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Placement Empowerment Program

Cloud Computing and DevOps Centre

Installing Docker and Running Your First Container on Windows

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Introduction and Overview

Docker is a powerful tool that allows developers to create, deploy, and run applications in isolated environments called containers. These containers ensure that applications run consistently across different systems, eliminating compatibility issues.

In this guide, we will go through the step-by-step process of installing Docker on Windows, setting up a basic Nginx web server inside a container, and accessing it through a browser.

Objective

- To install Docker on Windows and verify its functionality.
- To learn how to pull and run a basic Nginx container.
- To understand how to access a containerized web application using a browser.
- To gain hands-on experience with containerization and Docker commands.

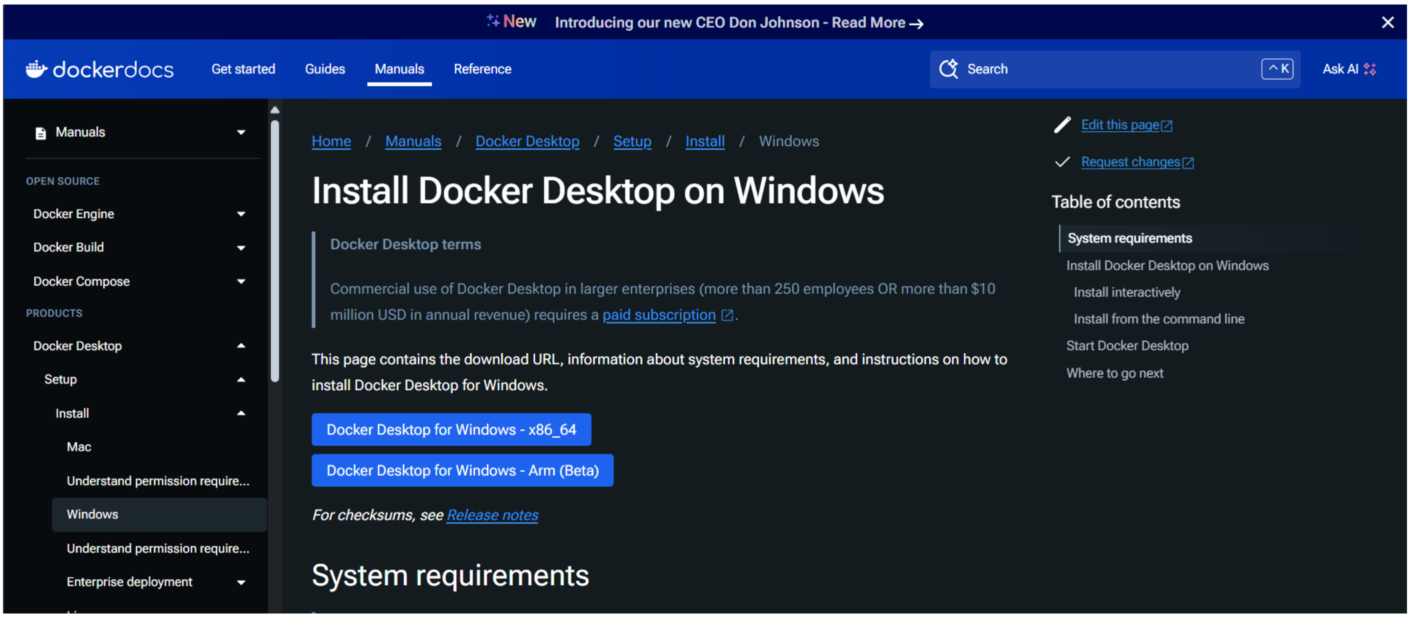
Importance

- Simplifies Deployment – Containers eliminate compatibility issues by packaging applications with all their dependencies.
- Improves Efficiency – Docker containers are lightweight and use system resources more effectively than virtual machines.
- Enhances Portability – Applications run consistently across different environments (local, cloud, or server).
- Boosts Scalability – Docker makes it easier to scale applications up or down based on demand.
- Speeds Up Development – Developers can quickly create isolated environments for testing and debugging.

Step-by-Step Overview

Step 1: Install Docker Desktop.

1. Download **Docker Desktop for Windows** from the official website: https://www.docker.com/products/docker-desktop/
2. Run the installer and follow the on-screen instructions.
3. Ensure **WSL 2** is enabled (Docker requires this for Windows).
4. Restart your PC and launch **Docker Desktop**.



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Install Docker Desktop on Windows

Docker Desktop terms

Commercial use of Docker Desktop in larger enterprises (more than 250 employees OR more than $10 million USD in annual revenue) requires a paid subscription.

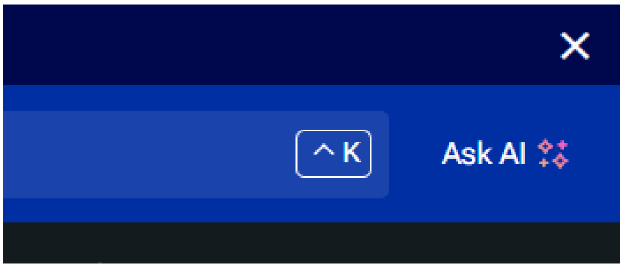
This page contains the download URL, information about system requirements, and instructions on how to install Docker Desktop for Windows.

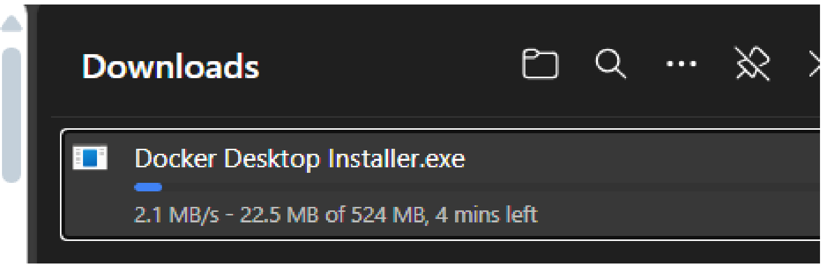
Docker Desktop for Windows - x86_64

Docker Desktop for Windows - Arm (Beta)

For checksums, see Release notes

System requirements





Downloads

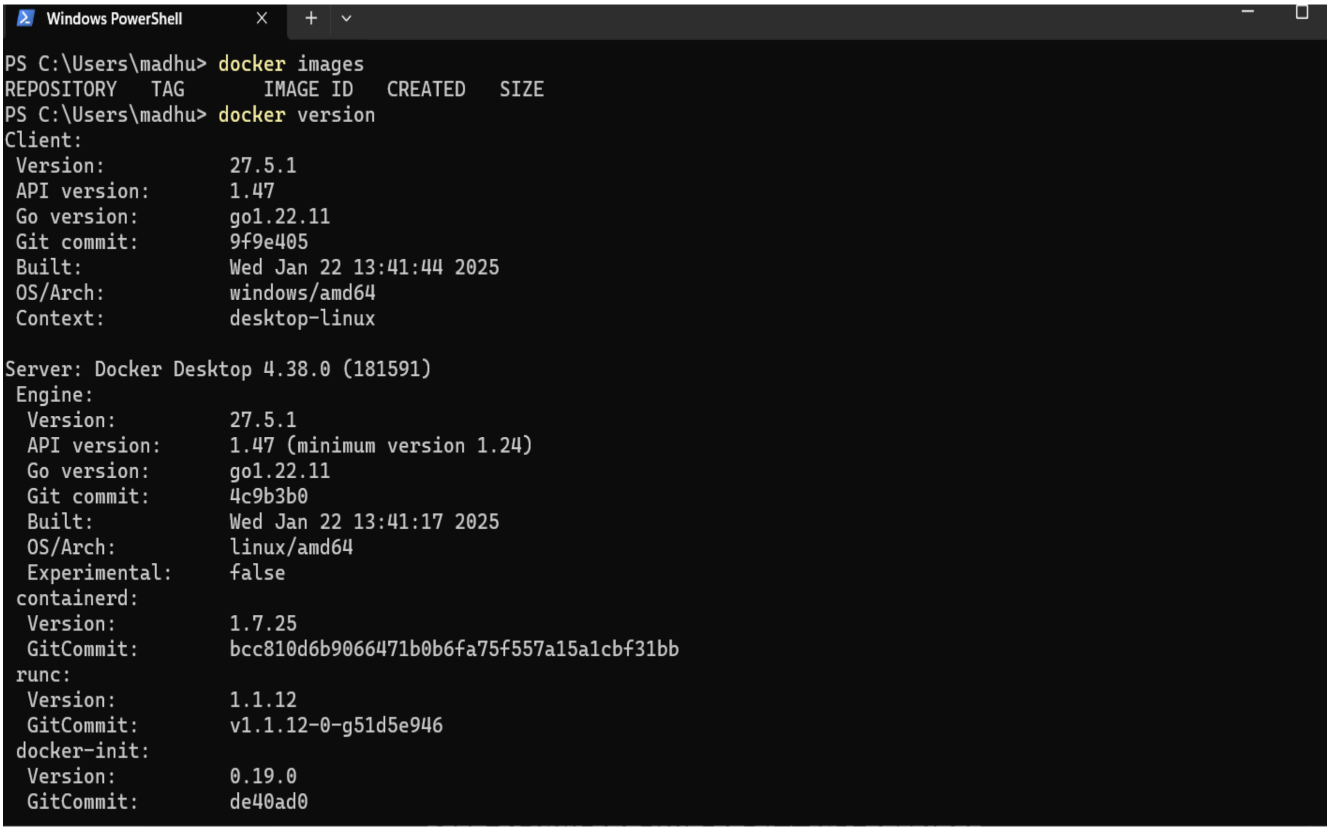
Docker Desktop Installer.exe

2.1 MB/s - 22.5 MB of 524 MB, 4 mins left

Step 2: Verify Docker Installation

- Open PowerShell and check if Docker is installed by running the version command.
- Verify that Docker is running properly by checking its system information.

- If there are any errors, ensure Docker Desktop is open and running in the background

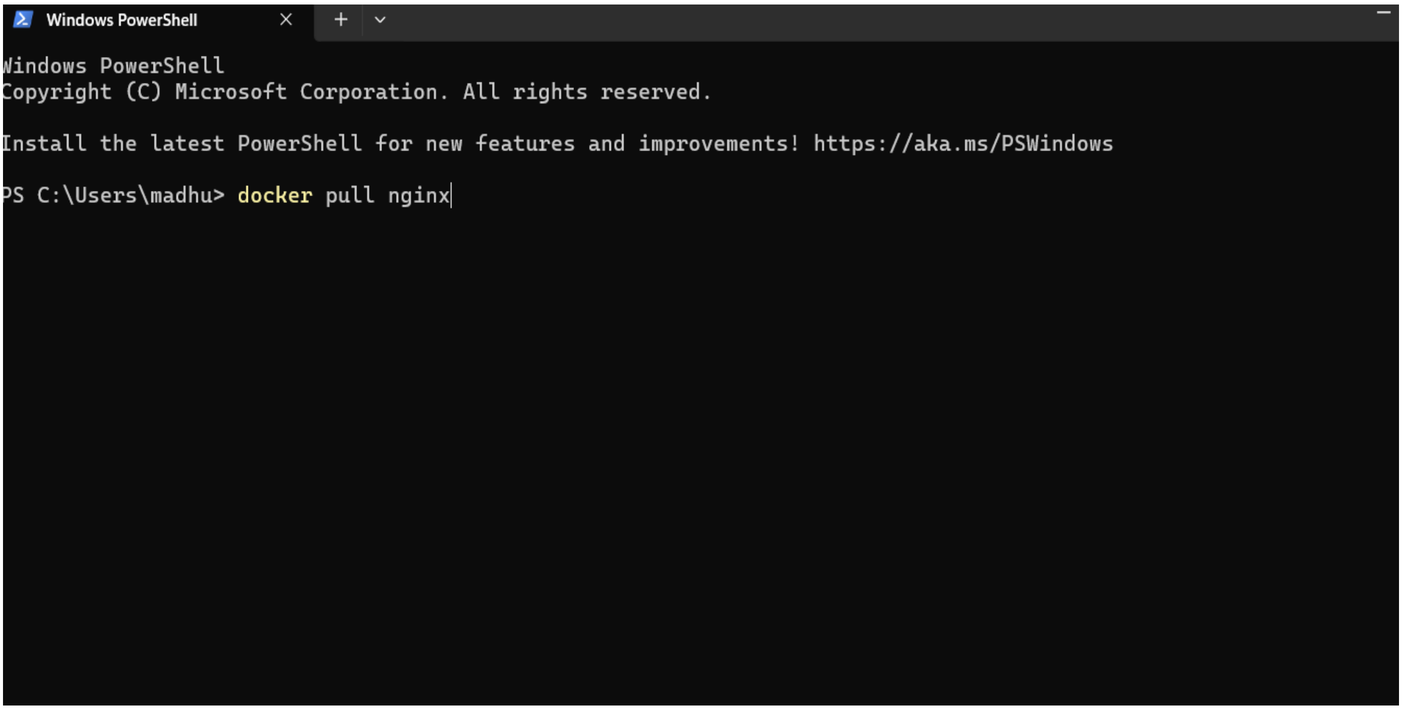


```
PS C:\Users\madhu> docker images
REPOSITORY   TAG       IMAGE ID   CREATED   SIZE
PS C:\Users\madhu> docker version
Client:
 Version:           27.5.1
 API version:       1.47
 Go version:        go1.22.11
 Git commit:        9f9e405
 Built:             Wed Jan 22 13:41:44 2025
 OS/Arch:           windows/amd64
 Context:           desktop-linux

Server: Docker Desktop 4.38.0 (181591)
 Engine:
  Version:          27.5.1
  API version:      1.47 (minimum version 1.24)
  Go version:       go1.22.11
  Git commit:       4c9b3b0
  Built:            Wed Jan 22 13:41:17 2025
  OS/Arch:          linux/amd64
  Experimental:     false
 containerd:
  Version:          1.7.25
  GitCommit:        bcc810d6b9066471b0b6fa75f557a15a1cbf31bb
 runc:
  Version:          1.1.12
  GitCommit:        v1.1.12-0-g51d5e946
 docker-init:
  Version:          0.19.0
  GitCommit:        de40ad0
```

Step 3: Pull the Nginx Docker Image

- Use the Docker pull command to download the latest Nginx image from Docker Hub.
- Once the image is downloaded, verify it by listing all available images in Docker.



```
indows PowerShell
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nstall the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

S C:\Users\madhu> docker pull nginx
```

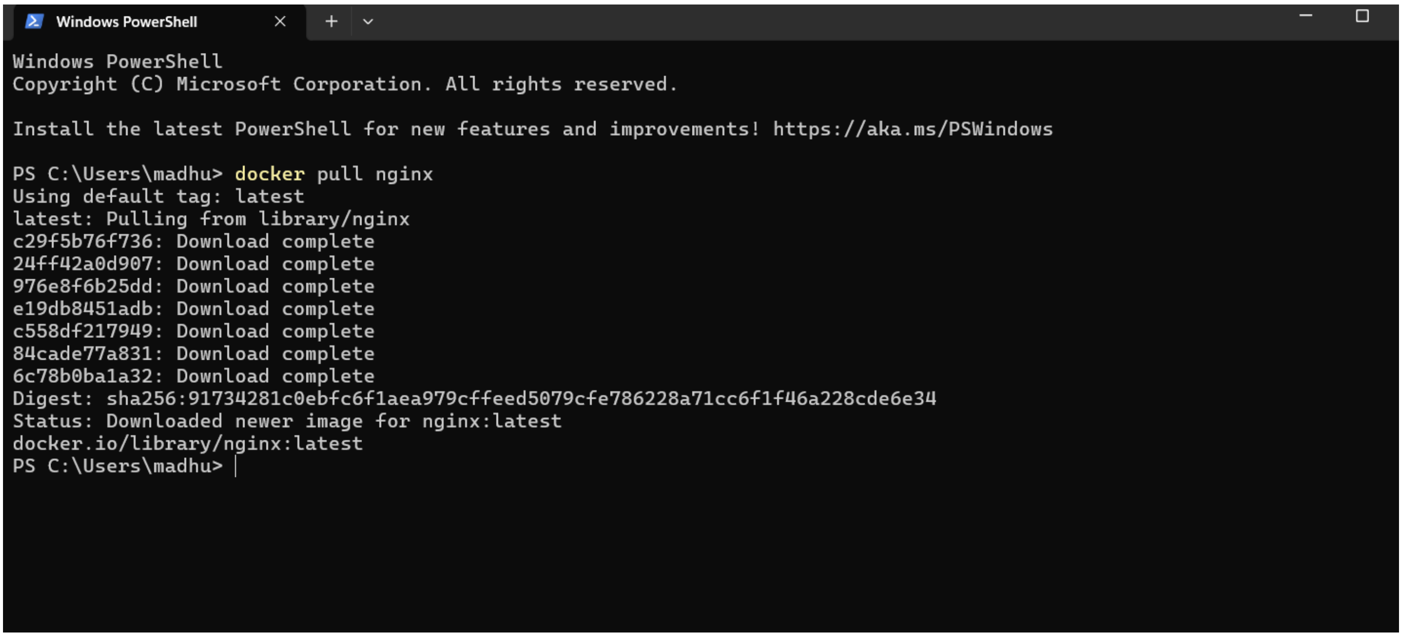

```
Windows PowerShell
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Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\madhu> docker pull nginx
Using default tag: latest
latest: Pulling from library/nginx
c29f5b76f736: Download complete
24ff42a0d907: Download complete
976e8f6b25dd: Download complete
e19db8451adb: Download complete
c558df217949: Download complete
84cade77a831: Download complete
6c78b0ba1a32: Download complete
Digest: sha256:91734281c0ebfc6f1aea979cffeed5079cfe786228a71cc6f1f46a228cde6e34
Status: Downloaded newer image for nginx:latest
docker.io/library/nginx:latest
PS C:\Users\madhu>
```
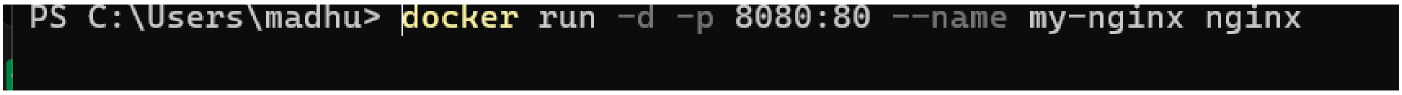
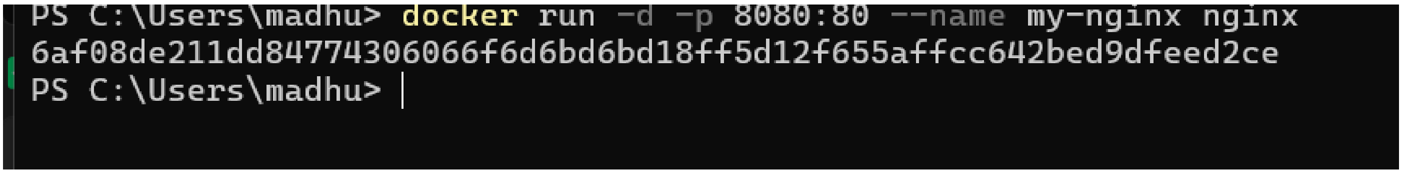

Step 4: Run the Nginx Container

- Start an Nginx container by running it in detached mode and mapping it to port 8080.
- Verify that the container is running by listing all active containers.

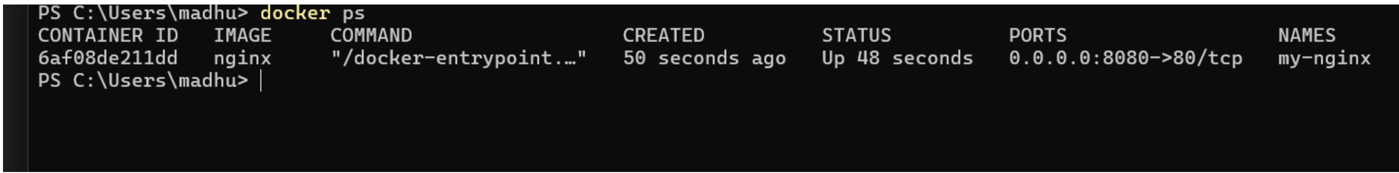


```
PS C:\Users\madhu> docker run -d -p 8080:80 --name my-nginx nginx
```

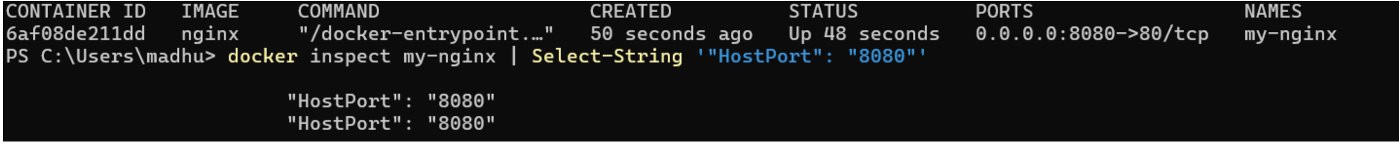


```
PS C:\Users\madhu> docker run -d -p 8080:80 --name my-nginx nginx
6af08de211dd84774306066f6d6bd6bd18ff5d12f655affcc642bed9dfeed2ce
PS C:\Users\madhu> |
```

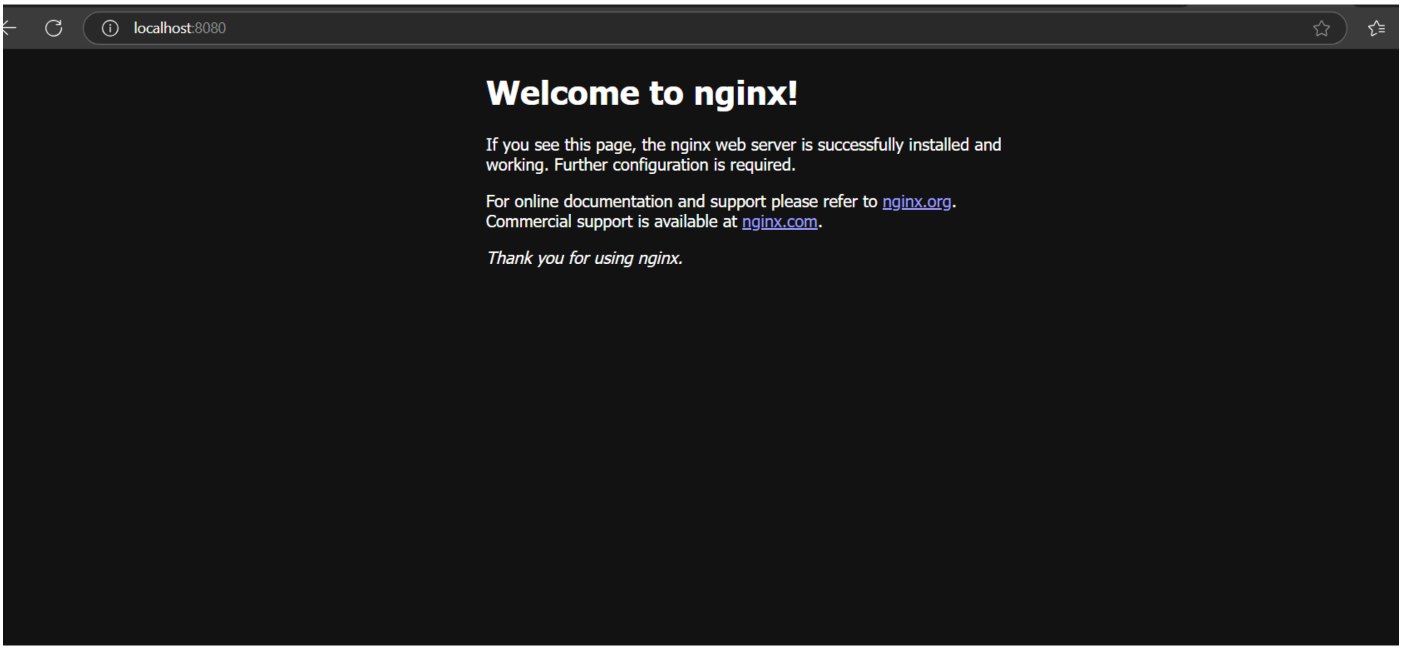
Step 5: Access the Nginx Web Page

- Open a web browser and go to http://localhost:8080.
- If everything is set up correctly, the default Nginx welcome page should appear.
- 

```
PS C:\Users\madhu> docker ps
CONTAINER ID   IMAGE     COMMAND                  CREATED          STATUS          PORTS                  NAMES
6af08de211dd   nginx     "/docker-entrypoint.…"   50 seconds ago   Up 48 seconds   0.0.0.0:8080->80/tcp   my-nginx
PS C:\Users\madhu> |
```

- 

```
CONTAINER ID   IMAGE     COMMAND                  CREATED          STATUS          PORTS                  NAMES
6af08de211dd   nginx     "/docker-entrypoint.…"   50 seconds ago   Up 48 seconds   0.0.0.0:8080->80/tcp   my-nginx
PS C:\Users\madhu> docker inspect my-nginx | Select-String '"HostPort": "8080"'

                        "HostPort": "8080"
                        "HostPort": "8080"
```



Welcome to nginx!

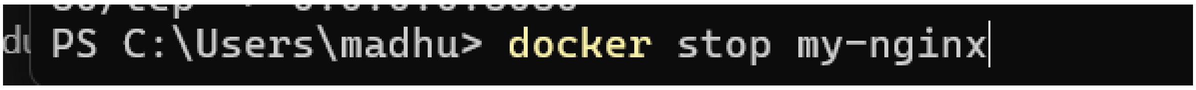
If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.

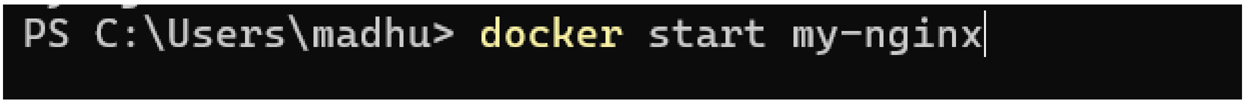
Thank you for using nginx.

Step 6: Stop and Remove the Container

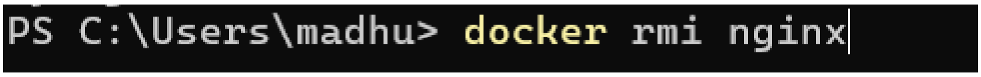
- If you no longer need the container, stop it using the stop command.
- Remove the stopped container from Docker.
- Optionally, remove the Nginx image if you want to free up space.



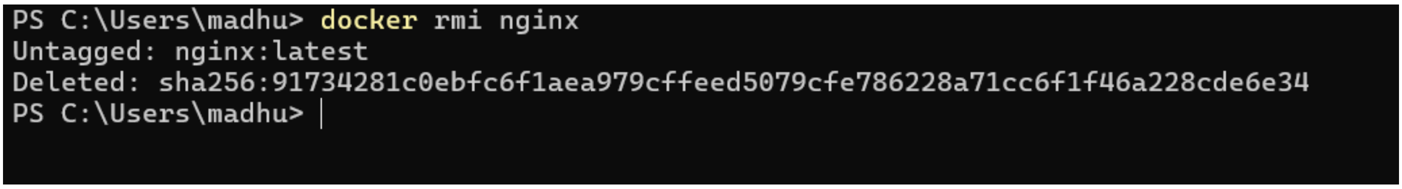
```
PS C:\Users\madhu> docker stop my-nginx
```



```
PS C:\Users\madhu> docker start my-nginx
```



```
PS C:\Users\madhu> docker rmi nginx
```



```
PS C:\Users\madhu> docker rmi nginx
Untagged: nginx:latest
Deleted: sha256:91734281c0ebfc6f1aea979cffeed5079cfe786228a71cc6f1f46a228cde6e34
PS C:\Users\madhu>
```

Expected Outcome

- Successful installation of **Docker Desktop** on Windows.
- Verification that Docker is running correctly through **PowerShell commands**.
- Pulling and running an **Nginx container** without errors.
- Accessing the **Nginx default welcome page** in a web browser at http://localhost:8080.
- Understanding basic **Docker commands** like pull, run, stop, and remove.