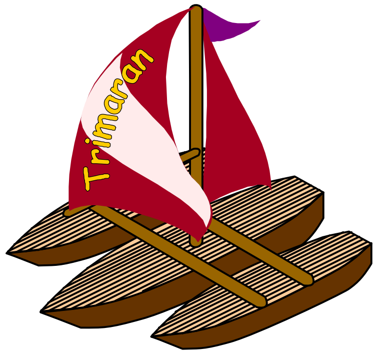

Installing and Running the Trimaran System

1. System Requirements

Trimaran requires your system to have certain packages installed. Some of these requirements may be relaxed in future releases, but for now they must be followed exactly. The install script will test for all of these, so if you like you can skip this section and come back to it if you have trouble.

These packages must be in the PATH both during installation and during usage.

- Trimaran currently runs on HP systems running HP-UX 10.20 or higher, as well as platforms running RedHat Linux 5.2+
- Trimaran requires 300 MB of disk space for complete installation
- Ability to run jobs as big as 256Meg. For some of the larger SPEC benchmarks, at least 1 GB of virtual memory and at least 256 MB of real memory is recommended.
    - HPUX kernel parameters will need to be changed. By default, the maximum process size is usually set to 64Megs.

2. LINUX and HPUX Required packages

TCL 8.0p2 (binary named "tclsh"), 8.1a2+ should work.
for HPUX, Available at

http://salam.cae.wisc.edu/hppd/hpux/Tcl/tcl-8.0p2/

Tk 8.0p2 (binary named "wish"), 8.1a2+ should work.
for HPUX, Available at

http://salam.cae.wisc.edu/hppd/hpux/Tcl/tk-8.0p2/

Perl 5.0p3+ (binary named "perl")
for HPUX, Available at

http://hpux.cae.wisc.edu/hppd/hpux/Languages/perl-5.004_04/

gnumake version 3.76.1 to be installed as "*gnumake*" **and** "*make*".
for HPUX, Available at

http://hpux.cae.wisc.edu/hppd/hpux/Gnu/make-3.76.1/

for LINUX, Available at

http://www.gnu.org

imake current version of 'imake' (usually the version included with HPUX will not work), including the 'make depend' portion to be installed and place in your path.
For HPUX and LINUX Available at

http://www.primate.wisc.edu/software/imake-book/index.html

- *We strongly recommend installing itools-R6.3.tar.gz (from the above web site), since it is known to be compatible with IMPACT's Imakefiles.*

GNU **gzip** *and* **gunzip** to be installed and placed in your path.
for HPUX, Available at

http://hpux.cae.wisc.edu/hppd/hpux/Gnu/gzip-1.2.4/

- for LINUX, Available at
  http://www.gnu.org

gcc (version 2.8.1) for C++ compilation, and packages required by gcc
for HPUX, Available at

http://hpux.cae.wisc.edu/hppd/hpux/Gnu/gcc-2.8.1
http://hpux.cae.wisc.edu/hppd/hpux/Gnu/binutils-2.9.1/
http://hpux.cae.wisc.edu/hppd/hpux/Gnu/sed-3.02

for LINUX, Available at

http://www.gnu.org

For HPUX systems: if aCC is used for C++ compilation, then cc must be used for C compilation, and NOT gcc

- **aCC** version A.01.12 or greater
- **cc** version G.10.32.05 HP ANSI C Compiler, not the bundled version. An older cc version is acceptable but we recommend patching cc to a current version.

Trimaran defaults to using gcc for both C and C++. To use aCC and/or HP cc, set the variables CC and CXX in your environment before using Trimaran's install script - Please read the Installation section for proper settings.

GNU **ar** version 2.9.1
for HPUX, Available at
    http://hpux.cae.wisc.edu/hppd/hpux/Gnu/binutils-2.9.1

for LINUX, Available at
    http://www.gnu.org

GNU **ranlib** version 2.9.1
for HPUX, Available at
    http://hpux.cae.wisc.edu/hppd/hpux/Gnu/binutils-2.9.1

for LINUX, Available at
    http://www.gnu.org

xterm

emacs, invoked by the Trimaran GUI to edit a machine description
for HPUX, Available at
    http://salam.cae.wisc.edu/hppd/hpux/Editors/emacs-20.3/
    previous versions are also acceptable

for LINUX, Available at
    http://www.gnu.org

tcsh

Dot - *Graph visualizing tool*
for HPUX and LINUX, Available at
    http://www.research.att.com/sw/tools/graphviz/

vcg (binary named "*xvcg*") - *Graph visualizing tool*
for HPUX and LINUX, Available at
    http://www.cs.uni-sb.de/RW/users/sander/html/gsvcg1.html

3. Installation

using the install script

Before running the *install* script, you may wish to set the variables CC and CXX in your environment. The CC variable is used for ANSI C compilation and may be set to either "**gcc**" or "**cc -Aa +DA1.1**". For HPUX users, If you wish to use **aCC** for C++ compilation then CC must be set to "**cc -Aa +DA1.1**" (and CXX to aCC). The *install* script takes care to set any other environment variables.

To begin the installation process, type "**./install >& install.log**" or "**./install | tee -a install.log**" at your shell prompt (*Note that the **tee** utility pipes the output of the install script to both the screen **and** the specified file - install.log in this case. **tee** does not however redirect standard output! Also note the "**>&**" redirection is shell dependent*). If you encounter trouble using the install script, consult the Trouble Shooting Section, if you still can not resolve the problem, consult the Manual Installation Section below.

Executing "**grep Error install.log**" and **"grep Exit install.log**" and getting no output indicates a successful installation. If you encounter compilation errors or other problems please see the Trouble Shooting Section.

Once the install script has successfully completed, you will have a functional Trimaran distribution. Trimaran is designed to be installed in a multi-user setting. The first time a user invokes the Trimaran GUI (**trimaran/bin/trimaran-gui**) a local workspace is created for the user to hold their files. The default location for this is ***~/trimaran-workspace***. If you want to override this default, then set the environment variable **TRIMARAN_WORKSPACE** to the desired path in your shell initialization files. In general, there is no need to do this.

Users of the system may also want to add ***trimaran/bin*** to their *path* or a system administrator could add it to the central initialization file for user shells.

From the Trimaran GUI, you may wish to run the following test benchmarks to verify proper installation and platform compatibility:

1. test_install
2. mismatch_test
3. switch_test
4. type_test
5. varargs_test

manual installation

Complete Trimaran compilation requires the compilation of the ***impact, elcor, simu,*** and ***gui*** directories. Refer to respective directories for installation instructions.

4. Directory Structure

For the interested, the directory structure of the Trimaran release is as follows:

benchmarks/	Set of benchmarks released with Trimaran
bin/	Trimaran compilation scripts, and sample environment variables
elcor/	Backend HPL-PD optimizations on intermediate representation from HP-CAR
gui/	Trimaran Grahpical User Interface from NYU
impact/	Front end and optimizations on intermediate representation from UIUC
simu/	Trimaran HPL-PD simulator and performance monitoring tools from NYU

In each user's workspace, pointed to by the environment variable **TRIMARAN_WORKSPACE** or the default location ***~/trimaran-workspace***:

benchmarks/	Links to the distributed set of benchmarks for use with Trimaran. Users can create new benchmarks here.
machines/	HMDES2 format machine descriptions
parms/	Parameter sets for compilation
projects/	The place where all intermediate and result files are stored after a compilation.
temp/	A temporary workspace for the Trimaran GUI

5. Troubleshooting

Problem: *When I run the GUI I get an error saying it can't find package "cde".*

Solution: Either make sure the environment variable **TRIMARAN_REL_PATH** is not set or make sure you have set **TRIMARAN_REL_PATH** to the place where Trimaran is installed. In general it shouldn't be necessary to set this variable.

Problem: *When I run the GUI I get a message saying it is my first time running the GUI but I've already used the GUI before.*

Solution: If you set the environment variable **TRIMARAN_WORKSPACE** when you first ran the GUI, make sure you have it set to the same value every time you run the GUI. An easy way to do this is to set **TRIMARAN_WORKSPACE** in your shell's initialization file.

Problem : *I want to use HP **cc** and/or **aCC** for compilation and I don't know how.*

Solution : Trimaran defaults to using **gcc** for both C and C++. To use **aCC** and/or HP **cc**, set the variables CC and CXX in your environment before using Trimaran as shown:

setenv CC "**cc -Aa +DA1.1**"
setenv CXX "**aCC**"

Problem : *I'm trying to use **aCC** for C++ and **gcc** for C compilation but its not working.*

Solution : It won't work. Only HP **cc** works with **aCC**.

Problem : *I hate trying to remember the path to trimaran!*

Solution : Add "your_path_to_trimaran"/bin to your *path* in your shell initialization file.

Problem : The install script says that **make** isn't really **gnumake**, but it is!

Solution : Maybe you have a **make** earlier in your path that is getting picked up before the real **make** (**gnumake**). Check "**which make**" and adjust your path if necessary.

If your problem does not appear above, please send us a detailed bug report stating exactly what you did up to the point where you had the problem and your system configuration. You can find our contact information in Section 8 : Contacting the Trimaran Team.

6. Using Trimaran – The Trimaran GUI

Trimaran provides a GUI based approach to carry out ILP (instruction-level parallelism) experiments with the Trimaran compiler system. The command **trimran-gui** launches this GUI. The main panel of the GUI holds buttons that spawn various other windows to help configure the system. A brief description of each of these windows is given below. Please browse through the online help in the GUI for a more detailed usage.

The ***Compile*** window is used to select a Project, compile the source code and execute its object code. A Project is a collection of source files and parameter settings associated with a compilation.

The ***Machine*** window allows one to create a customized version of the HPL-PD processor or to select one from a list of pre-configured processors. The selected processor will be used by the compiler as the target architecture for compilation.

The ***Parameters*** window allows one to set the parameters in the compiler's front-end (***impact***), the back-end (***elcor***), and the HPL-PD simulation environment (***simulator***).

The ***Statistics*** window is used to view and compare statistical information collected from the different runs of the executable. The information is rendered in various forms such as pie-charts, bar-diagrams, etc.

The ***View IR*** button allows one to view the IR (Internal representation) of the control flow graph used by the back-end (**elcor**). It provides navigation mechanisms to move through the graph and view the various components in it.

The ***Projects*** window allows one to browse through the items in a Project. A Project is a collection of source files and parameter settings associated with a compilation.

The ***Configuration*** window allows one to customize this GUI.

7. Using Trimaran – The Trimaran C Compiler *tcc*

The Trimaran C Compiler can be found in the ***trimaran/bin*** directory. Type "**tcc –help"** for usage.

8. Contacting the Trimaran team

The Trimaran team can be contacted at support@trimaran.org
Bug reports should be sent to bugreport@trimaran.org