Getting started with NetBeans IDE

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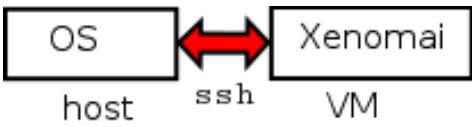
This user guide allows to use NetBeans in a **host** computer with the source code, and execute this code in the VM (virtual machine) with the real time operational system Xenomai.
The host computer can be **your** computer, or a computer in the **ISAE lab.** The host can use any OS (operational system): Linux, Windows or MacOS.



Remark: Be sure you have already installed Virtual Box (VB) and the Xenomai Virtual Machine (VM). See userGuideVB_ve.pdf. For installing NetBeans, see InstallingNetBeans.pdf.

1. Import a project in NetBeans:

Open NetBeans software. If you did not yet installed NetBeans, please do it. This user guide presents a project called Ex11_vm.zip. You will use projects with other names.

Navigate into the File menu: `File → Import Projet → From ZIP` as depicted in Figure 1.
The window on Figure 2 pops out: click on the Browse button beside `ZIP File`. The project is unzipped and stored by default[1] in the `Folder` homedir/NetBeansProject or ~/NetBeansProject.. In my Mac I have /Users/j.cardoso/NetBeansProjects.
The window on Figure 3 appears: choose the source directory where your ZIP file is and click on the ZIP file. You can also enter the whole address in the field `File Name` (or copy/paste).

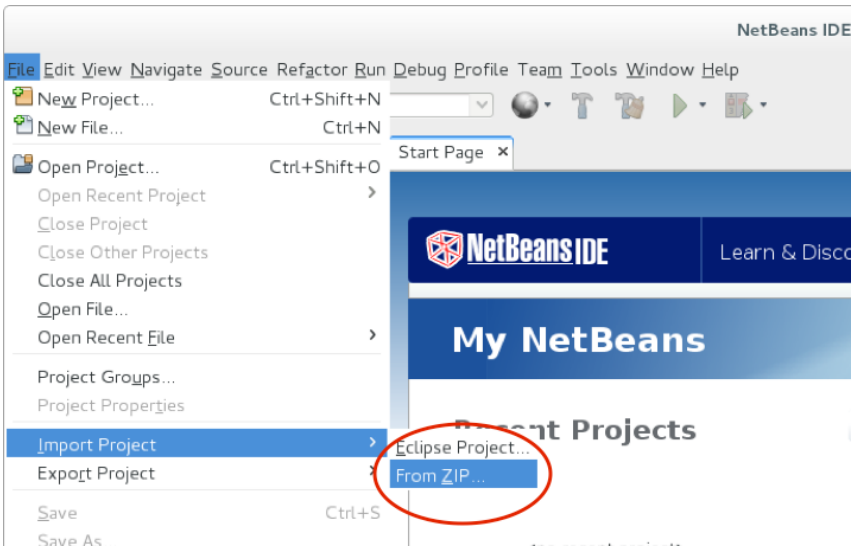


Figure 1: File → Import Projet → From ZIP.

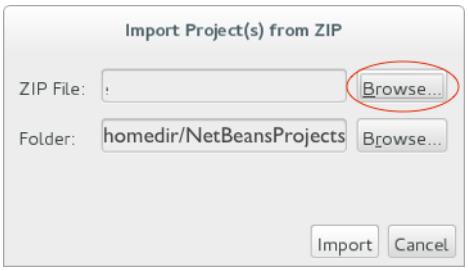


Figure 2: Browse the ZIP file.

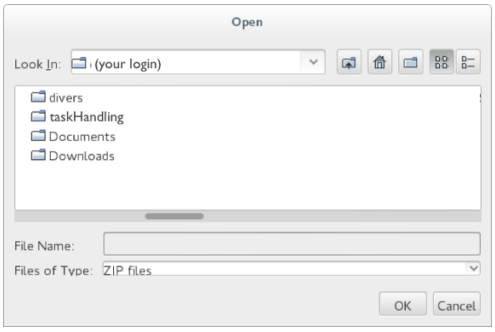
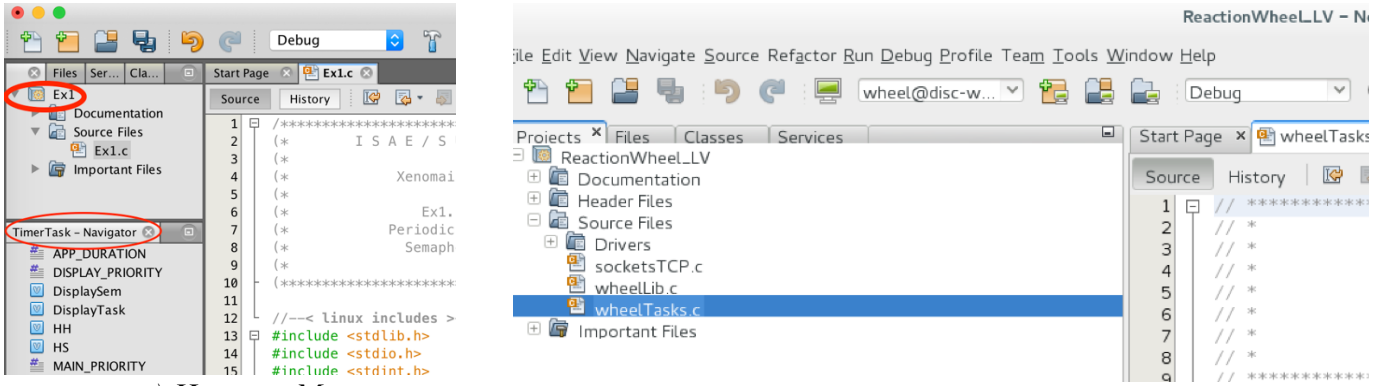


Figure 3: Choose the ZIP file.

After importing Ex1_vm.zip, open the source file `Ex1.c` in the ***Source File*** folder as indicated in Figure 4 (left upper corner of NetBeans window). In Figure 4.a, just below the project Ex1, there is the "Timer Task - Navigator", where the tasks, semaphores, priorities as well the variables of this source code can be seen.
Remark: if there is a "?" symbol on the icon of project Ex1 (on NetBeans), with the following message:

[1] If you want to change the location, see section **FAQ** "Setting up the project location".

" Some #include or #errors directive failed.", don't pay attention, the project works. After doing all the steps, you can go to Section 5 for fixing this issue.



a) Host is a Mac *b) Host is a Linux*

Figure 4: Source file: a) Ex1. c, b) ReactionWheel

2. Configuring the target "Xenomai VM":

2.1. Launch the Xenomai VM[2] (Virtual Machine) using VB (Virtual Box) software.

2.2. Add a target in the NetBeans project

Select in the ***Projects*** tab the current project (**Ex1** in Figure 4.a).
Right click on the project **Ex1**, and navigate into ***Set Build Hosts → Manage Hosts*** as indicated in Figure 5**.**
The ***Build Hosts Manager*** window on Figure 6 appears: Click on ***Add*** button.

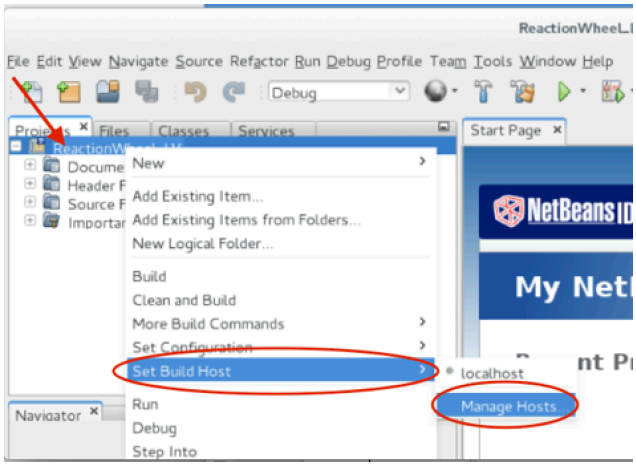


Figure 5: (Project) Set Build Hosts/Manage Hosts.

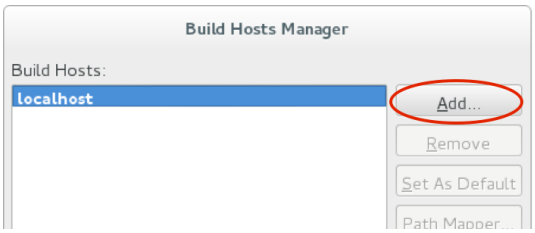


Figure 6:Build Host Manager window.

The **New Remote Host Setup** (depicted in *Figure 7: New Remote Host Setup window.*) pops out: enter or copy/paste the hostname in the **Hostname** field: **xenomailinux.local (**seen in userGuideVB_v*.pdf**).** *Then press on* ***Next*** *button***.** If the warning "Hostname cannot be associated to the port 22" appears, just close the window and launch the VM**.**

- In the ***setup Host*** step (Figure 8), in the ***login*** window, enter `root` as login name, then press the ***Next*** button. In the bottom of this window, it appears the message "Connecting to.... Done. (...)". It disappears very quickly and there is no problem[3].

[2] If the VM is not launched, the target cannot be configured and the window on **Erreur ! Source du renvoi introuvable.** may appear. In this case, click the "Close" button and launch the VM.
[3] If you want to read the whole message, when the next window appears, click the "Back" button (it is not

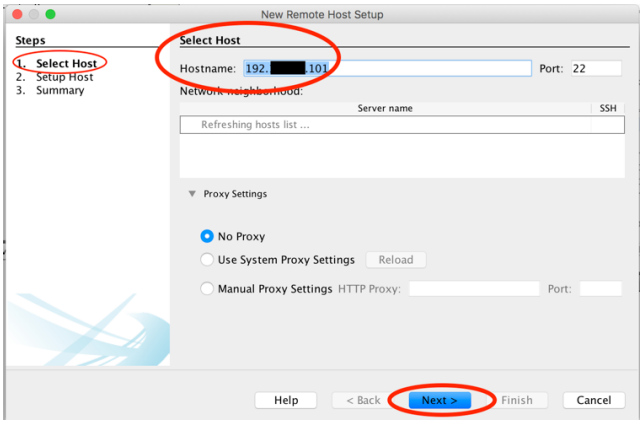


Figure 7: New Remote Host Setup window.

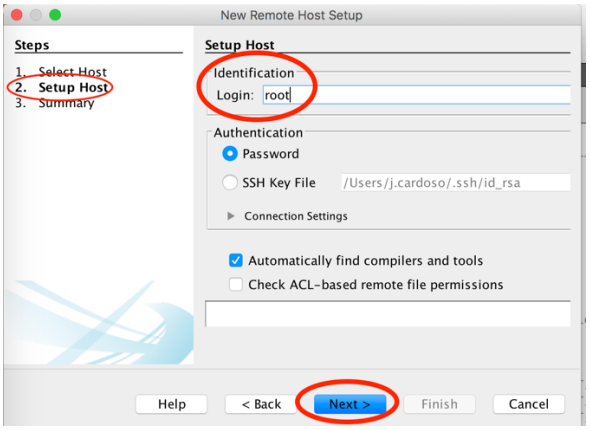
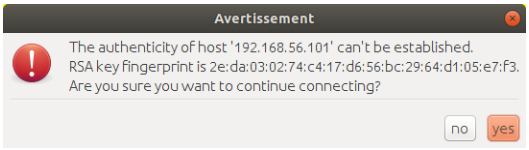


Figure 8:Setup Host, login window.

In step 2.2 "Add a target", a ***warning*** window may appear; in this case, click on the **`yes`** button.



Now, the windows of Figure 9 pops out. The "***Access project files via***" field may have the value "System level ... (NFS, Samba....)". **Change** this field to "***SFTP***", and click the "**Finish**" button. The message of Figure 11 may appear. A last window appears (Figure 10), choose the Xenomai target, **root@192.168.56.101**.
The Build Hosts Manager window on Figure 10 pops out. Select the chosen target and press ***OK.***
Remark: If a new project is added, just select the same target by choosing root@192.168.56.101 in the set build host menu.

Congratulations! You are now connected to the target where the RTOS (real time operational system) Xenomai is installed.

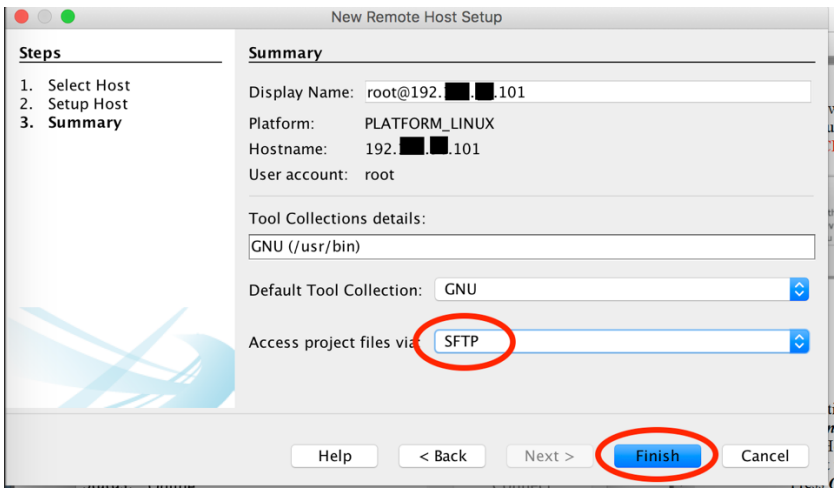


Figure 9: Summary: choose SFTP.

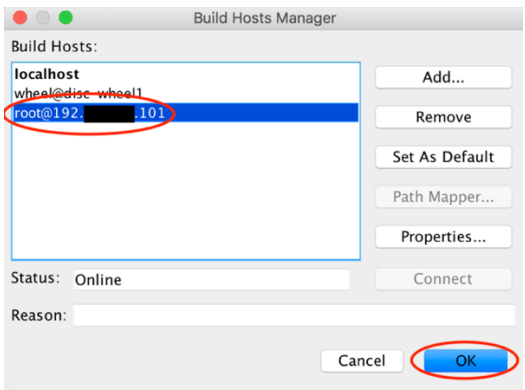


Figure 10: Select the target.

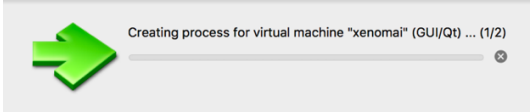


Figure 11: Message when host is selected.

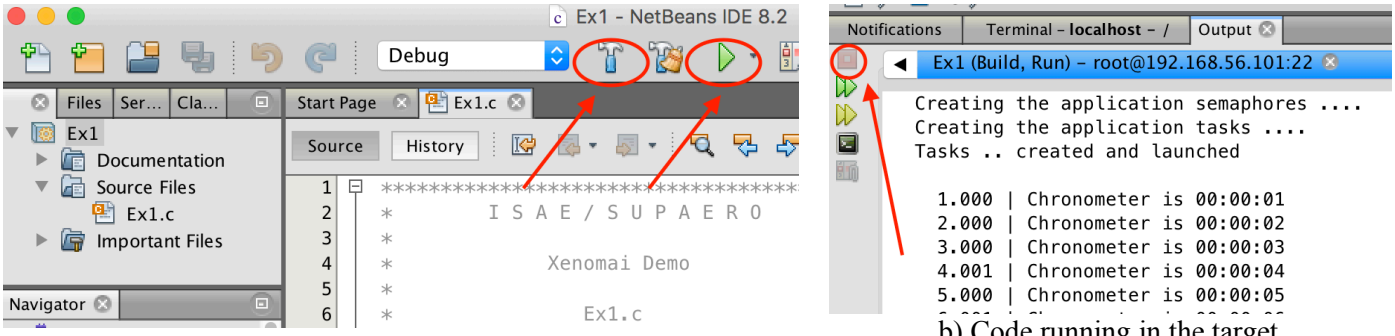
necessary). If you clicked the Back button, click the Next button for finishing the configuration.

3. Compilation and execution (Figure 12.a):

To compile the project, click on the hammer icon. To launch the execution, click on the green arrow icon. A whole NetBeans window is depicted in Figure 15.

4. Exit from execution (Figure 12.b):

To stop the execution, click on the red square in the ***output*** sub-window (left bottom of NetBeans).



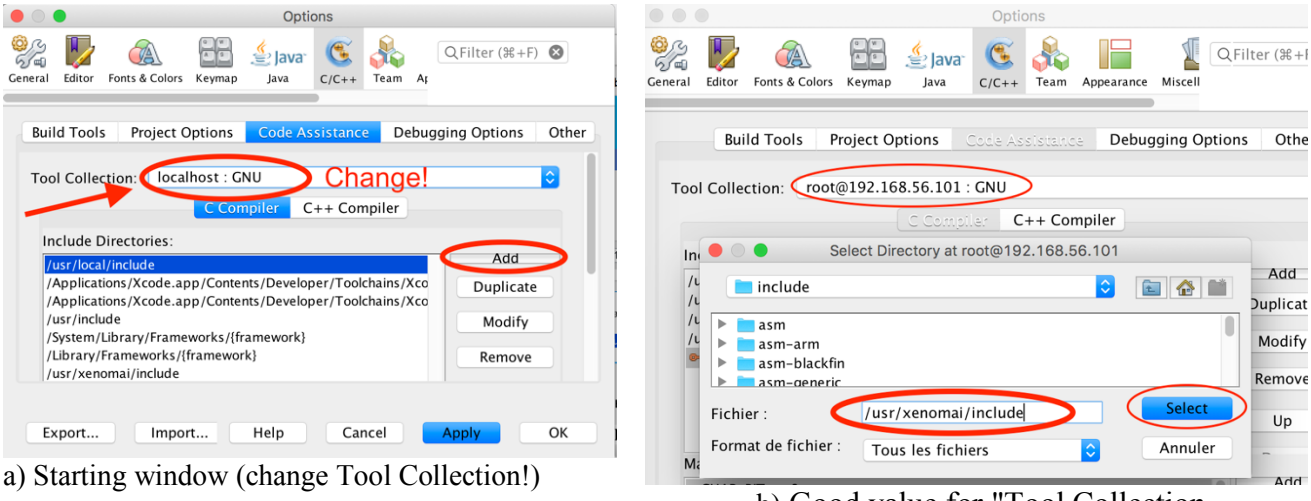
a) Hammer: compile; Green arrow: run

b) Code running in the target

Figure 12: a) Compile and run a file; b) Stopping the execution in the Xenomai target

5. Fixing the problem of icon "?" on Ex1 project

This problem appears because the syntactic analyzer does not know the files "include" on the VM Xenomai. This is not a problem for the compilation, that will be done inside the VM.
For fixing the problem got to Tools->Options (in a Mac, open NetBeans/Preference -> C/C++ -> Code Assistance -> C Compiler). The window of Figure 13.a pops out. In the field **Tool Collection**: choose **root@192.168.56.101** (If this address does not appear, be sure you performed **Step 2.2**). Then, click the "**Add**" button. A new window pops out (Figure 13.b). Notice the name of this new window is "Select Directory at root@192.168.56.101". Just write in the field Fichier (**File**) the address `/usr/xenomai/include`, or browse until find `/usr/xenomai/include` and click **Select**.



a) Starting window (change Tool Collection!)

b) Good value for "Tool Collection

Figure 13: Code Assistance/ C Compiler: a) Starting window; B) After changing "Tool Collection"

Click **Apply** then **OK**. The final result is given in in Figure 14.e: `/usr/local/include` appears in the field "Include directories", with an orange key on its left.

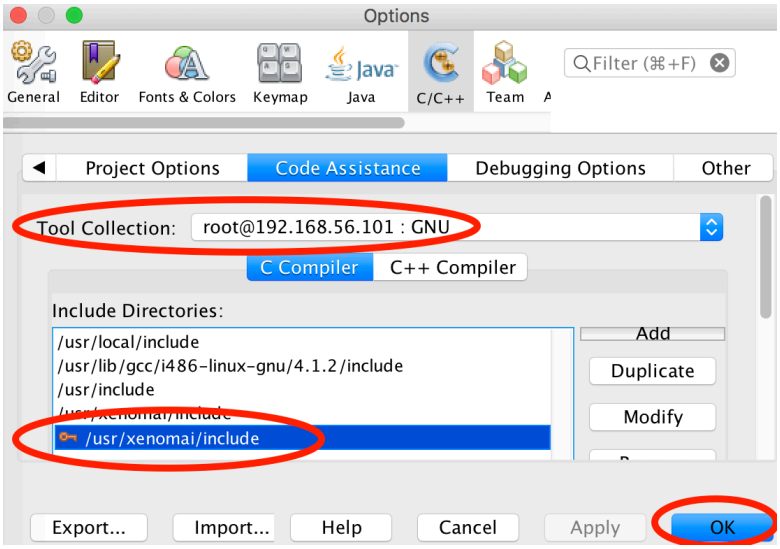


Figure 14: Fixing the problem with "?"

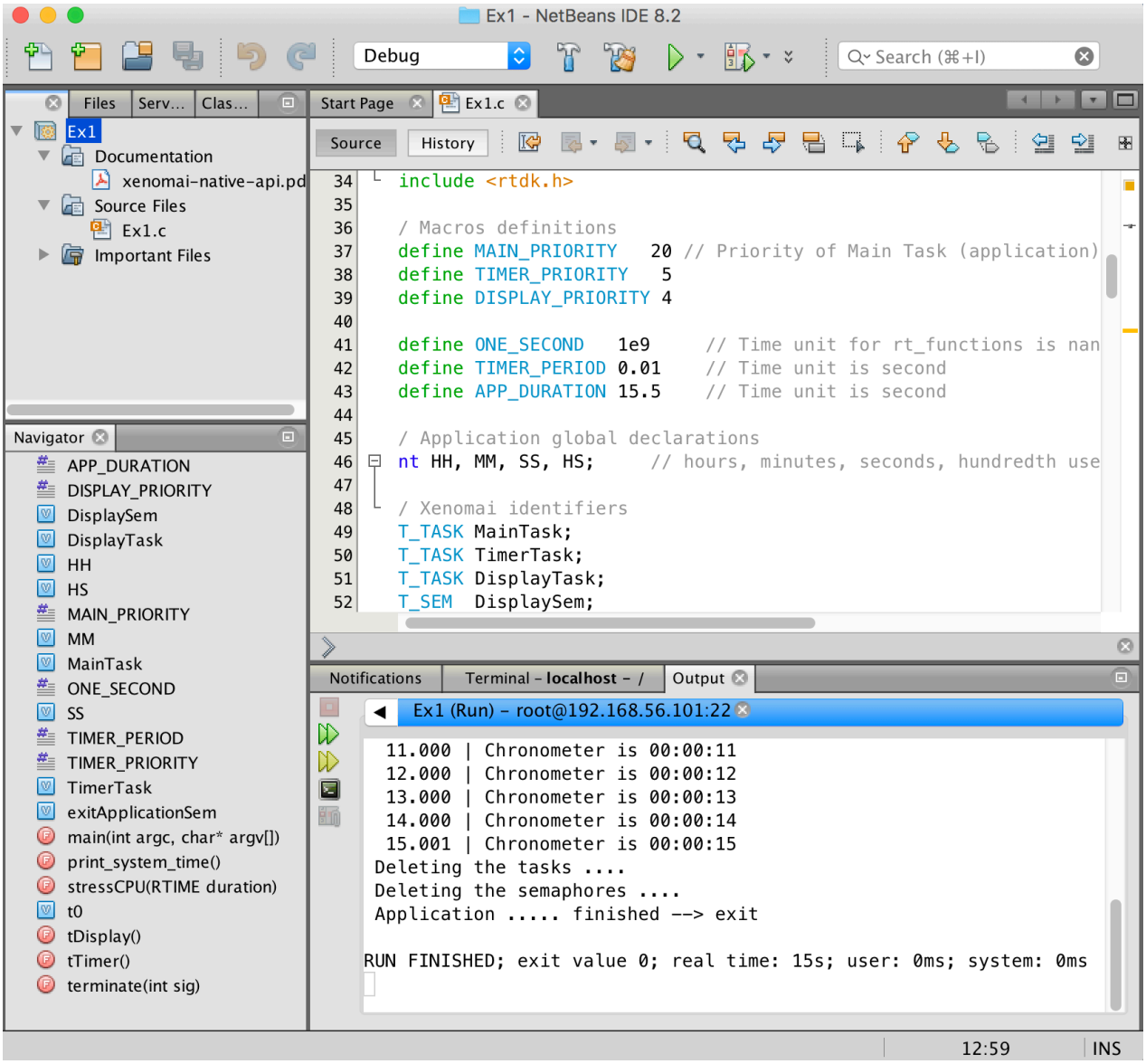


Figure 15: NetBeans 8.2 window.

7. FAQ Problems found:

7.1 Warning of Figure 16:

This warning appears when your try to open a project, and the VM *was not launched* before the configuration of the NetBeans project. Just press Close, and launch the VM (see userGuideVB_v.pdf).

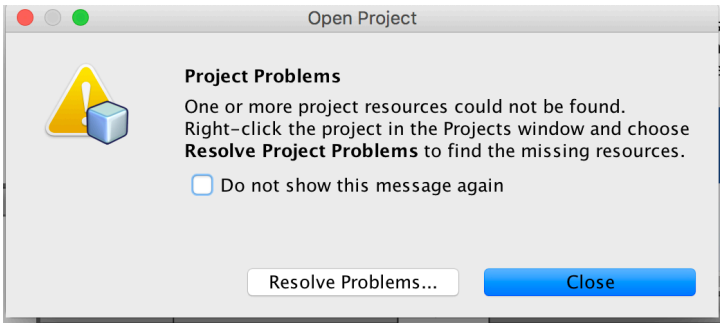


Figure 16: When the VM was not launched before configuring (warning on MacOSX).

7.2. Hostname cannot be associated to the port 22

This warning appears when your try to open a project, and the VM *was not launched* before the configuration of the NetBeans project. Just close the window, and open the VM.

7.3 Setting up the project location:

Before this step, you need to create a folder, and put inside the Ex1.zip file.
Select in the ***projects*** tab the current project, ***Ex1*** as in Figure 17. Right click, Navigate into ***Properties***: the window in Figure 18 pops out. Then click on ***General*** category. In this figure, there is already a folder in ***Project Location*** field. You can directly change the address of the folder in this field.
Remark: Notice that you import the **zip file** in NetBeans, but here you do not use the extension ".zip". Click on ***OK*** button.

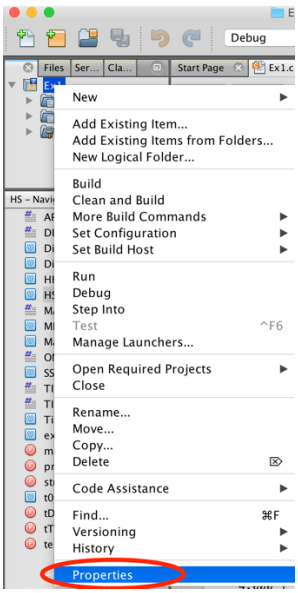


Figure 17: Select the project; right-click.

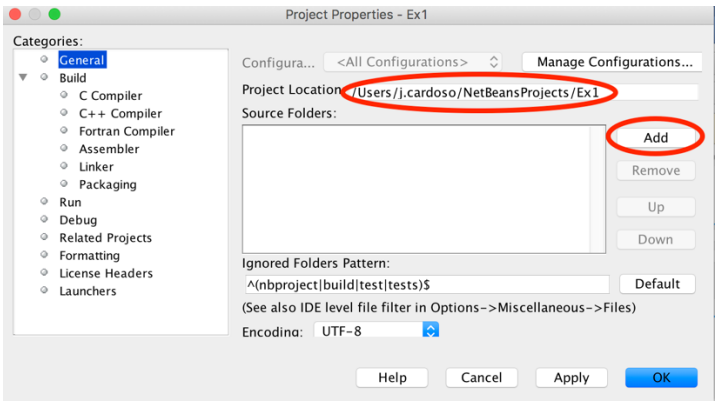


Figure 18: Project Properties window.

8. Using NetBeans at ISAE lab, with the target on the real wheel

8.1. Adding the embedded computer in the platform as a target

In ISAE lab (rooms 07.061 and 07.062), Linux session, Open a terminal, Enter the command: `netbeans &`
The netbeans windows appears.

When using the target at ISAE lab, you can choose one of the targets: `disc-wheel1` to `disc-wheel6`.
Notice that a target can be used by **only one** *user.*

In step 2.2 "Add a target", a ***warning*** window in Figure 19 may appear; in this case, click on the **`yes`** button.
When the authentication windows in Figure 20 pops out, enter `wheel` for password.
DO NOT CHECK `"Remember Password"` (The connection will crash).

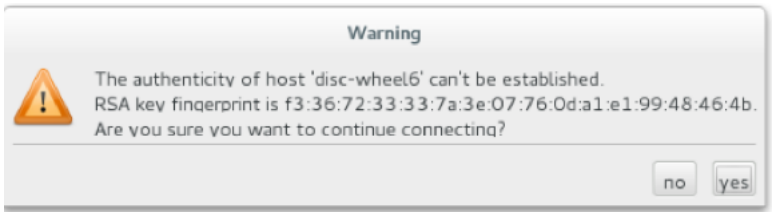


Figure 19: Warning: click Yes.

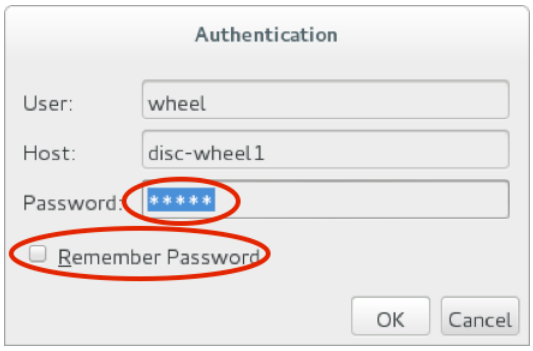


Figure 20: Do NOT remember password.

8.2. Setting up the target's terminal:

Select in the ***projects*** tab the current project, ***Ex1,*** Figure 17, Right click - Navigate into ***Properties***: the window in Figure 21pops out. Then click on ***Run*** category; in ***Console Type*** parameter, select ***Standard Output***. Click on ***OK*** button.

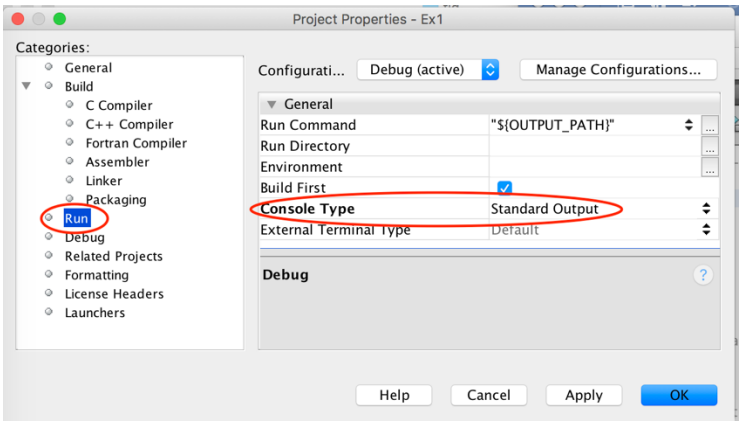
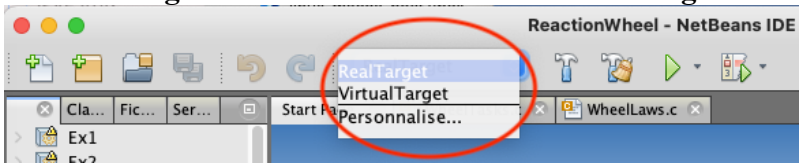


Figure 21: Project Properties window.

8.3. Running the code in the VM or in the real target

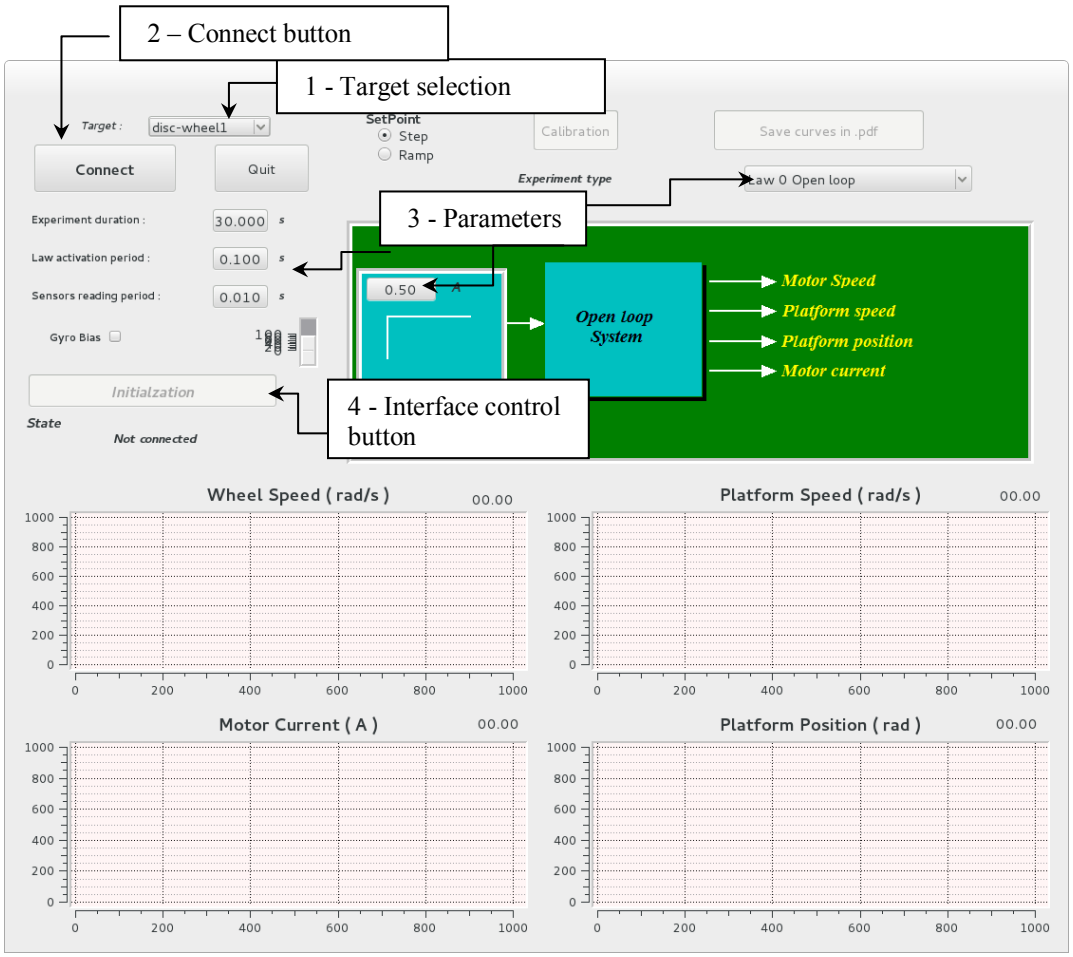


9. Human interface

Launching the interface at ISAE lab: 1) Open a terminal, 2) Enter or copy/paste the command:

Launching the interface in the VM in your computer:
In a mac, launch projRoueV6.app; in Windows, launch projRoueV6.exe.

The human interface appears:



Rationale:

- Before using the interface, The real time application must Run (see section 4)
- Choose the same target used with netbeans (disc-wheel1 to disc-wheel6) (1)
- Click on ***connect*** button (2)
- Setup the experiment parameters: (3)
  - Periods, Experiment duration, Law type, Law coefficients, Set point
- Click on the Interface control button ***(Initialization***) (4)
  The interface control button turns to ***Start***
- To start an experiment Click on ***Start*** (the experiment starts the execution)
  - the control button turns to ***Abort***
- To terminate an experiment:
  - Press on ***Abort***
  - Or wait until the experiment duration elapsed
- When an experiment is finished the interface control button returns to initialize, a new experiment can be done.
- Stop the real time application before leaving the interface.