Windows H2OLAB installation

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1 Requirements

- Visual Studio C++ 2005

- Windows implementation of SSH: Putty

- Windows subversion client Tortoise 1.6.6 or higher

- Microsoft Compute Cluster Pack (MPICH2 implementation), if you do not use this one, you will probably have to change the include paths in the Visual Studio settings.

2 Getting H2OLAB sources

This section explains how to get Hydrolab sources, whose Subversion repository is stored on the GForge INRIA server.

- Create an account on GForge INRIA

- Contact H2olab administrator to join the project.

  Note : Network protocol **svn+ssh** is stateful and noticeably **faster** than WebDAV. For every day usage, it is highly recommended to do the following step. Webdav protocol is an http extension, therefore you do not need a ssh authentication.

- Open an ssh connection between you personal computer and GForge INRIA server ; this is done by ssh keys system : you generate a private and a public key on your PC, and then copy the public key on the GForge INRIA server. Detailed procedure :

  - use Puttygen to create both keys and copy the public key on your personal page on the GForge INRIA web site , a documentation is available in Gforge site admin

  - use Pageant to activate the private key on your computer
    Note : a delay is necessary to the GForge INRIA server to take your key into account, so it is possible that you cannot access to the sources immediately - keep your private key in a safe place

- Install a Subversion client on your computer

  - recommanded : TortoiseSVN.
    See on http://siteadmin.gforge.inria.fr/tortoise.html (be careful to follow the TortoiseSVN tutorial : second part of the page)

  - command-line: Slik Subversion

2.1   Create Directory structure

- Create a folder to install H2olab in.
  For example *C:\H2OLAB*
  This folder will be referred as `%HYDROLAB_ROOT%`.

  - In this folder, create a folder named *svn*

- Create a folder *lib_ext* **outside** `%HYDROLAB_ROOT%`,
  for example *C:\LIB_EXT*
  This folder will be referred as `%LIB_EXT%`.

2.2   Checkout code sources from Inria Gforge repository

Now we realize a checkout operation, we copy all sources of H2OLAB, from the GForge INRIA server to the folder *svn* and all sources of External Libraries to the folder *lib_ext*.
Remember : Network protocol **svn+ssh** is stateful and noticeably **faster** than WebDAV.
Information : `login` is your GForge INRIA login.

- In the folder *svn*, by using Tortoise realise a "Checkout" of H2olab sources.
  svn+ssh mode(See figures **??** and **??**):

  `svn+ssh://login@scm.gforge.inria.fr/svn/hydrolab/trunk`

  Webdav mode:

  `https://scm.gforge.inria.fr/svn/hydrolab/trunk`

- In the folder *lib_ext*, by using Tortoise checkout external libraries.
  svn+ssh mode(See figures **??** and **??**):

  `svn+ssh://nsoualem@scm.gforge.inria.fr/svn/h2olibext/windows`

  Webdav mode:

  `https://scm.gforge.inria.fr/svn/h2olibext/windows`

3   Configuration of your development environment

3.1   Installation of H2OLAB

In the folder *%HYDROLAB_ROOT%/svn/install/windows*:

- **Launch** *install.bat*
  It will create an appropriate folders structure under `%HYDROLAB_ROOT%` and create your own parameters files in *%HYDROLAB_ROOT%/runs*.

- **Log off and re-log your Windows session**
  in order that Visual Studio could know your new environment variables.

3.2   Visual Studio Settings

You have to import the Visual Studio settings to have good **VC++ directories**
to search include files and libraries. To do that :

- Open Visual Studio

- **Menu Tools :: Import and Export Settings :: Import selected
  environment settings :: No, just import new settings**
  browse and import the last(see the timestamp) Visual Studio settings file
  (**.vssettings**) located in the folder
  %HYDROLAB_ROOT%/svn/install/windows.

<u>**Caution!!!**</u> **:** these may not be saved when you close Visual Studio (known
bug), you can resolve this problem by using the following tip. After importing
the settings, make a fake change in them

- **Menu Tools :: Options :: Project and Solutions :: VC++ direc-
  tories**

- Add a letter to a path for example

- **Click Ok**, Visual Studio will do save all the settings.

- **Undo your fake change**

3.3   Installation of External Libraries

3.3.1   Extract the boost archive

- **Unzip the archive** *boost_1_40_0.zip* in the directory **%LIB_EXT%** (**Right-
  click :: Extract here**)
  <u>**Note**</u> **:** You must have something like *%LIB_EXT%/boost_1_40_0/libs*
  and NOT *%LIB_EXT%/boost_1_40_0/boost_1_40_0/libs*

There are two ways installation according buggy Visual Studio 2005 versions.
Choose between **Automatic installation** or **Step by Step installation**.
<u>**Information**</u> **:** Do not worry about Boost messages, Boost try to find python
installation in your path.

3.3.2   Automatic installation

- **Launch** *install.bat* in the directory **%LIB_EXT%**
  This script compiles the solution *lib_ext.sln* in all configurations (**Debug**,
  Release) and platforms (**Win32**, **x64**)

3.3.3   Step by Step installation

- **Launch** *boost-install.bat* in the directory **%LIB_EXT%**
  This script compiles the boost library in all configurations (**Debug**, **Re-
  lease**) and platforms (**Win32**, **x64**)

- Open the solution *lib_ext.sln* located in *%LIB_EXT%*

- Compile the solution in all configurations (**Debug**, **Release**) and plat-
  forms (**Win32**, **x64**)

External Libraries are installed.

4   Compilation of H2OLAB softwares

For example, here is the location of few Visual Studio solutions :
PARADIS: */svn/Launchers/PARADIS/build/windows_visual/PARADIS.sln*
Isthmus: */svn/Launchers/Inverse_Problem/build/windows_visual/Isthmus.sln*
To compile the software you want : open the corresponding Visual Studio solution,

- Choose **Debug** or **Release** configuration

- Choose **Win32** or **x64** platform

- Build the solution using **F7** or right-click on the solution in the **Solution Explorer** and click on **Build Solution**

5   Execution of H2OLAB softwares

You can execute the solution by using **Ctrl+F5** or the shell prompt (command line).
Executables such *PARADIS* you have built are in
%HYDROLAB_ROOT%/bin/$Platform/$Configuration
for example for **Win32** platform and **Release** Configuration:

```
C:\> cd %HYDROLAB_ROOT%/bin/Win32/Release/bin
C:\> dir PARADIS.exe
10/12/2009 13:31 2 867 200 PARADIS.exe
```

5.1   Sequential execution

To execute *PARADIS* in sequential mode

```
C:\> PARADIS.exe
```

5.2   Parallel execution

To execute *PARADIS* with several nodes or processors, for example 4:

```
C:\> mpiexec -np 4 PARADIS.exe
```
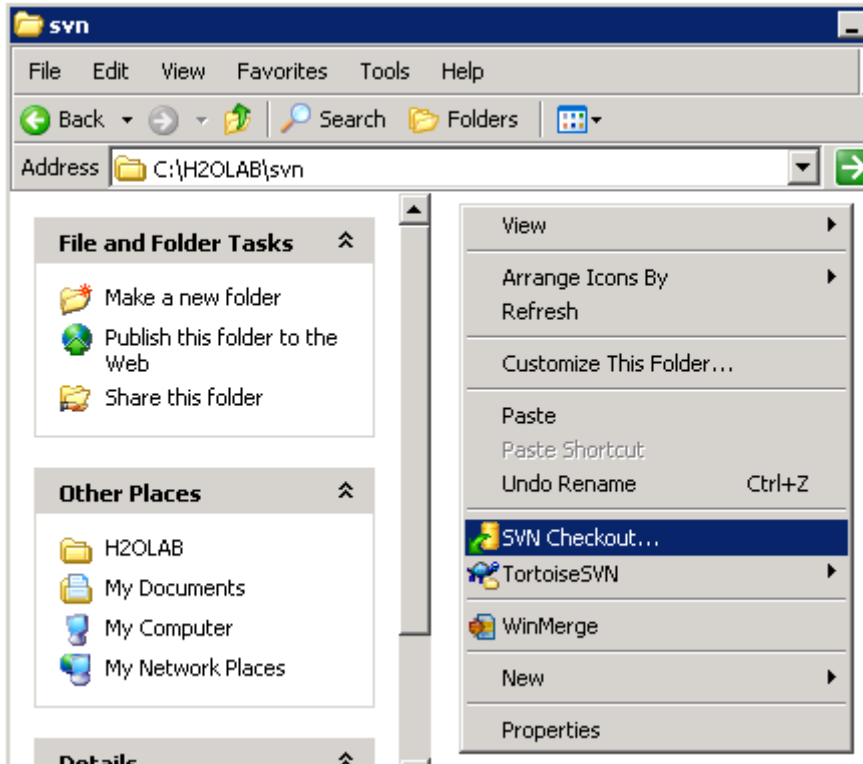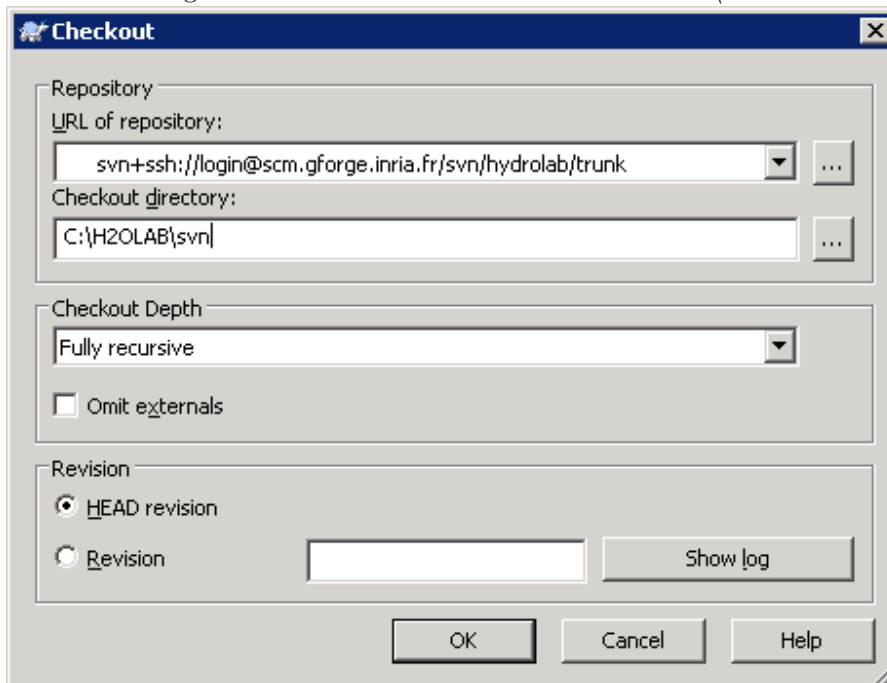
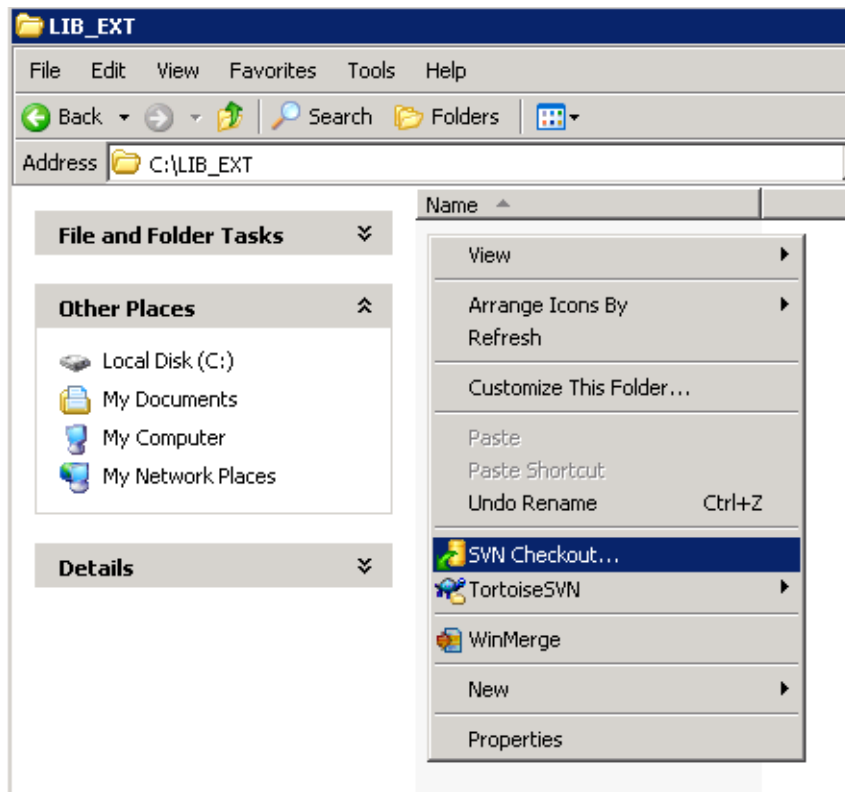Figure 1: Checkout in *%HYDROLAB_ROOT%\svn*
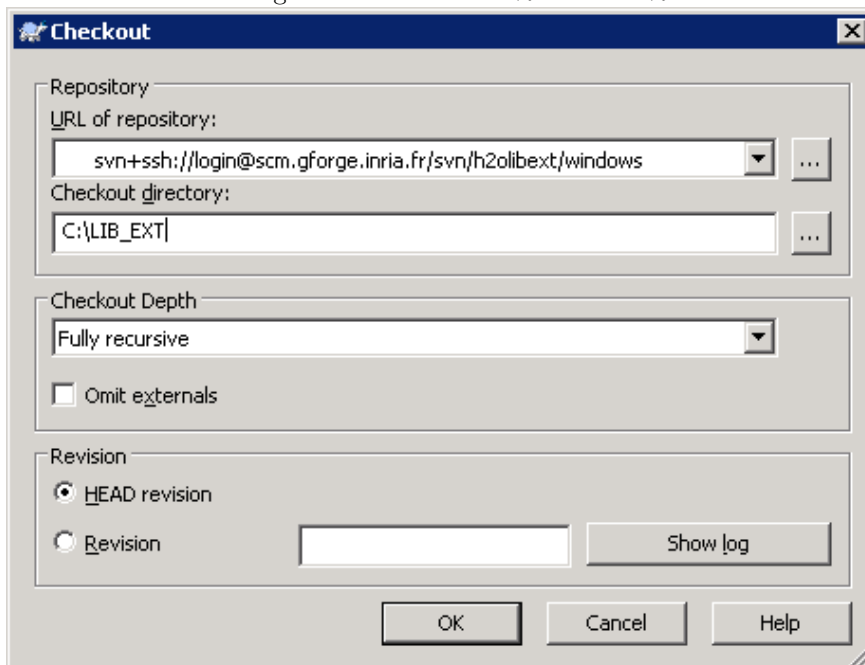

Figure 2: trunk URL Repository

Figure 3: Checkout in *%LIB_EXT%*

Figure 4: External libraries URL Repository