Installation of Cadfaelbrew on Xubuntu Linux 16.04 LTS

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This note reports how I have built and installed Cadfaelbrew on my Xubuntu Linux 16.04 LTS (xenial) system.
Links:

- DocDB 3738
- https://github.com/SuperNEMO-DBD/brew

System

- OS: Xubuntu Linux 16.04 LTS
- Architecture: `x86_64`
- Processors: 4 x Intel(R) Core(TM) i7-3540M CPU @ 3.00GHz

Requirements

Installed packages

```
$ doxygen --version
1.8.11

$ g++ --version
g++ (Ubuntu 5.4.0-6ubuntu1~16.04.4) 5.4.0 20160609

$ make --version
GNU Make 4.1

$ git --version
git version 2.7.4
```

System dependencies

```
$ LANG=C sudo apt-get install \
    build-essential \
    curl \
    git \
    m4 \
    ruby \
    texinfo \
    libbz2-dev \
    libcurl4-openssl-dev \
    libexpat-dev \
    libncurses-dev \
    zlib1g-dev \
    libx11-dev \
    libxpm-dev \
```

```
    libxft-dev \
    libxext-dev \
    libpng-dev \
    libjpeg-dev \
    libxmu-dev \
    libgl1-mesa-dev \
    libglu1-mesa-dev
```

Disk storage

In this report, the `/opt` directory is used to host the Cadfaelbrew build/installation tree. At least 6 GB must be available.

```
$ LANG=C df /opt
Filesystem     1K-blocks    Used Available Use% Mounted on
/dev/sda11      34471692 3851676  28845888  12% /opt
```

You may also choose the `${HOME}` directory.

Installation

1. Prepare working directory:

   ```
   $ sudo chmod 1777 /opt # Allow installation in /opt by a standard user
   $ export SNSW_BASE_DIR=/opt/sw/SuperNEMO-DBD
   $ mkdir -p ${SNSW_BASE_DIR}
   ```

   It may be useful to define some specific directories used by the brew build process. You can choose the cache and temporary directories used during the building of Cadfaelbrew formulae with:

   ```
   $ mkdir -p /opt/var/cache/Homebrew
   $ export HOMEBREW_CACHE=/opt/var/cache/Homebrew
   $ mkdir -p /opt/var/tmp
   $ export HOMEBREW_TEMP=/opt/var/tmp
   ```

   This will supersede the default cache and tmp dirs.

2. Download the software:

   ```
   $ 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}"
   $ which brew
   /opt/sw/SuperNEMO-DBD/Cadfaelbrew/bin/brew
   ```

3. Bootstrap:

   ```
   $ brew update
   ==> Tapping supernemo-dbd/cadfael
   Clonage dans '/opt/sw/SuperNEMO-DBD/Cadfaelbrew/Library/Taps/supernemo-dbd/homeb
   remote: Counting objects: 359, done.
   remote: Total 359 (delta 0), reused 0 (delta 0), pack-reused 359
   Réception d'objets: 100% (359/359), 83.84 KiB | 0 bytes/s, fait.
   Résolution des deltas: 100% (219/219), fait.
   ```

```
Vérification de la connectivité... fait.
Tapped 14 formulae (41 files, 242.6K)
==> Pinned supernemo-dbd/cadfael
Already up-to-date.

$ brew cadfael-bootstrap
...
==> Bootstrap of toolchain complete, installed formulae
zlib 1.2.8
xz 5.2.2
readline 6.3.8_1
gdbm 1.12
sqlite 3.13.0
makedepend 1.0.5
pkg-config 0.29.1_1
gettext 0.19.8.1
ninja 1.7.1
curl 7.50.1
gnu-getopt 1.1.6
sphinx-doc 1.4.5
libidn 1.33
openssl 1.0.2h_1
libxml2 2.9.4
gpatch 2.7.5
ncurses 6.0_1
unzip 6.0_2
python 2.7.12_1
bzip2 1.0.6_1
cmake 3.6.1
git-flow-avh 1.9.1
patchelf 0.9_1
Bootstrap of CadfaelBrew complete under

/opt/sw/SuperNEMO-DBD/Cadfaelbrew

To use the programs and libraries supplied by Cadfael you can:

1. (Recommended) Use brew's setup facility to start a new shell session
   with the environment correctly configured:

   $ /opt/sw/SuperNEMO-DBD/Cadfaelbrew/bin/brew sh

   This starts a new shell with PATH and other environment variables
   set correctly. Just exit the shell to return to your original session.

2. Set the following environment variables either directly in your
   shell's .rc file or through the configuration mechanism of your choice
   (e.g. Environment Modules)

   PATH="/opt/sw/SuperNEMO-DBD/Cadfaelbrew/bin:$PATH"
   MANPATH="/opt/sw/SuperNEMO-DBD/Cadfaelbrew/share/man:$MANPATH"
   INFOPATH="/opt/sw/SuperNEMO-DBD/Cadfaelbrew/share/info:$INFOPATH"

In both cases that should be all that's needed, though certain use cases
may also required the dynamic loader or Python path to be set. This is
```

```
to be reviewed.

$ brew ls
bzip2  gdbm       gnu-getopt  libxml2     ninja     pkg-config  sphinx-doc  xz
cmake  gettext            gpatch      makedepend  openssl   python      sqlite
curl   git-flow-avh  libidn   ncurses     patchelf  readline    unzip
```

4. Installation of third-party software:

```
$ brew sh
$ LANG=C tree ./Cadfaelbrew/Library/Taps/supernemo-dbd/homebrew-cadfael
...
$ brew search boost
$ brew install supernemo-dbd/cadfael/boost
$ brew install supernemo-dbd/cadfael/camp
$ brew install supernemo-dbd/cadfael/clhep
$ brew install supernemo-dbd/cadfael/xerces-c
$ brew install supernemo-dbd/cadfael/geant4
$ brew install supernemo-dbd/cadfael/root5
```

Setup

In Bash (`~/.bashrc`) :

```
export SNSW_BASE_DIR="/opt/sw/SuperNEMO-DBD"
function do_cadfaelbrew_setup()
{
  if [ -n "${CADFAELBREW_INSTALL_DIR}" ]; then
     echo >&2 "[warning] do_cadfaelbrew_setup: Cadfaelbrew is already setup !"
     return 1
  fi
  export CADFAELBREW_INSTALL_DIR="${SNSW_BASE_DIR}/Cadfaelbrew"
  export PATH="${CADFAELBREW_INSTALL_DIR}/bin:${PATH}"
  if [ -n "${MANPATH}" ]; then
     export MANPATH="${CADFAELBREW_INSTALL_DIR}/share/man:${MANPATH}"
  else
     export MANPATH="${CADFAELBREW_INSTALL_DIR}/share/man"
  fi
  if [ -n "${INFOPATH}" ]; then
     export INFOPATH="${CADFAELBREW_INSTALL_DIR}/share/info:${INFOPATH}"
  else
     export INFOPATH="${CADFAELBREW_INSTALL_DIR}/share/info"
  fi
  echo >&2 "[info] do_cadfaelbrew_setup: Cadfaelbrew is setup."
  return 0;
}
alias cadfaelbrew_setup='do_cadfaelbrew_setup'
```

Test

Activate the software managed by Cadfaelbrew:

```
$ cadfaelbrew_setup
```

Testing CLHEP (brew version) :

```
$ which clhep-config
/opt/sw/SuperNEMO-DBD/Cadfaelbrew/bin/clhep-config
```

Testing GSL (brew version) :

```
$ which gsl-config
/opt/sw/SuperNEMO-DBD/Cadfaelbrew/bin/gsl-config
$ gsl-config --prefix
/opt/sw/SuperNEMO-DBD/Cadfaelbrew/Cellar/gsl/1.16
```

Testing Root (brew version) :

```
$ which root
/opt/sw/SuperNEMO-DBD/Cadfaelbrew/bin/root
$ root
...
root [0] .q
```

Entering a brew shell

You may need to enter a brew shell in order to run specific operations:

```
$ cadfaelbrew_setup
$ brew sh
brew>   # this is a brew shell
...
brew> exit
$       # back to the 'normal' shell
```