Configuring Pub/Sub notifications

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ot be compatible with other pre-GA versions. For more information, see the launch stage descriptions
ducts#product-launch-stages).

You can receive notifications from Pub/Sub (/pubsub) for the changes to a Docker repository.

Pub/Sub publishes messages about your repositories to named resources called *topics*.
Applications that *subscribe* to Pub/Sub topics receive these messages and receive notifications
when a repository's state changes.

Artifact Registry publishes messages for the following changes:

- Image uploads

- New tags added to images

- Image deletion

Additionally, you can configure roles and permissions for publishing or subscribing to
notifications.

Overview

Artifact Registry publishes messages about changes to repositories in a topic named `gcr`.

To receive notifications, you must:

1. Create a topic (#topic) named `gcr` in the project with Artifact Registry.

2. Create a subscription (#subscription) to the topic.

3. Set up your subscriber application (#subscriber) to receive messages about repository
   changes.

4. If appropriate, <u>configure permissions</u> (#permissions) to control access to your topic and subscription.

Creating the Artifact Registry topic

Artifact Registry publishes messages to a topic named `gcr`. This is the same topic that <u>Container Registry</u> (/container-registry/docs) uses to publish messages.

In each project where Artifact Registry is running, you must create the `gcr` topic if it does not already exist. To view a list of existing topics, you can check the <u>Pub/Sub topics page</u> (https://console.cloud.google.com/cloudpubsub/topicList) in Google Cloud Console or run the following command:

```
d pubsub topics list
```

To create the `gcr` topic:

<u>Console</u><u>gcloud</u> (#gcloud)

1. Go to the Pub/Sub topics page in the Cloud Console.

   <u>Go to the Pub/Sub topics page</u> (https://console.cloud.google.com/cloudpubsub/topicList)

2. Click **Create Topic**.

3. Enter the topic ID `gcr`.

4. Click **Create**.

Now that you have created the `gcr` topic, you can create a <u>subscription</u> (#subscription) to the topic.

Creating a subscription

After you have created a topic (#topic) for repository changes, you can configure a subscription to it that uses either push delivery (/pubsub/docs/push) or pull delivery (/pubsub/docs/pull). We recommend using pull delivery since CI/CD systems can generate numerous changes to stored artifacts, and pull delivery is more effective for a large volume of messages.

To create a subscription with pull delivery:

Consolegcloud (#gcloud)

1. Go to the Pub/Sub topics page in the Cloud Console.

   Go to the Pub/Sub topics page (https://console.cloud.google.com/cloudpubsub/topicList)

2. Click your project's topic.

3. Click **Create Subscription**.

4. Enter a subscription name:

   ```
   projects/PROJECT/subscriptions/[SUBSCRIPTION-NAME]
   ```

   Leave **Delivery Type** set to **Pull**.

5. Click **Create**.

You now have a subscription to the `gcr` topic. The next step is configuring permissions (/artifact-registry/docs/permissions) for the identities that trigger changes in repositories.

Configuring your subscriber application

After you have created a topic (#topic) and a subscription (#subscription) to that topic, you can set up your subscriber application, the application that receive messages about changes to repositories. Subscriber applications fulfill tasks like event notifications, system logging, and communication between applications.

When you push or delete an image, the following steps occur:

1. The Artifact Registry service account publishes the change to your `gcr` topic. The service account is **service-*PROJECT-NUMBER*@gcp-sa-artifactregistry.iam.gserviceaccount.com**, where *PROJECT-NUMBER* is your Google Cloud project number (/resource-manager/docs/creating-managing-projects#identifying_projects). The Artifact Registry service account has `pubsub.topics.publish` permissions by default so that it can publish changes to your topic.

2. Pub/Sub forward the message from the topic to your subscription.

3. When your subscriber application makes a request for messages, it pulls the new message from the subscription.

   The identity that pulls messages on behalf of the subscriber must have permissions to access the subscription. You can use the Pub/Sub Subscriber role (/pubsub/docs/access-control#roles) to grant this permission.

To learn about setting up a subscriber to receive messages from a subscription with pull delivery, see Receiving messages using Pull (/pubsub/docs/pull).

Configuring permissions

You can use Pub/Sub permissions to control access to your topics and subscriptions.

For more information about Pub/Sub permissions and granting access to topics and subscriptions, see the Pub/Sub access control documentation (/pubsub/docs/access-control).

Notification examples

Pub/Sub sends notifications as JSON-formatted strings. Review the following examples to learn what to expect when receiving Artifact Registry notifications from Pub/Sub.

When an image is pushed to Artifact Registry, the notification payload might look like this:

```
tion":"INSERT",
gest":"us-east1-docker.pkg.dev/my-project/my-repo/hello-world@sha256:6ec128e26cd5...
```

When a new image tag is pushed to Artifact Registry, the notification payload looks like this:

```
tion":"INSERT",
gest":"us-east1-docker.pkg.dev/my-project/my-repo/hello-world@sha256:6ec128e26cd5...
g":"us-east1-docker.pkg.dev/my-project/my-repo/hello-world:1.1"
```

The message identifies the relevant image using either a `digest` or `tag` key.

When an image tag is deleted from Artifact Registry, the notification payload might look like this:

```
tion":"DELETE",
g":"us-east1-docker.pkg.dev/my-project/my-repo/hello-world:1.1"
```

The message might contain either `DELETE` or `INSERT` as values for the `action` key.

What's next

- Read the Pub/Sub documentation (/pubsub/docs).

- For an in-depth explanation of Pub/Sub, see What is Pub/Sub? (/pubsub/docs/overview)

- Learn more about Pub/Sub access control roles (/pubsub/docs/access_control#tbl_roles).