User Expectations from and Contributions to DUNE

Discussion at the Dune User Meeting, 6.-8.10.2010, Stuttgart

This is a collection of poll and discussion results from the first DUNE User Meeting held in Stuttgart October 6th – 8th 2010. For the polls, a total number of 27 participants have been asked. The statements in the discussion results have not been voted on, meaning that a statement there can reflect the opinion of between 1 and 27 users.

Poll: Usage of DUNE Modules

- common, grid: 27
- grid-howto: 22
- istl: 21
- localfunctions: 19
- pdelab(-howto): 12
- fem: 9
- grid-glue: 5
- dumux: 5
- cornerpoint: 3
- solvers: 2
- multidomain(grid): 2
- rb: 2
- subgrid: 1
- disc: 1

Other Polls

- How many work with a DUNE release: 16
- How many work with the DUNE trunk: 13
- How many have write access to the core: 6
- How many have written a DUNE grid: 6
- How many use DUNE in teaching: 9
- How many use other PDE software for teaching: 5
- Whose None-DUNE-core project is publicly available: 11
- How many use adaptivity: 12 (+8 want to use it in the future)
- How many use parallelism: 11 (+8 want to use it in the future)
- Which primary university education do you have:
  - Mathematics: 19
  - Computer Science: 5
  - Engineering: 3
  - Physics: 2
• Which applications do you target with your DUNE based code:
  – Numerical method development: 17
  – Porous media: 14
  – CFD: 7
  – Computational biology: 4
  – Petroleum engineering: 5
  – Solid mechanics: 3

**What Users Like about DUNE**

• grid-howto (esp. ease of parallelism)
• complete stack
• ability to easily move from 2d to 3d
• ability to use different grids
• code can easily be accessed and adapted
• no bad macros
• development and usage of code in groups
• international community
• fast response to mailing list questions

**What Users Don’t Like about DUNE**

• too abstract
• not easy to install
• buildsystem too complicated (to maintain)
• grid implementation complicated and time consuming
• difficult to suggest extensions to the grid interface
• too many and too long warnings
• long compilation times
• difficult to find out about the availability of a certain feature
• no wiki
• deprecated warnings do not give an alternative
• mailing list too general

**User Expectations/Wishes from DUNE**

• packages
• incremental grid testing environment
• separate flyspray from general DUNE mailing list
• (OpenMP) parallel iterator concept
• thread safety (at least for the interface)
• random access to entities (and intersections)
• include motion of mesh vertices in the grid interface (see UGGrid)
• predefined way of suggesting extensions
• grid or solver implementations on GPU
• project hosting by DUNE
• list of publications using DUNE
• list of groups using DUNE

**User Contributions to DUNE**

• gallery
• wiki setup and contributions
• advertise your project on the website
• code
• make your project available
• advertise the use of DUNE at conferences and in papers
• add to the publication and group list
• share problems and solutions (-> wiki)