Installation report for CadfaelBrew on Xubuntu Linux 14.04 (LTS)

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2016-06-28

Version: 0.2

This note explains the CadfaelBrew installation procedure on Xubuntu Linux 14.04 (LTS) (64-bits). CadfaelBrew is a package manager, derived from the Linux/Homebrew projects. It allows you to install various software *formulas*. Thanks to the generic `brew` utility, you will be able to install the *Cadfael* formula which includes Boost, CAMP, CLHEP, ROOT, Geant4... that is all the software you need to run Bayeux and the SuperNEMO software. Other formulas can also be added (Bayeux, Falaise...). This is out of the scope of this document which concentrates on the installation of the basic layer of CadfaelBrew and Cadfael formulas.

CadfaelBrew is hosted at https://github.com/SuperNEMO-DBD/.

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Contents

Preparation

a. Requirements:
   - A working network connection
   - Bash shell

b. The working directory:
   In this report, the `/data3/sw/SuperNEMO-DBD` directory will be used as the base working directory to build and install the software. You are free to choose any other location on your system, provided there is enough space on it (~10 GB).

```
$ export SNSW_BASE_DIR="/data3/sw/SuperNEMO-DBD"
$ mkdir -p ${SNSW_BASE_DIR}
$ cd ${SNSW_BASE_DIR}
$ git clone https://github.com/SuperNEMO-DBD/brew.git ./CadfaelBrew
$ export PATH="${SNSW_BASE_DIR}/CadfaelBrew/bin:${PATH}"
$ export MANPATH="${SNSW_BASE_DIR}/CadfaelBrew/share/man:${MANPATH}"
$ export INFOPATH="${SNSW_BASE_DIR}/CadfaelBrew/share/info:${INFOPATH}"
```

c. Install mandatory packages:

```
bash$ LANG=C sudo apt-get install \
       build-essential \
       curl \
       git \
       m4 \
       ruby \
       texinfo \
       libbz2-dev \
       libcurl4-openssl-dev \
       libexpat-dev \
       libncurses-dev \
       zlib1g-dev \
       libxmu-dev
```

Prepare the installation

The following steps are not mandatory. It depends on the available storage on your filesystem. By default, CadfaelBrew uses the `~/.cache/Homebrew` directory as the download cache directory. If your home directory has not enough space left, you will need to define the `HOMEBREW_CACHE` environmental variable to another location of your filesystem.

Also CadfaelBrew uses the `/tmp` directory as the temporary location to build the software. If the disk partition hosting this directory has not enough space left, you will need to define the `HOMEBREW_TEMP` environmental variable.

Examples:

a. Here we create a directory that will be used as the cache directory to download source tarballs. This directory must be large enough to endure at least 500 MB of downloaded files (source tarballs, patch files, Geant4 datasets...).

```
bash$ mkdir -p /data3/var/cache/Homebrew
bash$ export HOMEBREW_CACHE=/data3/var/cache/Homebrew
```

b. Here we create a directory that will be used as the temporary build directory for all software packages (formulas). This directory must be large enough to endure at least 4 GB of temporary files (mainly because compiling GCC uses a huge amount of disk space).

```
bash$ mkdir -p /data3/var/tmp
bash$ export HOMEBREW_TEMP=/data3/var/tmp
```

Build and install CadfaelBrew base software

The `cadfael-bootstrap` formula is provided to automate the installation of CadfaelBrew core software packages (formulas) needed to build Bayeux and the SuperNEMO software.

a. Brew it!

```
bash$ brew cadfael-bootstrap
...
```

This is a rather long process, particularly because the GCC compiler (version 4.9) is built and installed (~35 min on this system). Geant4 and Root are also rather long to build. All the software will be installed in `/data3/sw/CadfaelBrew`. The full installation uses approximatively 3 GB.

Install formulas

Now CadfaelBrew is setup, we can install useful formulas on top of which Bayeux will be installed:

```
bash$ brew sh --cc=gcc-4.9
bash$ export HOMEBREW_CACHE=/data3/var/cache/Homebrew
bash$ export HOMEBREW_TEMP=/data3/var/tmp
bash$ brew install supernemo-dbd/cadfael/boost
bash$ brew install supernemo-dbd/cadfael/camp
bash$ brew install supernemo-dbd/cadfael/clhep
bash$ brew install supernemo-dbd/cadfael/xerces-c
bash$ brew install supernemo-dbd/cadfael/geant4 --with-opengl-x11
bash$ brew install supernemo-dbd/cadfael/root5
```

We do not install qt5 here. We will use Ubuntu Qt5 system install.

Setup CadfaelBrew for your environment

To activate CadfaelBrew in your environement, you have two possibilities:

a. You can use the `brew.sh` script provided by CadfaelBrew. In your `~/.bashrc` startup file, define:

```
alias brewsh='/data3/sw/SuperNEMO-DBD/CadfaelBrew/bin/brew sh --cc=gcc-4.9'
```

Then, each time you need to use CadfaelBrew or some software managed by it, you just type in your shell:

```
bash$ brewsh
bash$ # ... you can now work with brewed software ...
```

This will start a dedicated shell with all CadfaelBrew software activated. To leave this environment, type:

```
bash$ exit
```

b. Alternatively, you can define a specific Bash function in your `~/.bashrc` startup file:

```
function do_cadfaelbrew_setup()
{
   if [ -n "${CADFAELBREW_INSTALL_DIR}" ]; then
       echo "WARNING: CadfaelBrew is already setup !" >&2
       return 1
   fi
   export CADFAELBREW_INSTALL_DIR="/data3/sw/CadfaelBrew"
   export MANPATH="${CADFAELBREW_INSTALL_DIR}/share/man:${MANPATH}"
   export INFOPATH="${CADFAELBREW_INSTALL_DIR}/share/info:${INFOPATH}"
   mkdir -p /data3/var/cache/Homebrew
   export HOMEBREW_CACHE=/data3/var/cache/Homebrew
   mkdir -p /data3/var/tmp
   export HOMEBREW_TEMP=/data3/var/tmp
   ${CADFAELBREW_INSTALL_DIR}/bin/brew sh --cc=gcc-4.9
   echo "NOTICE: CadfaelBrew is now setup !" >&2
   return
}
export -f do_cadfaelbrew_setup
```

You can thus activate a CadfaelBrew shell :

```
bash$ do_cadfaelbrew_setup
```

To leave this environment, type:

```
bash$ exit
```