

Why3 Installation Instructions

15-414: Automated program verification

We provide here some instructions for installing Why3 along with Alt-Ergo and Z3 (the two automated provers we will use for this class) on Ubuntu Linux and MacOS. It should not be too hard to adapt these instructions for other Linux distributions. If you happen to use Windows however, we recommend that you use the Ubuntu virtual machine that we provide on the class website (<http://www.cs.cmu.edu/~15414/labs/15-414-VM.ova>).

Instructions for MacOS

You will need the Homebrew package manager. Then:

1. Install `opam`, the OCaml package manager and libraries for why3:
`brew install hg darcs opam gtk+ gmp gtksourceview libgnomecanvas z3 autoconf`
2. Initialize `opam`: `opam init ; opam config setup -a ; eval $(opam config env)`.
Answer *yes* if queried.
3. `opam install lablgtk zarith why3 why3-ide alt-ergo`
4. Finally, setup `why3` by running `why3 config --detect-provers`. The two provers Alt-Ergo and Z3 should be detected on your system (at least).

Instructions for Ubuntu Linux

1. Install `opam`, the OCaml package manager: `sudo apt-get install opam`
2. Initialize `opam`: `opam init ; opam config setup -a ; eval $(opam config env)`.
Answer *yes* if queried.
3. `sudo apt-get install libgmp-dev libgtksourceview2.0-dev m4`

4. `opam install why3 why3-ide alt-ergo`
5. `sudo apt-get install z3`
6. Finally, setup why3 by running `why3 config --detect-provers`. The two provers Alt-Ergo and Z3 should be detected on your system (at least).

A note on versions

You should make sure that the version of Why3 that you install is 1.0.0. You can check this by running `why3 --version`. If you see a version number less than 1.0.0, then you should upgrade as follows:

1. `opam remove why3`
2. Make sure that the `.why3.conf` file in your home directory is removed.
3. `opam upgrade; opam update`
4. `opam install why3 why3-ide`
5. `why3 config --detect-provers`

Setting up the virtual machine

1. Download the VM at <http://www.cs.cmu.edu/~15414/labs/15-414-VM.ova>.
2. Install the latest version of Oracle VirtualBox.
3. Launch VirtualBox, go to “*Files/Import Appliance*” and select the file above.
4. Start the virtual machine, and then you’re done: everything you need is already pre-installed.

Installing a text editor for WhyML

There are WhyML plugins for Emacs and Atom. If you have no experience with Emacs, we recommend that you use the atom plugin. If you do not have a strong preference, you are encouraged to use the editor included with the Why3 IDE.

- To install the Atom plugin, start Atom (<https://atom.io/>) and go to Preferences/Install. Search for `language-whyml`.
- To install the Emacs plugin, download `why3.el` at

`https://gist.github.com/sagotch/46a92bcc41abfecf4d79`

and put in in your `~/.emacs.d/lisp/` folder. Then, add the following lines to your `.emacs` file:

```
(add-to-list 'load-path "~/.emacs.d/lisp/")  
(load "why3.el")
```