

Downloading and building Fluidity

Dave Robinson¹

1 - Dept of Earth Science and Engineering, Imperial College London

Outline

Getting Fluidity

Configuring and building

Installing

Today...

...we will learn how to:

- ▶ Build Fluidity
- ▶ Make a mesh
- ▶ Set up a Fluidity simulation
- ▶ Run a Fluidity simulation
- ▶ Look at the output
- ▶ Run Fluidity in parallel

Where to get Fluidity

- ▶ **Binary** (release only)
Prebuilt Debian package available through wajig, apt-get, etc.
- ▶ **Source** (release, trunk or branch)
Download using bazaar commands, accessing Launchpad.
- ▶ **Archived** (release only)
Tarballed release source code (.tgz)

Downloading the Release binary

*** please don't do this bit now ***

```
sudo apt-add-repository -y ppa:fluidity-core/ppa  
sudo apt-get update  
sudo apt-get -y install fluidity
```

The binary of Fluidity requires no compiling or building and will be updated automatically by apt-get.

Downloading the Release source

*** please don't do this bit now ***

Alternatively, the source code for the release can be accessed using bzip.

```
bzip co lp:fluidity/4.1 fluidity-release/
```

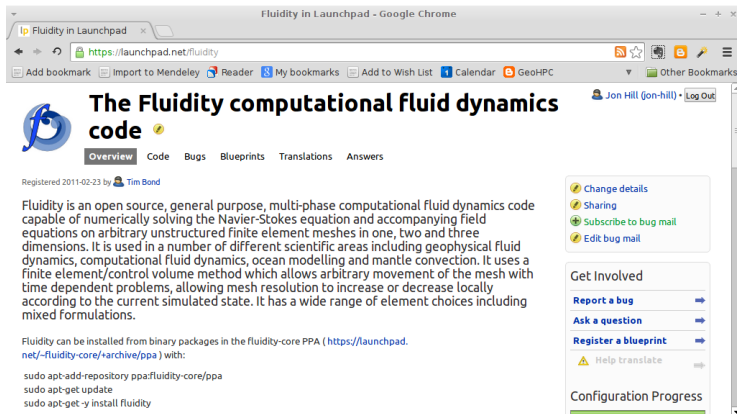
This will require configuring and building, which we will cover later.

Downloading the Trunk source

The source code for the trunk (or any branch) can also be accessed using bazaar.

```
bzr co lp:fluidity/ fluidity/
```

Launchpad



The screenshot shows a web browser window titled "Fluidity in Launchpad - Google Chrome". The address bar shows the URL "https://launchpad.net/fluidity". The page content includes the Launchpad logo, the title "The Fluidity computational fluid dynamics code", and a list of tabs: Overview, Code, Bugs, Blueprints, Translations, and Answers. The "Overview" tab is selected. The text describes Fluidity as an open source, general purpose, multi-phase computational fluid dynamics code. It mentions that Fluidity can be installed from binary packages in the fluidity-core PPA. The installation instructions are provided as terminal commands. On the right side, there are links for "Change details", "Sharing", "Subscribe to bug mail", and "Edit bug mail". Below these, there is a "Get Involved" section with links for "Report a bug", "Ask a question", and "Register a blueprint". At the bottom right, there is a "Configuration Progress" bar.

Fluidity in Launchpad - Google Chrome

https://launchpad.net/fluidity

Add bookmark Import to Mendeley Reader My bookmarks Add to Wish List Calendar GeoHPC

Jon Hill (jon-hill) Log Out

The Fluidity computational fluid dynamics code

Overview Code Bugs Blueprints Translations Answers

Registered 2011-02-23 by Tim Bond

Fluidity is an open source, general purpose, multi-phase computational fluid dynamics code capable of numerically solving the Navier-Stokes equation and accompanying field equations on arbitrary unstructured finite element meshes in one, two and three dimensions. It is used in a number of different scientific areas including geophysical fluid dynamics, computational fluid dynamics, ocean modelling and mantle convection. It uses a finite element/control volume method which allows arbitrary movement of the mesh with time dependent problems, allowing mesh resolution to increase or decrease locally according to the current simulated state. It has a wide range of element choices including mixed formulations.

Fluidity can be installed from binary packages in the fluidity-core PPA (<https://launchpad.net/~fluidity-core/+archive/ppa>) with:

```
sudo apt-add-repository ppa:fluidity-core/ppa
sudo apt-get update
sudo apt-get -y install fluidity
```

Change details
Sharing
Subscribe to bug mail
Edit bug mail

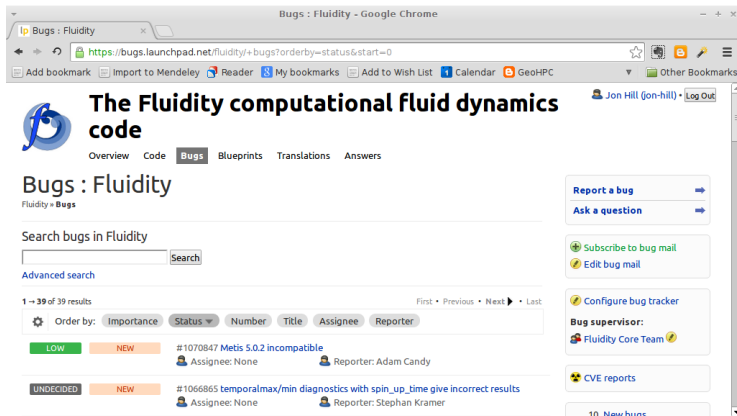
Get Involved

Report a bug
Ask a question
Register a blueprint
Help translate

Configuration Progress

<http://launchpad.net/fluidity>

Launchpad



The screenshot shows a web browser window titled "Bugs : Fluidity - Google Chrome". The address bar shows the URL "https://bugs.launchpad.net/fluidity/+bugs?orderby=status&start=0". The page header includes navigation links: Overview, Code, Bugs (selected), Blueprints, Translations, and Answers. The main heading is "The Fluidity computational fluid dynamics code". Below this is a search bar with the text "Search bugs in Fluidity" and a "Search" button. The results section shows "1 -> 39 of 39 results". The table lists bugs with columns for status, importance, number, title, assignee, and reporter. The first bug is #1070847, titled "Metis 5.0.2 incompatible", with status "LOW" and importance "NEW". The second bug is #1066865, titled "temporalmax/min diagnostics with spin_up_time give incorrect results", with status "UNDECIDED" and importance "NEW". On the right side, there are links for "Report a bug", "Ask a question", "Subscribe to bug mail", "Edit bug mail", "Configure bug tracker", "Bug supervisor: Fluidity Core Team", and "CVE reports".

Bugs : Fluidity

Fluidity » Bugs

Search bugs in Fluidity

Advanced search

1 -> 39 of 39 results

Order by: Importance Status Number Title Assignee Reporter

LOW NEW #1070847 Metis 5.0.2 incompatible

Assignee: None Reporter: Adam Candy

UNDECIDED NEW #1066865 temporalmax/min diagnostics with spin_up_time give incorrect results

Assignee: None Reporter: Stephan Kramer

Report a bug

Ask a question

Subscribe to bug mail

Edit bug mail

Configure bug tracker

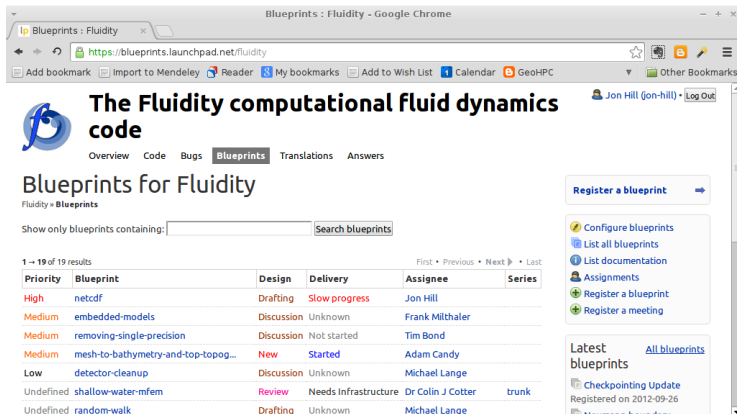
Bug supervisor: Fluidity Core Team

CVE reports

10 New bugs

<http://launchpad.net/fluidity>

Launchpad



The screenshot shows a web browser window titled "Blueprints : Fluidity - Google Chrome" with the URL "https://blueprints.launchpad.net/fluidity". The page header includes the Fluidity logo and the title "The Fluidity computational fluid dynamics code". Navigation links include Overview, Code, Bugs, Blueprints (selected), Translations, and Answers. A search bar is present with the text "Show only blueprints containing:". Below this, a table lists 19 results, showing the first 7. The table has columns for Priority, Blueprint, Design, Delivery, Assignee, and Series.

Priority	Blueprint	Design	Delivery	Assignee	Series
High	netcdf	Drafting	Slow progress	Jon Hill	
Medium	embedded-models	Discussion	Unknown	Frank Mithaler	
Medium	removing-single-precision	Discussion	Not started	Tim Bond	
Medium	mesh-to-bathymetry-and-top-topog...	New	Started	Adam Candy	
Low	detector-cleanup	Discussion	Unknown	Michael Lange	
Undefined	shallow-water-mfem	Review	Needs Infrastructure	Dr Colin J Cotter	trunk
Undefined	random-walk	Drafting	Unknown	Michael Lange	

On the right side of the page, there is a sidebar with a "Register a blueprint" button and a list of actions: Configure blueprints, List all blueprints, List documentation, Assignments, Register a blueprint, and Register a meeting. Below this is a "Latest blueprints" section with links to "Checkpointing Update" and "Neumann boundary".

<http://launchpad.net/fluidity>

Launchpad

Code : Fluidity - Google Chrome

https://code.launchpad.net/fluidity

The Fluidity computational fluid dynamics code

Overview **Code** Bugs Blueprints Translations Answers

Bazaar branches of Fluidity

Fluidity » Code

You can [browse the source code](#) for the development focus branch or get a copy of the branch using the command:

```
bzr branch lp:fluidity
```

You can push the branch directly to Launchpad with the command:

```
bzr push lp:~jon-hill/fluidity/fluidity
```

There are [download files](#) available for Fluidity.

Fluidity has [14 active reviews](#).

Fluidity has 245 active branches owned by 29 people and 10 teams. There were 414 commits by 31 people in the last month.

Branches with status:

Name	Status	Last Modified	Last Commit
lp:fluidity Series: trunk	Development	20 hours ago	4118. Ignore the zero reattachment length.

New branches for Fluidity are **Public**.

Import a branch

Configure code hosting

Jon Hill (jon-hill) Log Out

AMCG

<http://launchpad.net/fluidity>

Launchpad

Code : Fluidity - Google Chrome

Ip Code : Fluidity

https://code.launchpad.net/fluidity

Add bookmark Import to Mendeley Reader My bookmarks Add to Wish List Calendar GeoHPC Other Bookmarks

Series: trunk			reattachment length.
lp:fluidity/4.1	Mature	2012-06-19	3858. Minor point release to 4.1.7.1 mergin...
Series: 4.1			
lp:fluidity/longtests	Development	2012-10-18	2084. Missed one.
Series: longtests			
lp:~fluidity-core/fluidity/MultiFluids_Dev	Development	18 hours ago	3968. Towards Adaptivity: continuing reengi...
lp:~fluidity-core/fluidity/pyop2	Development	20 hours ago	4132. Don't call op2.init unless we see a U...
lp:~wence/fluidity/use-options-tree-for-backend-selection	Development	20 hours ago	4132. Don't call op2.init unless we see a U...
lp:~amcg-stokes/fluidity/stokes_combination	Development	21 hours ago	4017. Merging in parallel fix for velocity...
lp:~amcg-stokes/fluidity/velocity-fieldsplit	Development	21 hours ago	4114. Make fieldsplit work in parallel. Int...
lp:~ctjacobs-multiphase/fluidity/les-extend-and-fix	Development	2012-11-02	4113. Added a 3D test case to validate the ...
lp:~amcg-stokes/fluidity/combo_remove_rotation	Development	2012-11-01	4017. Merge stokes combo updates (fieldspli...
lp:~fluidity-core/fluidity/fldcomp_renumbering	Development	2012-11-01	4112. Adding Hilbert SFC reordering from Zo...
lp:~fluidity-core/fluidity/s3backe	Development	2012-11-01	4049. Merged in newes...

<http://launchpad.net/fluidity>

Buildbot



<http://buildbot-ocean.ese.ic.ac.uk:8080/waterfall>

Configure

Set up compile-time options, such as:

- ▶ External non-LGPL libraries
- ▶ Non-standard library locations
- ▶ Compiler flags
- ▶ Debugging

```
module load petsc-gcc4  
cd [fluidity directory]  
./configure --enable-2d-adaptivity
```

Building

```
make clean && make -j 4 && make fltools
```

Python

Fluidity contains several Python packages that are required for it to run. The Fluidity python directory must be added to the existing environment variable `PYTHONPATH`.

```
export PYTHONPATH=$PYTHONPATH:/data/fluidity/python
```

This can be checked by using the echo command.

```
echo $PYTHONPATH
```


Tests

If you wished to check that a particular build of Fluidity passes the group's library of verification tests then you can use one of these commands.

*** please don't do this bit now ***

```
make unittest  
make test  
make mediumtest
```

Installing

Installing Fluidity enables access for all other users of your computer.

```
make install  
make install-diamond  
make install-user-schemata
```

Running Fluidity

From source:

```
[fl. dir.]/bin/fluidity -v2 -l [filename].flml
```

From binary:

```
fluidity -v2 -l [filename].flml
```

Updating

```
bzr up
```

```
M preprocessor/Populate_State.F90
```

```
bzr status
```

```
bzr status -SV
```

```
bzr diff filename
```

edit ~/.bashrc

.bashrc is a file run everytime you open a new terminal.

```
cd
```

```
gedit .bashrc &
```

Go to the end of the file and add the following lines:

```
module load petsc-gcc4
```

```
export PYTHONPATH=$PYTHONPATH:/data/[your  
username]/fluidity/python
```