

preCICE build and test on Ubuntu 16.04

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Generally, the tutorial from preCICE its wiki is easy to follow.

install preCICE

```
cd /opt/  
git clone https://github.com/precice/precice  
cd precice
```

install necessary packages, see

<https://github.com/precice/precice/wiki/Dependencies>

for boost VMD installation, the boost version is too low on Ubuntu 16.04, a hack is shown on wki "Option 3: Install an older Boost version and add any missing files manually".

copy boost1.60's VMD headers to 1.58 default installation note the default boost installation path is /usr not /usr/local:

```
sudo cp -r include/boost/vmd/ /usr/include/boost/vmd/
```

note: I need to add also /usr/include/petsc to get PETSC headers located

```
CPLUS_INCLUDE_PATH="/usr/include/eigen3:/usr/include/petsc:$CPLUS_INCLUDE_PATH" scons petsc=yes python=yes -j 3 solib symlink
```

test 1D FSI (elastictube1d)

source code need to be downloaded and built, see instruction:

<https://github.com/precice/precice/wiki/1D-Example>

```
cd /opt  
git clone https://github.com/precice/elastictube1d  
cd elastictube1d  
sudo apt-get install liblapack-dev  
#build for c++ source code
```

```
scons petsc=on python=on
```

```
#test with parameter substitution, in serial mode
```

```
./StructureSolver ./ConfigurationFiles/precice-config.xml 100
```

in a different shell terminal window

```
./FluidSolver ./ConfigurationFiles/precice-config.xml 100 0.1 100
```

if there is error during building ". /StructureSolver: error while loading shared libraries: libprecice.so: cannot open shared object file: No such file or directory "

check and set in ~/.bashrc

```
export PRECICE_ROOT="/opt/precice"  
export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:$PRECICE_ROOT/build/1  
ast/
```

test 1D case in pure python

Since I have python compiled without error, I will give it a trial.

<https://github.com/precice/precice/wiki/Using-the-Python-API>

need to setup Anaconda, actually, I did not follow that anaconda

the missing file (PySolverInterface) is under folder

/opt/precice/src/precice/adapters/python it is in cpython's pyx file, need a compilation by python2 setup.py --inplace

/opt/precice/src/precice/adapters/python/readme has details to use this python adapter

```
sudo apt-get install cython
```

```
##export MPI setting, if MPI is enabled during preCICE compilation
```

```
export PRECICE_MPI_IMPLEMENTATION=openmpi
```

```
python2 setup.py build_ext --inplace
```

run python FluidSolver.py precice-config.xml and python StructureSolver.py precice-config.xml, each in a different shell.

test OpenFOAM

<https://github.com/precice/openfoam-adapter/wiki>

<https://github.com/precice/openfoam-adapter/wiki/Building>

if there is error during building

check and set in ~/.bashrc

```
export PRECICE_ROOT="/opt/precice"  
export LD_LIBRARY_PATH=$LD_LIBRARY_PATH:$PRECICE_ROOT/build/  
ast/
```

test passed.