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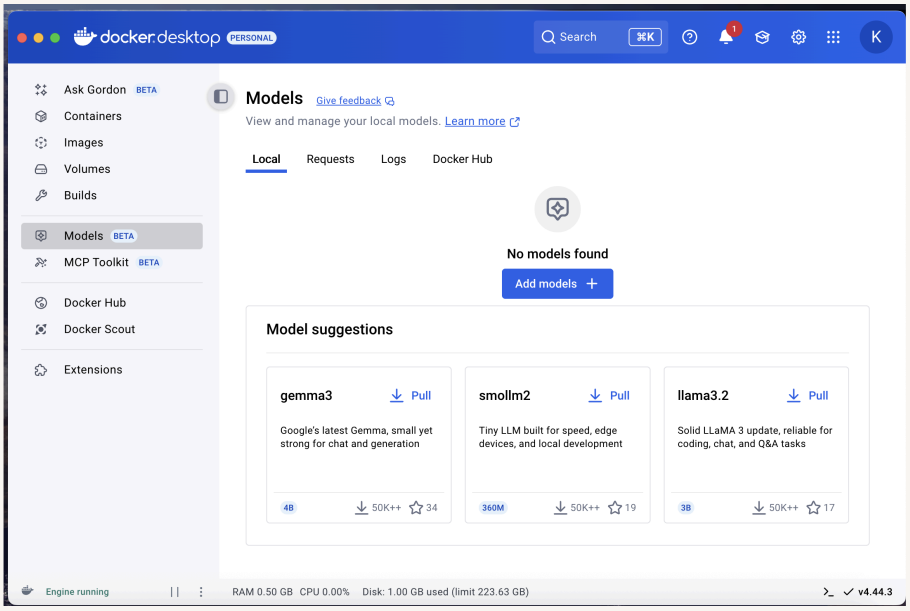
Deploy an App with Docker

Kehinde Abiuwa



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Introducing Today's Project!

What is Docker?

Docker is a platform for building and running containers—packaged apps with their runtime and dependencies. It is useful because containers give portability, consistency, isolation, and fast startup, so the same image runs the same way on any machine or cloud. I used Docker in this project to containerize my web app with a Dockerfile, build the image, test it locally, and deploy that container to AWS Elastic Beanstalk so it’s publicly accessible.

One thing I didn't expect...

One thing I didn’t expect in this project was a port conflict on my Mac. When I ran docker run -p 80:80, Docker failed with “port is already allocated” because an earlier NGINX container was still bound to 80. I fixed it by stopping/removing the old container (or using a different host port like -p 8080:80).

This project took me...

This project took me 50 minutes

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Understanding Containers and Docker

Containers

Containers are lightweight, isolated environments that package an app with everything it needs so it runs the same anywhere. They are useful because they provide portability (works on any host), consistency (no “works on my machine”), isolation (safer, fewer conflicts), speed (fast start/stop), and efficiency (better resource usage than full VMs).

A container image is a blueprint or template for making containers. It tells Docker exactly what to put inside each container - things like your app’s code, the libraries it needs, and any other required files.

Docker

Docker is a platform for building, shipping, and running containers—packaged apps with all their dependencies. It includes the Docker Engine (daemon), CLI, images, and the workflow to create and run containers. Docker Desktop is the Mac/Windows app that bundles Docker Engine, CLI, Compose, and a GUI. It runs Linux containers inside a lightweight VM (e.g., Apple Virtualization/Hypervisor or WSL2 on Windows) and makes local container dev easy.

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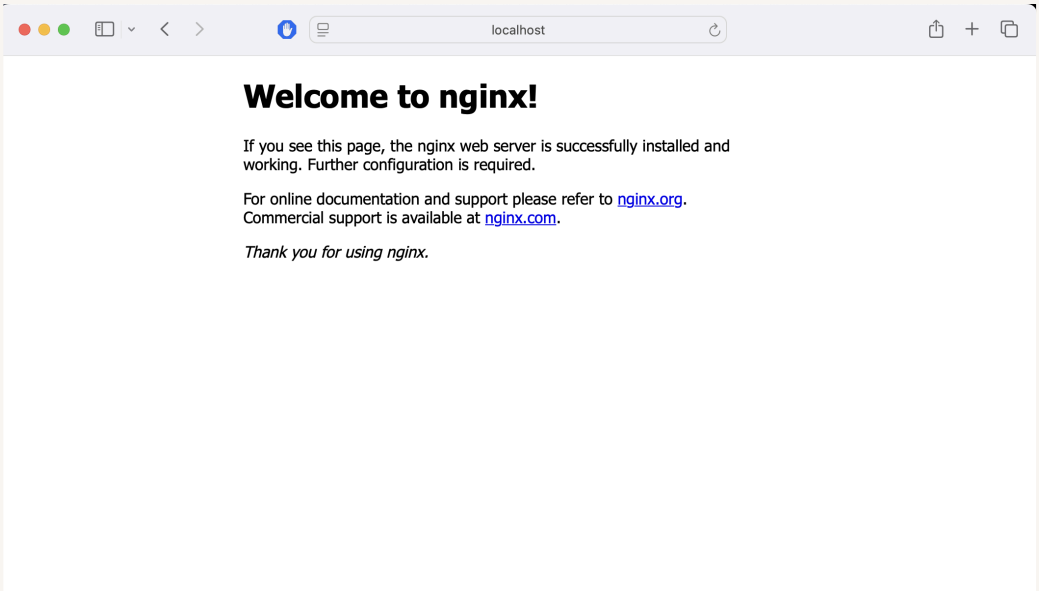
Running an Nginx Image

Nginx is a web server, which is a program you use to run websites and web apps. If you want people to visit your site, you're going to need a web server to deliver your website's files to their browsers!

The command I ran to start a new container was 'docker run -d -p 80:80 nginx' This runs NGINX in the background (-d) and maps host port 80 to container port 80 (-p 80:80) so I can open http://localhost in my browser.

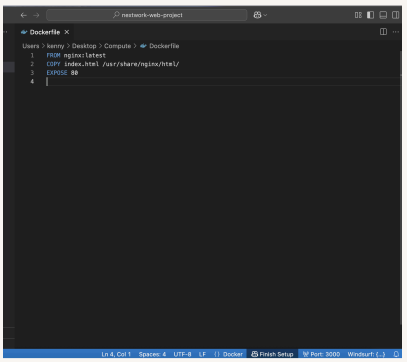


Creating a Custom Image

The Dockerfile is a plain text file of build instructions that tells Docker how to create your image. Each instruction (e.g., FROM, RUN, COPY, EXPOSE, CMD) adds a layer, producing a reproducible, portable image

My Dockerfile tells Docker three things: Base image: start from nginx:latest. App content: copy index.html into NGINX's web root /usr/share/nginx/html/. Port: document that the container listens on 80 (EXPOSE 80)—I'll map it with -p when running so the page is reachable on my host.

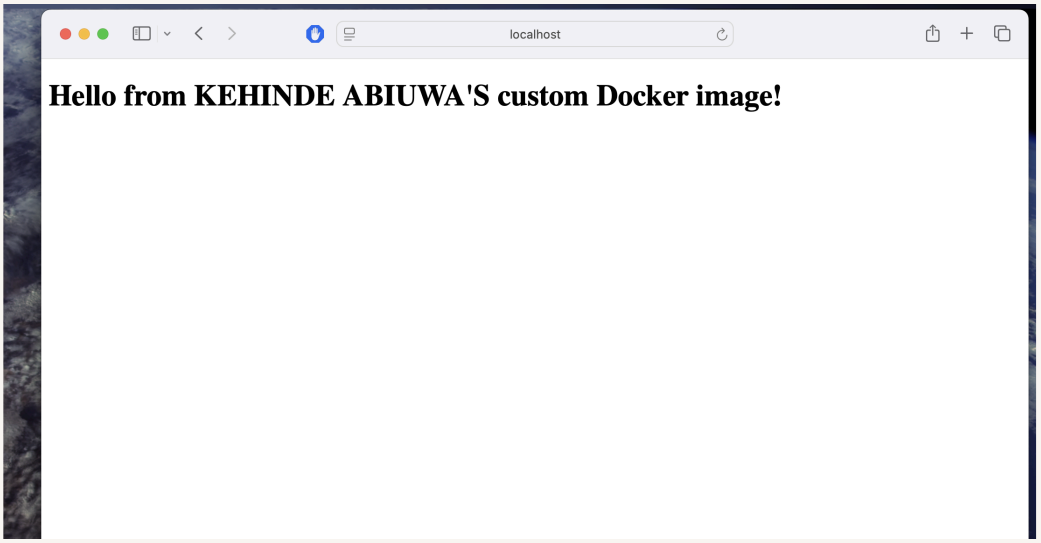
The command I used to build a custom image with my Dockerfile was: docker build -t my-web-app . The . at the end tells Docker to use the current folder as the build context—i.e., send this directory's files (respecting .dockerignore) to the daemon so instructions like COPY index.html /usr/share/nginx/html/ can work.



Running My Custom Image

There was an error when I ran my custom image because port 80 on my Mac was already in use, likely from the earlier nginx container. I resolved this by stopping the old container.

In this example, the container image is the blueprint that tells Docker the application code, dependencies, libraries etc that should go into a container. The container is the actual software that's created from this image and running the web server displaying your index.html



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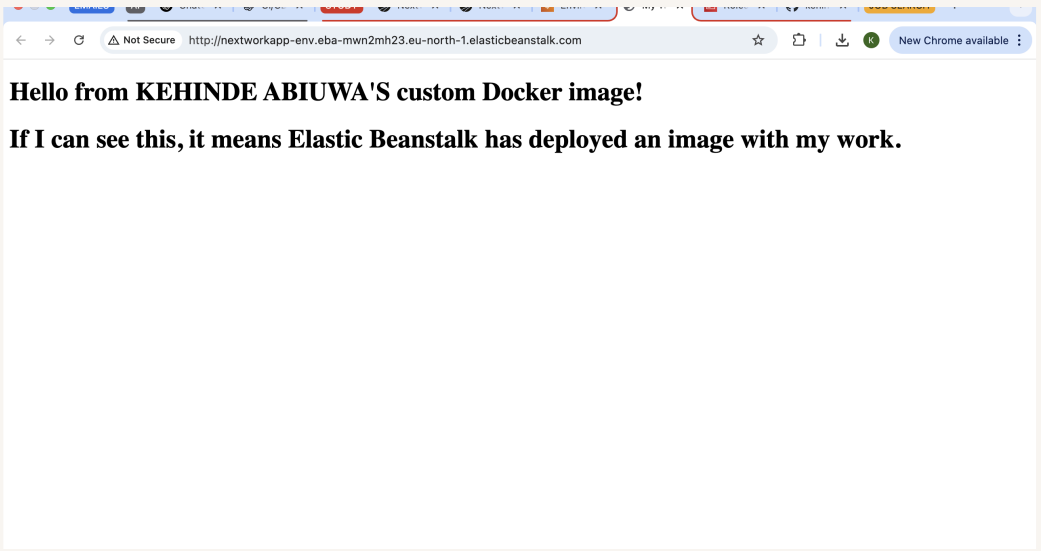
Elastic Beanstalk

Elastic Beanstalk is a service by AWS that makes it easy to deploy cloud applications without worrying about the underlying infrastructure. You simply upload your code and Elastic Beanstalk handles everything needed to get it running, like setting up servers and managing scaling. This lets you focus on your application code without having to spend too much time on managing cloud infrastructure.

Deploying my custom image with Elastic Beanstalk took me 45minutes



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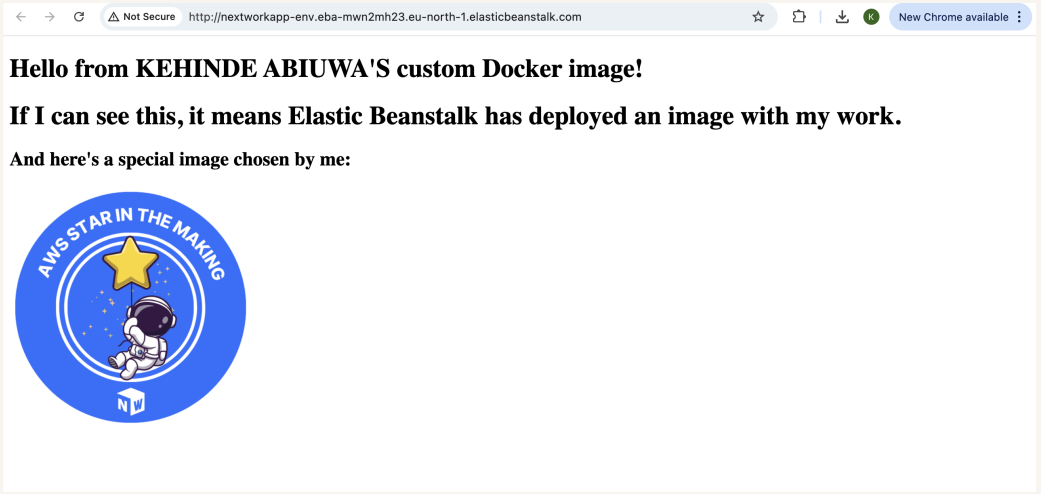
Deploying App Updates

To learn how to deploy app updates with Elastic Beanstalk, I updated my app by adding this line of code '<h2>And here's a special image chosen by me:</h2> <img src="https://storage.googleapis.com/nextwork_course_resources/courses/aws/AWS%20Project%20People%20projects/Project%3A%20Containers%20on%20Elastic%20Beanstalk/NextWork%20Course%20Trophy%20Badge.png " alt="NextWork AWS Star" style="width:100%; max-width:300px;">' I verfied those changes by opening my index.html file locally in my browser and I can see the added line and image.

My app updates didn't show up in my live environment immediately because the updates I made only saved locally. To deploy my changes, I only had to compile my web app again by compressing the docker file and the index.html file in a zip file, head back to my elastic beanstalk project environment a and uploaded and deployed the updated zip file


Not Secure
http://nextworkapp-env.eba-mwn2mh23.eu-north-1.elasticbeanstalk.com
New Chrome available
Hello from KEHINDE ABIUWA'S custom Docker image!
If I can see this, it means Elastic Beanstalk has deployed an image with my work.
And here's a special image chosen by me:
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