- Call the service by publishing a message to a [Pub/Sub](/pubsub) (/pubsub) topic.

This tutorial uses billable components of Cloud Platform, including:

- [Cloud Build](/cloud-build/) (/cloud-build/)
- [Container Registry](/container-registry/) (/container-registry/)
- [Pub/Sub](/pubsub/) (/pubsub/)
- [Cloud Run or Cloud Run for Anthos on Google Cloud](/run/) (/run/)

Use the [Pricing Calculator](/products/calculator/) (/products/calculator/) to generate a cost estimate based on your projected usage.

New Cloud Platform users might be eligible for a [free trial](/free/) (/free/).

1. [Sign in](https://accounts.google.com/Login) (https://accounts.google.com/Login) to your Google Account.

If you don't already have one, [sign up for a new account](https://accounts.google.com/SignUp) (https://accounts.google.com/SignUp).

2. In the Cloud Console, on the project selector page, select or create a Cloud project.

★ **Note:** If you don't plan to keep the resources that you create in this procedure, create a project instead of selecting an existing project. After you finish these steps, you can delete the project, removing all resources associated with the project.

[Go to the project selector page](https://console.cloud.google.com/projectselector2/home/dashboard) (https://console.cloud.google.com/projectselector2/home/dashboard)

3. Make sure that billing is enabled for your Google Cloud project. [Learn how to confirm billing is enabled for your project](/billing/docs/how-to/modify-project) (/billing/docs/how-to/modify-project).

4. [Enable the Cloud Run API](https://console.cloud.google.com/apis/library/run.googleapis.com) (https://console.cloud.google.com/apis/library/run.googleapis.com)

5. [Install and initialize](/sdk/docs/) (/sdk/docs/) the Cloud SDK.

6. For Cloud Run for Anthos on Google Cloud install the gcloud kubectl component:

7. Update components:

8. If you are using Cloud Run for Anthos on Google Cloud, create a new cluster using the instructions in [Setting up Cloud Run for Anthos on Google Cloud](/run/docs/gke/setup) (/run/docs/gke/setup).

To configure gcloud with defaults for your Cloud Run service:

1. Set your default project:

Replace **PROJECT-ID** with the name of the project you created for this tutorial.

2. If you are using Cloud Run (fully managed), configure gcloud for your chosen region:

Replace **REGION** with the supported Cloud Run region (#follow-cloud-run) of your choice.

3. If you are using Cloud Run for Anthos on Google Cloud, configure gcloud for your cluster:

Replace

- **CLUSTER-NAME** with the name you used for your cluster,
- **REGION** with the supported cluster location of your choice.

The sample service is triggered by messages published to a Pub/Sub topic, so you'll need to create a topic in Pub/Sub.

To create a new Pub/Sub topic, use the command:

You can use **myRunTopic** or replace with a topic name unique within your Google Cloud project.

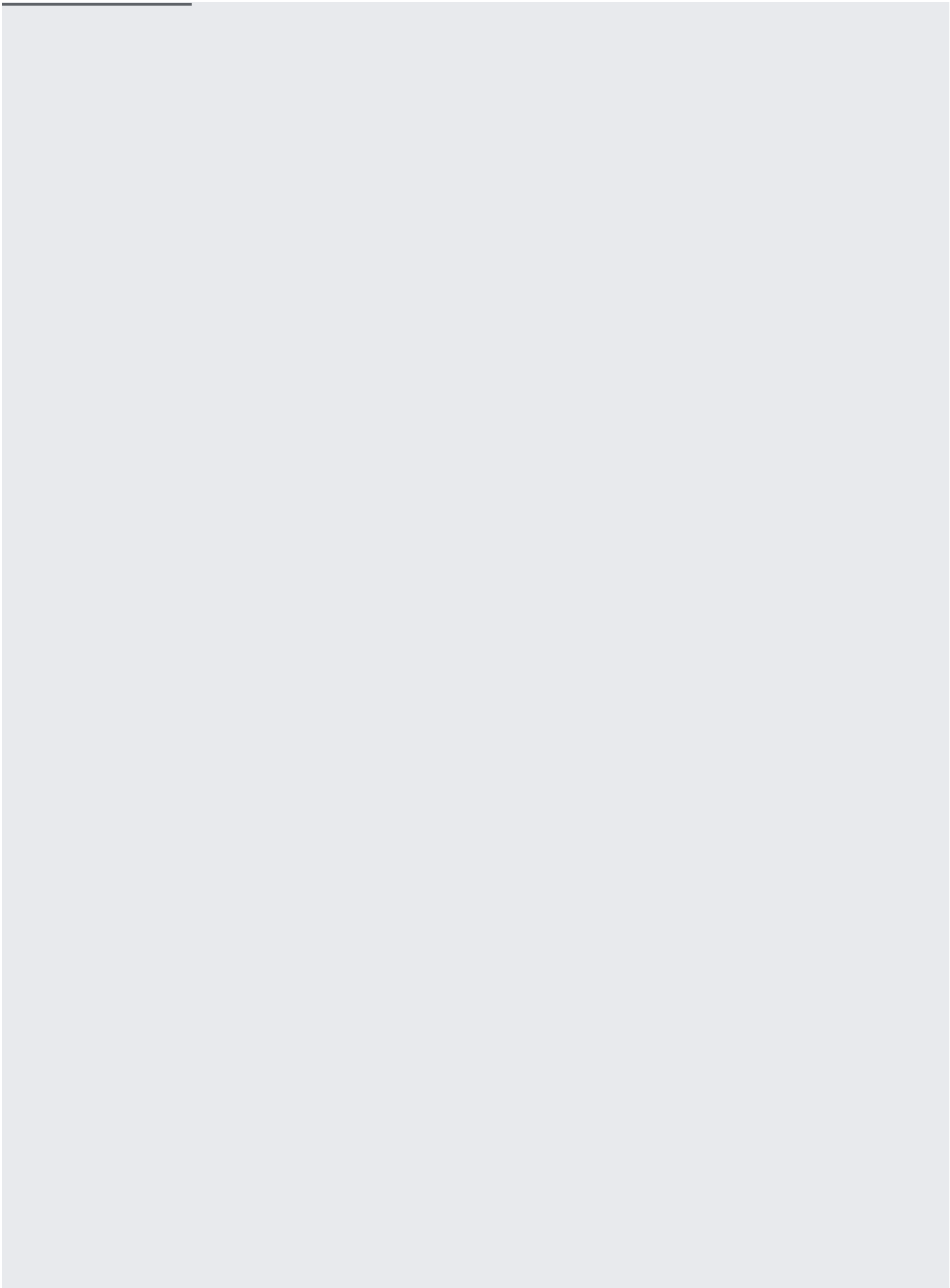
To retrieve the code sample for use:

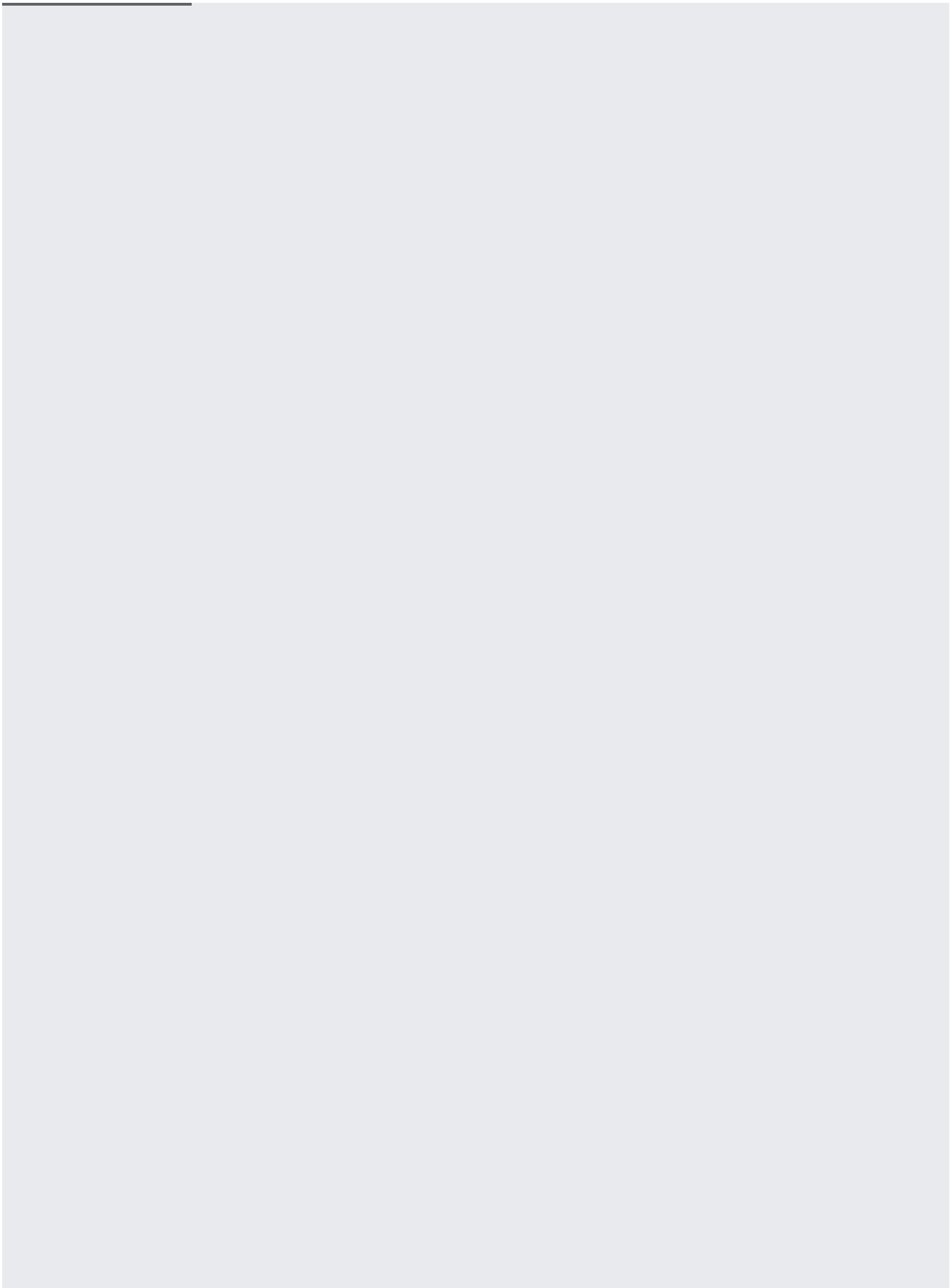
1. Clone the sample app repository to your local machine:

2. Change to the directory that contains the Cloud Run sample code:

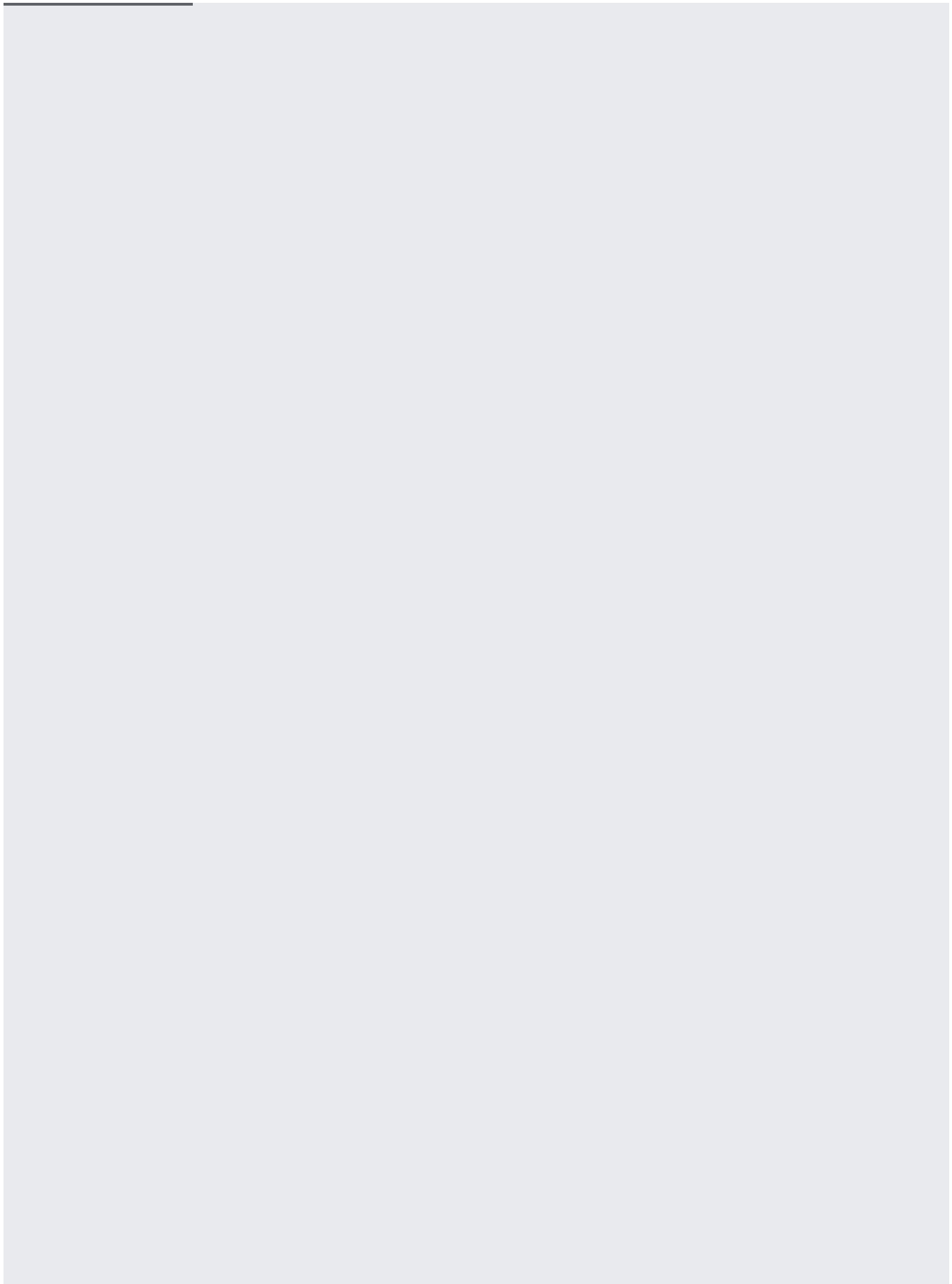
The code for this tutorial consists of the following:

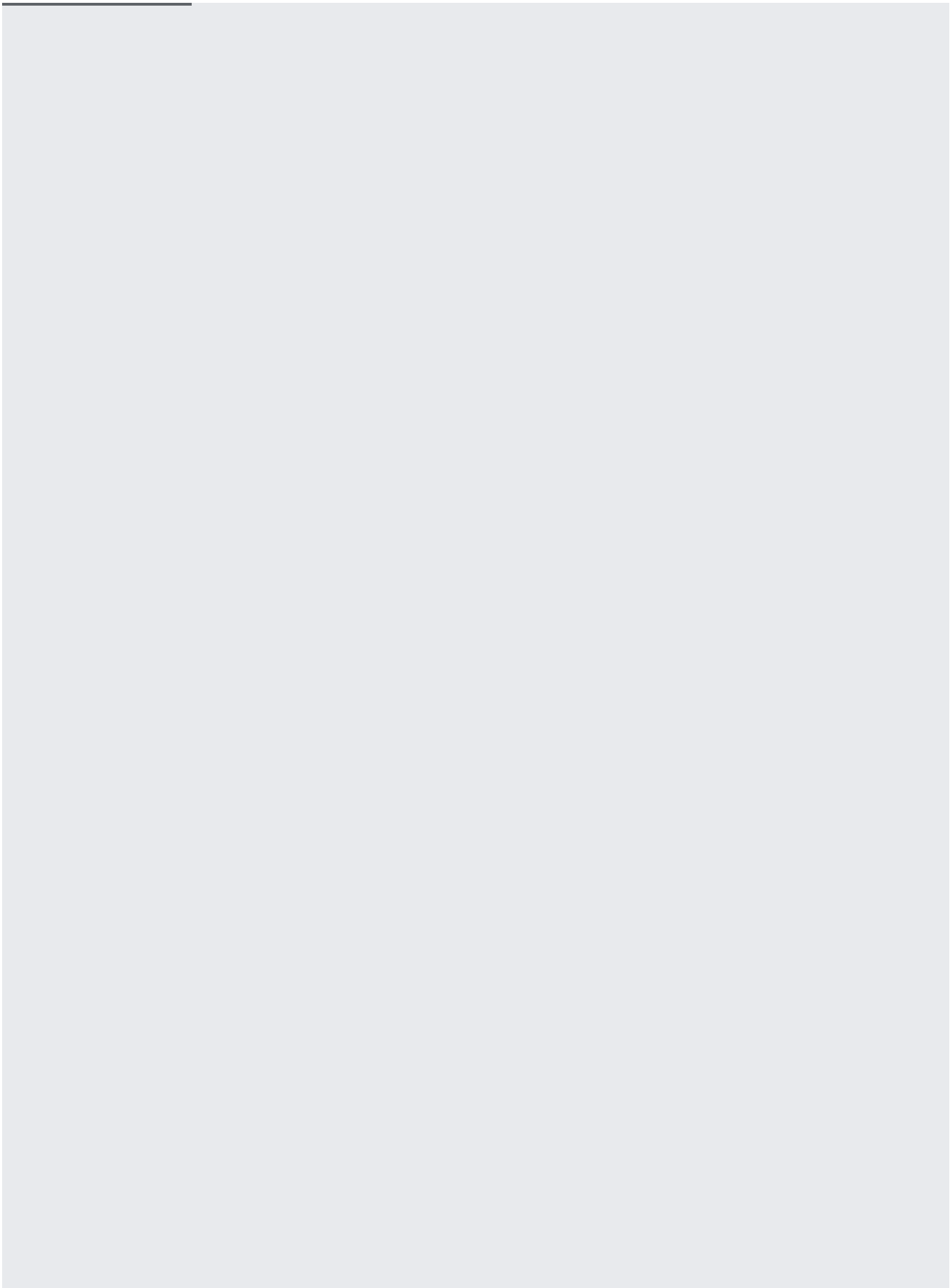
- A server that handles incoming requests.

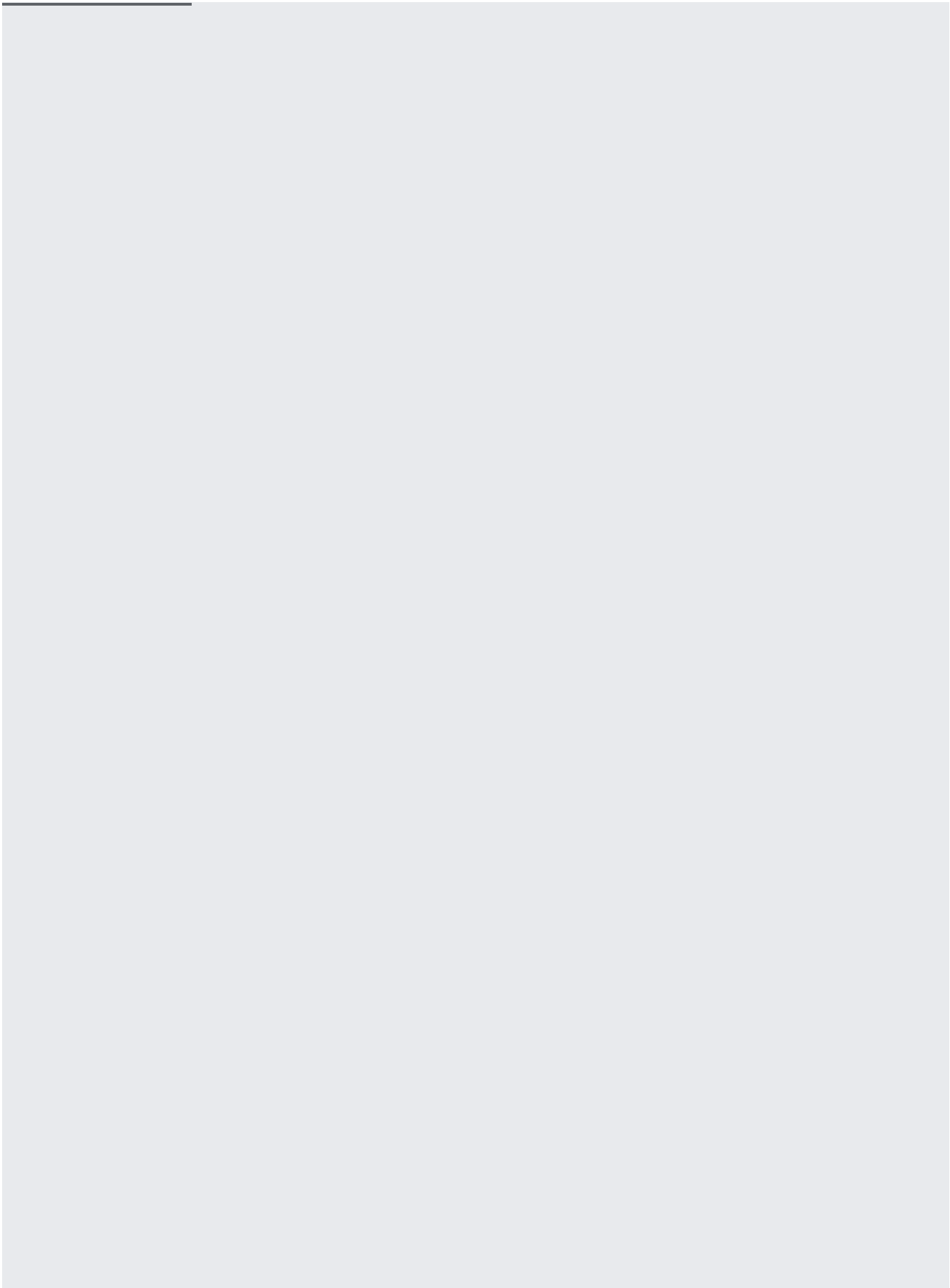




- A handler that processes the Pub/Sub message and logs a greeting.

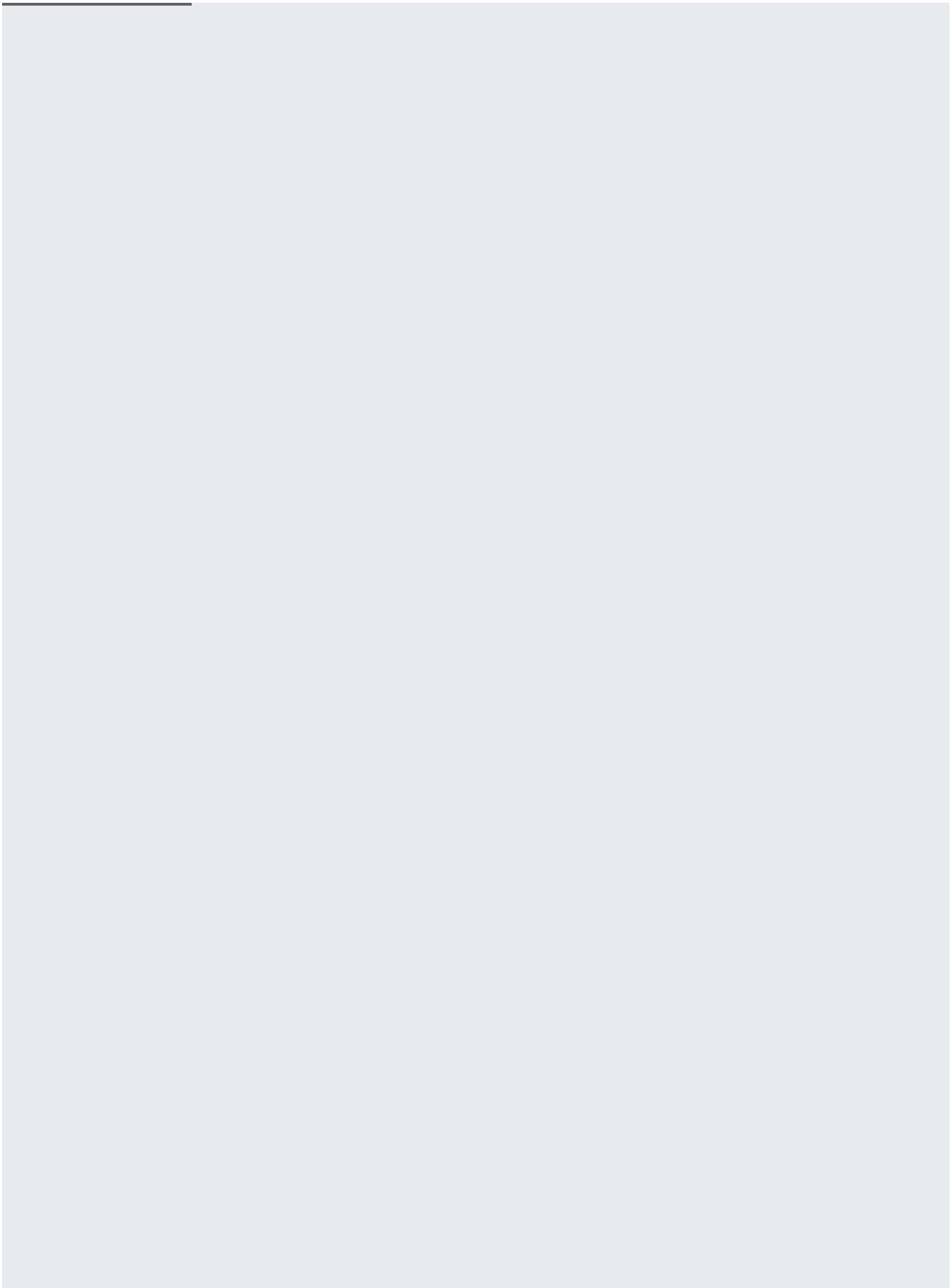


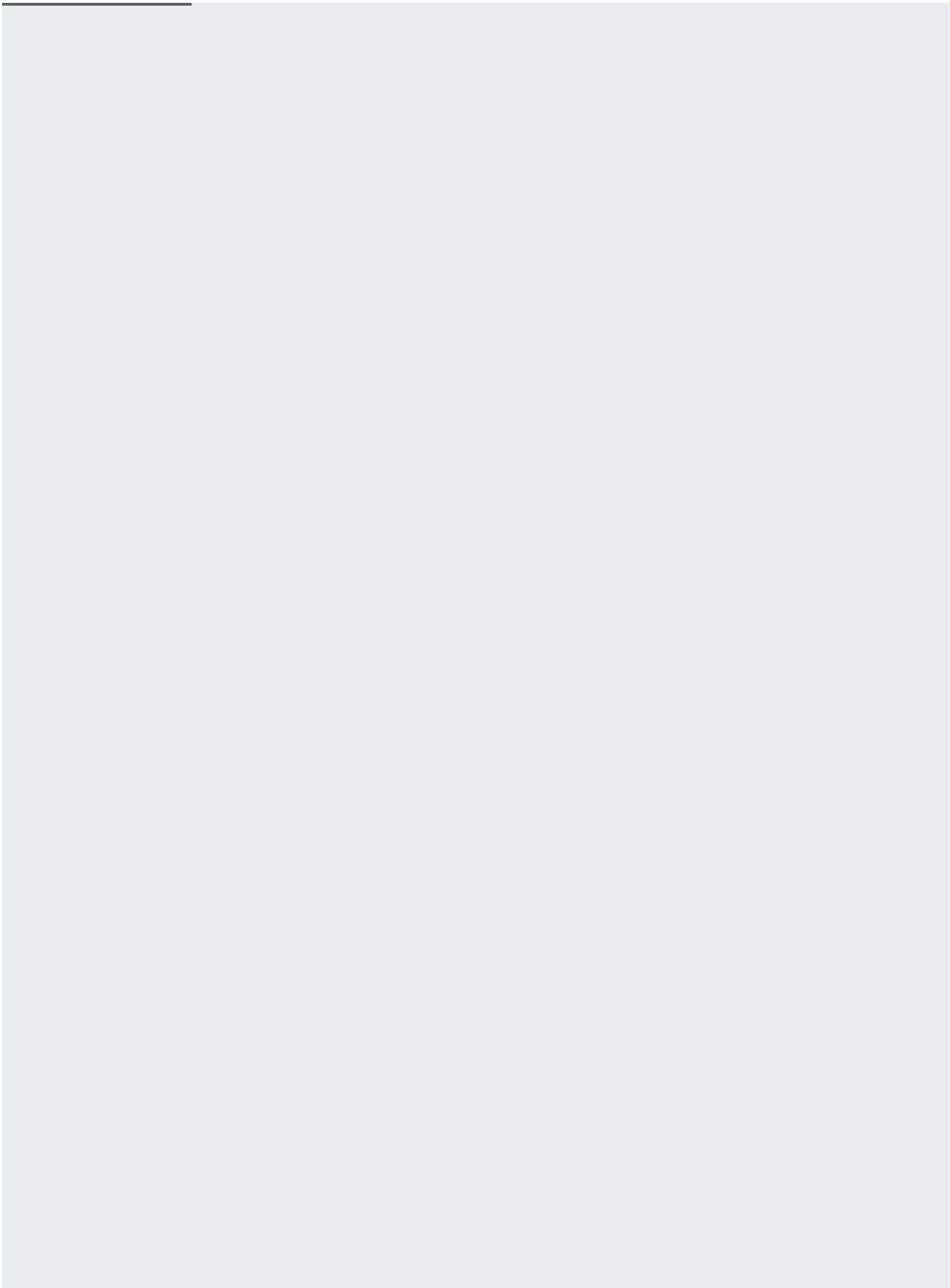




You must code the service to return an accurate HTTP response code. Success codes, such as HTTP **200** or **204**, acknowledge complete processing of the Pub/Sub message. Error codes, such as HTTP **400** or **500**, indicate the message will be retried, as described in [Receiving messages using Push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

- A **Dockerfile** that defines the operating environment for the service. The contents of the **Dockerfile** vary by language.





For details on how to authenticate the origin of Pub/Sub requests, read the section below on [Integrating with Pub/Sub \(#integrating-pubsub\)](#).

Shipping code consists of three steps: building a container image with Cloud Build, uploading the container image to Container Registry, and deploying the container image to Cloud Run or Cloud Run for Anthos on Google Cloud.

To ship your code:

1. Build your container and publish on Container Registry:

Where **PROJECT-ID** is your GCP project ID, and `pubsub` is the name you want to give your service.

Upon success, you should see a SUCCESS message containing the ID, creation time, and image name. The image is stored in Container Registry and can be re-used if desired.

2. Run the following command to deploy your app:

Replace **PROJECT-ID** with your GCP project ID. `pubsub` is the container name and `pubsub-tutorial` is the name of the service. Notice that the container image is deployed to the service and region (Cloud Run) or cluster (Cloud Run for Anthos on Google Cloud) that you configured previously under [Setting up gcloud](#) (`#setting-up-gcloud`)

If deploying to Cloud Run, respond n, "No", to the "allow unauthenticated" prompt. By keeping the service private you can rely Cloud Run's automatic Pub/Sub integration to authenticate requests. See [Integrating with Pub/Sub](#) (`#integrating-pubsub`) for more details on how this is configured. See [Managing Access](#) (`/run/docs/securing/managing-access`) for more details on IAM-based authentication.

Wait until the deployment is complete: this can take about half a minute. On success, the command line displays the service URL. This URL is used to configure a Pub/Sub subscription.

3. If you want to deploy a code update to the service, repeat the previous steps. Each deployment to a service creates a new revision and automatically starts serving traffic when ready.

Now that we have deployed our Cloud Run service, we will configure Pub/Sub to push messages to it.

To integrate the service with Pub/Sub:

1. Enable Pub/Sub to create authentication tokens in your project:

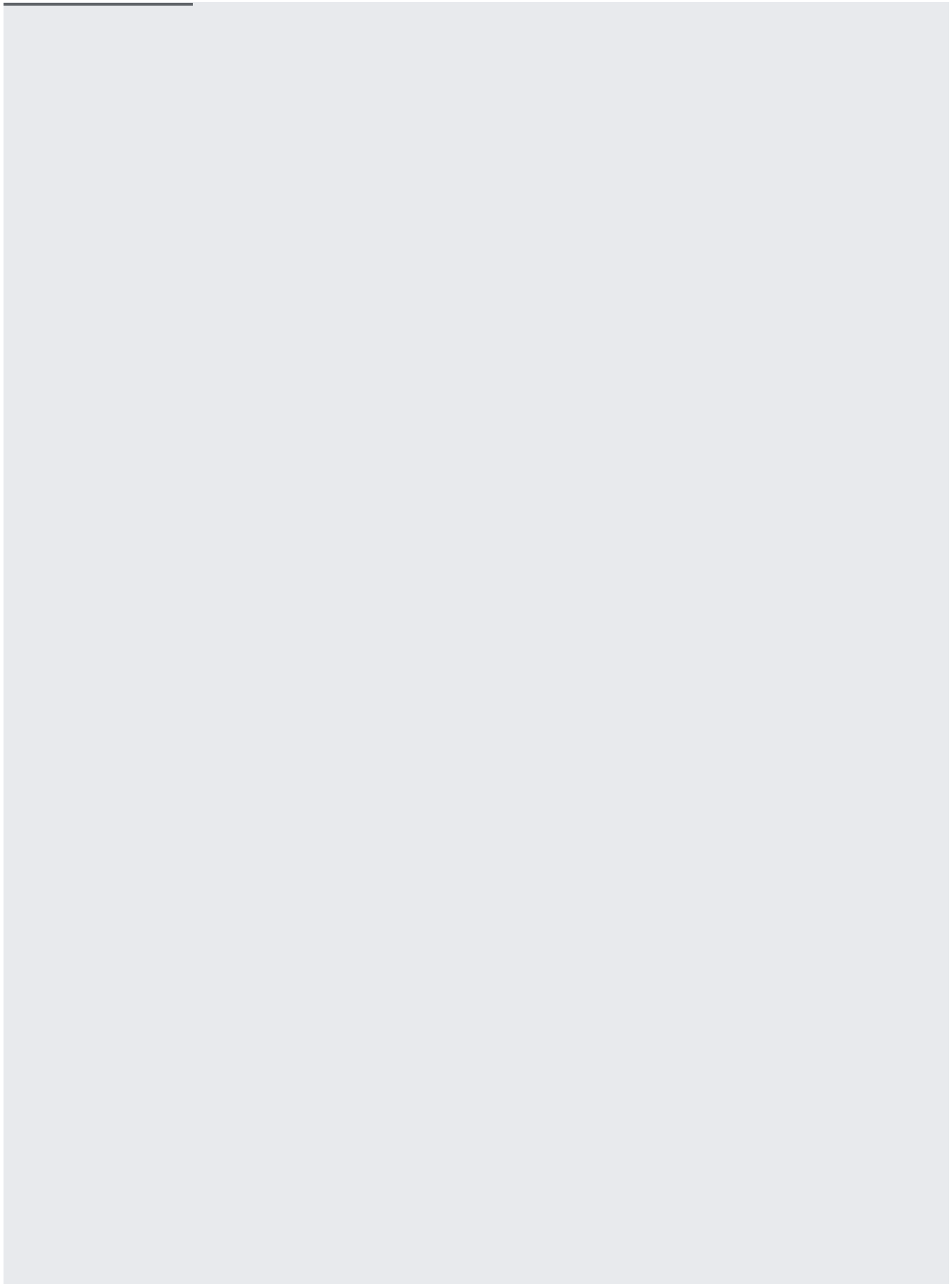
Replace

- **PROJECT-ID** with your Google Cloud project ID.
- **PROJECT-NUMBER** with your Google Cloud project number.

2. Create or select a service account to represent the Pub/Sub subscription identity.

You can use `cloud-run-pubsub-invoker` or replace with a name unique within your Google Cloud project.

3. Create a Pub/Sub subscription with the service account using the appropriate tab depending on whether you are using Cloud Run or Cloud Run for Anthos on Google Cloud.



Your service is now fully integrated with Pub/Sub.

To test the end-to-end solution:

1. Send a Pub/Sub message to the topic:

You can also publish messages programmatically instead of using the command-line as shown in this tutorial. For more information, see [Publishing messages \(/pubsub/docs/publisher\)](/pubsub/docs/publisher).

2. Navigate to the service logs:

- a. Navigate to the [Google Cloud Console](https://console.cloud.google.com/run) (<https://console.cloud.google.com/run>)
- b. Click the `pubsub-tutorial` service.
- c. Select the **Logs** tab.

Logs might take a few moments to appear. If you don't see them immediately, check again after a few moments.

3. Look for the "Hello Runner!" message.

To walk through a more in-depth use case of using Cloud Run with Pub/Sub, skip cleanup for now and continue with the [Image Processing with Cloud Run tutorial \(/run/docs/tutorials/image-processing\)](/run/docs/tutorials/image-processing).

If you created a new project for this tutorial, delete the project (#delete-project). If you used an existing project and wish to keep it without the changes added in this tutorial, delete resources created for the tutorial (#delete-resources).

The easiest way to eliminate billing is to delete the project that you created for the tutorial.

To delete the project:


! **Caution:** Deleting a project has the following effects:

- **Everything in the project is deleted.** If you used an existing project for this tutorial, when you delete it, you also delete any other work you've done in the project.
- **Custom project IDs are lost.** When you created this project, you might have created a custom project ID that you want to use in the future. To preserve the URLs that use the project ID, such as an **appspot.com** URL, delete selected resources inside the project instead of deleting the whole project.

If you plan to explore multiple tutorials and quickstarts, reusing projects can help you avoid exceeding project quota limits.

1. In the Cloud Console, go to the **Manage resources** page.

[Go to the Manage resources page](https://console.cloud.google.com/iam-admin/projects) (https://console.cloud.google.com/iam-admin/projects)

2. In the project list, select the project you want to delete and click **Delete** .

3. In the dialog, type the project ID, and then click **Shut down** to delete the project.

1. Delete the Cloud Run service you deployed in this tutorial:

Where **SERVICE-NAME** is your chosen service name.

You can also delete Cloud Run services from the [Google Cloud Console](https://console.cloud.google.com/run) (<https://console.cloud.google.com/run>).

2. Remove the gcloud default configurations you added during tutorial setup.

If you use Cloud Run (fully managed), remove the region setting:

If you use Cloud Run for Anthos on Google Cloud, remove the cluster configuration:

3. Remove the project configuration:

4. Delete other Google Cloud resources created in this tutorial:

- [Delete the Pub/Sub topic `myRunTopic`](#) (/pubsub/docs/admin#pubsub-delete-topic-gcloud)
 - [Delete the Pub/Sub subscription `myRunSubscription`](#) (/pubsub/docs/admin#delete_subscription)
 - [Delete the container image](#) (/container-registry/docs/managing#deleting_images) named `gcr.io/PROJECT-ID/pubsub` from Container Registry.
 - [Delete the invoker service account `cloud-run-pubsub-invoker@PROJECT-ID.iam.gserviceaccount.com`](#) (/iam/docs/creating-managing-service-accounts#iam-service-accounts-delete-gcloud)
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- [Expand the sample service deployed in this tutorial to add image processing functionality that modifies images uploaded to Cloud Storage](#) (/run/docs/tutorials/image-processing).

- Learn more about how topics fit into [Pub/Sub architecture](/pubsub/docs/overview) (/pubsub/docs/overview) and how to [manage topics](/pubsub/docs/admin#managing_topics) (/pubsub/docs/admin#managing_topics)
- Learn more about Pub/Sub subscriptions in [managing subscriptions](/pubsub/docs/admin#manage_subs) (/pubsub/docs/admin#manage_subs).
- Try out other Google Cloud features for yourself. Have a look at our [tutorials](/docs/tutorials) (/docs/tutorials).