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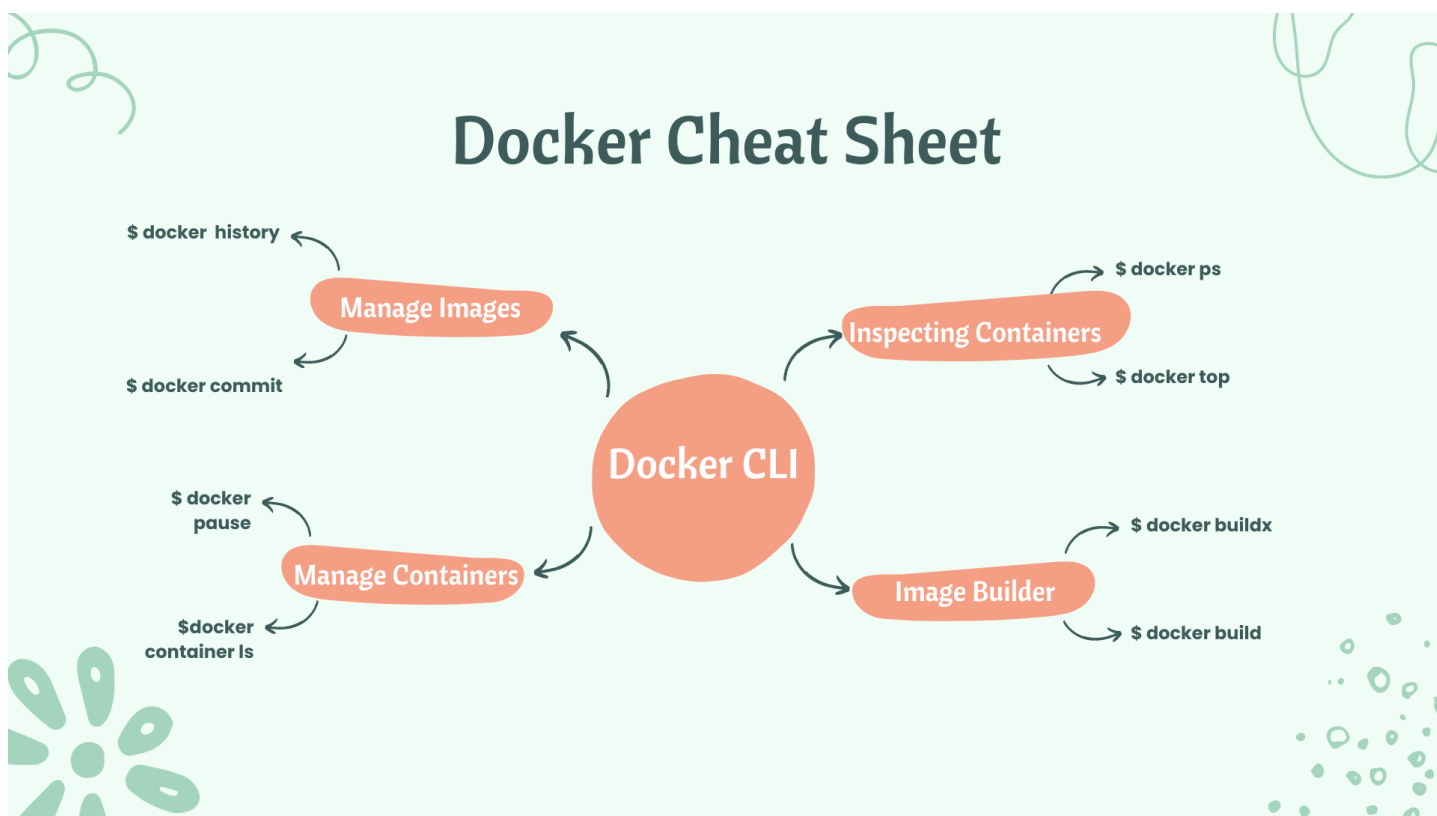
1,387

# 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.

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## Basic Docker CLIs

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

 Cheatsheet for Docker CLI			
Run a new Container	Manage Containers	Manage Images	Info & Stats
<p>Start a new Container from an Image</p> <pre>docker run IMAGE docker run nginx</pre> <p>...and assign it a name</p> <pre>docker run --name CONTAINER IMAGE docker run --name web nginx</pre> <p>...and map a port</p> <pre>docker run -p HOSTPORT:CONTAINERPORT IMAGE docker run -p 8080:80 nginx</pre> <p>...and map all ports</p> <pre>docker run -P IMAGE docker run -P nginx</pre> <p>...and start container in background</p> <pre>docker run -d IMAGE docker run -d nginx</pre> <p>...and assign it a hostname</p> <pre>docker run --hostname HOSTNAME IMAGE docker run --hostname srv nginx</pre> <p>...and add a dns entry</p> <pre>docker run --add-host HOSTNAME:IP IMAGE</pre> <p>...and map a local directory into the container</p> <pre>docker run -v HOSTDIR:TARGETDIR IMAGE docker run -v ~/.usr/share/nginx/html nginx</pre> <p>...but change the entrypoint</p> <pre>docker run -it --entrypoint EXECUTABLE IMAGE docker run -it --entrypoint bash nginx</pre>	<p>Show a list of running containers</p> <pre>docker ps</pre> <p>Show a list of all containers</p> <pre>docker ps -a</pre> <p>Delete a container</p> <pre>docker rm CONTAINER docker rm web</pre> <p>Delete a running container</p> <pre>docker rm -f CONTAINER docker rm -f web</pre> <p>Delete stopped containers</p> <pre>docker container prune</pre> <p>Stop a running container</p> <pre>docker stop CONTAINER docker stop web</pre> <p>Start a stopped container</p> <pre>docker start CONTAINER docker start web</pre> <p>Copy a file from a container to the host</p> <pre>docker cp CONTAINER:SOURCE TARGET docker cp web:/index.html index.html</pre> <p>Copy a file from the host to a container</p> <pre>docker cp TARGET CONTAINER:SOURCE docker cp index.html web:/index.html</pre> <p>Start a shell inside a running container</p> <pre>docker exec -it CONTAINER EXECUTABLE docker exec -it web bash</pre> <p>Rename a container</p> <pre>docker rename OLD_NAME NEW_NAME docker rename 096 web</pre> <p>Create an image out of container</p> <pre>docker commit CONTAINER docker commit web</pre>	<p>Download an image</p> <pre>docker pull IMAGE[:TAG] docker pull nginx</pre> <p>Upload an image to a repository</p> <pre>docker push IMAGE docker push myimage:1.0</pre> <p>Delete an image</p> <pre>docker rmi IMAGE</pre> <p>Show a list of all Images</p> <pre>docker images</pre> <p>Delete dangling images</p> <pre>docker image prune</pre> <p>Delete all unused images</p> <pre>docker image prune -a</pre> <p>Build an image from a Dockerfile</p> <pre>docker build DIRECTORY docker build .</pre> <p>Tag an image</p> <pre>docker tag IMAGE NEWIMAGE docker tag ubuntu ubuntu:18.04</pre> <p>Build and tag an image from a Dockerfile</p> <pre>docker build -t IMAGE DIRECTORY docker build -t myimage .</pre> <p>Save an image to .tar file</p> <pre>docker save IMAGE &gt; FILE docker save nginx &gt; nginx.tar</pre> <p>Load an image from a .tar file</p> <pre>docker load -i TARFILE docker load -i nginx.tar</pre>	<p>Show the logs of a container</p> <pre>docker logs CONTAINER docker logs web</pre> <p>Show stats of running containers</p> <pre>docker stats</pre> <p>Show processes of container</p> <pre>docker top CONTAINER docker top web</pre> <p>Show installed docker version</p> <pre>docker version</pre> <p>Get detailed info about an object</p> <pre>docker inspect NAME docker inspect nginx</pre> <p>Show all modified files in container</p> <pre>docker diff CONTAINER docker diff web</pre> <p>Show mapped ports of a container</p> <pre>docker port CONTAINER docker port web</pre>

## Container Management CLIs

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

## Container management commands

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

---

<sup>2</sup>send SIGTERM to the main process + SIGKILL 10 seconds later

<sup>3</sup>-f allows removing running containers (= `docker kill` + `docker rm`)

## Inspecting The Container

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

## Inspecting the container

command	description
<code>docker ps</code>	list running containers
<code>docker ps -a</code>	list all containers
<code>docker logs [ -f<sup>6</sup> ] container</code>	show the container output ( <i>stdout+stderr</i> )
<code>docker top container [ ps options ]</code>	list the processes running inside the containers
<code>docker diff container</code>	show the differences with the image (modified files)
<code>docker inspect container...</code>	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
<code>docker attach container</code>	attach to a running container (stdin/stdout/stderr)
<code>docker cp container:path hostpath -</code> <code>docker cp hostpath - container:path</code>	copy files from the container copy files into the container
<code>docker export container</code>	export the content of the container (tar archive)
<code>docker exec container args. . .</code>	run a command in an existing container ( <b>useful</b> for debugging)
<code>docker wait container</code>	wait until the container terminates and return the exit code
<code>docker commit container image</code>	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
<code>docker images</code> <code>docker history image</code> <code>docker inspect image...</code>	list all local images show the image history (list of ancestors) show low-level infos (in json format)
<code>docker tag image tag</code>	tag an image
<code>docker commit container image</code> <code>docker import url - [tag]</code>	create an image (from a container) create an image (from a tarball)
<code>docker rmi image...</code>	delete images

## Image Transfer Commands

Here's the list of Docker image transfer commands:

## Image transfer commands

### Using the registry API

<code>docker pull repo[:tag]...</code>	pull an image/repo from a registry
<code>docker push repo[:tag]...</code>	push an image/repo from a registry
<code>docker search text</code>	search an image on the official registry
<code>docker login ...</code>	login to a registry
<code>docker logout ...</code>	logout from a registry

### Manual transfer

<code>docker save repo[:tag]...</code>	export an image/repo as a tarball
<code>docker load</code>	load images from a tarball
<code>docker-ssh<sup>10</sup> ...</code>	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
<b>FROM</b> <i>image scratch</i>	base image for the build
<b>MAINTAINER</b> <i>email</i>	name of the mainainer (metadata)
<b>COPY</b> <i>path dst</i>	copy <i>path</i> from the context into the container at location <i>dst</i>
<b>ADD</b> <i>src dst</i>	same as <b>COPY</b> but untar archives and accepts http urls
<b>RUN</b> <i>args...</i>	run an arbitrary command inside the container
<b>USER</b> <i>name</i>	set the default username
<b>WORKDIR</b> <i>path</i>	set the default working directory
<b>CMD</b> <i>args...</i>	set the default command
<b>ENV</b> <i>name value</i>	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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## Practice Docker Tutorial














[free Ubuntu VM](#)

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