

Docker Compose

SK

Successfully deployed three microservices using Docker Compose for multi-container application orchestration:

```
devops2025@Senthil-Kumar-Rajan:/mnt/c/DevOps/devops-practical-2024/demolab/docker/docker-compose$ docker-compose -f docker-compose.yaml up -d
WARN[0000] /mnt/c/DevOps/devops-practical-2024/demolab/docker/docker-compose/docker-compose.yaml: the attribute `version` is obsolete, it will be ignored, please remove it to avoid potential confusion
[+] Running 4/4
 ✓ Network docker-compose_default Created 0.1s
 ✓ Container demo-mongo Healthy 13.5s
 ✓ Container demo-flask Started 14.2s
 ✓ Container demo-mongo-express Started 14.1s
devops2025@Senthil-Kumar-Rajan:/mnt/c/DevOps/devops-practical-2024/demolab/docker/docker-compose$
```

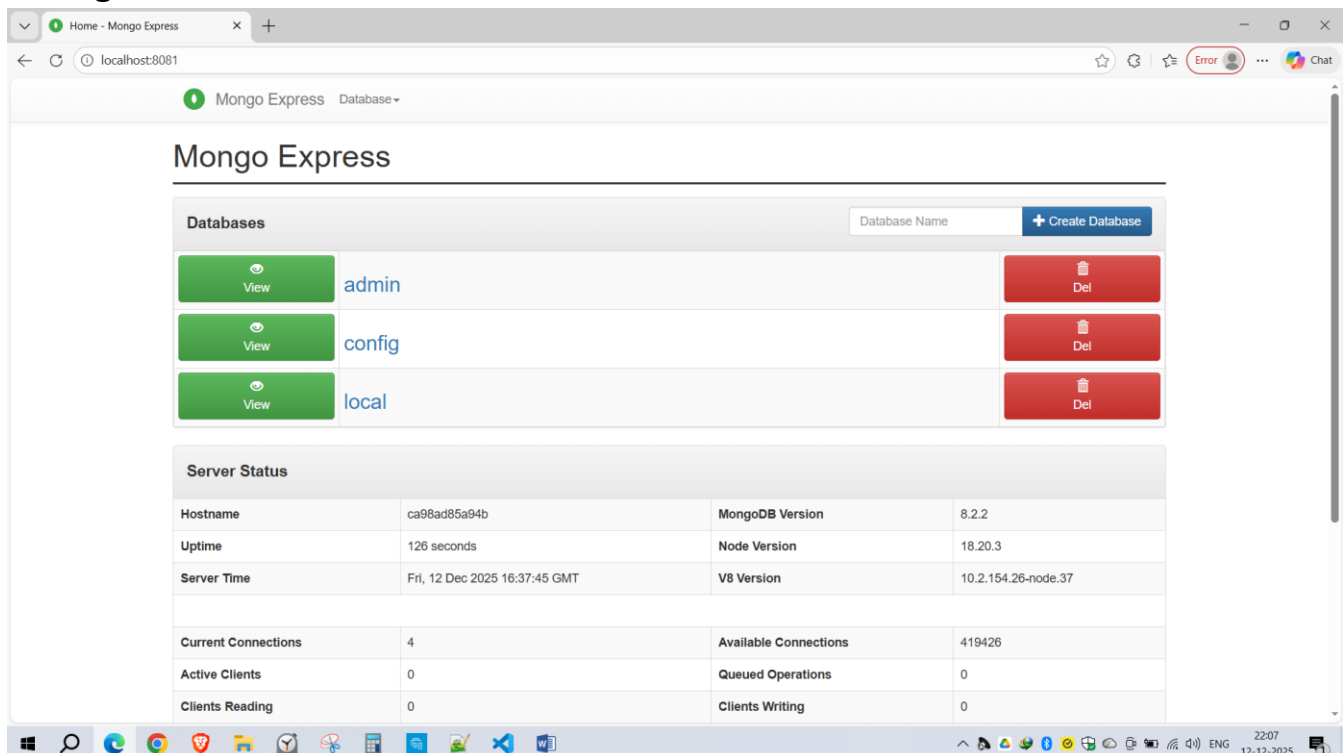
Listed all running containers created via Docker Compose:

```
devops2025@Senthil-Kumar-Rajan:/mnt/c/DevOps/devops-practical-2024/demolab/docker/docker-compose$ docker ps
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS
f2abd8651b99	mongo-express	"/sbin/tini -- /dock..."	56 seconds ago	Up 44 seconds	0.0.0.0:8081->8081/tcp, [::]:8081->8081/tcp
demo-mongo-express					
846e8de64176	docker-compose-web	"flask run --host=0..."	56 seconds ago	Up 44 seconds (health: starting)	0.0.0.0:5000->5000/tcp, [::]:5000->5000/tcp
demo-flask					
ca98ad85a94b	mongo	"docker-entrypoint.s..."	57 seconds ago	Up 55 seconds (healthy)	0.0.0.0:27017->27017/tcp, [::]:27017->27017/tcp
/tcp	demo-mongo				

```
devops2025@Senthil-Kumar-Rajan:/mnt/c/DevOps/devops-practical-2024/demolab/docker/docker-compose$
```

Configured MongoDB to run as a service and integrated Mongo Express for database management:



Enabled user data creation through a Python application integrated with the frontend:

Python + MongoDB Demo

localhost:5000

Error

Chat

Items (MongoDB)

id	name	designation	city
1	Sam	Account manager	Pune
2	Mike	Product manager	Chennai
3	Isaac	Director	Mumbai
4	John	Devops engineer	Bangalore
5	David	Architect	Hyderabad

Add item

id

name

designation

city

Add

Designed and executed MongoDB insert operations to persist application data:

items - Mongo Express

localhost:8081/db/mydb/items

Summarize

Error

Chat

Mongo Express Database: mydb Collection: items

New Document

New Index

Simple

Advanced

Key

Value

String

Find

Delete all 5 documents retrieved

_id	id	name	designation	city
<div><div></div><div></div></div> 693c451069f7f4b2b672d8b9	1	Sam	Account manager	Pune
<div><div></div><div></div></div> 693c452369f7f4b2b672d8ba	2	Mike	Product manager	Chennai
<div><div></div><div></div></div> 693c453769f7f4b2b672d8bb	3	Isaac	Director	Mumbai
<div><div></div><div></div></div> 693c456169f7f4b2b672d8bc	4	John	Devops engineer	Bangalore
<div><div></div><div></div></div> 693c45b969f7f4b2b672d8bd	5	David	Architect	Hyderabad

Built Docker images for the application:

```
devops2025@Senthil-Kumar-Rajan: /mnt/c/DevOps/devops-practical-2024/demolab/docker/docker-compose/app$ docker build -t semever/docker-compose-app:1.0 .
[+] Building 4.6s (11/11) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 357B
=> [internal] load metadata for docker.io/library/python:3.11-slim
=> [auth] library/python:pull token for registry-1.docker.io
=> [internal] load .dockerignore
=> => transferring context: 2B
=> [1/5] FROM docker.io/library/python:3.11-slim@sha256:7cd0079a9bd8800c81632d65251048fc2848bf9afda542224b1b10e0cae45575
=> => resolve docker.io/library/python:3.11-slim@sha256:7cd0079a9bd8800c81632d65251048fc2848bf9afda542224b1b10e0cae45575
=> [internal] load build context
=> => transferring context: 4.48kB
=> CACHED [2/5] WORKDIR /usr/src/app
=> CACHED [3/5] COPY requirements.txt ./
=> CACHED [4/5] RUN pip install --no-cache-dir -r requirements.txt
=> [5/5] COPY . .
=> exporting to image
=> => exporting layers
=> => exporting manifest sha256:4a03b2f216180ea5219186f97ed9d68829e7fd7b0b704f22269380446bf60606
=> => exporting config sha256:a79e8073ea3ce7f3cf45c716f973ff97324f7248a13748d9901e340c8be64611
=> => exporting attestation manifest sha256:352b57361ef788a4ac03b07bdba1fbdffc00dbc9c934748c7a541166eeb088a9
=> => exporting manifest list sha256:23f9d8eab252c47e85b5c07f9246b8b83fbf2b17a9e7d042f07a5b8e7d41c8cc
=> => naming to docker.io/semever/docker-compose-app:1.0
=> => unpacking to docker.io/semever/docker-compose-app:1.0
devops2025@Senthil-Kumar-Rajan: /mnt/c/DevOps/devops-practical-2024/demolab/docker/docker-compose/app$
```

```
IMAGE                                ID                                DISK USAGE  CONTENT SIZE  EXTRA
gcr.io/k8s-minikube/kicbase:v0.0.48 41454ef774d0                      1.84GB      512MB
gcr.io/k8s-minikube/kicbase@sha256:7171c97a51623558720f8e5878e4f4637da093e2f2ed589997bedc6c1549b2b1 7171c97a5162                      1.84GB      512MB  U
mongo-express:latest                 1b23d7976f02                      287MB       59.8MB
mongo:latest                         bf5995bcccb6                      1.25GB      326MB
semever/docker-compose-app:1.0       23f9d8eab252                      220MB       53.1MB
devops2025@Senthil-Kumar-Rajan: /mnt/c/DevOps/devops-practical-2024/demolab/docker/docker-compose/app$
```

Logged into DockerHub via CLI to enable secure image push and pull operations:

```
devops2025@Senthil-Kumar-Rajan: /mnt/c/DevOps/devops-practical-2024/demolab/docker/docker-compose/app$ docker login
Authenticating with existing credentials... [Username: semever]

Info -> To login with a different account, run 'docker logout' followed by 'docker login'

Login Succeeded
devops2025@Senthil-Kumar-Rajan: /mnt/c/DevOps/devops-practical-2024/demolab/docker/docker-compose/app$
```

```
devops2025@Senthil-Kumar-Rajan: /mnt/c/DevOps/devops-practical-2024/demolab/docker/docker-compose/app$ docker push semever/docker-compose-app:1.0
The push refers to repository [docker.io/semever/docker-compose-app]
a2c70d73528f: Pushed
5462c5f4a4cf: Pushed
1733a4cd5954: Pushed
4d55cfe366: Pushed
3f0dbca744e: Pushed
80372c6d6c40: Pushed
6c94c56dddea: Pushed
2449c3068184: Pushed
72cf4c3b8301: Pushed
1.0: digest: sha256:23f9d8eab252c47e85b5c07f9246b8b83fbf2b17a9e7d042f07a5b8e7d41c8cc size: 856
devops2025@Senthil-Kumar-Rajan: /mnt/c/DevOps/devops-practical-2024/demolab/docker/docker-compose/app$
```

Published the Docker image to DockerHub repository:

Repositories / docker-compose-app / Tags

Using 1 of 1 private repositories.

semever/docker-compose-app

Last pushed 1 minute ago · Repository size: 50.6 MB · ☆0 · ⬇0

Docker Compose App

Add a category

General

Tags

Image Management

Collaborators

Webhooks

Settings

Sort by

Newest

Filter tags

Delete

TAG

1.0

Last pushed 1 minute by semever

Digest	OS/ARCH	Last pull	Compressed size
4a03b2f21618	linux/amd64	less than 1 day	50.62 MB

docker pull semever/docker-compose-app:1.0

Deployed the application using Docker Compose with images pulled from DockerHub:

```
devops2025@Senthil-Kumar-Rajan: /mnt/c/DevOps/devops-practical-2024/demolab/docker/docker-compose$ docker-compose -f docker-compose.yaml up -d
WARN[0000] /mnt/c/DevOps/devops-practical-2024/demolab/docker/docker-compose/docker-compose.yaml: the attribute `version` is obsolete, it will be ignored, please remove it to avoid potential confusion
[+] Running 4/4
 ✓ Network docker-compose_default Created 0.1s
 ✓ Container demo-mongo Healthy 13.3s
 ✓ Container demo-flask Started 13.7s
 ✓ Container demo-mongo-express Started 13.8s
devops2025@Senthil-Kumar-Rajan: /mnt/c/DevOps/devops-practical-2024/demolab/docker/docker-compose$ docker ps
CONTAINER ID   IMAGE                                COMMAND                  CREATED        STATUS                   PORTS
8c140eedeac1   semever/docker-compose-app:1.0     "flask run --host=0...  16 seconds ago Up 4 seconds (health: starting) 0.0.0.0:5000->5000/tcp, [::]:5000->5000/tcp
31e93875d5c7   mongo-express                      "/sbin/tini -- /dock...  16 seconds ago Up 4 seconds                0.0.0.0:8081->8081/tcp, [::]:8081->8081/tcp
d577cad490dd   mongo                              "docker-entrypoint.s...  16 seconds ago Up 15 seconds (healthy)    0.0.0.0:27017->27017/tcp, [::]:27017->27017/tcp
7017->27017/tcp demo-mongo
```

Application deployed from a DockerHub image:

Python + MongoDB Demo

localhost:5000

Items (MongoDB)

id	name	designation	city
1	docker hub	repository	online

Add item

1 docker hub repository online Add

items - Mongo Express

localhost:8081/db/mydb/items

Mongo Express Database: mydb Collection: items

Viewing Collection: items

New Document New Index

Simple Advanced

Key Value String Find

Delete all 1 documents retrieved

_id	id	name	designation	city
693c4d0727fec535b9d972c0	1	docker hub	repository	online

Rename Collection

mydb.items Rename

Tools