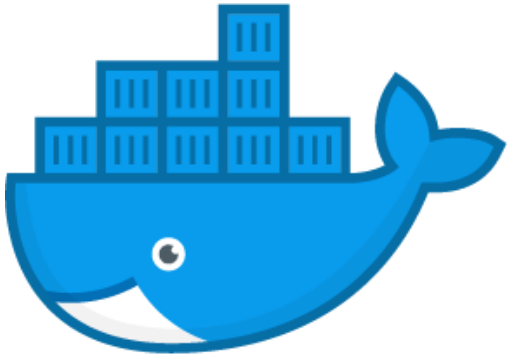



# The Ultimate Docker Cheat Sheet

Docker - Beginners | Intermediate | Advanced

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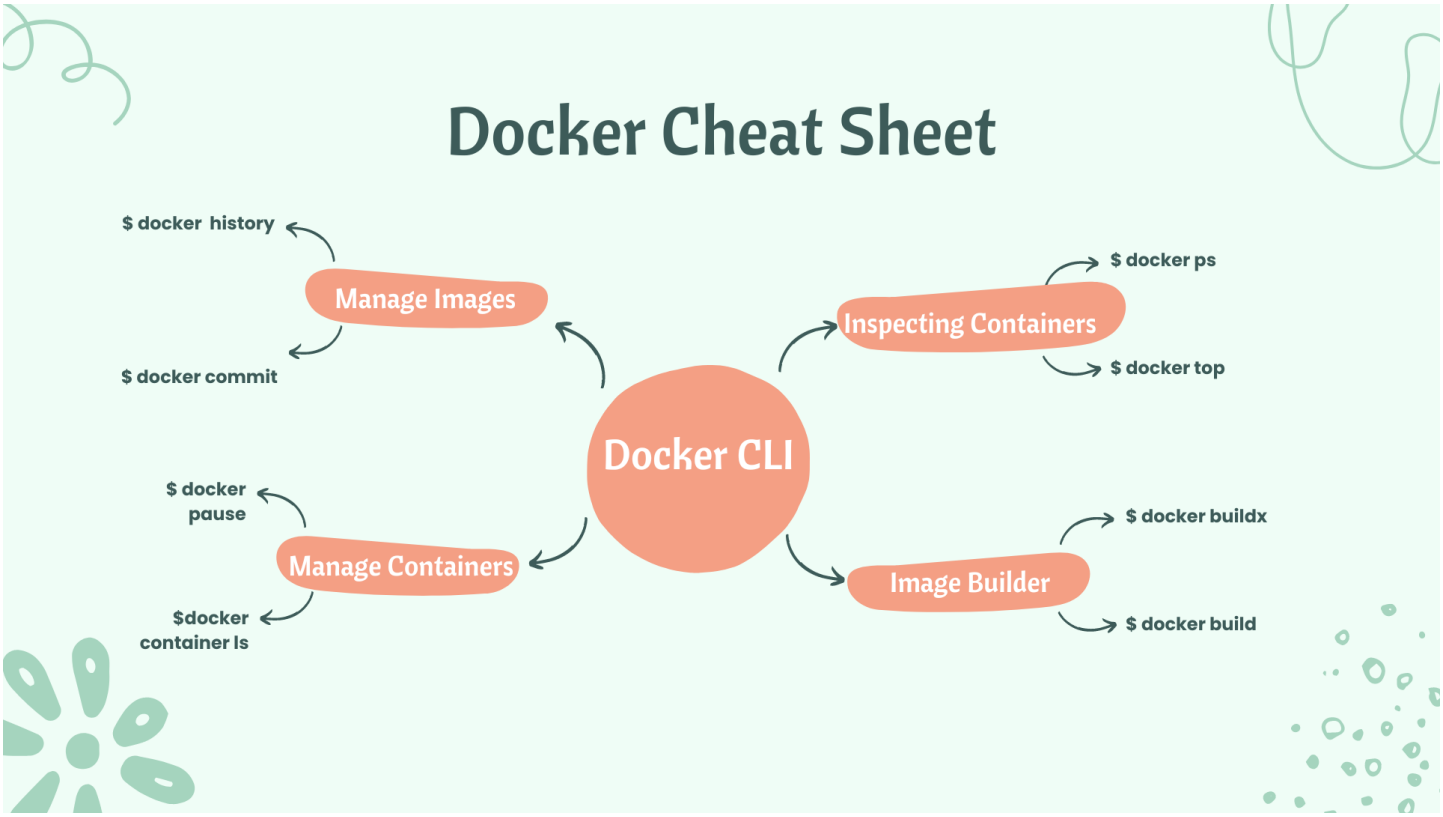
## The Ultimate Docker Cheat Sheet




A cheatsheet is a concise summary of important information that is meant to be used as a quick reference. Cheatsheets are often used in the form of a list or a table, and they typically cover a specific topic or subject area. In the context of Docker, a Docker cheatsheet is a summary of commonly used Docker commands and their options, as well as other useful information related to Docker.

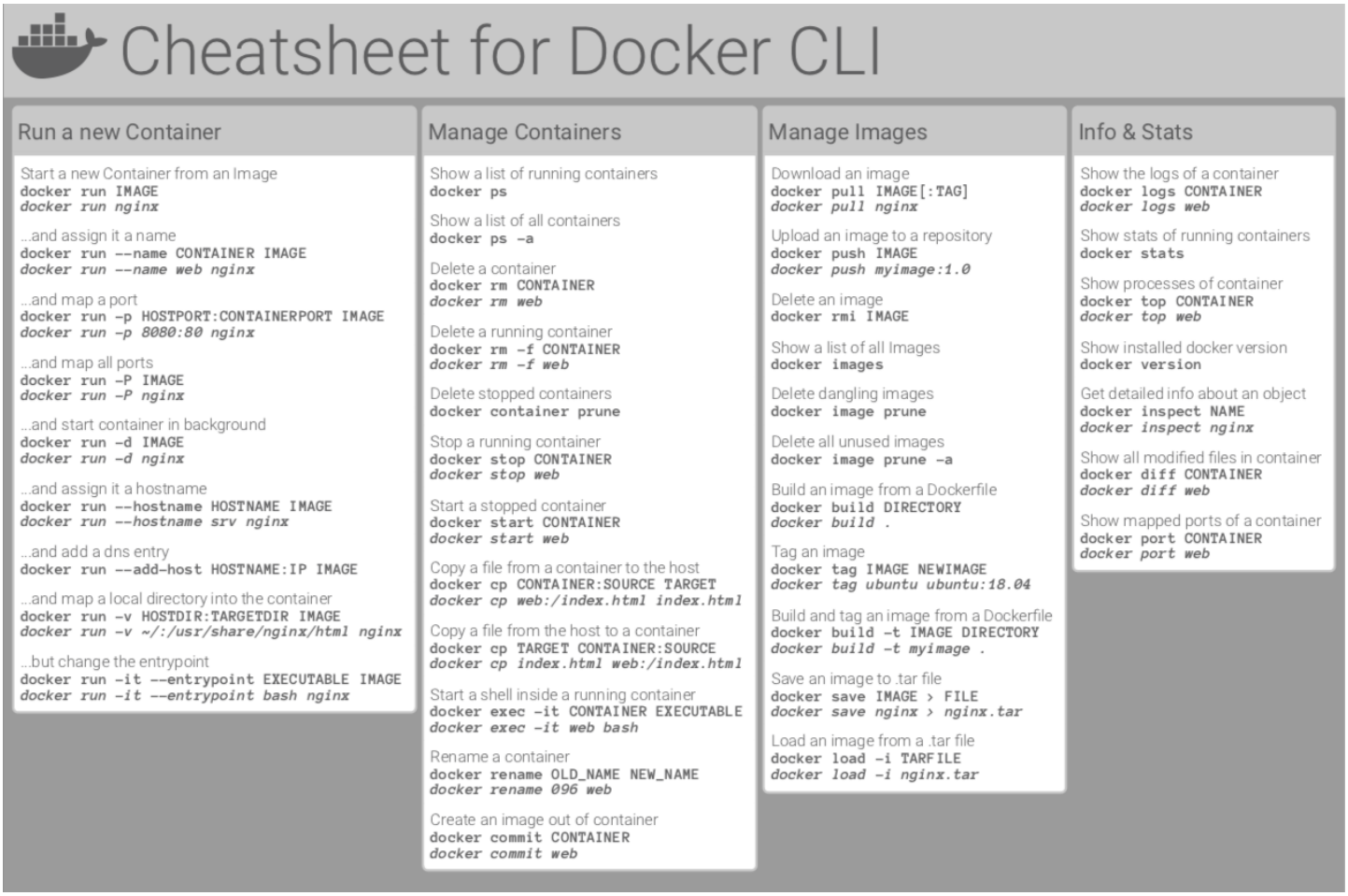
Cheatsheets can be particularly helpful when learning a new tool or technology, as they provide a convenient way to quickly look up and remind oneself of key concepts and commands. They can also be useful for experienced users who need to recall a specific command or option but may not remember all the details.

# Table of Contents



## Basic Docker CLIs

Here's the list of the basic Docker commands that works on both Docker Desktop as well as Docker Engine:




## Container Management CLIs

Here's the list of the Docker commands that manages Docker images and containers flawlessly:

## Container management commands

| command | description |
|---|---|
| `docker create` *image* [ *command* ]<br>`docker run` *image* [ *command* ] | create the container<br>= `create` + `start` |
| `docker start` *container...*<br>`docker stop` *container...*<br>`docker kill` *container...*<br>`docker restart` *container...* | start the container<br>graceful[2] stop<br>kill (SIGKILL) the container<br>= `stop` + `start` |
| `docker pause` *container...*<br>`docker unpause` *container...* | suspend the container<br>resume the container |
| `docker rm` [ `-f`[3] ] *container...* | destroy the container |

[2] send SIGTERM to the main process + SIGKILL 10 seconds later
[3] `-f` allows removing running containers (= `docker kill` + `docker rm`)

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## Inspecting The Container

Here's the list of the basic Docker commands that helps you inspect the containers seamlessly:

## Inspecting the container

| command | description |
|---|---|
| `docker ps` | list running containers |
| `docker ps -a` | list all containers |
| `docker logs` [ `-f`[6] ] *container* | show the container output (*stdout+stderr*) |
| `docker top` *container* [ *ps options* ] | list the processes running inside the containers |
| `docker diff` *container* | show the differences with the image (modified files) |
| `docker inspect` *container...* | show low-level infos (in json format) |

## Interacting with Container

Do you want to know how to access the containers? Check out these fundamental commands:

## Interacting with the container

| command | description |
|---|---|
| `docker attach` *container* | attach to a running container (stdin/stdout/stderr) |
| `docker cp` *container:path hostpath*\|-<br>`docker cp` *hostpath*\|- *container:path* | copy files from the container<br>copy files into the container |
| `docker export` *container* | export the content of the container (tar archive) |
| `docker exec` *container args...* | run a command in an existing container (**useful** for debugging) |
| `docker wait` *container* | wait until the container terminates and return the exit code |
| `docker commit` *container image* | commit a new docker image (snapshot of the container) |

## Image Management Commands

Here's the list of Docker commands that helps you manage the Docker Images:

## Image management commands

| command | description |
|---|---|
| `docker images` | list all local images |
| `docker history` *image* | show the image history (list of ancestors) |
| `docker inspect` *image...* | show low-level infos (in json format) |
| `docker tag` *image tag* | tag an image |
| `docker commit` *container image* | create an image (from a container) |
| `docker import` *url*\|- [*tag*] | create an image (from a tarball) |
| `docker rmi` *image...* | delete images |

## Image Transfer Commands

Here's the list of Docker image transfer commands:

## Image transfer commands

Using the registry API

| | |
|---|---|
| `docker pull` *repo*[:*tag*]... | pull an image/repo from a registry |
| `docker push` *repo*[:*tag*]... | push an image/repo from a registry |
| `docker search` *text* | search an image on the official registry |
| `docker login` ... | login to a registry |
| `docker logout` ... | logout from a registry |

Manual transfer

| | |
|---|---|
| `docker save` *repo*[:*tag*]... | export an image/repo as a tarbal |
| `docker load` | load images from a tarball |
| `docker-ssh`[10] ... | proposed script to transfer images between two daemons over ssh |

## Builder Main Commands

Want to know how to build Docker Image? Do check out the list of Image Build Commands:

## Builder main commands

| command | description |
|---|---|
| FROM *image*\|scratch | base image for the build |
| MAINTAINER *email* | name of the mainainer (metadata) |
| COPY *path dst* | copy *path* from the context into the container at location *dst* |
| ADD *src dst* | same as COPY but untar archives and accepts http urls |
| RUN *args...* | run an arbitrary command inside the container |
| USER *name* | set the default username |
| WORKDIR *path* | set the default working directory |
| CMD *args...* | set the default command |
| ENV *name value* | set an environment variable |

# The Docker CLI

## Manage images

`docker build`

```
docker build [options] .
  -t "app/container_name"     # name
```

Create an `image` from a Dockerfile.

`docker run`

```
docker run [options] IMAGE
  # see `docker create` for options
```

Run a command in an `image`.

## Manage containers

`docker create`

```
docker create [options] IMAGE
  -a, --attach               # attach stdout/err
  -i, --interactive          # attach stdin (interactive)
  -t, --tty                  # pseudo-tty
      --name NAME            # name your image
  -p, --publish 5000:5000    # port map
      --expose 5432          # expose a port to linked containers
  -P, --publish-all          # publish all ports
      --link container:alias # linking
  -v, --volume `pwd`:/app    # mount (absolute paths needed)
  -e, --env NAME=hello       # env vars
```

### Example

```
$ docker create --name app_redis_1 \
  --expose 6379 \
  redis:3.0.2
```

Create a `container` from an `image`.

`docker exec`

```
docker exec [options] CONTAINER COMMAND
  -d, --detach        # run in background
  -i, --interactive   # stdin
  -t, --tty           # interactive
```

### Example

```
$ docker exec app_web_1 tail logs/development.log
$ docker exec -t -i app_web_1 rails c
```

Run commands in a `container`.

`docker start`

```
docker start [options] CONTAINER
  -a, --attach        # attach stdout/err
  -i, --interactive   # attach stdin

docker stop [options] CONTAINER
```

Start/stop a `container`.

`docker ps`

```
$ docker ps
$ docker ps -a
$ docker kill $ID
```

Manage `container`s using ps/kill.

## Images

`docker images`

```
$ docker images
  REPOSITORY   TAG        ID
  ubuntu       12.10      b750fe78269d
  me/myapp     latest     7b2431a8d968
```

```
$ docker images -a   # also show intermediate
```

Manages `image`s.

`docker rmi`

```
docker rmi b750fe78269d
```

Deletes `image`s.

## Also see

- Getting Started *(docker.io)*

# Dockerfile

### Inheritance

```
FROM ruby:2.2.2
```

## Variables

```
ENV APP_HOME /myapp
RUN mkdir $APP_HOME
```

## Initialization

```
RUN bundle install
```

```
WORKDIR /myapp
```

```
VOLUME ["/data"]
# Specification for mount point
```

```
ADD file.xyz /file.xyz
COPY --chown=user:group host_file.xyz /path/container_file.xyz
```

## Onbuild

```
ONBUILD RUN bundle install
# when used with another file
```

## Commands

```
EXPOSE 5900
CMD    ["bundle", "exec", "rails", "server"]
```

## Entrypoint

```
ENTRYPOINT ["executable", "param1", "param2"]
ENTRYPOINT command param1 param2
```

Configures a container that will run as an executable.

```
ENTRYPOINT exec top -b
```

This will use shell processing to substitute shell variables, and will ignore any `CMD` or `docker run` command line arguments.

### Metadata

```
LABEL version="1.0"
```

```
LABEL "com.example.vendor"="ACME Incorporated"
LABEL com.example.label-with-value="foo"
```

```
LABEL description="This text illustrates \
that label-values can span multiple lines."
```

## See also

- https://docs.docker.com/engine/reference/builder/

# docker-compose

### Basic example

```
# docker-compose.yml
version: '2'

services:
  web:
    build: .
    # build from Dockerfile
    context: ./Path
    dockerfile: Dockerfile
    ports:
     - "5000:5000"
    volumes:
     - .:/code
  redis:
    image: redis
```

### Commands

```
docker-compose start
docker-compose stop
```

```
docker-compose pause
docker-compose unpause
```

```
docker-compose ps
docker-compose up
docker-compose down
```

# Reference

## Building

```
web:
  # build from Dockerfile
  build: .
```

```
  # build from custom Dockerfile
  build:
    context: ./dir
    dockerfile: Dockerfile.dev
```

```
  # build from image
  image: ubuntu
  image: ubuntu:14.04
  image: tutum/influxdb
  image: example-registry:4000/postgresql
  image: a4bc65fd
```

## Ports

```
  ports:
    - "3000"
    - "8000:80"  # guest:host
```

```
  # expose ports to linked services (not to host)
  expose: ["3000"]
```

## Commands

```
  # command to execute
  command: bundle exec thin -p 3000
  command: [bundle, exec, thin, -p, 3000]
```

```
  # override the entrypoint
  entrypoint: /app/start.sh
  entrypoint: [php, -d, vendor/bin/phpunit]
```

## Environment variables

```
  # environment vars
  environment:
    RACK_ENV: development
```

```
  environment:
    - RACK_ENV=development
```

```
  # environment vars from file
  env_file: .env
  env_file: [.env, .development.env]
```

### Dependencies

```
  # makes the `db` service available as the hostname `database`
  # (implies depends_on)
  links:
    - db:database
    - redis
```

```
  # make sure `db` is alive before starting
  depends_on:
    - db
```

### Other options

```
  # make this service extend another
  extends:
    file: common.yml  # optional
    service: webapp
```

```
  volumes:
    - /var/lib/mysql
    - ./_data:/var/lib/mysql
```

## Advanced features

### Labels

```
services:
  web:
    labels:
      com.example.description: "Accounting web app"
```

### DNS servers

```
services:
  web:
    dns: 8.8.8.8
    dns:
```

```
      - 8.8.8.8
      - 8.8.4.4
```

## Devices

```
services:
  web:
    devices:
    - "/dev/ttyUSB0:/dev/ttyUSB0"
```

## External links

```
services:
  web:
    external_links:
      - redis_1
      - project_db_1:mysql
```

## Hosts

```
services:
  web:
    extra_hosts:
      - "somehost:192.168.1.100"
```

## services

To view list of all the services running in swarm

```
docker service ls
```

To see all running services

```
docker stack services stack_name
```

to see all services logs

```
docker service logs stack_name service_name
```

To scale services quickly across qualified node

```
docker service scale stack_name_service_name=replicas
```

## clean up

To clean or prune unused (dangling) images

```
docker image prune
```

To remove all images which are not in use containers , add - a

```
docker image prune -a
```

To prune your entire system

```
docker system prune
```

To leave swarm

```
docker swarm leave
```

To remove swarm ( deletes all volume data and database info)

```
docker stack rm stack_name
```

To kill all running containers

```
docker kill $(docker ps -q )
```

## Docker Security

### Docker Scout

Command line tool for Docker Scout:

```
docker scout
```

Analyzes a software artifact for vulnerabilities

```
docker scout cves [OPTIONS] IMAGE|DIRECTORY|ARCHIVE
```

Display vulnerabilities from a docker save tarball

```
 docker save redis > redis.tar
```

Display vulnerabilities from an OCI directory

```
skopeo copy --override-os linux docker://alpine oci:redis
```

Export vulnerabilities to a SARIF JSON file

```
docker scout cves --format sarif --output redis.sarif.json redis
```

Comparing two images

```
docker scout compare --to redis:6.0 redis:6-bullseye
```

Displaying the Quick Overview of an Image

```
docker scout quickview redis:6.0
```

## Contributors

Sangam biradar - Docker Community Leader
Ajeet Singh Raina - Docker Captain, Collabnix

## Support and Community

If you do get enough interest to contribute to this Cheat Sheet, the community at Collabnix is available to support you. Feel free to raise PR and get your favorite Cheat Sheet added to the list via PR, or you can connect to us either on Slack or Discord server.

## Other Cheat Sheets

- Kubectl Cheat Sheet
- Docker Compose Cheat Sheet

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free Ubuntu VM

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