ora_bench_dev: OraBench Development Image

This image supports the use of a Docker container for the development of the OraBench project in an Ubuntu environment.

Table of Contents

1. Installed core components

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

```
apt list --installed
```

Version 1.2.0

Component	Version	Remark	Status
Alien	8.95	base version	
asdf	v0.8.1-847ec73	base version	
CMake	3.21.3		
curl	7.68.0	base version	
DBeaver	21.2.2	for virtual machine only	
Docker Desktop	20.10.9	base version [Docker Image & VM]	
dos2unix	7.4.0	base version	
Eclipse	2021-09-R		
Elixir	1.12.3-otp-24		
Erlang/OTP	24.1.2		
GCC & G++	10.3.0		
Git	2.25.1	base version	
GNU Autoconf	2.69	base version	
GNU Automake	1.16.1	base version	

Component	Version	Remark	Status
GNU make	4.2.1	base version	
Go	1.17.2		
Gradle	7.2		
htop	3.1.0		
Java	17	openjdk	
Julia	1.6.3		
Kotlin	1.5.31		
LCOV	1.14	base version	
ODBC	2.3.7	base version	
OpenSSL	1.1.1f	base version	
Oracle Instant Client	21.3.0.0.0		
Python3	3.10.0		
- cx-Oracle	8.2.1	base version	
- pip	21.2.4	base version	
- PyYAML	5.4.1	base version	
rebar3	3.16.1		
Rust	1.55.0		
tmux	3.2a		
Ubuntu	20.04.3 LTS	base version [focal]	
Vim	8.1.2269	base version	
wget	1.20.3	base version	
wget2	1.99.1	base version	

Version 1.1.0

Component	Version	Remark	Status
Alien	8.95	base version	
asdf	v0.8.1-847ec73	base version	
CMake	3.21.3		upgrade
curl	7.68.0	base version	
DBeaver	21.2.2	for virtual machine only	upgrade

Component	Version	Remark	Status
Docker Desktop	20.10.9	base version [Docker Image & VM]	upgrade
dos2unix	7.4.0	base version	
Eclipse	2021-09-R		upgrade
Elixir	1.12.3-otp-24		upgrade
Erlang/OTP	24.1.2		upgrade
GCC & G++	10.3.0		
Git	2.25.1	base version	
GNU Autoconf	2.69	base version	
GNU Automake	1.16.1	base version	
GNU make	4.2.1	base version	
Go	1.17.2		upgrade
Gradle	7.2		
htop	3.1.0		upgrade
Java	17	openjdk	upgrade
Julia	1.6.3		new
Kotlin	1.5.31		upgrade
LCOV	1.14	base version	
ODBC	2.3.7	base version	
OpenSSL	1.1.1f	base version	
Oracle Instant Client	21.3.0.0.0		
Python3	3.10.0		upgrade
- cx-Oracle	8.2.1	base version	
- pip	21.2.4	base version	
- PyYAML	5.4.1	base version	
rebar3	3.16.1		
Rust	1.55.0		upgrade
tmux	3.2a		
Ubuntu	20.04.3 LTS	base version [focal]	
Vim	8.1.2269	base version	
wget	1.20.3	base version	

Component	Version	Remark	Status
wget2	1.99.1	base version	

2. Creating a new OraBench 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_ora_bench_dev
> REM   - the path the host repository is: //C/projects/my_repro
> REM   - the directory name for this repository inside the container should be:
my_repro_dir
> REM   - you want to use the latest version of the OraBench development image
> docker run -it -p 443:8443 \
             --name my_ora_bench_dev \
             -v //C/projects/my_repro:/my_repro_dir \
             konnexionsgmbh/ora_bench_dev:latest

> REM Stopping the container
> docker stop my_ora_bench_dev

> REM Restarting the container
> docker start my_ora_bench_dev

> REM Entering a running container
> docker exec -it my_ora_bench_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/ora_bench_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_ora_bench_dev` using a repository inside the Docker container:

   ```
   docker run -it --name my_ora_bench_dev konnexionsgmbh/ora_bench_dev:latest
   ```

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

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

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

   ```
   docker run -it --name my_ora_bench_dev -p 8000:8443 -v /my_repro:/my_repro
   konnexionsgmbh/ora_bench_dev:latest
   ```

3. Working with an existing OraBench 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 OraBench 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.

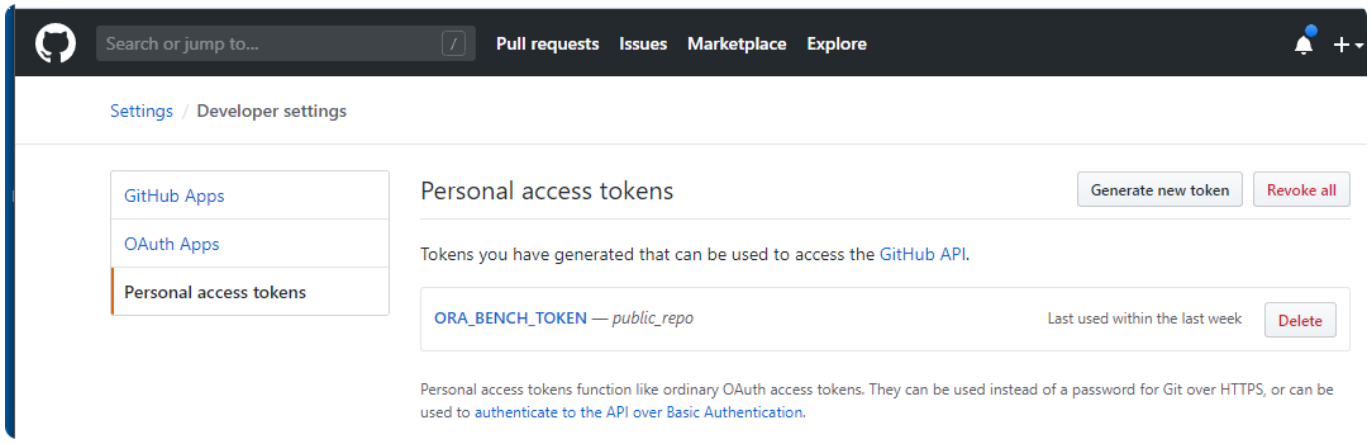
```
>C:\Temp\my_projects>docker run -it --name ora_bench_dev -v
//C/Temp/my_projects:/projects konnexionsgmbh/ora_bench_dev:latest
root@35b9310932f1:/# cd projects
root@35b9310932f1:/projects# ls -ll
total 0
drwxrwxrwx 1 root root 4096 May  2 14:05 dderl
```

4.2 Use of private GitHub repositories inside the container

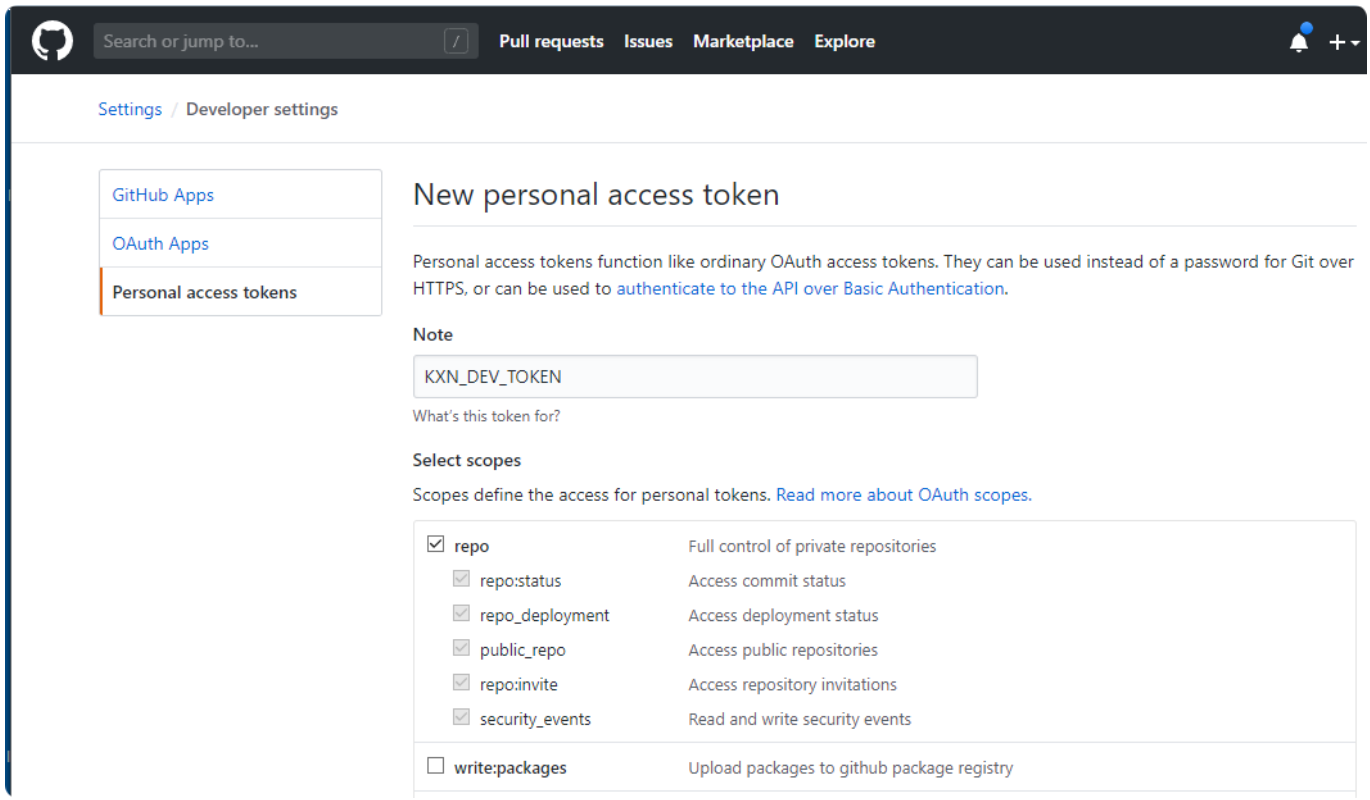
To access private repositories in GitHub, you must first create a new personal access token in GitHub and then add it to your git configuration inside the container.

1. Create a new personal access token in GitHub

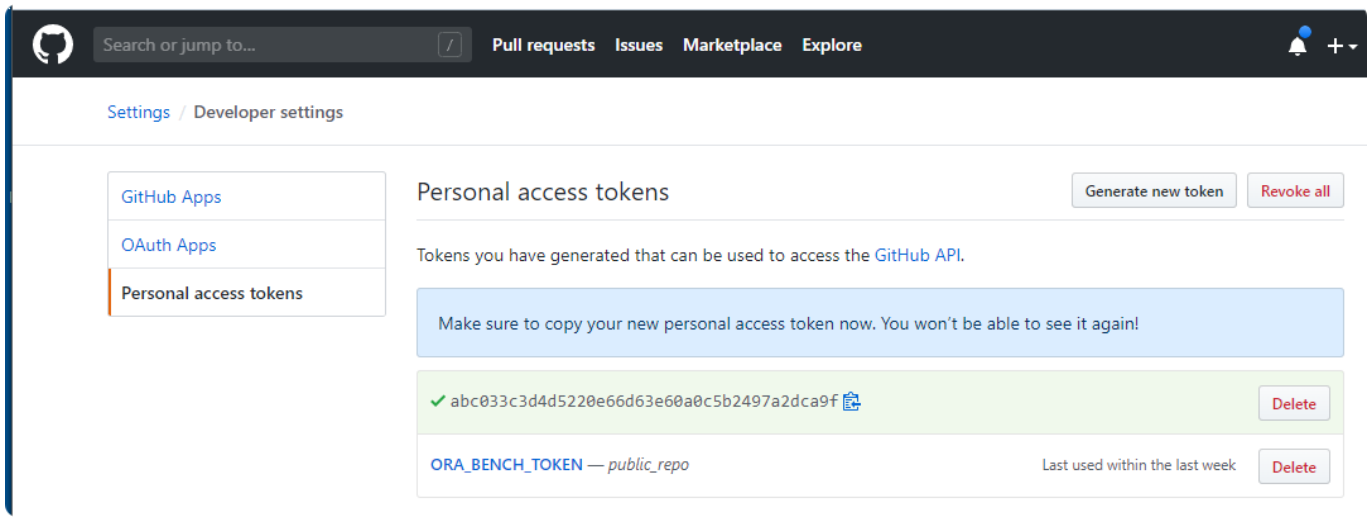
- With the following URL you can create the access token: https://github.com/settings/tokens



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

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

C:\Temp\my_projects\dderl>docker images
REPOSITORY                  TAG                 IMAGE ID            CREATED
SIZE
```

```
konnexionsgmbh/ora_bench_dev      latest              51757b5e414e        6 hours
ago         3.71GB

C:\Temp\my_projects\dderl>docker rmi 51757b5e414e
Untagged: konnexionsgmbh/ora_bench_dev:latest
Untagged:
konnexionsgmbh/ora_bench_dev@sha256:5f6d6afc566ef9142d2d85b85dd331c0558eafaaf28617
9fd0ae787988c1b89b
Deleted: sha256:51757b5e414e5333ace7b163484c06e4685c29312ad09d5d7d648c6936011a60
...
Deleted: sha256:7789f1a3d4e9258fbe5469a8d657deb6aba168d86967063e9b80ac3e1154333f
```

- Recreating the Docker container (and image)

```
C:\Temp\my_projects\dderl>docker run -it --name ora_bench_dev -v
//C/Temp/my_projects:/projects konnexionsgmbh/ora_bench_dev:latest
Unable to find image 'konnexionsgmbh/ora_bench_dev:latest' locally
latest: Pulling from konnexionsgmbh/ora_bench_dev
d51af753c3d3: Pull complete
...
a6bb30d1a5cf: Pull complete
Digest: sha256:5f6d6afc566ef9142d2d85b85dd331c0558eafaaf286179fd0ae787988c1b89b
Status: Downloaded newer image for konnexionsgmbh/ora_bench_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 4, `git` access (clone/push/pull) doesn't ask for username/password anymore.