DDErl Development Image

This image supports the use of a Docker container for the further development of **DDErl** in an Ubuntu environment.

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1. Installed core components

With the following command you can check in detail which software components in which versions are included in the Docker image:

```
apt list --installed
```

Version 4.0.0

Component	Version	Remark	Status
Alien	8.95		
asdf	v0.8.1-a1ef92a		
curl	7.68.0		
Docker Compose	1.29.2		
Docker Desktop	20.10.8	Docker Image & VM	
dos2unix	7.4.0		
Erlang/OTP	24.0.5		
G++ & GCC	10.3.0		
Git	2.25.1		
GNU Autoconf	2.69		
GNU Automake	1.16.1		
GNU make	4.2.1		
htop	3.0.5		

Component	Version	Remark	Status
Java	11.0.11	openjdk	
LCOV	1.14		
Node.js [npm]	v14.17.4 [6.14.14]		
ODBC	2.3.7		
OpenSSL	1.1.1k		
Oracle Instant Client	21.1.0.0.0		
Python3	3.8.10		
rebar3	3.16.1		
tmux	3.2a		
Ubuntu	20.04.2 LTS	focal	
wget	1.20.3		
Yarn	n/a	asdf plugin is faulty	

2. Creating a new DDErl development container

2.1 Getting started

```
> REM Assumptions:
> REM   - you want to map the container port 8443 to the host port 443
> REM   - the name of the Docker container should be: my_dderl_dev
> REM   - the path the host repository is: //C/projects/dderl
> REM   - the directory name for this repository inside the container should be:
dderl_dir
> REM   - you want to use the latest version of the **DDErl** development image
> docker run -it -p 443:8443 \
             --name my_dderl_dev \
             -v //C/projects/dderl:/dderl_dir \
             konnexionsgmbh/dderl_dev:latest

> REM Stopping the container
> docker stop my_dderl_dev

> REM Restarting the container
> docker start my_dderl_dev

> REM Entering a running container
> docker exec -it my_dderl_dev bash
```

2.2 Detailed Syntax

A new container can be created with the `docker run` command.

Syntax:

```
docker run -it
           [-p <port>:8443] \
           [--name <container_name>] \
           [-v <directory_repository>:/dderl] \
           konnexionsgmbh/dderl_dev[:<version>]
           [<cmd>]
```

Parameters:

- **port** - an optional listener port
- **container_name** - an optional container identification
- **directory_repository** - an optional host repository directory - the default value is expecting the repository inside the container
- **version** - an optional version number of the image or the constant `latest`
- **cmd** - an optional command to be executed in the container, default is `bash` for running the `bash` shell

Detailed documentation for the command `docker run` can be found here.

Examples:

1. Creating a new Docker container named `my_dderl_dev` using a repository inside the Docker container:

   ```
   docker run -it --name my_dderl_dev konnexionsgmbh/dderl_dev:latest
   ```

2. Creating a new Docker container named `my_dderl_dev` using the host repository of a Windows directory `D:\projects\dderl`:

   ```
   docker run -it --name dderl_dev -v //D/projects/dderl:/dderl
   konnexionsgmbh/dderl_dev:latest
   ```

3. Creating a new Docker container named `my_dderl_dev` using the host repository of a Linux directory `/dderl` and mapping port `8443` to port `8000`:

   ```
   docker run -it --name my_dderl_dev -p 8000:8443 -v /dderl:/dderl
   konnexionsgmbh/dderl_dev:latest
   ```

3 Working with an existing DDErl development container

3.1 Starting a stopped container

A previously stopped container can be started with the `docker start` command.

Syntax:

```
docker start <container_name>
```

Parameter:

- **container_name** - the mandatory container identification, that is an UUID long identifier, an UUID short identifier or a previously given name

Detailed documentation for the command `docker start` can be found here.

3.2 Entering a running container

A running container can be entered with the `docker exec` command.

Syntax:

```
docker exec -it <container_name> <cmd>
```

Parameter:

- **container_name** - the mandatory container identification, that is an UUID long identifier, an UUID short identifier or a previously given name
- **cmd** - the command to be executed in the container, e.g. `bash` for running the `bash` shell

Detailed documentation for the command `docker exec` can be found here.

4 Best practices

4.1 Use of a root repository directory on the host computer

If all relevant repositories are located within a common parent directory, then development work in all these repositories can be done within a single **DDErl** development container.

Example:

In the following example we assume that the host directory is named `C:\Temp\my_projects` and should be mapped to the `projects` directory in the container.

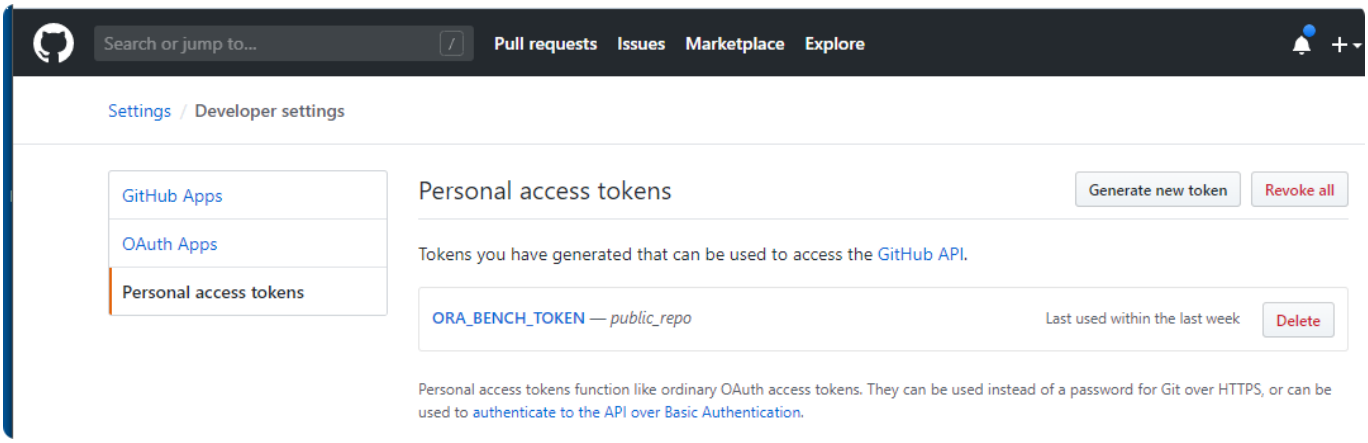
```
>C:\Temp\my_projects>docker run -it --name dderl_dev -v
//C/Temp/my_projects:/projects konnexionsgmbh/dderl_dev:latest
root@35b9310932f1:/# cd projects
root@35b9310932f1:/projects# ls -ll
total 0
drwxrwxrwx 1 root root 4096 May  2 14:05 dderl
```

4.2 Use of private GitHub repositories inside the container

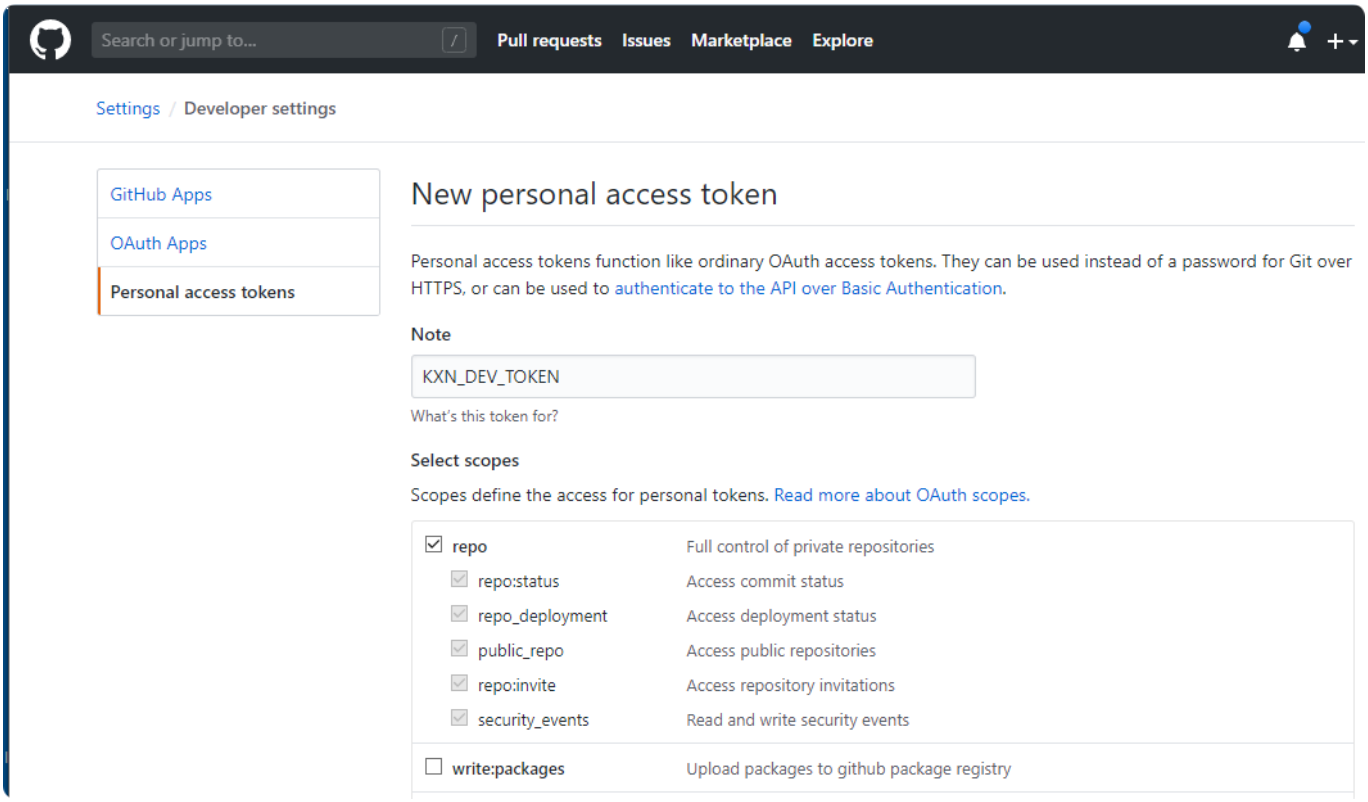
To access private repositories in GitHub, you must first create a new personal access token in GitHub and then add it to your git configuration inside the container.

1. Create a new personal access token in GitHub

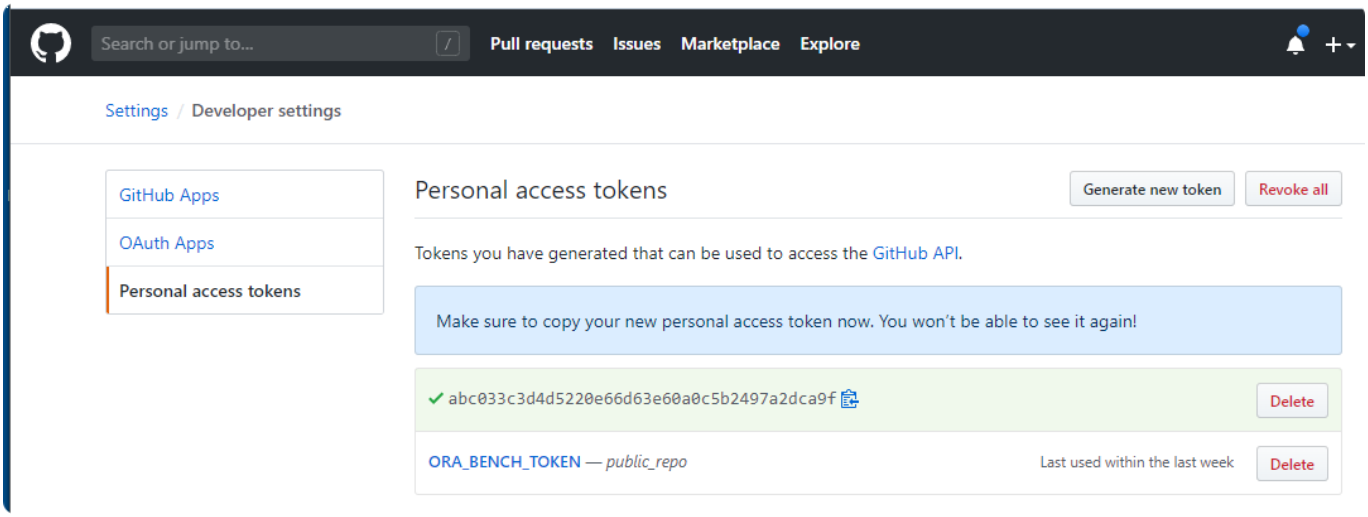
- With the following URL you can create the access token: https://github.com/settings/tokens



- Press the button `Generate new token`



- Name the new token, select the scopes and press the button `Generate token`



- Write down the secret code and keep it in a safe place

2. Setting up the Docker container on the host machine

In the following example we assume that the host directory is named `C:\Temp\my_projects` and should be mapped to the `projects` directory in the container.

```
C:\Temp\my_projects\dderl>docker run -it --name dderl_dev -v
//C/Temp/my_projects:/projects konnexionsgmbh/dderl_dev:latest
Unable to find image 'konnexionsgmbh/dderl_dev:latest' locally
latest: Pulling from konnexionsgmbh/dderl_dev
d51af753c3d3: Pull complete
...
a6bb30d1a5cf: Pull complete
Digest: sha256:5f6d6afc566ef9142d2d85b85dd331c0558eafaaf286179fd0ae787988c1b89b
Status: Downloaded newer image for konnexionsgmbh/dderl_dev:latest
```

3. Initial configuration of git in the container

```
root@332206c300f1:/# export XDG_CONFIG_HOME=/projects
root@332206c300f1:/# mkdir -p $XDG_CONFIG_HOME/git/
root@332206c300f1:/# touch $XDG_CONFIG_HOME/git/config
root@332206c300f1:/# touch $XDG_CONFIG_HOME/git/credentials
root@332206c300f1:/# git config --file=$XDG_CONFIG_HOME/git/config
credential.helper 'store --file=/projects/git/credentials'
root@332206c300f1:/# git config --file=$XDG_CONFIG_HOME/git/config user.name "John
Doe"
root@332206c300f1:/# git config --file=$XDG_CONFIG_HOME/git/config user.email
"john.doe@company.com"
root@332206c300f1:/# git config --list --show-origin
file:/projects/git/config       credential.helper=store --
file=/projects/git/credentials
file:/projects/git/config       user.name=John Doe
file:/projects/git/config       user.email=john.doe@company.com
```

4. Verification of the settings

```
root@332206c300f1:/# cat /projects/git/config
[credential]
        helper = store --file=/projects/git/credentials
[user]
        name = John Doe
[user]
        email = john.doe@company.com
```

5. Clone a repository for the first time

When prompted provide your github user name and the new personal access token from (1).

```
root@332206c300f1:/# cd projects
root@332206c300f1:~# git clone https://github.com/KonnexionsGmbH/docker_images
Cloning into 'docker_images'...
Username for 'https://github.com': John Doe
Password for 'https://john.doe@company.com':
abc033c3d4d5220e66d63e60a0c5b2497a2dca9f
remote: Enumerating objects: 78, done.
remote: Counting objects: 100% (78/78), done.
remote: Compressing objects: 100% (49/49), done.
remote: Total 78 (delta 33), reused 68 (delta 23), pack-reused 0
Receiving objects: 100% (78/78), 167.83 KiB | 867.00 KiB/s, done.
Resolving deltas: 100% (33/33), done.
```

6. Verify if the clone completed with success

```
root@332206c300f1:~# cat /projects/git/credentials
https://John Doe:abc033c3d4d5220e66d63e60a0c5b2497a2dca9f@github.com
```

7. Verification after a restart of the Docker container

```
C:\Temp\my_projects\dderl>docker start dderl_dev
dderl_dev
C:\Temp\my_projects\dderl>docker exec -it dderl_dev bash
root@332206c300f1:/# export XDG_CONFIG_HOME=/projects
root@332206c300f1:/# git config --list --show-origin
file:/projects/git/config       credential.helper=store --
file=/projects/git/credentials
file:/projects/git/config       user.name=John Doe
file:/projects/git/config       user.email=john.doe@company.com
```

8. Verification after the removal of the Docker container

- Deleting the Docker container and image

```
C:\Temp\my_projects\dderl>docker stop dderl_dev
dderl_dev

C:\Temp\my_projects\dderl>docker rm dderl_dev
dderl_dev

C:\Temp\my_projects\dderl>docker images
REPOSITORY                  TAG                 IMAGE ID            CREATED
SIZE
konnexionsgmbh/dderl_dev      latest              51757b5e414e        6 hours ago
3.71GB

C:\Temp\my_projects\dderl>docker rmi 51757b5e414e
Untagged: konnexionsgmbh/dderl_dev:latest
Untagged:
konnexionsgmbh/dderl_dev@sha256:5f6d6afc566ef9142d2d85b85dd331c0558eafaaf286179fd0
ae787988c1b89b
Deleted: sha256:51757b5e414e5333ace7b163484c06e4685c29312ad09d5d7d648c6936011a60
...
Deleted: sha256:7789f1a3d4e9258fbe5469a8d657deb6aba168d86967063e9b80ac3e1154333f
```

- Recreating the Docker container (and image)

```
C:\Temp\my_projects\dderl>docker run -it --name dderl_dev -v
//C/Temp/my_projects:/projects konnexionsgmbh/dderl_dev:latest
Unable to find image 'konnexionsgmbh/dderl_dev:latest' locally
latest: Pulling from konnexionsgmbh/dderl_dev
d51af753c3d3: Pull complete
...
a6bb30d1a5cf: Pull complete
Digest: sha256:5f6d6afc566ef9142d2d85b85dd331c0558eafaaf286179fd0ae787988c1b89b
Status: Downloaded newer image for konnexionsgmbh/dderl_dev:latest
root@ad1f036bbc44:/# export XDG_CONFIG_HOME=/projects
root@ad1f036bbc44:/# git clone https://github.com/KonnexionsGmbH/docker_images
Cloning into 'docker_images'...
remote: Enumerating objects: 78, done.
remote: Counting objects: 100% (78/78), done.
remote: Compressing objects: 100% (49/49), done.
remote: Total 78 (delta 33), reused 68 (delta 23), pack-reused 0
Receiving objects: 100% (78/78), 167.83 KiB | 895.00 KiB/s, done.
Resolving deltas: 100% (33/33), done.
```

- If we use the same path - where `git/config` and `git/credentials` exist - as in Step 3, `git` access (clone/push/pull) doesn't ask for username/password anymore.

5 Working inside a running DDErl development container

5.1 DDErl development

Inside the Docker container you can either clone a **DDErl** repository or switch to an existing **DDErl** repository. If a Docker container with an Oracle database is located on the host computer it can be accessed by using the IP address of the host computer. Any **DDErl** script can be executed inside the Docker container, for example:

```
rebar3 compile
rebar3 as prod release
./start.sh
```

The following port numbers are exposed and can be mapped if necessary:

```
1236
7000-7020
8125
8443
9443
```