

Tugas Hasil Uji Coba

Sistem Paralel dan Terdistribusi A

Docker Compose



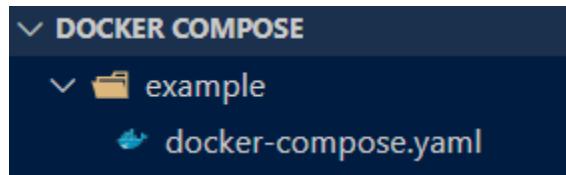
Disusun Oleh :

Zakaria Fattawari 11231092

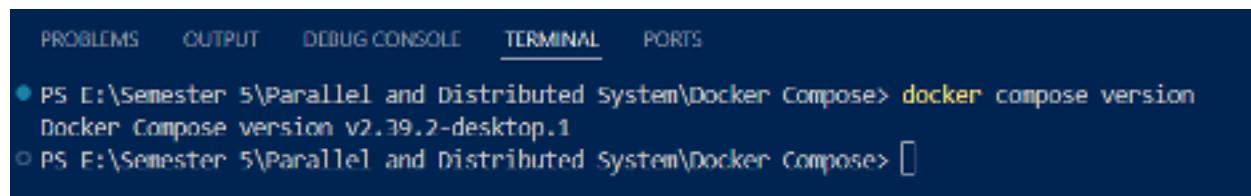
10 November 2025

DOCKER COMPOSE

Apa itu Docker Compose?



Docker Compose: Version



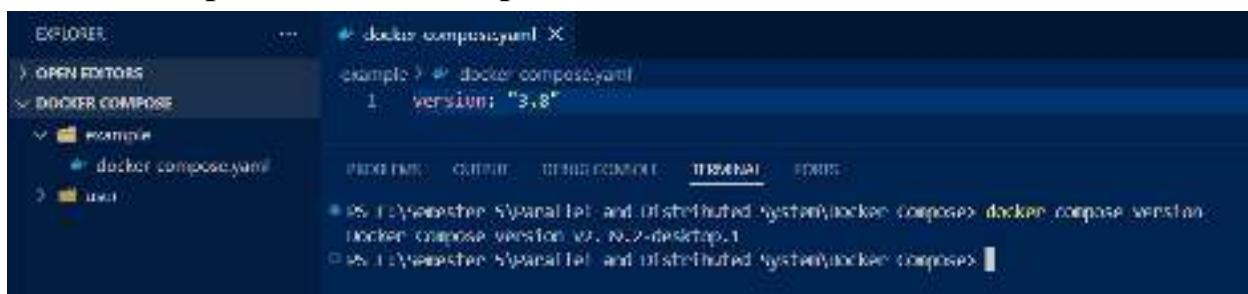
A screenshot of a terminal window with a dark blue background. At the top, there are tabs labeled PROBLEMS, OUTPUT, DEBUG CONSOLE, TERMINAL (which is underlined), and PORTS. Below the tabs, there is a command-line interface. The first line shows a prompt "PS E:\Semester 5\Parallel and Distributed System\Docker Compose>" followed by the command "docker compose version". The second line displays the output: "Docker Compose version v2.39.2-desktop.1". A small square icon is visible on the right side of the terminal window.

```
PROBLEMS    OUTPUT    DEBUG CONSOLE    TERMINAL    PORTS
● PS E:\Semester 5\Parallel and Distributed System\Docker Compose> docker compose version
Docker Compose version v2.39.2-desktop.1
○ PS E:\Semester 5\Parallel and Distributed System\Docker Compose> [ ]
```

CONFIGURATION FILE

Docker Compose: Versi Konfigurasi

Docker Compose: Docker Compose File



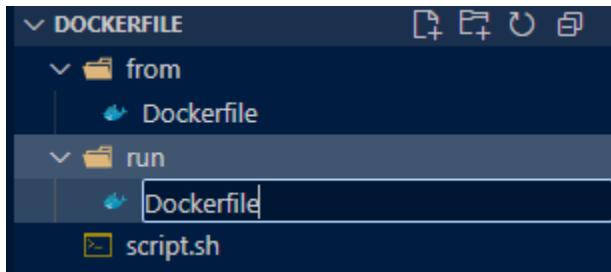
A screenshot of a code editor interface, likely Visual Studio Code, displaying a Docker Compose file named `docker-compose.yaml`. The file content is as follows:

```
version: "3.8"
```

The interface includes a sidebar labeled "EXPLORER" with sections for "OPEN FOLDERS", "Docker Compose", and "Home". The "Docker Compose" section shows the `docker-compose.yaml` file. The main area has tabs for "EDITOR", "OUTPUT", "TERMINAL", and "PROBLEMS", with "TERMINAL" currently selected. A status bar at the bottom indicates the file is open in a "cyberduck" session.

YAML

Pengenalan YAML



A screenshot of a code editor displaying a Dockerfile. The tabs at the top show 'Dockerfile from', 'Dockerfile ...\\run', and 'script.sh'. The code editor shows the following Dockerfile content:

```
from > run > Dockerfile > ...
1  FROM alpine:3
2
3  RUN mkdir hello
4  RUN echo "Hello World" > "/Hello/hello.txt"
5  RUN cat "/Hello/hello.txt"
```

Docker Compose: YAML Attribute

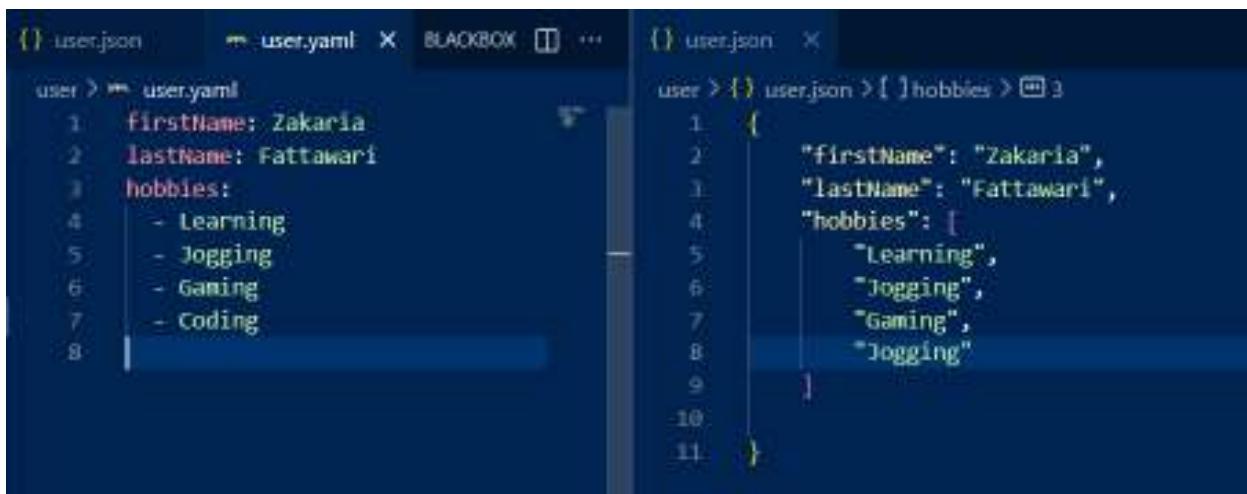
The screenshot shows a terminal window with two tabs: 'user.yaml' and 'user.json'. The 'user.yaml' tab contains the following YAML data:

```
user > m user.yaml
1   firstName: Zakaria
2   lastName: Fattawari
3   s|
```

The 'user.json' tab shows the resulting JSON output:

```
user > {} user.json > ...
1   {
2     "firstName": "Zakaria",
3     "lastName": "Fattawari"
4   }
```

Docker Compose: YAML Array

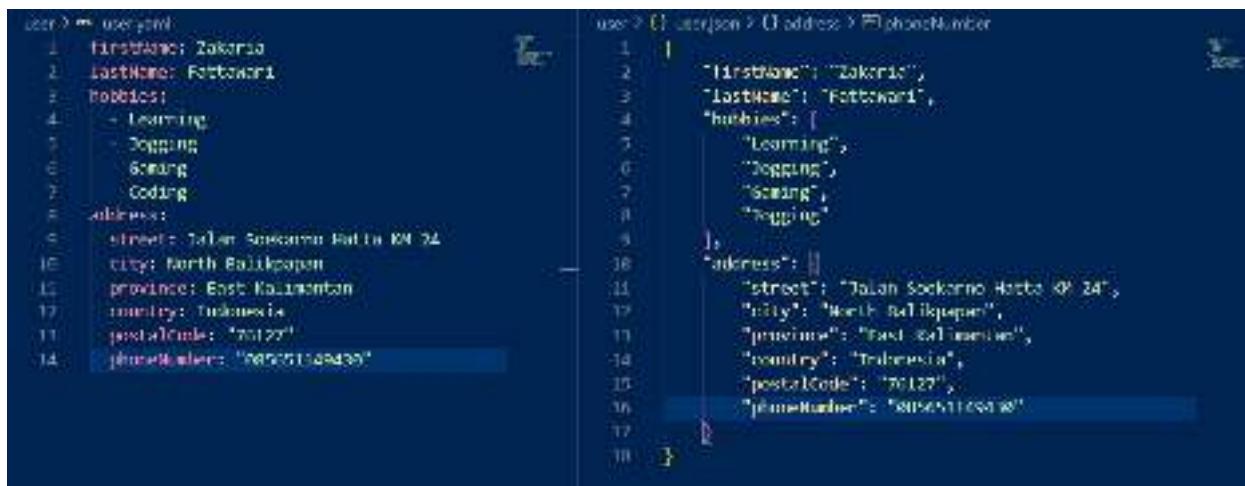


```
user > user.yaml
1  firstName: Zakaria
2  lastName: Fattawari
3  hobbies:
4    - Learning
5    - Jogging
6    - Gaming
7    - Coding
8

user > user.json
1  {
2    "firstName": "Zakaria",
3    "lastName": "Fattawari",
4    "hobbies": [
5      "Learning",
6      "Jogging",
7      "Gaming",
8      "Coding"
9    ]
10   }
11 }
```

=

Docker Compose: YAML Nested Object



```
user> cat user.yaml
1  firstName: Zakaria
2  lastName: Fattawati
3  hobbies:
4    - Learning
5    - Shopping
6    - Swimming
7    - Coding
8  address:
9    street: Jalan Sockarto Raya KM 24
10   city: North Balikpapan
11   province: East Kalimantan
12   country: Indonesia
13   postalCode: "76127"
14   phoneNumbers: "081234567890"

user> cat user.json > | address>Y|>phoneNumber
1  {
2    "firstName": "Zakaria",
3    "lastName": "Fattawati",
4    "hobbies": [
5      "Learning",
6      "Shopping",
7      "Swimming",
8      "Coding"
9    ],
10   "address": {
11     "street": "Jalan Sockarto Raya KM 24",
12     "city": "North Balikpapan",
13     "province": "East Kalimantan",
14     "country": "Indonesia",
15     "postalCode": "76127",
16     "phoneNumbers": "081234567890"
17   }
18 }
```

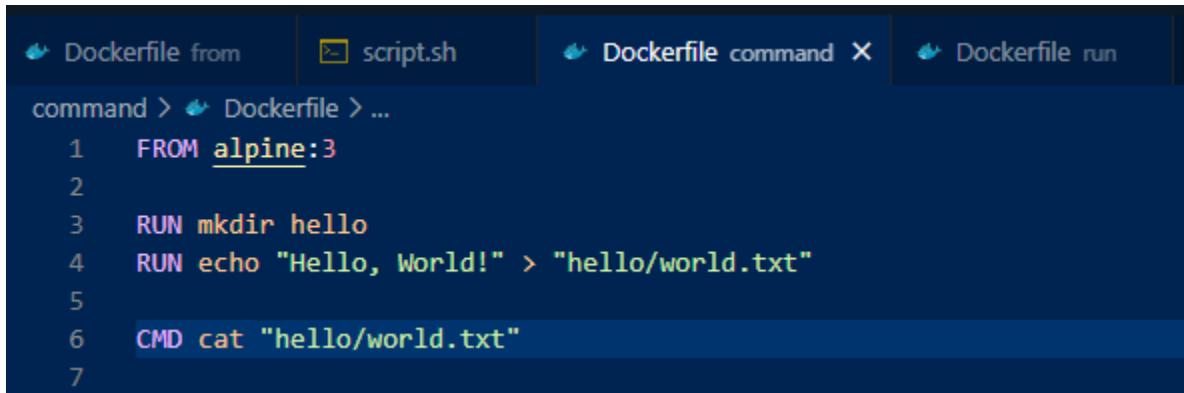
Docker Compose: YAML Array Nested Object

```
user1.yaml
1: user:
2:   - FirstName: Zakaria
3:   - LastName: Fatikawati
4:   - hobbies:
5:     - Learning
6:     - Debugging
7:     - Running
8:     - Coding
9:   - address:
10:     - street: Jalan Sukaasa No.12 KM.24
11:     - city: North Maluku
12:     - province: East Sulawesi
13:     - country: Indonesia
14:     - postalcode: "75122"
15:     - phonenumbers: "+628551149410"
16:   - emails:
17:     - zakafatikawati@gmail.com
18:     - alathirwongati@gmail.com
19:     - 11211892@student.stkip.ac.id
20:   - wallet:
21:     - type: cash
22:       amount: 50000
23:     - type: credit
24:       amount: 42000

user2.yaml
1: user> <!-- user1 -->
2:   - FirstName: "Zakaria"
3:   - LastName: "Fatikawati"
4:   - hobbies:
5:     - "Learning"
6:     - "Debugging"
7:     - "Running"
8:     - "Coding"
9:   - address:
10:     - "street": "Jalan Sukaasa No.12 KM.24",
11:     - "city": "North Maluku",
12:     - "province": "East Sulawesi",
13:     - "country": "Indonesia",
14:     - "postalcode": "75122",
15:     - "phonenumbers": "+628551149410",
16:   - emails:
17:     - "zakafatikawati@gmail.com",
18:     - "alathirwongati@gmail.com",
19:     - "11211892@student.stkip.ac.id"
20:   - wallet:
21:     - "type": "cash",
22:       "amount": 50000
23:
24:
25:
26:
27:
28:
29:
30:
31:
32:
33:
```

MEMBUAT CONTAINER

Membuat Konfigurasi Kontainer

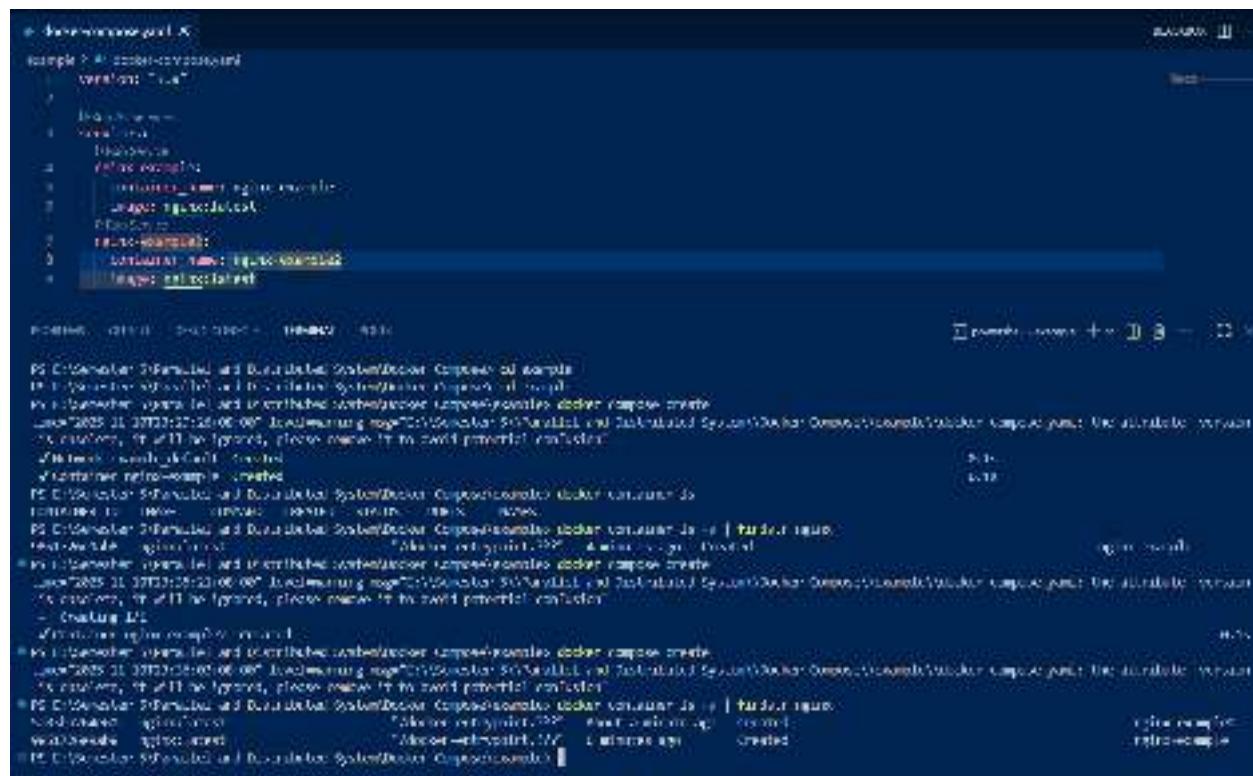


```
FROM alpine:3
RUN mkdir hello
RUN echo "Hello, World!" > "hello/world.txt"
CMD cat "hello/world.txt"
```

Docker Compose: Membuat Container

```
example > docker-compose.yaml
1     version: "3.8"
2
3     services:
4         > Run Service
5             nginx-example:
6                 container_name: nginx-example
7                 image: nginx:latest
```

10. Entitätsname: SystemDoktor. Kapitel: System-Doktor-Container	



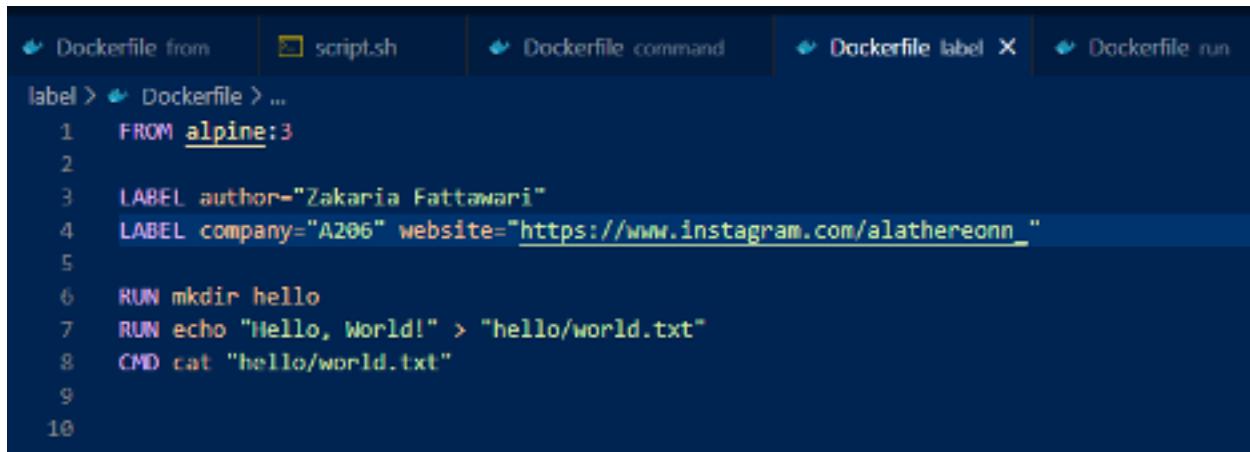
Docker Container: COMMAND

```
PS E:\Sonstige\SVParallel und Distributed System\dockerfiles> docker container create -volumes-from zakariaabdelkader1 command
d4c9805688188
PS E:\Sonstige\SVParallel und Distributed System\dockerfiles> docker container start command
command
PS E:\Sonstige\SVParallel und Distributed System\dockerfiles> docker container ls
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
PS E:\Sonstige\SVParallel und Distributed System\dockerfiles> docker container ls -a | findstr command
d4c9805688188 zakariaabdelkader1/command "tail -f /tmp/cheffit" About a minute ago Edited (6) About a minute ago command
PS E:\Sonstige\SVParallel und Distributed System\dockerfiles> docker container logs command
Hello, World!
PS E:\Sonstige\SVParallel und Distributed System\dockerfiles> docker container start command
command
PS E:\Sonstige\SVParallel und Distributed System\dockerfiles> docker container start command
command
PS E:\Sonstige\SVParallel und Distributed System\dockerfiles> docker container logs command
Hello, World!
Hello, World!
Hello, World!
Hello, World!
PS E:\Sonstige\SVParallel und Distributed System\dockerfiles>
```

MENJALANKAN CONTAINER

Pemgenalan Menjalankan Container

```
PS E:\Semester 5\Parallel and Distributed System>docker compose cd example
PS E:\Semester 5\Parallel and Distributed System>docker compose up
time="2025-11-10T23:57:45+08:00" level=warning msg="t:\Semester 5\Parallel and Distributed System\docker-compose\example\docker-compose.yaml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
[+] Running 2/2
  ✓ container nginx-example2 started
  ✓ container nginx-example started
PS E:\Semester 5\Parallel and Distributed System>docker container ls
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
5a0fba06de00 nginx:latest "/docker-entrypoint..." 2 minutes ago Up 5 seconds 80/tcp nginx-example2
9851726e9ab8 nginx:latest "/docker-entrypoint..." 8 minutes ago Up 5 seconds 80/tcp nginx-example
PS E:\Semester 5\Parallel and Distributed System>docker compose up
```



The screenshot shows a Dockerfile editor interface with several tabs at the top: Dockerfile from, script.sh, Dockerfile command, Dockerfile label (which is currently selected), and Dockerfile run. The Dockerfile content is as follows:

```
label > Dockerfile > ...
1  FROM alpine:3
2
3  LABEL author="Zakaria Fattawari"
4  LABEL company="A206" website="https://www.instagram.com/alathereonn\_"
5
6  RUN mkdir hello
7  RUN echo "Hello, World!" > "hello/world.txt"
8  CMD cat "hello/world.txt"
9
10
```

Docker Compose: Melihat Container

```
PS E:\Semester 5\Parallel and distributed System\docker-compose\examples> docker compose ps
time="2025-11-10T23:46:13+08:00" level=warning msg="E:\Semester 5\Parallel and distributed System\docker-compose\examples\docker-compose.yml: the attribute \"version\" is obsolete, it will be ignored, please remove it to avoid potential confusion"
NAME      IMAGE      COMMAND     SERVICE      CREATED     STATUS      PORTS
nginx-example   nginx:latest   "/docker-entrypoint..."    nginx-example   10 minutes ago   Up 2 minutes   80/tcp
nginx-example2  nginx:latest   "/docker-entrypoint..."    nginx-example2  4 minutes ago   Up 2 minutes   80/tcp
PS E:\Semester 5\Parallel and distributed System\docker-compose\examples>
```

Docker Compose: Menghentikan Container

```
PS E:\Semester 5\Parallel and Distributed System\docker-compose\example> docker compose stop
time="2025-11-10T21:41:48+00" level=warning msg="E:\Semester 5\Parallel and Distributed System\docker-compose\example\docker-compose.yml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
[+] stopping x/2
  ✓ Container nginx-example2 Stopped                                     0.2s
  ✓ Container nginx-example Stopped                                     0.3s
PS E:\Semester 5\Parallel and Distributed System\docker-compose\example> docker compose ps
time="2025-11-10T21:41:46+00:00" level=warning msg="E:\Semester 5\Parallel and Distributed System\docker-compose\example\docker-compose.yml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
NAME      IMAGE      COMMAND      SERVICE      CREATED      STATUS      PORTS
```

Docker Compose: Menghapus Container

```
PS E:\Semester 5\Parallel and distributed system\docker-compose\example> docker compose start
time="2025-11-18T23:43:56+08:00" level=warning msg="E:\Semester 5\Parallel and distributed system\docker-compose\example\docker-compose.yaml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
[+] Running 2/2
  ✓ container nginx-example  started
  ✓ container nginx-example2 Started
PS E:\Semester 5\Parallel and distributed system\docker-compose\example> docker compose ps
time="2025-11-18T23:43:54+08:00" level=warning msg="E:\Semester 5\Parallel and distributed system\docker-compose\example\docker-compose.yaml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
NAME      IMAGE          COMMAND       SERVICE      CREATED     STATUS        PORTS
nginx-example   nginx:latest   "/docker-entrypoint..."    nginx-example  14 minutes ago  Up 17 seconds  80/tcp
nginx-example2   nginx:latest   "/docker-entrypoint..."    nginx-example2  8 minutes ago   Up 17 seconds  80/tcp
PS E:\Semester 5\Parallel and distributed system\docker-compose\example> docker compose down
time="2025-11-18T23:44:08+08:00" level=warning msg="E:\Semester 5\Parallel and distributed system\docker-compose\example\docker-compose.yaml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
[+] Running 3/3
  ✓ container nginx-example  Removed
  ✓ container nginx-example2 Removed
  ✓ Network example_default Removed
PS E:\Semester 5\Parallel and distributed system\docker-compose\example>
```

PROJECT NAME

Pengenalan Project Name

```
PS E:\Semester 5\Parallel and distributed system\docker-compose\example> docker compose create
time="2025-11-18T23:46:51+08:00" level=warning msg="E:\Semester 5\Parallel and distributed System\docker Compose\example\docker-compose.yaml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
[+] Creating 3/3
  ✓ Network example_default created
  ✓ Container nginx-example created
  ✓ Container nginx-example2 created
  ✓ Container nginx-example3 created
  0.08
  0.15
  0.15
PS E:\Semester 5\Parallel and distributed System\docker-compose\example> docker compose ps
time="2025-11-18T23:46:56+08:00" level=warning msg="E:\Semester 5\Parallel and distributed system\docker compose\example\docker-compose.yaml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
NAME          IMAGE           COMMAND          SERVICE          CREATED         STATUS          PORTS
nginx-example  nginx:latest  "/docker-entrypoint..."  nginx-example  19 seconds ago  Up 6 seconds  80/tcp
nginx-example2 nginx:latest  "/docker-entrypoint..."  nginx-example2  19 seconds ago  Up 6 seconds  80/tcp
nginx-example3 nginx:latest  "/docker-entrypoint..."  nginx-example3  19 seconds ago  Up 6 seconds  80/tcp
PS E:\Semester 5\Parallel and distributed System\docker-compose\example>
```

```
PS E:\Semester 5\Parallel and distributed system\docker-compose\example> docker compose ps
time="2025-11-18T23:47:10+08:00" level=warning msg="E:\Semester 5\Parallel and distributed System\docker Compose\example\docker-compose.yaml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
NAME          IMAGE           COMMAND          SERVICE          CREATED         STATUS          PORTS
nginx-example  nginx:latest  "/docker-entrypoint..."  nginx-example  19 seconds ago  Up 6 seconds  80/tcp
nginx-example2 nginx:latest  "/docker-entrypoint..."  nginx-example2  19 seconds ago  Up 6 seconds  80/tcp
PS E:\Semester 5\Parallel and distributed System\docker-compose\example>
```

SERVICES

Pengenalan SERVICES

```
• docker-compose.yaml X
example > • docker-compose.yaml
1   version: "3.9"
2
3     ▷Run All Services
4   services:
5     ▷ Run Service
6     nginx-example:
7       image: nginx:latest
8       container_name: nginx-example
9
10    ▷ Run Service
11    mongodb-example:
12      image: mongo:latest
13      container_name: mongodb-example
```

Docker Compose: SERVICES

```
* ps E:\Semester 5\Parallel and distributed system\docker\Compose\example> docker compose create
time="2023-11-18T23:54:16+08:00" level=warning msg="E:\Semester 5\Parallel and distributed system\docker\Compose\example\docker-compose.yaml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
[+] Creating 3/3
  ✓ Network example_default created
  ✓ Container mongodb-example created
  ✓ Container nginx-example created
* ps E:\Semester 5\Parallel and distributed system\docker\Compose\example> docker compose start
time="2023-11-18T23:54:29+08:00" level=warning msg="E:\Semester 5\Parallel and distributed system\docker\Compose\example\docker-compose.yaml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
[+] Running 2/2
  ✓ Container mongodb-example started
  ✓ Container nginx-example started
* ps E:\Semester 5\Parallel and distributed system\docker\Compose\example>
```

KOMENTAR

Pengenalan Komentar

```
↳ docker-compose.yaml X
example > ↳ docker-compose.yaml
1   version: "3.9"
2
3     ▷Run All Services
4   services:
5     # contoh nginx bang
6     ▷Run Service
7     nginx-example:
8       image: nginx:latest
9       container_name: nginx-example
10    # kalau yang ini contoh mongodb
11    ▷Run Service
12    mongodb-example:
13      image: mongo:latest
14      container_name: mongodb-example
```

PORT

Pengenalan PORT

```
docker-compose.yaml X
example > docker-compose.yaml
1   version: "3.9"
2
3     >Run All Services
4   services:
5     # contoh port dengan long syntax
6     >Run Service
7     nginx-port1:
8       image: nginx:latest
9       container_name: nginx-port1
10      ports:
11        - protocol: tcp
12          published: 8080
13          target: 80
14      # contoh port dengan short syntax
15      >Run Service
16      nginx-port2:
17        image: nginx:latest
18        container_name: nginx-port2
19        ports:
20          - 8081:80
```

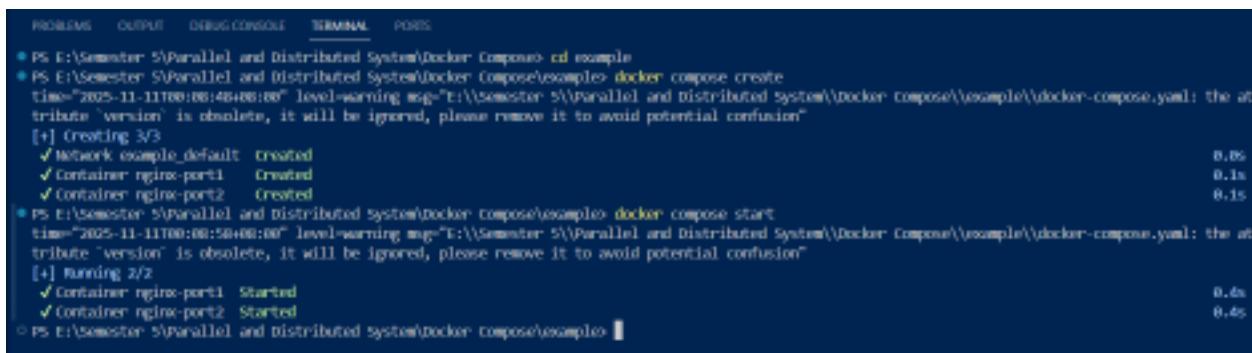
Docker Compose: Short Syntax

```
12  # contoh port dengan short syntax
    ▷ Run Service
13  nginx-port2:
14      image: nginx:latest
15      container_name: nginx-port2
16      ports:
17          - 8081:80
18
```

Docker Compose: Long Syntax

```
4  # contoh port dengan long syntax
>Run Service
5  nginx-port1:
6    image: nginx:latest
7    container_name: nginx-port1
8    ports:
9      - protocol: tcp
10     published: 8080
11     target: 80
```

Docker Compose: PORT (Menjalankan Container)



```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

● PS E:\Semester 5\Parallel and distributed system\docker-compose\cd example
● PS E:\Semester 5\Parallel and distributed system\docker-compose\example> docker compose create
time="2025-11-11T00:00:48+08:00" level-warning msg="E:\Semester 5\Parallel and distributed system\docker-compose\example\docker-compose.yaml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
[+] Creating 3/3
  ✓ Network example_default created
  ✓ Container nginx-port1 created
  ✓ Container nginx-port2 created
● PS E:\Semester 5\Parallel and distributed system\docker-compose\example> docker compose start
time="2025-11-11T00:00:58+08:00" level-warning msg="E:\Semester 5\Parallel and distributed System\docker Compose\example\docker-compose.yaml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
[+] Running 2/2
  ✓ Container nginx-port1 started
  ✓ Container nginx-port2 started
● PS E:\Semester 5\Parallel and distributed system\docker-compose\example>
```

ENVIRONMENT VARIABLE

Pengenalan ENVIRONMENT VARIABLE

```
↳ docker-compose.yaml X
example > ↳ docker-compose.yaml
1   version: "3.9"
2
3     ▷Run All Services
4   services:
5     # kalau yang ini contoh mongodb
6     ▷ Run Service
7     mongodb-example:
8       image: mongo:latest
9       container_name: mongodb-example
10      ports:
11        - 27017:27017
12      environment:
13        MONGO_INITDB_ROOT_USERNAME: alathereon
14        MONGO_INITDB_ROOT_PASSWORD: alathereonn
15        MONGO_INITDB_DATABASE: admin
```

Docker Compose: ENVIRONMENT VARIABLE

```
PS E:\Semester 5\Parallel and distributed system\docker-compose\example> docker compose create
time="2025-11-11T00:15:23+00:00" level=warning msg="E:\Semester 5\Parallel and distributed system\docker-compose\example\docker-compose.yaml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
[+] creating 2/2
  ✓ Network example default      Created                               0.0s
  ✓ Container mongodb-example   Created                               0.1s
PS E:\Semester 5\Parallel and distributed system\docker-compose\example> docker compose start
time="2025-11-11T00:15:29+00:00" level=warning msg="E:\Semester 5\Parallel and distributed system\docker-compose\example\docker-compose.yaml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
[+] running 1/1
  ✓ container mongodb-example   Started                             0.2s
PS E:\Semester 5\Parallel and distributed system\docker-compose\example>
```

```
PS E:\Semester 5\Parallel and distributed system\docker-compose\example> docker compose exec mongodb-example env
time="2025-11-11T00:16:08+00:00" level=warning msg="E:\Semester 5\Parallel and distributed system\docker-compose\example\docker-compose.yaml: the attribute 'version' is obsolete, it will be ignored, please remove it to avoid potential confusion"
PATH=/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin
HOSTNAME=ef9a1a7adaa
TERM=xterm
MONGO_INITDB_ROOT_PASSWORD=aLatheron
MONGO_INITDB_DATABASE=admin
MONGO_INITDB_ROOT_USERNAME=aLatheron
OSINU_VERSION=1.18
DSYML_VERSION=2.13.1
DSYML_CHECKSUM=662e32319bdd378e91f67578e56a34954b8a2e33ac11d79a9f4826af24b941
MONGO_PACKAGE=mongodb-org
MONGO_REPO=repo.mongodb.org
MONGO_MAJOR=8.0
MONGO_VERSION=8.0.14
MONGODATA=/data/db
GLIBC_TUNABLES=glibc.pthread.cseq=0
```

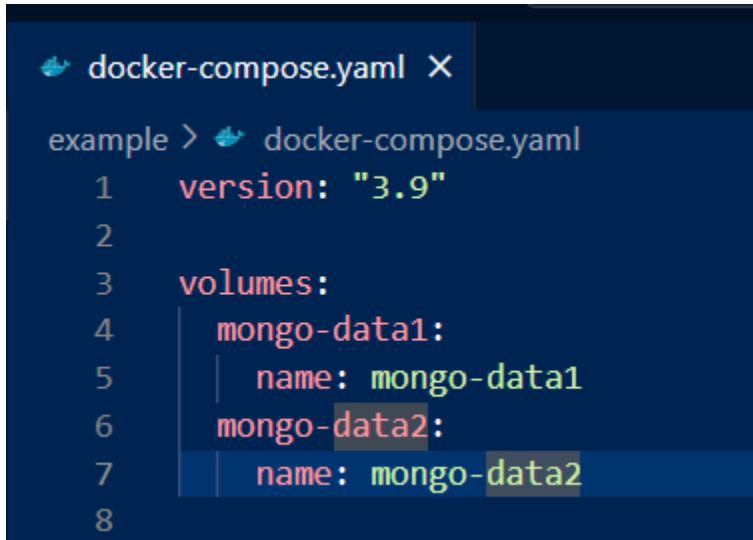
BIND MOUNT

Pengenalan BIND MOUNT

```
● docker-compose.yaml X
example> ➜ docker-compose.yaml
 1  version: "3.9"
 2
 3  > Run All Services
 4  services:
 5  | # kalau yang ini contoh mongodb
 6  | > Run Service
 7  | mongodb1:
 8  |   image: mongo:latest
 9  |   container_name: mongodb1
10  |   ports:
11  |     - 27017:27017
12  |   environment:
13  |     MONGO_INITDB_ROOT_USERNAME: alathereon
14  |     MONGO_INITDB_ROOT_PASSWORD: alathereon
15  |     MONGO_INITDB_DATABASE: admin
16  |   volumes:
17  |     - ./data-mongo1:/data/db
18
19  # mongodb2
20  > Run Service
21  mongodb2:
22  | image: mongo:latest
23  | container_name: mongodb2
24  | ports:
25  |   - 27018:27017
26  | environment:
27  |   MONGO_INITDB_ROOT_USERNAME: alathereon
28  |   MONGO_INITDB_ROOT_PASSWORD: alathereon
29  |   MONGO_INITDB_DATABASE: admin
30  | volumes:
31  |   - type: bind
32  |     source: ./data-mongodb2
33  |     target: /data/db
34  |     read_only: false
```

VOLUME

Pengenalan VOLUME



```
example > docker-compose.yaml X
1   version: "3.9"
2
3   volumes:
4     mongo-data1:
5       name: mongo-data1
6     mongo-data2:
7       name: mongo-data2
8
```

Docker Compose: SHORT SYNTAX VOLUME

```
4   a kalau yang ini contoh mongodb
5     ¶ Run Service
6     mongo1:
7       image: mongo:latest
8       container_name: mongo1
9       ports:
10         - 27017:27017
11       environment:
12         MONGO_INITDB_ROOT_USERNAME: alathereon
13         MONGO_INITDB_ROOT_PASSWORD: alathereonn
14       volumes:
15         - ./data-mongo1:/data/db
```

Docker Compose: LONG SYNTAX VOLUME

```
17  # mongodb2
18  # Run Service
19  mongodb2:
20    image: mongo:latest
21    container_name: mongodb2
22    ports:
23      - 27018:27017
24    environment:
25      MONGO_INITDB_ROOT_USERNAME: alathereon
26      MONGO_INITDB_ROOT_PASSWORD: alathereonn
27      MONGO_INITDB_DATABASE: admin
28    volumes:
29      - type: bind
30        source: ./data-mongodb2
31        target: /data/db
32        read_only: false
```

Docker Compose: Menghapus VOLUME

NETWORK

Pengenalan NETWORK

```
ps -l /user/tester $parallel) and distributed system docker-compose examples> docker inspect mongoDB
    "Networks": {
        "example_default": {
            "IPConfig": null,
            "Links": null,
            "Aliases": [
                "mongodh",
                "mongodb"
            ],
            "MacAddress": "16:2f:07:07:2b:ff",
            "DriverOpts": null,
            "Priority": 0,
            "NetworkID": "5ce752d053aaef1b6eckalnbaasw0z5z0dhenhsnfww0bdface291cc",
            "EndpointID": "93cdc2e833cccf14061218d3a652dca8332a08d5f6dcb01fb0a0fc5ed31",
            "Gateway": "172.19.0.1",
            "IPAddress": "172.19.0.3",
            "IPPrefixLen": 16,
            "IPv6Gateway": "",
            "GlobalIPv6PrefixLen": 0,
            "LinkLocalIPv6PrefixLen": 0,
            "Names": [
                "mongodh",
                "3345M980gP91"
            ]
        }
    }
}
```

```
user > ⌂ Dockerfile > ...
1  FROM golang:1.18-alpine
2
3  RUN mkdir /app
4
5  RUN addgroup -S a206group
6  RUN adduser -S -D -h /app a206user a206group
7  RUN chown -R a206user:a206group /app
8  USER a206user
9
10 COPY main.go /app
11
12 EXPOSE 8880
13 CMD go run /app/main.go
```

Docker Compose: Membuat NETWORK

```
docker-compose.yaml X
example > docker-compose.yaml
1   version: "3.9"
2
3   networks:
4     network-example:
5       name: network-example
6       driver: bridge
7
```

Docker Compose: Menggunakan NETWORK

```
↳ docker-compose.yaml X
example > ↳ docker-compose.yaml
1   version: "3.9"
2
3   networks:
4     network_example:
5       name: network_example
6       driver: bridge
7
8   services:
9     # kalau yang ini contoh mongodb
10    > Run Service
11    mongodb1:
12      image: mongo:latest
13      container_name: mongodb1
14      ports:
15        - 27017:27017
16      environment:
17        MONGO_INITDB_ROOT_USERNAME: alathereon
18        MONGO_INITDB_ROOT_PASSWORD: alathereonn
19        MONGO_INITDB_DATABASE: admin
20      networks:
21        - network_example
```

```
ps:~/cyberster$ parallel and distributed system$ docker-compose docker inspect mongo01
[{"Networks": {
    "network_example": {
        "IPAMConfig": null,
        "Links": null,
        "Aliases": [
            "mongod01",
            "mongoda"
        ],
        "MacAddress": "0aa:1ca:98:8d:19:3a",
        "DriverOpts": null,
        "GWPriority": 0,
        "NetworkID": "9441068174d0fa552696171b6ed52e9ec0942ac0bae3edabbfaa310da588fb",
        "EndpointID": "d0aa9e0149884c2aa042a44abef02ec01c730f08800fbff9c9bcbefcf",
        "Gateway": "172.19.0.1",
        "IPAddress": "172.19.0.2",
        "IPPrefixLen": 16,
        "IPv6Gateway": "",
        "GlobalIPv6Address": "",
        "GlobalIPv6PrefixLen": 0,
        "DNSNames": [
            "mongod01",
            "testheaven01.mes"
        ]
    }
}}
```

DEPENDS ON

Pengenalan DEPENDS ON

```
↳ docker-compose.yaml X
example > ↳ docker-compose.yaml
1   version: "3.9"
2
3   networks:
4     network_example:
5       name: network_example
6       driver: bridge
7
8   services:
9     ▷ Run All Services
10    mongodb-express-example:
11      image: mongo-express-latest
12      container_name: mongodb-express-example
13      depends_on:
14        - mongodb-example
15      ports:
16        - 8081:8081
17      environment:
18        ME_CONFIG_MONGODB_ADMINUSERNAME: alathereon
19        ME_CONFIG_MONGODB_ADMINPASSWORD: alathereonn
20        ME_CONFIG_MONGODB_SERVER: mongodb-example
21      networks:
22        - network_example
```

RESTART

Pengenalan RESTART

```
● docker-compose.yaml ✘

example > ● docker-compose.yaml
 1  version: "3.9"
 2
 3  networks:
 4    network_example:
 5      name: network_example
 6      driver: bridge
 7
 8    services:
 9      ▶ Run All Services
10      mongodb-express-example:
11        image: mongo-express-latest
12        container_name: mongodb-express-example
13        restart: always
14        depends_on:
15          - mongodb-example
16        ports:
17          - 8081:8081
18        environment:
19          ME_CONFIG_MONGODB_ADMINUSERNAME: alathereon
20          ME_CONFIG_MONGODB_ADMINPASSWORD: alathereonn
21          ME_CONFIG_MONGODB_SERVER: mongodb-example
22        networks:
23          - network_example
```

Docker Compose: Monitor Docker Events

```
PS E:\Semester 5\Parallel and Distributed System\dockerfile> docker build -t zakariafattawari/health health
[+] Building 6.2s (0/0) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 253B
=> [internal] load metadata for docker.io/library/golang:1.18-alpine
=> [internal] load .dockerignore
=> => transferring context: 28
=> CACHED [1/4] FROM docker.io/library/golang:1.18-alpine@sha256:77f25981bd57e68a510165f3be89c001aec00453fd0f1c5a45601f6cb1528887
=> => resolve docker.io/library/golang:1.18-alpine@sha256:77f25981bd57e68a510165f3be89c001aec00453fd0f1c5a45601f6cb1528887
=> [internal] load build context
=> => transferring context: 5318
=> [2/4] RUN apk --no-cache add curl
=> [3/4] RUN mkdir app
=> [4/4] COPY main.go app
=> exporting to image
=> => exporting layers
=> => exporting manifest sha256:b7de3a8668c2c919d85a65a4fa0c268574a88955e4bbb4ead5e9db51543d8b
=> => exporting config sha256:35ce73ae1c8fc1d7f2c49071ba622a456d1654f28fdb551baa54c3e4129b89b4
=> => exporting attestation manifest sha256:7eed0c23bc4f87c08b8884b896d38b875a4f0baa5881ef1eeff9633ded853ddfc
=> => exporting manifest list sha256:1c68c8a75128cbab8a55d64041b84ccc187df7a1fffb61930f131b5a052453d8
=> => naming to docker.io/zakariafattawari/health:latest
=> => unpacking to docker.io/zakariafattawari/health:latest

1 warning found (use docker --debug to expand):
- JSONArgsRecommended: JSON arguments recommended for CMD to prevent unintended behavior related to OS signals (line 18)

View build details: docker-desktop://dashboard/build/desktop-linux/desktop-1linux/xjkevpotkggyn8fz8nw0k89q
PS E:\Semester 5\Parallel and Distributed System\dockerfile>
```

RESOURCE LIMIT

Pengenalan RESOURCE LIMIT

```
resource limit > ⚡ docker-compose.yaml
1   version: "3.9"
2
3   nginx-example:
4     image: nginx:latest
5     container_name: nginx-example
6     ports:
7       - "8080:80"
8     deploy:
9       resources:
10         reservations:
11           cpus: "0.25"
12           memory: 50M
13         limits:
14           cpus: "0.5"
15           memory: 100M
```

```
entrypoint > 🎨 Dockerfile > ...
1  FROM golang:1.18-alpine
2
3  RUN mkdir /app/
4  COPY main.go /app/
5
6  EXPOSE 8080
7  ENTRYPOINT ["go", "run"]
8  CMD ["/app/main.go"]
```

Docker Compose: CONTAINER STATS

CONTAINER ID	NAME	CPU %	MEM USAGE / LIMIT	MEM %	NET I/O	BLOCK I/O	PIDS
d244126b0dd6	nginx-example	0.00%	17.4MB / 100MB	17.40%	1.7kB / 126B	13MB / 12.3kB	17

DOCKERFILE

Membuat Dockerfile



```
build > app > cc main.go
1 package main
2
3 import (
4     "fmt"
5     "net/http"
6     "os"
7 )
8
9 func main() {
10    port := os.Getenv("APP_PORT")
11    fmt.Println("Run app in port : " + port)
12    http.HandleFunc("/", HelloServer)
13    http.ListenAndServe(": "+port, nil)
14 }
15
16 func HelloServer(w http.ResponseWriter, r *http.Request) {
17     fmt.Fprintf(w, "Hello, World!")
18 }
```

```
build > app > Dockerfile > FROM
1   FROM golang:1.18-alpine
2
3   ENV APP_PORT=8080
4
5   RUN mkdir app
6   COPY main.go app
7
8   EXPOSE ${APP_PORT}
9
10  CMD go run app/main.go
```

```
build > docker-compose.yaml
1   version: "3.9"
2
3   services:
4     app:
5       container_name: app
6       build:
7         context: "./app"
8         dockerfile: Dockerfile
9         image: "app-golang:1.0.0"
10        environment:
11          - "APP_PORT=8080"
12        ports:
13          - "8080:8080"
```

Docker Compose: BUILD DOCKEFILE

Docker Compose: Menghapus Image

```
● PS E:\Semester 5\Parallel and Distributed System\Docker Compose\build> docker image rm app-golang:1.8.8
Untagged: app-golang:1.8.8
Deleted: sha256:4dc623d8af686b4dia85e110dde3d58188bb91860a328c745474ba5e43783fdc
○ PS E:\Semester 5\Parallel and Distributed System\Docker Compose\build> █
```

Docker Compose: BUILD Ulang

HEALTHCHECK

Pengenalan HEALTHCHECK



```
health > 🌐 docker-compose.yaml
1   version: "3.9"
2
3   ▷ Run All Services
4   services:
5     ▷ Run Service
6     app:
7       container_name: app
8       build:
9         context: "./app"
10        dockerfile: Dockerfile
11        image: "app-golang:1.0.0"
12        environment:
13          - "APP_PORT=8080"
14        ports:
15          - "8080:8080"
16        healthcheck:
17          test: ["CMD", "curl", "-f", "http://localhost:8080/health"]
18          interval: 5s
19          timeout: 5s
            retries: 3
            start_period: 3s
```

```
health > app > 🏢 Dockerfile > ...
1   FROM golang:1.18-alpine
2
3   RUN apk --no-cache add curl
4   RUN mkdir app
5
6   COPY main.go app
7
8   EXPOSE 8080
9
10  CMD go run app/main.go
```

```
health > app >  main.go
1 package main
2
3  import (
4     "fmt"
5     "net/http"
6 )
7
8 var counter = 0
9
10  func main() {
11     http.HandleFunc("/", HelloServer)
12     http.HandleFunc("/health", HealthCheck)
13
14     http.ListenAndServe(":8080", nil)
15 }
16
17  func HealthCheck(w http.ResponseWriter, r *http.Request) {
18     counter = counter + 1
19     if counter > 5 {
20         w.WriteHeader(500)
21         fmt.Fprintf(w, "KO")
22     } else {
23         fmt.Fprintf(w, "OK")
24     }
25 }
26
27  func HelloServer(w http.ResponseWriter, r *http.Request) {
28     fmt.Fprintf(w, "Hello, World!")
29 }
```

Docker Compose: HEALTHCHECK

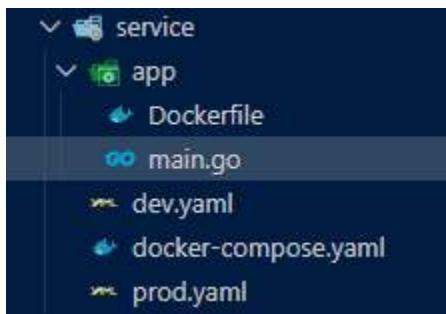
●	E-Simulator Parallel and Distributed System Docker Compose up health
●	E-Simulator Parallel and Distributed System Docker Compose up -healthcHECK
	Line="2025-11-16T22:11:26+00:00" level=warning msg="E-Simulator Parallel and Distributed System Docker Compose/health/docker-compose.yml: the attribute 'max' is to avoid potential confusion"
[+]	Initialise [0.0s] (0.0s) FINISHED
	↳ [Internal] Load local file definitions
	↳ > reading from statin:3000
	↳ [Internal] Load build definition from Dockerfile
	↳ > transcribing dockerfile: 3800
	↳ [Internal] Load metadata for docker://library/golang:1.18-alpine
	↳ [Internal] Load .dockerrc.json
	↳ > transcribing context: 20
	↳ [1/4] 100% docker://library/golang:1.18-alpine@sha256:7f128011e77a98d20160f1ba3a3001ae98412f30f11a5a4660fb1a1208827
	↳ > reading docker://library/golang:1.18-alpine@sha256:7f128011e77a98d20160f1ba3a3001ae98412f30f11a5a4660fb1a1208827
	↳ [Internal] Load build context
	↳ > transcribing context: 20
	↳ cached [0/4] 0B apk, 0B cache added
	↳ cached [0/4] 0B apk/app
	↳ cached [0/4] 0MB with go app
	> inspecting image
	> > inspecting layers
	> > inspecting manifest: digest=docker://library/golang:1.18-alpine@sha256:7f128011e77a98d20160f1ba3a3001ae98412f30f11a5a4660fb1a1208827
	> > inspecting config: digest=docker://library/golang:1.18-alpine@sha256:7f128011e77a98d20160f1ba3a3001ae98412f30f11a5a4660fb1a1208827
	> > inspecting environment variables: digest=docker://library/golang:1.18-alpine@sha256:7f128011e77a98d20160f1ba3a3001ae98412f30f11a5a4660fb1a1208827
	> > inspecting author: user=docker/golang:1.18-alpine@sha256:7f128011e77a98d20160f1ba3a3001ae98412f30f11a5a4660fb1a1208827
	> > inspecting maintainer: user=docker/golang:1.18-alpine@sha256:7f128011e77a98d20160f1ba3a3001ae98412f30f11a5a4660fb1a1208827
	> > inspecting build timestamp: 1636800000
	> > inspecting build context timestamp: 1636800000
	> > inspecting dependencies from metadata file
[+]	Building 2/2
	✓ app-golang:1.18.0 Built
	✓ Container app Started
●	E-Simulator Parallel and Distributed System Docker Compose health docker-compose.yml
	Line="2025-11-16T22:11:26+00:00" level=warning msg="E-Simulator Parallel and Distributed System Docker Compose/health/docker-compose.yml: the attribute 'max' is to avoid potential confusion"
	none 2790L 0MB/0B SERVICE CREATED STATUS PIDS
app	app-golang:1.18.0 "Dockerfile" go run -" app 4 seconds ago Up 4 seconds (healthy) 0.0.0.0:3000-3050/tcp, [::]:3000-3050/tcp
●	E-Simulator Parallel and Distributed System Docker Compose health docker-compose.yml
	Line="2025-11-16T22:11:26+00:00" level=warning msg="E-Simulator Parallel and Distributed System Docker Compose/health/docker-compose.yml: the attribute 'max' is to avoid potential confusion"
	none 2790L 0MB/0B SERVICE CREATED STATUS PIDS
app	app-golang:1.18.0 "Dockerfile" go run -" app 10 seconds ago Up 10 seconds (healthy) 0.0.0.0:3000-3050/tcp, [::]:3000-3050/tcp

Docker Compose: Disable HEALTHCHECK

```
health > ⚡ docker-compose.yaml
 1  version: "3.9"
 2
 3    ▷ Run All Services
 4  services:
 5    ▷ Run Service
 6      app:
 7        container_name: app
 8        build:
 9          context: "./app"
10          dockerfile: Dockerfile
11          image: "app-golang:1.0.0"
12        environment:
13          - "APP_PORT=8080"
14        ports:
15          - "8080:8080"
16        healthcheck:
17          test: ["CMD", "curl", "-f", "http://localhost:8080/health"]
18          interval: 5s
19          timeout: 5s
20          retries: 3
21          start_period: 3s
22        disable: true
```

EXTEND SERVICE

Pengenalan EXTEND SERVICE



```
service > ⚡ docker-compose.yaml
1   version: "3.9"
2
3     ▷Run All Services
4   services:
5     ▷Run Service
6     app:
7       container_name: app
8       build:
9         context: "./app"
10        dockerfile: Dockerfile
11        image: "app-golang:1.0.0"
12        environment:
13          - "APP_PORT=8080"
14          - "MODE=local"
15        ports:
16          - "8080:8080"
```

```
service > ✎ dev.yaml
1   version: "3.9"
2
3   services:
4     app:
5       environment:
6         - "MODE=dev"
```

```
service > ✎ prod.yaml
1   version: "3.9"
2
3   services:
4     app:
5       environment:
6         - "MODE=prod"
```

```
service > app > Dockerfile > ...
1  FROM golang:1.18-alpine
2
3  ENV APP_PORT=8080
4  ENV MODE=local
5
6  RUN mkdir app
7  COPY main.go app
8
9  EXPOSE ${APP_PORT}
10
11 CMD go run app/main.go
```

```
service > app > main.go
1 package main
2
3 import (
4     "fmt"
5     "net/http"
6     "os"
7 )
8
9 func main() {
10     port := os.Getenv("APP_PORT")
11     fmt.Println("Run app in port : " + port)
12     http.HandleFunc("/", HelloServer)
13     http.ListenAndServe(": "+port, nil)
14 }
15
16 func HelloServer(w http.ResponseWriter, r *http.Request) {
17     mode := os.Getenv("MODE")
18     response := "Hello " + mode
19     fmt.Fprintf(w, response)
20 }
```

Docker Compose: EXTEND SERVICE

10	100% of the initial and final values, up to the 100th sample point. It is a good test to check if the system is able to correctly identify the initial and intermediate system states. In case of a correct identification, the test will be stopped. Otherwise, it is possible to proceed to the next test.
11	Checking the system state. The system state is checked by comparing the current system state with the previous one. If the difference between the two states is greater than a threshold value, the test will be stopped. Otherwise, it is possible to proceed to the next test.
12	Checking the system state. The system state is checked by comparing the current system state with the previous one. If the difference between the two states is greater than a threshold value, the test will be stopped. Otherwise, it is possible to proceed to the next test.
13	Checking the system state. The system state is checked by comparing the current system state with the previous one. If the difference between the two states is greater than a threshold value, the test will be stopped. Otherwise, it is possible to proceed to the next test.
14	Checking the system state. The system state is checked by comparing the current system state with the previous one. If the difference between the two states is greater than a threshold value, the test will be stopped. Otherwise, it is possible to proceed to the next test.
15	Checking the system state. The system state is checked by comparing the current system state with the previous one. If the difference between the two states is greater than a threshold value, the test will be stopped. Otherwise, it is possible to proceed to the next test.
16	Checking the system state. The system state is checked by comparing the current system state with the previous one. If the difference between the two states is greater than a threshold value, the test will be stopped. Otherwise, it is possible to proceed to the next test.
17	Checking the system state. The system state is checked by comparing the current system state with the previous one. If the difference between the two states is greater than a threshold value, the test will be stopped. Otherwise, it is possible to proceed to the next test.
18	Checking the system state. The system state is checked by comparing the current system state with the previous one. If the difference between the two states is greater than a threshold value, the test will be stopped. Otherwise, it is possible to proceed to the next test.
19	Checking the system state. The system state is checked by comparing the current system state with the previous one. If the difference between the two states is greater than a threshold value, the test will be stopped. Otherwise, it is possible to proceed to the next test.
20	Checking the system state. The system state is checked by comparing the current system state with the previous one. If the difference between the two states is greater than a threshold value, the test will be stopped. Otherwise, it is possible to proceed to the next test.