Saturne 2.2 coupled with syrthes 4.0 under Ubuntu 12.04 LTS

Preparing your Ubuntu distro:

Install Ubuntu 12.04 on your pc

run updates, remember to activate the option "not supported updates (precise-backports)" and reboot

from Software Center install : Synaptic package manager

from Synaptic package manager install : nautilus-open-terminal

Restart Nautilus : open a terminal (ctrl+alt+t) = ***killall nautilus***

Now if you right-click on a folder you can launch the terminal directly into the folder (avoiding boring cd /...)

Preparing Saturne 2.2 Environment

Download Code_Saturne 2.2 from http://code-saturne.org/cms/download/2.2

extract the content (code_saturne-2.2.1) in your home folder (/home/user/) where user is your ubuntu username

create a folder in /home/user/ called saturne2.2 , we will compile saturne here

Saturne libraries

from synaptic install in order (including subpackets required):

g++

gfortran

pyqt4-dev-tools
python-qt4-dev

zlib1g
zlib1g-dev

mpi-default-bin
mpi-default-dev

libblas-dev

libxml2-dev

libscotchparmetis-dev

ptscotch
libscotch-dev
libptscotch-dev

libhdf5-openmpi-dev
h5utils
hdf5-tools

libcgns-dev
cgns-convert

libmed-dev
libmedc-dev
libmedimport-dev

Compile Saturne

open a terminal in /home/user/saturne2.2 and write

/home/user/code_saturne-2.2.1/configure

if your ending lines are like these :

 Zlib (gzipped file) support: yes
 MPI (Message Passing Interface) support: yes
   MPI I/O support: yes
   MPI2 one-sided communication support: yes
 OpenMP support: no
 BLAS (Basic Linear Algebra Subprograms) support: yes
 Libxml2 (XML Reader) support: yes
 ParMETIS (Parallel Graph Partitioning) support: no
 PT-SCOTCH (Parallel Graph Partitioning) support: yes
 ADF support: no
 CCM support: no
 HDF (Hierarchical Data Format) support: yes
 CGNS (CFD General Notation System) support: yes
 MED (Model for Exchange of Data) support: yes
   MED MPI I/O support: no
 MEDCoupling support: no
 SALOME GUI support: yes
 SALOME Kernel support: no
 Dynamic loader support (for YACS): yes

SYRTHES 3 coupling support: no

Warning: CGNS version used is 2.5, which is deprecated.
in future versions, CGNS >= 3.1 will be required.

you can now enter (it may take long) :

make

and next :

sudo make install

Congratulations you succesfully installed Saturne 2.2.

Install Syrthes

Download 4 syrthes4.0 packages from:
http://research.edf.com/research-and-the-scientific-community/software/syrthes-44340.html

Extract the files in /home/user/, unzip them and make sure that you extract the 4 archives in the following order :

  tar xvf syrthes4.0.1-part1.tar

  tar xvf syrthes4.0.1-part2.tar

  tar xvf syrthes4.0.1-part3.tar

 tar xvf syrthes4.0.1-part4.tar

At the end you should have a folder "syrthes4.0.1" in your /home/user

edit the file **setup.ini** that is placed in /home/user/syrthes4.0.1/src/syrthes-install/

You have to change the setup.ini for these libraries (mpi,metis,...), scroll down the file to find the lines and edit (adding or removing # is easier) like the following :

mpi USE=yes PATH=/usr

metis USE=yes PATH=/usr

blas USE=yes PATH=/usr

ple USE=yes PATH=/home/user/saturne2.2

syrthescfd INSTALL=yes

Now open a terminal in /home/user/syrthes4.0.1/src/syrthes-install/ and type:

python syrthes_install.py

At the end you have succesfully installed syrthes4.0, now you have to tell to Saturne2.2 where is the syrthes installation directory.

Go to /usr/local/etc and open a terminal

sudo gedit code_saturne.cfg

now you simply put these 3 lines in your file:

[install]
syrthes = /home/user/syrthes4.0.1/arch/Linux_x86_64
[run]

save and exit .

Open a terminal (ctrl+alt+t) and source :

source /home/user/syrthes4.0.1/arch/Linux_x86_64/bin/syrthes.profile

MPI BUG FIX

Now the last step, you have to edit :
/home/user/syrthes4.0.1/arch/Linux_x86_64/share/syrthes/syrthes.py

at the line 1391 we have to define manually s4bin and s4home, change line 1391 and 1392 as it follows :

s4bin = '/home/user/syrthes4.0.1/arch/Linux_x86_64/bin'
s4home = '/home/user/syrthes4.0.1/arch/Linux_x86_64'

save and exit

How to create a coupled case

Open a terminal (ctrl+alt+t) and digit:

code_saturne create -s studyname -c fluid --syrthes=solid

now in your home directory you can find the directory studyname.

Put your meshes in the MESH folder, then you can edit by gui both your CFD domain opening a terminal in /home/user/studyname/fluid/DATA/   and running:

./SaturneGUI

create a new file and setup your CFD case.

Than for the syrthes part run
syrthes.gui

in /home/user/syrthes4.0.1/arch/Linux_x86_64/bin , create a new data file located in /home/user/studyname/solid/

After setting both fluid and solid domain launch the case running

./runcase_coupling

from a terminal in /home/user/studyname/

This tutorial has been written by Andrea "pisolino" (andrea.pisa@polito.it) and Andrea "biko86" collecting all the tips and helps inside the forum http://code-saturne.org/forum. A special thank to Yvan Fournier for the support.

Feel free to improve this step by step guide and sorry for our poor english.