

Quickstart Guide for Coastal Modeling with Docker

Running Models

Prepare Input Data

The input data could be under any directory that you have full access to. In this example the input data directory is under

/Users/yuanshuai/docker/inputdata

```
→ inputdata ls
config_flow2d3d.ini      f34.dis          f34.par          run_flow2d3d_parallel.sh
config_flow2d3d.xml     f34.dry          f34.src          run_flow2d3d_parallel_sge.sh
f34.bca                 f34.enc          f34.thd          run_flow2d3d_xml.bat
f34.bch                 f34.grd          f34.wnd          run_flow2d3d_xml.sh
f34.bnd                 f34.ldb          run_flow2d3d.bat
f34.crs                 f34.mdf          run_flow2d3d.sh
f34.dep                 f34.obs          run_flow2d3d_parallel.bat
→ inputdata pwd
/Users/yuanshuai/docker/inputdata
```

Run Model

In the console, type in the command:

```
docker run -v /Users/yuanshuai/docker/inputdata:/data -w /data lsucrc/delft3d mpirun -x LD_PRELOAD=libmpi.so -np 4 d_hydro.exe ./config_flow2d3d.xml
```

[docker run] is the Docker command to start a docker container.

[-v /Users/yuanshuai/docker/inputdata:/data] tells docker to mount your data directory to a predefined data directory which is /data in the Delft3D image lsucrc/delft3d.

[-w /data] is changing work directory to the default data directory in the container.

[lsucrc/delft3d] the model image prepared by the CRC team. Of course, you will need to make sure the input data are ready for the model you want to run.

[mpirun/config_flow2d3d.xml] is the command to run your model.

If the model runs successfully, you will see the following output.

```
1. docker run -v /Users/yuanshuai/docker/inputdata:/data -w /data lsucrc/delft3d (docker)
→ inputdata docker run -v /Users/yuanshuai/docker/inputdata:/data -w /data lsucrc/delft3d mpirun -x LD_PRELOAD=/usr/lib
64/openmpi/lib/libmpi.so -np 4 /root/delft3d-5.01.00.2163/bin/linux/flow2d3d/bin/d_hydro.exe ./config_flow2d3d.xml
MPI process number 003 has host unknown and is running on processor 49bbc1d4a13c
MPI process number 001 has host unknown and is running on processor 49bbc1d4a13c
MPI process number 002 has host unknown and is running on processor 49bbc1d4a13c
MPI process number 000 has host unknown and is running on processor 49bbc1d4a13c
-----
Deltares, FLOW2D3D Version 5.01.00.000000, Nov 12 2015, 03:59:26
libflow2d3d.so entry Flow2D3D::Run
-----

Part I   - Initialisation Time Dep. Data module...
          runid : f34
Part II  - Creating intermediate files...
Part III - Initialisation of the Execution module...
Part IV  - Reading complete MD-file...
Part V   - Initialisation & checking input...
Part VI  - Initialisation & checking second part...
Part VII - Initialisation output...
Part VIII - Start Simulation...

Time to finish 0s, 0.0% completed, time steps left 300
Time to finish 3m 36s, 0.3% completed, time steps left 299
Time to finish 3m 33s, 0.7% completed, time steps left 298
Time to finish 3m 35s, 1.0% completed, time steps left 297
Time to finish 3m 31s, 1.3% completed, time steps left 296
Time to finish 3m 24s, 1.7% completed, time steps left 295
Time to finish 3m 27s, 2.0% completed, time steps left 294
Time to finish 3m 11s, 2.3% completed, time steps left 293
Time to finish 3m 0s, 2.7% completed, time steps left 292
```

```
1. yuanshuai@ac-bc-32-78-ea-77: ~/docker/inputdata (zsh)
          runid      : f34
          date, time : 2016-02-03, 20:22:05
SUMMARY FOR PARTITION : 1
          0 errors and 0 warnings
returning to main program from domain f34
-----
SUMMARY FOR PARTITION : 2
*** WARNING Discharge (m,n,k)=(14,2,1) is disabled: inlet and/or outfall not in
*** this partition
          0 errors and 1 warnings
returning to main program from domain f34
-----
SUMMARY FOR PARTITION : 3
*** WARNING Discharge (m,n,k)=(14,2,1) is disabled: inlet and/or outfall not in
*** this partition
          0 errors and 1 warnings
returning to main program from domain f34
-----
SUMMARY FOR PARTITION : 4
*** WARNING Discharge (m,n,k)=(14,2,1) is disabled: inlet and/or outfall not in
*** this partition
*** WARNING Station lies outside the computational domain
          0 errors and 2 warnings
returning to main program from domain f34
-----
D_Hydro [1454530925.774857] <anonymous> >> d_hydro shutting down normally
D_Hydro [1454530925.782166] <anonymous> >> d_hydro shutting down normally
D_Hydro [1454530925.783873] <anonymous> >> d_hydro shutting down normally
D_Hydro [1454530925.786275] <anonymous> >> d_hydro shutting down normally
→ inputdata
```

You can then check, analyze, or visualize your output data.

```
→ inputdata ls
config_flow2d3d.ini      f34.enc          run_flow2d3d.bat      tri-diag.f34-003
config_flow2d3d.xml     f34.grd          run_flow2d3d.sh       tri-diag.f34-004
f34.bca                  f34.ldb          run_flow2d3d_parallel.bat trih-f34.dat
f34.bch                  f34.mdf          run_flow2d3d_parallel.sh trih-f34.def
f34.bnd                  f34.obs          run_flow2d3d_parallel_sge.sh trim-f34.dat
f34.crs                  f34.par          run_flow2d3d_xml.bat  trim-f34.def
f34.dep                  f34.src          run_flow2d3d_xml.sh
f34.dis                  f34.thd          tri-diag.f34-001
f34.dry                  f34.wnd          tri-diag.f34-002
→ inputdata
```