Build a Website on Google Cloud

LAB-1**(Deploy your website on cloud run**)

Task-1 **Clone the source repository**

Since you are deploying an existing website, you just need to clone the source, so you can focus on creating Docker images and deploying to Cloud Run.

- In Cloud Shell run the following commands to clone the git repository and change to the appropriate directory.

  git clone https://github.com/googlecodelabs/monolith-to-microservices.git

  cd ~/monolith-to-microservices

❖ Install the NodeJS dependencies so you can test the application before deploying:

  ./setup.sh

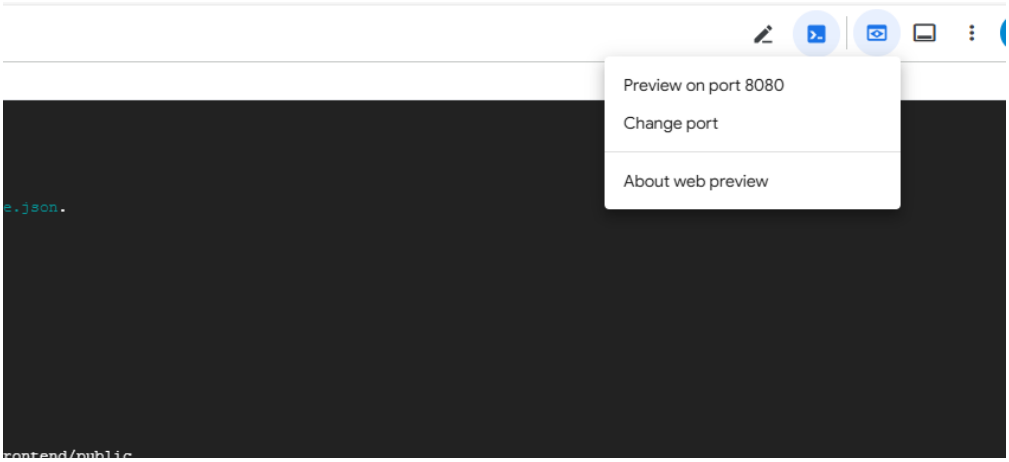
❖ Test your application by running the following command to start the web server:

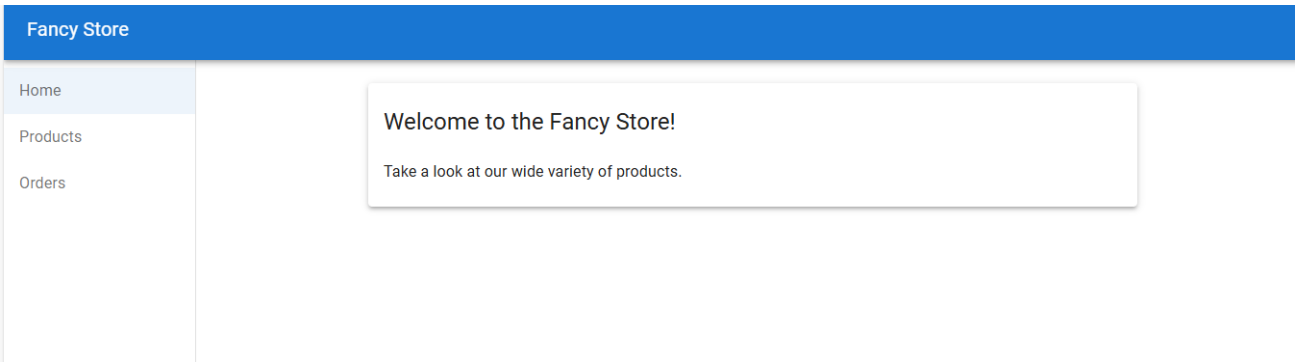
  cd ~/monolith-to-microservices/monolith

  npm start

```
Setup completed successfully!
student_03_62df556f9850@cloudshell:~/monolith-to-microservices (qwiklabs-gcp-03-bf08d3651b58)$ cd ~/monolith-to-microservices/monolith
student_03_62df556f9850@cloudshell:~/monolith-to-microservices/monolith (qwiklabs-gcp-03-bf08d3651b58)$ npm start

> monolith@1.0.0 start
> node ./src/server.js

Monolith listening on port 8080!
```

❖ Preview your application by clicking the web preview icon and selecting Preview on port 8080.





❖ Close this window after viewing the website, and stop the web server process by pressing CTRL+C in Cloud Shell.

Task 2**. <u>Create a Docker container with Cloud Build</u>**

Create the target Docker repository
You must create a repository before you can push any images to it. Pushing an image can't trigger creation of a repository and the Cloud Build service account does not have permissions to create repositories**.**

1. In the console, search for Artifact Registry in the search field, then click on Artifact Registry result.

2. Click Create Repository.

3. Specify monolith-demo as the repository name.

4. Choose Docker as the format.

5. Under Location Type, select Region and then choose the location Region.

6. Click Create.

Configure authentication

Before you can push or pull images, configure Docker to use the Google Cloud CLI to authenticate requests to Artifact Registry**.**

- To set up authentication to Docker repositories in the region Region, run the following command in Cloud Shell:

  gcloud auth configure-docker Region-docker.pkg.dev

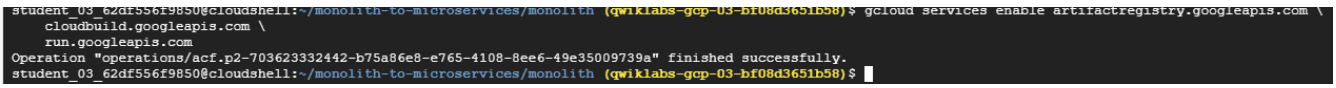
  The command updates your Docker configuration. You can now connect with Artifact Registry in your Google Cloud project to push and pull images.

Deploy the image

You will now deploy the image that was built earlier.

- First you need to enable the Cloud Build, Artifact Registry, and Cloud Run APIs. Run the following command in Cloud Shell to enable them:

  gcloud services enable artifactregistry.googleapis.com \
  cloudbuild.googleapis.com \
  run.googleapis.com

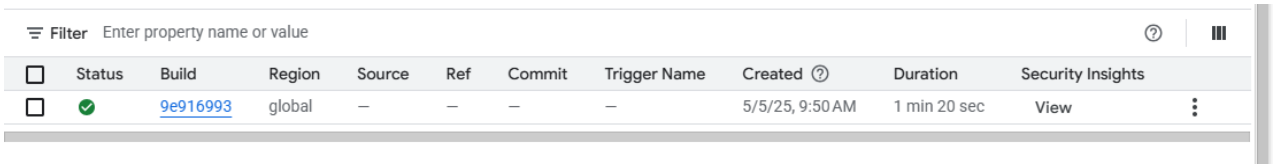


- After the APIs are enabled, run the following command to start the build process: gcloud builds submit --tag Region-docker.pkg.dev/${GOOGLE_CLOUD_PROJECT}/monolith-demo/monolith:1.0.0

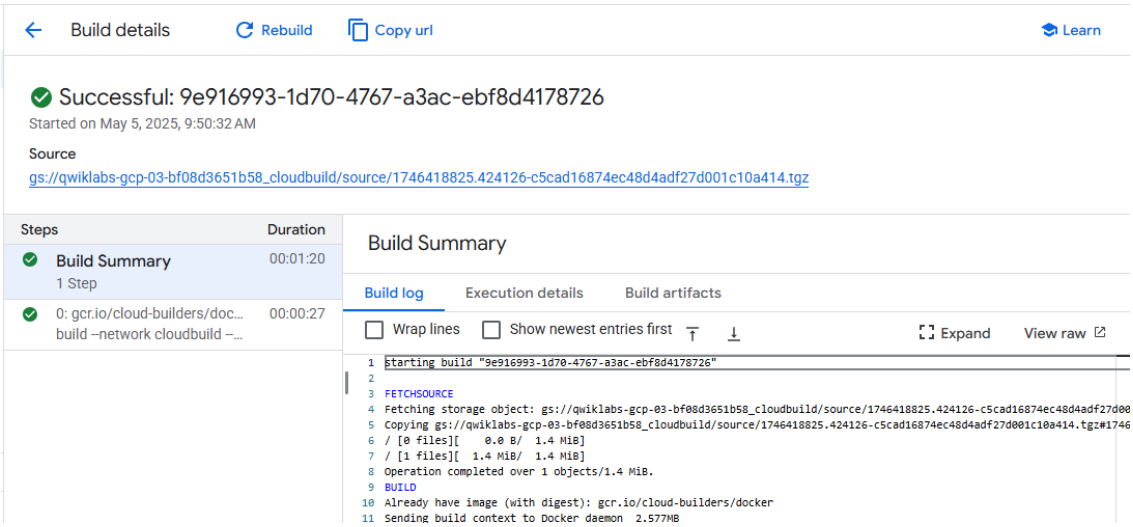
```
student_03_62df556f9850@cloudshell:~/monolith-to-microservices/monolith (qwiklabs-gcp-03-bf08d3651b58)$ gcloud builds submit --tag us-east1-docker.pkg.dev/${GOOGLE_CLOUD
_PROJECT}/monolith-demo/monolith:1.0.0
Creating temporary archive of 27 file(s) totalling 2.4 MiB before compression.
Uploading tarball of [.] to [gs://qwiklabs-gcp-03-bf08d3651b58_cloudbuild/source/1746418825.424126-c5cad16874ec48d4adf27d001c10a414.tgz]
Created [https://cloudbuild.googleapis.com/v1/projects/qwiklabs-gcp-03-bf08d3651b58/locations/global/builds/9e916993-1d70-4767-a3ac-ebf8d4178726].
Logs are available at [ https://console.cloud.google.com/cloud-build/builds/9e916993-1d70-4767-a3ac-ebf8d4178726?project=703623332442 ].
Waiting for build to complete. Polling interval: 1 second(s).
------------------------------------------------------------------------ REMOTE BUILD OUTPUT ------------------------------------------------------------------------
starting build "9e916993-1d70-4767-a3ac-ebf8d4178726"

FETCHSOURCE
Fetching storage object: gs://qwiklabs-gcp-03-bf08d3651b58_cloudbuild/source/1746418825.424126-c5cad16874ec48d4adf27d001c10a414.tgz#1746418829276880
Copying gs://qwiklabs-gcp-03-bf08d3651b58_cloudbuild/source/1746418825.424126-c5cad16874ec48d4adf27d001c10a414.tgz#1746418829276880...
/ [1 files][  1.4 MiB/  1.4 MiB]
Operation completed over 1 objects/1.4 MiB.
BUILD
Already have image (with digest): gcr.io/cloud-builders/docker
Sending build context to Docker daemon  2.577MB
Step 1/7 : FROM node:16
```

```
161c67e1534b: Pushed
3156345ca77e: Pushed
6881a17c90ac: Pushed
45a825e0c06a: Pushed
be322b479aee: Pushed
f25ec1d93a58: Pushed
d41bcd3a037b: Pushed
684f82921421: Pushed
fe0d845e767b: Pushed
9af5f53e8f62: Pushed
3220beed9b06: Pushed
794ce8b1b516: Pushed
1.0.0: digest: sha256:f1ecbb138ca05f4b1586406d2450e93f393bc66d856831d20ef9addb17b3b184 size: 2841
DONE
--------------------------------------------------------------------------------------------------------------------------------------------------------
ID: 9e916993-1d70-4767-a3ac-ebf8d4178726
CREATE_TIME: 2025-05-05T04:20:29+00:00
DURATION: 1M21S
SOURCE: gs://qwiklabs-gcp-03-bf08d3651b58_cloudbuild/source/1746418825.424126-c5cad16874ec48d4adf27d001c10a414.tgz
IMAGES: us-east1-docker.pkg.dev/qwiklabs-gcp-03-bf08d3651b58/monolith-demo/monolith:1.0.0
STATUS: SUCCESS
```

- To view your build history, or watch the process in real time, in the console, search for Cloud Build then click on the Cloud Build result.
- On the History page you can see a list of all your builds; there should only be 1 that you just created.



- If you click on the Build ID, you can see all the details for that build including the log output.
- From the Build Details page you can view the container image that was created by clicking the Execution Details tab, then clicking on on the image link.



Task 3**. Deploy the container to Cloud Run**

Now that you have containerized your website and pushed the container to Artifact Registry, it is time to deploy to Cloud Run!

There are two approaches for deploying to Cloud Run:

Managed Cloud Run: The Platform as a Service model where all container lifecycle is managed by the Cloud Run product itself. You'll be using this approach in this lab.

Cloud Run on GKE: Cloud Run with an additional layer of control which allows you to bring your own clusters & pods from GKE.

- Run the following command to deploy the image to Cloud Run:

gcloud run deploy monolith --image Region-docker.pkg.dev/${GOOGLE_CLOUD_PROJECT}/monolith-demo/monolith:1.0.0 --region Region

```
student_03_62df556f9850@cloudshell:~/monolith-to-microservices/monolith (qwiklabs-gcp-03-bf08d3651b58)$ gcloud run deploy monolith --image us-east1-docker.pkg.dev/${GOOGLE
_CLOUD_PROJECT}/monolith-demo/monolith:1.0.0 --region us-east1
Allow unauthenticated invocations to [monolith] (y/N)?  y

Deploying container to Cloud Run service [monolith] in project [qwiklabs-gcp-03-bf08d3651b58] region [us-east1]
OK Deploying new service... Done.
  OK Creating Revision...
  OK Routing traffic...
  OK Setting IAM Policy...
Done.
Service [monolith] revision [monolith-00001-gtf] has been deployed and is serving 100 percent of traffic.
Service URL: https://monolith-703623332442.us-east1.run.app
```

- When asked to allow unauthenticated invocations to [monolith] type Y.

Verify deployment

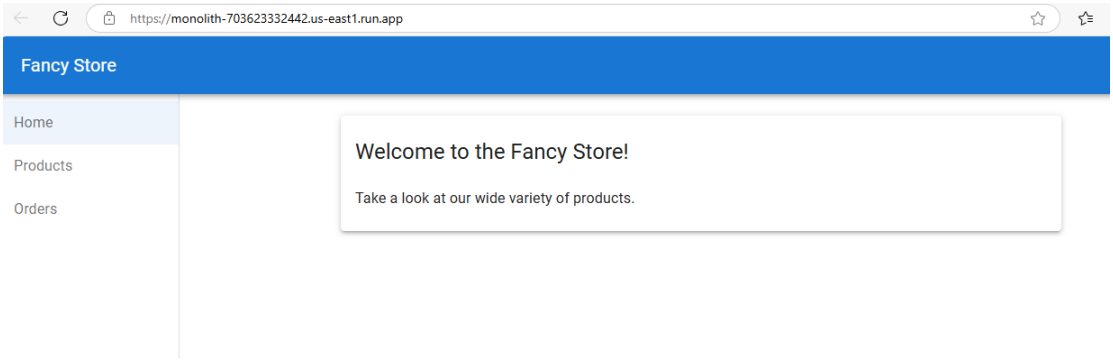
To verify the deployment was created successfully, run the following command:

gcloud run services list

```
Service URL: https://monolith-703623332442.us-east1.run.app
student_03_62df556f9850@cloudshell:~/monolith-to-microservices/monolith (qwiklabs-gcp-03-bf08d3651b58)$ gcloud run services list
✓
SERVICE: monolith
REGION: us-east1
URL: https://monolith-703623332442.us-east1.run.app
LAST DEPLOYED BY: student-03-62df556f9850@qwiklabs.net
LAST DEPLOYED AT: 2025-05-05T04:30:45.919213Z
```

This output shows several things. You can see the deployment, as well as the user that deployed it (your email) and the URL you can use to access the app. Looks like everything was created successfully!

- Click on the URL provided in the list of services. You should see the same website you previewed locally.



Task 4**. Create new revision with lower concurrency**

In this section you will deploy your application again, but this time adjusting one of the parameters.

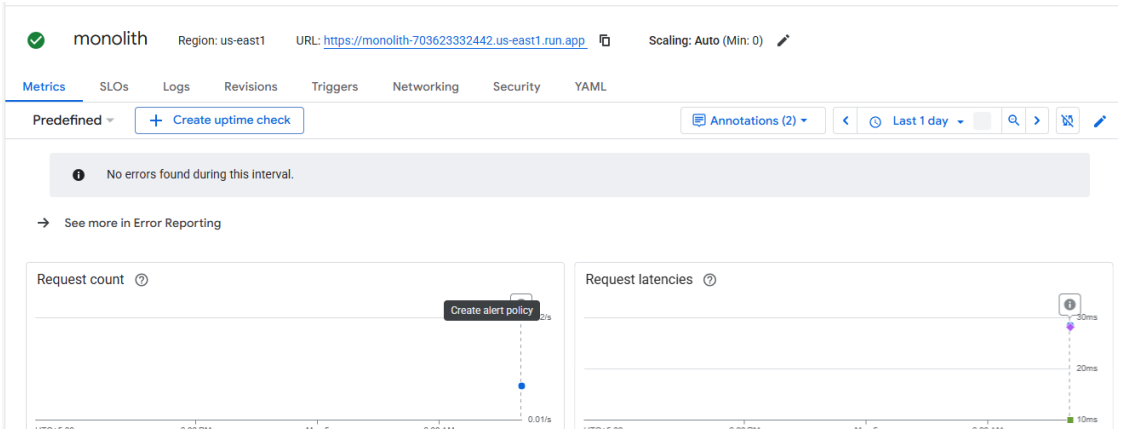
By default, a Cloud Run application will have a concurrency value of 80, meaning that each container instance will serve up to 80 requests at a time. This is a big departure from the Functions-as-a-Service model, where one instance handles one request at a time.

- Run the following command to re-deploy the same container image with a concurrency value of 1 (just for testing), and see what happens:

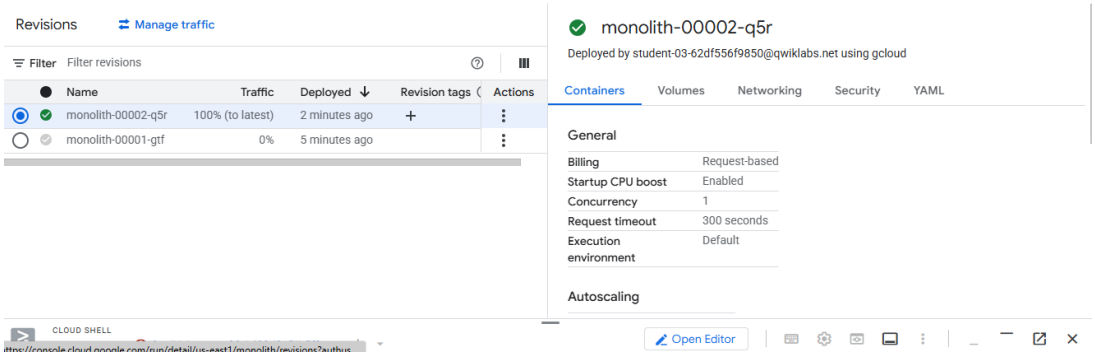
gcloud run deploy monolith --image Region-docker.pkg.dev/${GOOGLE_CLOUD_PROJECT}/monolith-demo/monolith:1.0.0 --region Region --concurrency 1

```
student_03_62df556f9850@cloudshell:~/monolith-to-microservices/monolith (qwiklabs-gcp-03-bf08d3651b58)$ gcloud run deploy monolith --image us-east1-docker.pkg.dev/${GOOGLE
_CLOUD_PROJECT}/monolith-demo/monolith:1.0.0 --region us-east1 --concurrency 1
Deploying container to Cloud Run service [monolith] in project [qwiklabs-gcp-03-bf08d3651b58] region [us-east1]
OK Deploying... Done.
  OK Creating Revision...
  OK Routing traffic...
Done.
Service [monolith] revision [monolith-00002-q5r] has been deployed and is serving 100 percent of traffic.
Service URL: https://monolith-703623332442.us-east1.run.app
```

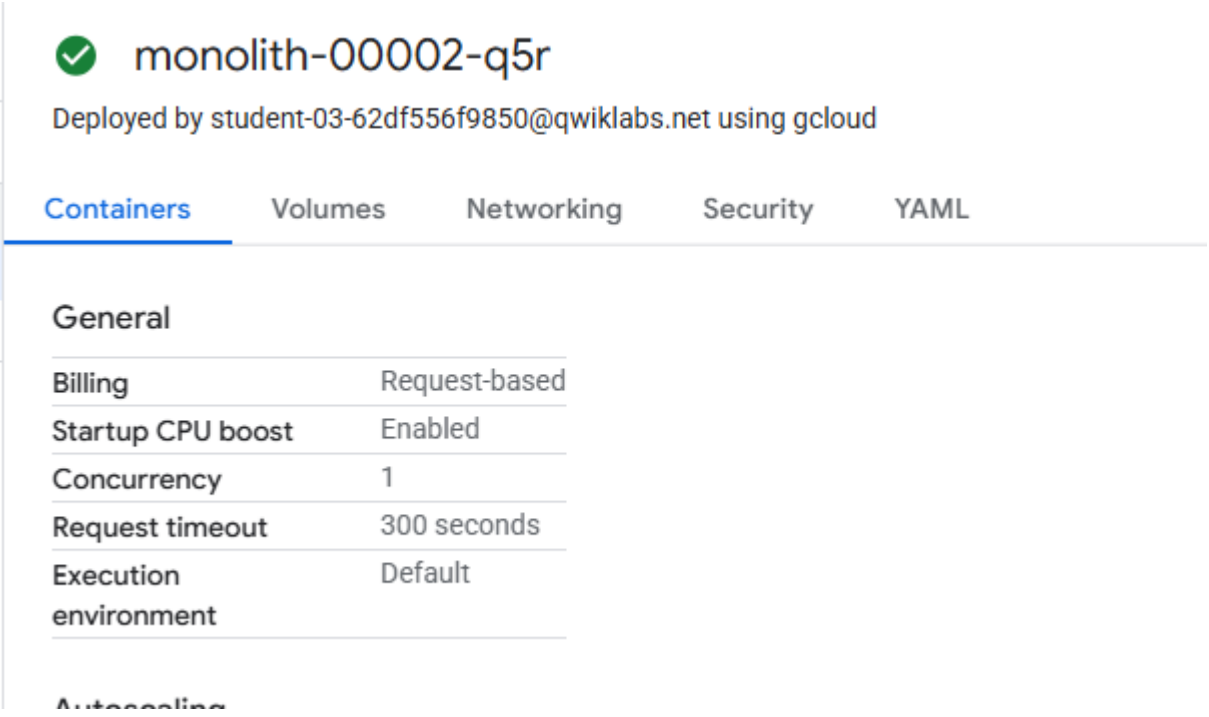
- To see the details, from the Navigation menu, click on Cloud Run, then click on the monolith service:



- On the Service Details page, click on the Revisions tab. You should now see 2 revisions created.



You will see that the concurrency value has been reduced to "1".

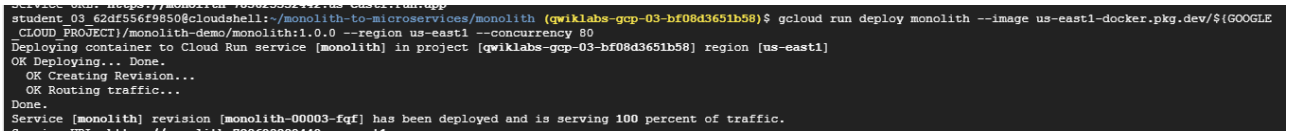


Although this configuration is sufficient for testing, in most production scenarios you will have containers supporting multiple concurrent requests.

Next, you can restore the original concurrency without re-deploying. You could set the concurrency value back to the default of "80", or you could just set the value to "0", which will remove any concurrency restrictions and set it to the default max (which happens to be 80).

- Run the following command to update the current revision, using a concurrency value of 80:

gcloud run deploy monolith --image Region-docker.pkg.dev/${GOOGLE_CLOUD_PROJECT}/monolith-demo/monolith:1.0.0 --region Region --concurrency 80



Task 5. **Make changes to the website**

Scenario: Your marketing team has asked you to change the homepage for your site. They think it should be more informative of who your company is and what you actually sell.

Task: You will add some text to the homepage to make the marketing team happy! It looks like one of our developers already created the changes with the file name index.js.new. You can just copy this file to index.js and your changes should be reflected. Follow the instructions below to make the appropriate changes.

- Run the following commands to copy the updated file to the correct file name:

cd ~/monolith-to-microservices/react-app/src/pages/Home

mv index.js.new index.js

- Print its contents to verify the changes:

cat ~/monolith-to-microservices/react-app/src/pages/Home/index.js

```
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distributed under the License is distributed on an "AS IS" BASIS,
WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
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limitations under the License.
*/
import React from "react";
import { Box, Paper, Typography } from "@mui/material";

export default function Home() {
  return (
    <Box sx={{ flexGrow: 1 }}>
      <Paper
        elevation={3}
        sx={{
          width: "800px",
          margin: "0 auto",
          padding: (theme) => theme.spacing(3, 2),
        }}
      >
        <Typography variant="h5">Fancy Fashion &amp;amp; Style Online</Typography>
        <br />
        <Typography variant="body1">
          Tired of mainstream fashion ideas, popular trends and societal norms?
          This line of lifestyle products will help you catch up with the Fancy
          trend and express your personal style. Start shopping Fancy items now!
        </Typography>
      </Paper>
    </Box>
  );
}
student_03_62df556f9850@cloudshell:~/monolith-to-microservices/react-app/src/pages/Home (qwiklabs-gcp-03-bf08d3651b58)$
```

You updated the React components, but you need to build the React app to generate the static files.

- Run the following command to build the React app and copy it into the monolith public directory:

  cd ~/monolith-to-microservices/react-app

  npm run build:monolith

- Run the following command to trigger a new Cloud Build with an updated image version of 2.0.0:

  cd ~/monolith-to-microservices/monolith

  gcloud builds submit --tag Region-docker.pkg.dev/${GOOGLE_CLOUD_PROJECT}/monolith-demo/monolith:2.0.0

```
student_03_62df556f9850@cloudshell:~/monolith-to-microservices/react-app (qwiklabs-gcp-03-bf08d3651b58)$ cd ~/monolith-to-microservices/monolith
gcloud builds submit --tag us-east1-docker.pkg.dev/${GOOGLE_CLOUD_PROJECT}/monolith-demo/monolith:2.0.0
Creating temporary archive of 27 file(s) totalling 2.4 MiB before compression.
Uploading tarball of [.] to [gs://qwiklabs-gcp-03-bf08d3651b58_cloudbuild/source/1746419955.454289-58724d52e04747eaa7e95607da73d747.tgz]
```

```
ID: 095c723f-bf07-4b17-b71a-8413717494a1
CREATE_TIME: 2025-05-05T04:39:19+00:00
DURATION: 45S
SOURCE: gs://qwiklabs-gcp-03-bf08d3651b58_cloudbuild/source/1746419955.454289-58724d52e04747eaa7e95607da73d747.tgz
IMAGES: us-east1-docker.pkg.dev/qwiklabs-gcp-03-bf08d3651b58/monolith-demo/monolith:2.0.0
STATUS: SUCCESS
student_03_62df556f9850@cloudshell:~/monolith-to-microservices/monolith (qwiklabs-gcp-03-bf08d3651b58)$
```

In the next section you will use this image to update your application with zero downtime.

Task 6. **Update website with zero downtime**

The changes are complete and the marketing team is happy with your updates! It is time to update the website without interruption to the users. Cloud Run treats each deployment as a new Revision which will first be brought online, then have traffic redirected to it.

By default the latest revision will be assigned 100% of the inbound traffic for a service. It is possible to use "Routes" to allocate different percentages of traffic to different revisions within a service. Follow the instructions below to update your website.

- Run the following command to re-deploy the service to update the image to a new version with the following command:

  gcloud run deploy monolith --image Region-docker.pkg.dev/${GOOGLE_CLOUD_PROJECT}/monolith-demo/monolith:2.0.0 --region Region

Verify deployment

- Validate that your deployment updated by running the following command:

  gcloud run services describe monolith --platform managed --region Region

- Run the following command to list the services and view the service Url:

  gcloud beta run services list

```
student_03_62df556f9850@cloudshell:~/monolith-to-microservices/monolith (qwiklabs-gcp-03-bf08d3651b58)$ gcloud beta run services list
✓
SERVICE: monolith
REGION: us-east1
URL: https://monolith-703623332442.us-east1.run.app
LAST DEPLOYED BY: student-03-62df556f9850@qwiklabs.net
LAST DEPLOYED AT: 2025-05-05T04:40:53.134121Z
```

- Click on the URL of the service. Your web site should now be displaying the text you just added to the homepage component!