How to compile Delft3D Open Source on Windows

Webinar, February 8, 2012
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Webinar overview

- Introduction
- Prerequisites
- Downloading the Delft3D open source code using TortoiseSVN
- Compiling the source code using VisualStudio
- Debugging in VisualStudio
- Version 5.00 versus 4.00
- Questions & answers
Introduction
Introduction

Assumed knowledge to follow this webinar

• Just some general knowledge about (what is):
  • Downloading
  • Source code
  • Compiling
  • Binaries (executable, dlls)
  • Run a simulation

• Advised:
  • What is Delft3D?
  • What is Delft3D-FLOW used for?
  • What is Subversion?
January webinar:
   Compiling on Linux

This webinar:
   Compiling on Windows

Currently open source:
• Delft3D-FLOW (and tools)
• Delft3D-WAVE
• QuickPlot (not handled in this webinar)
About this webinar:
Presenter: Adri Mourits
Organization: Roderik Hoekstra
Cooperators: Bert Jagers
Edward Melger
Frank Platzek

Use the webinar chat option for questions
Prerequisites
Prerequisites

... for working with the Delft3D-FLOW/-WAVE open source code:
www.oss.deltares.nl -> Delft3D -> Download -> Source code ->
1. Prerequisites

- TortoiseSVN (www.tortoisesvn.net) (this webinar: 1.7)
- Intel Fortran compiler 11.0 or higher (this webinar: 12.0)

Also used in this webinar: Total Commander (www.ghisler.com)
(for exploring files/directories)
Downloading the source code
First: register on www.oss.deltares.nl -> Delft3D -> Getting started
Then: follow www.oss.deltares.nl -> Delft3D -> Download
-> Source code -> 3. Download the source code

SVN repository:
• Trunk, main line:
  • Fixing bugs, new developments being merged in, being tested
    => Possibly not stable
• Tags:
  • Copies of stable, fully tested Trunk-revisions
• Branches:
  • Separate develop versions
  • “Your own private version”
Compiling the source code
Compiling the source code

www.oss.deltares.nl -> Delft3D -> Download -> Source code
    -> 4. Compile the source code
1. Open "src\d_hydro_open_source.sln" in VS2008 or "src\d_hydro_open_source_vs2010.sln" in VS2010
2. Select the "solution configuration" you want: Debug or Release
3. <Ctrl><Shift>B
4. The binaries are installed in directory "bin\win32" (release) or in the subdirectory of the executable, e.g. "src\engines_gpl\d_hydro\bin\Debug" (debug)

INTERMEZZO: www.oss.deltares.nl -> Delft3D -> Download
    -> Release notes -> Release notes Delft3D-FLOW
    -> “Introduction of Delft3D-FLOW version 5.00.00”
Compiling the source code

Using created binaries:

• First check: run examples
• To use them in an existing Delft3D setup:
  • Execute “convert_win32_to_old_directory_structure_w32.bat”
  • Copy “w32” to your Delft3D installation, overwriting existing files
Debugging in Visual Studio
Not parallel:

- Compile the debug version
- Produce the input file for “d_hydro.exe”:
  deltares_hydro.exe <config.ini> -keepXML
- Add a breakpoint
- “d_hydro” project -> properties -> debugging:
  - Set working directory
  - Set command argument (<config.xml>)
- “d_hydro” project -> debug -> new instance
Parallel:
  • Compile the debug version
  • Produce the input file for “d_hydro.exe”:
    deltares_hydro.exe <config.ini> -keepXML
  • Add a breakpoint
  • Edit <config.xml>
    See example on next slide
  • Edit batch file to start the simulation:
    See example on next slide
  • Run the batch file:
    Waiting for file "debug.txt" to appear...
  • Debug -> Attach to process(es) “d_hydro.exe”
  • Add file “debug.txt”
Parallel:
File “TMP_config_flow2d3d_8280.xml”:
<DeltaresHydro start="flow2d3d">
  <flow2d3d
    library = 'flow2d3d'
    MDFile = 'f34'
    waitFile = 'debug.txt'
    description = 'Delft3D-FLOW single domain calculation'
  >
  </flow2d3d>
</DeltaresHydro>

File “run_flow2d3d_parallel.bat”:
set argfile=TMP_config_flow2d3d_8280.xml
set D3D_HOME=d:\sources\webinar\live\src\engines_gpl\d_hydro\bin\Debug
set exedir=%D3D_HOME%
set PATH=%exedir%;%PATH%
mpiexec -n 2 -localonly %exedir%\d_hydro.exe %argfile%
Debugging in Visual Studio

Switch on NaN checking:
In trisim.F90, activate 4 lines:
1. 46: use ifcore
2. 75: INTEGER*4 OLD_FPE_FLAGS, NEW_FPE_FLAGS
3. 84: NEW_FPE_FLAGS = FPE_M_TRAP_OVF
   + FPE_M_TRAP_DIV0 + FPE_M_TRAP_INV
4. 85: OLD_FPE_FLAGS = FOR_SET_FPE (NEW_FPE_FLAGS)

Rebuild
Version 5.00 versus 4.00
Why all these changes?

- Prepare for 64-bit AND 32-bit binaries, which both need correct dynamic libraries
- Minimize Fortran <-> C interfaces in top routines
- FLOW-, WAVE-, WAQ-dynamic libs started by:
  - Small executable(s)
  - OpenMI
  - OpenDA
  - DeltaShell
- One configuration file in common file format (XML)

Ready for the future!
Version 5.00 versus 4.00

See Delft3D-FLOW release notes:
www.oss.deltares.nl -> Delft3D -> Download -> Release notes
  -> Release notes Delft3D-FLOW
  -> “Introduction of Delft3D-FLOW version 5.00.00”
  • Main binaries
  • Directory structure
  • Compiling on Linux
  • Running a calculation
Questions & answers
Q: Can I get pre-built tested executables?
A: Yes, via service packages:

   www.oss.deltaires.nl -> Delft3D -> Services

Q: How can I get help on compiling?
A: 1) Info: www.oss.deltaires.nl -> Delft3D -> Download  
   -> Source code
       2) FAQ: www.oss.deltaires.nl -> Delft3D -> FAQ
       3) Forum: www.oss.deltaires.nl -> Delft3D -> Discussion Groups  
          -> General

Q: How can I get help on modelling?
A: 1) Training courses: www.oss.deltaires.nl -> Delft3D -> Services
       2) Forum: www.oss.deltaires.nl -> Delft3D -> Discussion Groups
Q: How can I contribute my own source code?
A: Bugfixes/minor improvements: put on the forum
   (optional: TortoiseSVN -> create patch)
   Get your own branch to work in: mail to oss-webmaster@deltasres.nl

Q: Will this webinar be placed on the oss-site?
A: Yes, together with this presentation:
   www.oss.deltares.nl -> Delft3D -> Webinars

Q: What is the next webinar about?
A: About “Unibest”
   Presenter: Bas Huisman
   Wednesday 14 March 2012, at 17:00 CET
   See www.oss.deltares.nl -> Delft3D -> Webinars