

# Docker Image for Grav CMS

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OWNER	Giovanni Minniti	GITHUB	docker-grav	BRANCH	Main
PHPVER	8.1.x	APACHE	2.4.x	CMSVER	1.7.x
SEMPER	1.x.x	STATUS	Development		
UPDATE	10.12.2022				
TARGET	amd64				



[[Img.1](#)]: Grav CMS

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## 1.0 Prerequisites

This project is cloned from the official [GRAV CMS GitHub](#) repository. If you want work with me, feel free to download it from [my docker-grav GitHub](#) repository.

It contains the original packages based on PHP 8.1:

ORIGINAL	PACKAGES
docker-ce	vim editor
apache-2.4.38	php8.1
GD library	php8.1-opcache
Unzip library	php8.1-acpu
cron	php8.1-yaml

In addition other packages are included:

REQUIRED	PACKAGES
ca-certificates	php8.1_pdo      openssh-client      yq (>= 4.29)      wget (>= 1.20)
ccache	php8.1_pdo_mysql      rsync      uuid (>= -v4)
iputils-ping	php8.1_pdo_pqsql      sudo      openssl (>= 1.1.1)
net-tools	php8.1-pgsql      tree (>= 1.8.0)      git (>= 2.17)
dropbear	php8.1_xdebug      jq (>= 1.5)      getssl (>= 2.32)

NOTE: Please ensure that the PHP base docker image is an actual version (e.g. php8.1) and not [\[EOL\]](#), otherwise application security is highly impacted.

### 1.1 Packages

This project needs the following prerequisites on the HOST machine:

- Install at least uuid -v4 >= 1.5 (macOS: brew install ossp-uuid) (Ubuntu: sudo apt install uuid) (Alpine: sudo apk add -U ossp-uuid)
- Install at least jq >= 1.5 (macOS: brew install jq) (Ubuntu: sudo apt install jq) (Alpine: sudo apk add -U jq)
- Install at least yq >= 4.29 (macOS: brew install yq) (Ubuntu: sudo apt install yq) (Alpine: sudo apk add -U yq)

- Install at least openssl >= 1.1.1 (macOS: brew install openssl@1.1) (Ubuntu: sudo apt install openssl) (Alpine: sudo apk add -U openssl)
- Install at least docker-ce >= 20.10 (Ubuntu: sudo apt install docker-ce) (Alpine: sudo apk add -U docker) (See <https://docs.docker.com/engine/install>) or Docker Desktop for Mac which includes docker-ce (macOS: brew install --cask docker)
- Install at least docker buildx plugin >= 0.5.0 (See <https://docs.docker.com/buildx/working-with-buildx>) NOTE: It is already included in a recent version of docker.
- Install at least getssl >= 2.32 (See <https://github.com/srvrco/getssl>) (macOS: `curl --silent https://raw.githubusercontent.com/srvrco/getssl/master/getssl > getssl && chmod 700 getssl && sudo mv getssl /usr/local/bin`)
- Install at least git 2.x >=2.17 (macOS: brew install git) (Ubuntu: sudo apt install git) (Alpine: sudo apk add -U git)
- Install tree >=1.8.0 (macOS: brew install tree) (Ubuntu: sudo apt install tree) (Alpine: sudo apk add -U tree)
- Install vim (macOS: brew install vim) (Ubuntu: sudo apt install vim) (Alpine: sudo apk add -U vim)
- Install wget (macOS: brew install wget) (Ubuntu: sudo apt install wget) (Alpine: sudo apk add -U wget)
- Install vscode for development (macOS: brew install vscode)
- Add the following vscode extensions: - Docker - EditorConfig for VS Code - Remote - WSL - Remote - Containers - Remote - SSH - Remote - SSH:Editing

This prerequisites are checked automatically with `mkinit.sh init`. Execute it with `${GRAV_HOME}/bin/mkinit.sh init`. After that reload your shell with `source ${HOME}/.bashrc`, now the home path variable is `${GRAV_HOME}`.

NOTE: If you have installed all the above mentioned packages earlier, you can update it with:

- `brew upgrade``
- `getssl --upgrade`

## 2.0 Project structure

The project consists of different directories, each one has a specific role:

```

${GRAV_HOME}
|-- [ ] bin           |-- (Directory for bash scripts)
|-- [*] cache        |-- (Directory for cache files)
|-- [*] cfg          |-- (Directory for config files)
|-- [*] cert         |-- (Directory for certificate files)
|-- [*] data         |-- (Directory for data files)
|-- [ ] docker       |-- (Directory for docker files)
|-- [*] key          |-- (Directory for SSH & user keys)
|-- [ ] lib          |-- (Library for shell scripts)
|-- [*] rootfs       |-- (Repository for packages and files)
|-- [*] .context
|-- [ ] .dockerignore
|-- [ ] .editorconfig
|-- [ ] .gitattributes

```

```
|-- [ ] .gitignore  
|-- [ ] Dockerfile -> ./docker/Dockerfile  
`-- [ ] README.md
```

**Note:** The file 

## 3.0 Installation procedure

- Install the prerequisite software (See 1.0 Prerequisites)
- Download the project with git `git clone https://github.com/giminni/docker-grav`
- Change into the current project directory with `cd docker-grav`
- `docker-grav` is now your `<PROJECT_HOME>` directory
- Initialize the project with `<PROJECT_HOME>/bin/grav-mkinit.sh init`
- Reload bash shell with `source ${HOME}/.bashrc`
- Set the current grav core production and development package version with `grav-core.sh set all`, older grav core packages version can be set manually, for example with `grav-core.sh set 1.6.0` for production package version or `grav-core.sh set 1.7.0-rc.19` for development package version.
- Download the grav core production packages with `grav-core.sh get all grav` or the core development packages with `grav-core.sh get all grav-admin`, older grav core packages can be set manually, for example with `grav-core.sh get 1.6.0 grav` for production package version or `grav-core.sh get 1.7.0-rc.19 grav-admin` for development package version.
- Create the encrypted password for user `grav` with `grav-mkpass.sh <user-password> grav`, the password must contain at least 11 characters
- Create new or use your own SSH private and public key with `grav-mkssh.sh <email-address>` by answering with `1` for create new SSH key or `2` for use own SSH key. The latter case will copy the key from your `${HOME}/.ssh` directory.
- Create the cache directory with `grav-mkcache.sh cache`
- Build the docker image with `grav-build.sh grav grav-admin testing` for the development version or `grav-build.sh grav` for the production version.
- Create the data directory with `grav-mkdata.sh data`
- Create the certificate directory with `grav-mkcert.sh cert`
- Run the docker image with `grav-run.sh grav grav-admin testing` for the development version or `grav-run.sh grav` for the production version.
- Enter the command line of the running grav image, with `grav-shell.sh grav-admin` for the development version or `grav-shell.sh grav` for the production version.

### 3.1 Installation checklist

- Check if scripts are available by entering `grav-` and pressing the TAB-key.
- Check aliases from the command line with `alias`.
- Check libraries from the command line with `func`.
- Check if the `.context` file is created in the project directory with `cat ${GRAV_HOME}/.context`.
- Check if the configuration directory `cfg` is populated with `.config.*` files with `ls -las ${GRAV_HOME}/cfg`.
- Check `grav_pass.key` file under the key directory `key` with `cat ${GRAV_HOME}/key/grav_pass.key`.
- Check if the SSH keys exists with `ls -las ${GRAV_HOME}/key/grav_rsa*` if you are using the `rsa` algorithm. Other algorithm that can be used are `dsa` and `ecdsa`.
- Check if the grav core file was downloaded correctly into the `rootfs` directory, with `ls -las ${GRAV_HOME}/rootfs/tmp/grav/core`.
- Check if the cache directories exists with `ls -las ${GRAV_HOME}/cache`. A subdirectory `.ccache` and `.phpcache` must exists, otherwise the `grav-build.sh` script does not start.

- Check if the certificate directory exists, with `ls -las ${GRAV_HOME}/cert`.
- Check if the docker grav image exists, with `sudo docker images`.
- Check if the docker grav image is running, with `sudo docker ps -a`.

### 3.2 Using local key/value files for configuration

To persist some project configuration data a couple of key/value files are created in the `${GRAV_HOME}/cfg` directory. A `${GRAV_HOME}/.context` file will be generated with `<PROJECT_HOME/bin/grav-mkinit.sh init` at init time holding the configuration directory where all configuration files are stored.

E.g. `.context` file in `${GRAV_HOME}/` directory:

```
GRAV_CTX="${GRAV_HOME}/cfg"
```

E.g. `.config.bin` file in `${GRAV_HOME}/cfg` directory:

```
GRAV_BIN="${GRAV_HOME}/bin"
```

**Note:** Every configuration files can be changed manually by expert user or use the handy local bash scripts that starts with `${GRAV_HOME}/bin/grav-mk*.sh` for novice user.

### 3.3 Using docker multiarch environment

Using the extended docker build features of `buildx` this project is prepared for multiarch images. That means it uses one name for different target architectures `linux/amd64`, `linux/arm64`, `linux/armv7`, .... Currently only the `linux/amd64` architecture is supported.

### 3.4 Using local docker cache repository

In addition to the build and compile cache environment, there is another local directory `./${GRAV_HOME}/rootfs/*` that holds cached artefacts. This directory can be used to store for example the grav core zip files to reduce bandwidth and avoid a lengthy download time from the internet.

In this case store the `grav-admin.zip` file under `${GRAV_HOME}/rootfs/tmp`. If the name is correct the file will be inserted into the docker buildtime context and used instead of downloading the file from the internet.

### 3.5 Handling user password and SSH secrets

The extended docker build features of `buildx` allows injecting sensitive data without leaving any history trace. The user password is generated externally with openssl `SHA512` encryption by a provided bash script `${GRAV_HOME}/bin/mkssh.sh`. The encrypted password is then stored under `${GRAV_HOME}/key/grav_pass.key` and injected into the container at buildtime.

The same thing occurs for the SSH private and public key. The keys are stored under `${GRAV_HOME}/key/grav_rsa` and `${GRAV_HOME}/key/grav_rsa.pub` respectively.

**Note:** Ensuring

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- Grav certificate directory path `.config.cert`, e.g. `GRAV_CERT="${GRAV_HOME}/cert"`



- Define wich grav version is needed to be installed from the grav download site using a local script `${GRAV_HOME}/bin/grav-core.sh set`. Insert as first argument `prod` or `dev`. To download a specific version use `<PROJECT_HOME/bin/grav-core.sh get`. Use the same arguments like `${GRAV_HOME}/bin/grav-core.sh set`

E.g. to download a specific version of grav-admin core `1.6.0` enter:

```
${GRAV_HOME}/bin/grav-core.sh get 1.6.0 grav-admin
```

**Note:** The files are stored into the `${GRAV_HOME}/rootfs/tmp`. To reduce the container size, remove all superfluous artefacts before starting the build.

## 4.2 Persisting data into an external storage

To save the Grav site data to the host file system (so that it persists even after the container has been removed), simply map the container's `/var/www/html` directory to a named Docker volume `data`. This named docker volume `data` is mapped into the project directory on the host `${GRAV_HOME}/data`.

**Note:** If the mapped directory or named volume is empty, it will be automatically populated with a fresh install of Grav the first time that the container starts. However, once the directory/volume has been populated, the data will persist and will not be overwritten the next time the container starts.

## 4.3 Building the image from Dockerfile

To build the image from the command line a local bash script `${GRAV_HOME}/bin/grav-build.sh` is used.

This script as a lot of presetted arguments. The first argument is mandatory if not set, the script emits a usage string.

Here an example, how to create a user `grav` and build the latest grav+admin development package.

```
${GRAV_HOME}/bin/grav-build.sh grav grav-admin testing
```

Here an example how to create a user `grav` and build the latest grav+admin production package. Observe that the last two arguments are omitted while presetted.

```
${GRAV_HOME}/bin/grav-build.sh grav
```

Here the complete usage string of `${GRAV_HOME}/bin/grav-build.sh` script:

```
${GRAV_HOME} $ ./bin/grav-build.sh
grav-build: Error: Arguments are not provided!

grav-build:  Args: grav-build.sh grav_user [grav_imgname] [grav_tagname]
```

```
[grav_passfile] [grav_privfile] [grav_pubfile]
grav-build: Note: (*) are default values, (#) are recommended values

grav-build: Arg1:  user-name: any|(#)          - (#=grav)"
grav-build: Arg2:  [img-name]: grav|grav-admin - (*=grav)"
grav-build: Arg3:  [tag-name]: latest|testing  - (*=latest)"
grav-build: Arg4:  [pass-file]: any|(*)        - (*=
<PROJECT_HOME>/key/grav_pass.key)"
grav-build: Arg5:  [priv-file]: any|(*)        - (*=
<PROJECT_HOME>/key/grav_rsa)"
grav-build: Arg6:  [pub-file]: any|(*)        - (*=
<PROJECT_HOME>/key/grav_rsa.pub)"

grav-build: Info: grav-build.sh grav grav-admin latest
/home/rpiadmin/Workspace/docker-grav/key/grav_pass.key
/home/rpiadmin/Workspace/docker-grav/key/grav_rsa
/home/rpiadmin/Workspace/docker-grav/key/grav_rsa.pub

grav-build: Help: grav-build.sh: Builds the docker file from some entered
arguments. (See Note, Info and Args)
```

## 5.0 Running the image from Do kerfile

To run the image from the command line a local bash script `${GRAV_HOME}/bin/grav-run.sh` is needed. This script as a lot of presetted arguments. The first argument is mandatory if not set the script emits a usage string. The default run mode is `normal` if there is a need to start only a bash command line and test something inside, run with the `debug` flag set.

Here an example how to run as user `grav` and use the latest `grav-admin` development package in debug mode.

```
${GRAV_HOME}/bin/grav-run.sh grav grav-admin testing d
```

Here an example how to run as user `grav` and use the **latest** `grav-admin` production package. Observe that the last two arguments are omitted while presetted with `normal` and `data`.

```
${GRAV_HOME}/bin/grav-run.sh grav grav-admin latest
```

Here the complete usage string of `${GRAV_HOME}/bin/grav-run.sh` script:

```
${GRAV_HOME} $ ./bin/grav-run.sh
grav-run: Error: Arguments are not provided!

grav-run: Args: grav-run.sh grav_user [grav_imgname=grav]
[grav_imgtag=latest] [grav_voldata=data]
grav-run: Note: (*) are default values, (#) are recommended values
```

```

grav-run: Arg1: user-name: any|(#) - (#=grav)
grav-run: Arg2: [img-name]: any|(*) - (#=grav-admin)
grav-run: Arg3: [tag-name]: any|(*) - (#=latest)
grav-run: Arg4: [run-mode]: n|d|(*) - (#=normal|(d)debug)
grav-run: Arg5: [vol-data]: any|(*) - (#=data)

grav-run: Info: grav-run.sh grav grav-admin latest n data

grav-run: Help: grav-run.sh: Instantiate a docker container depending
from some entered arguments. (See Note, Info and Args)

```

IF you installed the **grav-admin** package then point the browser to <http://localhost:9080/admin> and create a user account, otherwise point the browser to <http://localhost:9080/> directly.

**Note:** The following external <-> internal docker ports are exposed:

- **2222 <-> 22**: for SSH external host access using the named user
- **9080 <-> 80**: for HTTP external host access
- **9443 <-> 443**: for HTTPS external host access (WIP)

The docker image has the following scheme:

- **<grav-user=grav>/<grav-name=<grav|grav-admin>:<grav-tag=latest|testing>**

E.g. **grav/grav:latest** for production images or **grav/grav-admin:testing** for development images.

## 6.0 License agreement

docker-grav was released under [Apache License Version 2.0](#) by [Giovanni Minniti](#).

## 7.0 Abbreviation reference list

- [EOL]: [End of life](#)
- [SVG]: [Scalable Vector Graphics](#)

## 8.0 Image reference list

- [Img.1]: [Grav CMS \[SVG\]](#)

## 9.0 Link reference list

- [1]: [Grav v1.7 Documentation](#)
- [2]: [Docker multiple architectures](#)
- [3]: [Working with buildx](#)
- [4]: [Visual Studio Code Tips & Tricks](#)
- [5]: [Visual Studio Code macOS Shortcuts](#)
- [6]: [Visual Studio Code Linux Shortcuts](#)
- [7]: [Visual Studio Code Windows Shortcuts](#)
- [8]: [Embed SVG images in dark mode](#)
- [9]: [Colorize SVG background color with CSS filters](#)

- [10]: [GitHub badges examples with Shields.io](#)
- [11]: [Shields.io website](#)

## 10.0 Notes

- To dynamically invert [\[SVG\]](#) image colors depending on actual theme with inline CSS, see [\[8\]](#) and [\[9\]](#).
- To use generic badges in markdown files, see [\[10\]](#) and [\[11\]](#).