Open CASCADE Technology

Guide for building third-party products on Linux

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1. INTRODUCTION

This document presents additional guidelines for building third-party products used by Open CASCADE Technology and samples on Linux platform (Mandriva 2008 and Debian 4.0).

The links for downloading the third-party products are available on the web site of OPEN CASCADE SAS at http://www.opencascade.org/getocc/require/.

There are two types of third-party products, which are necessary to build OCCT:

a) Mandatory products: Tcl 8.5, Tk 8.5, FreeType 2.4.10

b) Optional products: TBB 3.x or 4.x, gl2ps 1.3.5, FreeImage 3.14.1

2. BUILDING MANDATORY THIRD-PARTY PRODUCTS

2.1. Tcl/Tk 8.5

Tcl/Tk is required for DRAW test harness. Version 8.5 or 8.6 can be used with OCCT.

2.1.1. installation from binaries

It is possible to download ready-to-install binaries from
http://www.activestate.com/activetcl/downloads
1. Download the binaries archive and unpack them to some <TCL_SRC_DIR>.
2. Enter the directory <TCL_SRC_DIR>.
cd <TCL_SRC_DIR>
3. Run the install command
install.sh
and follow instructions.

2.1.2. Installation from sources: Tcl 8.5

Download the necessary archive from http://www.tcl.tk/software/tcltk/download.html and unpack it.
1. Enter the unix sub-directory of the directory where the source files of Tcl are located (<TCL_SRC_DIR>).
cd <TCL_SRC_DIR>/unix
2. Run the configure command
configure --enable-gcc --enable-shared --enable-threads --prefix=<TCL_INSTALL_DIR>
For a 64 bit platform also add --enable-64bit option to the command line.
3. If the configure command has finished successfully, start the building process
make
4. If building is finished successfully, start the installation of Tcl. All binary and service files of the product will be copied to the directory defined by <TCL_INSTALL_DIR>
make install

2.1.3. Installation from sources: Tk 8.5

Download the necessary archive from http://www.tcl.tk/software/tcltk/download.html and unpack it.
1. Enter the unix sub-directory of the directory where the source files of Tk are located (<TK_SRC_DIR>).
cd <TK_SRC_DIR>/unix
2. Run the configure command, where <TCL_LIB_DIR> is <TCL_INSTALL_DIR>/lib
configure --enable-gcc --enable-shared --enable-threads --with-tcl=<TCL_LIB_DIR> --prefix=<TK_INSTALL_DIR>
where <TCL_LIB_DIR> is <TCL_INSTALL_DIR>/lib
For a 64 bit platform also add --enable-64bit option to the command line.
3. If the configure command has finished successfully, start the building process
make

4. If building has finished successfully, start the installation of Tk. All binary and service files of the product will be copied to the directory defined by <TK_INSTALL_DIR> (usually <TK_INSTALL_DIR> is <TCL_INSTALL_DIR>)
make install

2.2. FreeType 2.4.10

FreeType is required for display of text in 3D viewer.

Download the necessary archive from http://sourceforge.net/projects/freetype/files/ and unpack it.
1. Enter the directory where the source files of FreeType are located (<FREETYPE_SRC_DIR>).
cd <FREETYPE_SRC_DIR>
2. Run the configure command
configure --prefix=<FREETYPE_INSTALL_DIR>
For a 64 bit platform also add CFLAGS='-m64 -fPIC' CPPFLAGS='-m64 -fPIC' option to the command line.
3. If the configure command has finished successfully, start the building process
make
4. If building has finished successfully, start the installation of FreeType. All binary and service files of the product will be copied to the directory defined by <FREETYPE_INSTALL_DIR>
make install

3. BUILDING OPTIONAL THIRD-PARTY PRODUCTS

3.1. TBB 3.x or 4.x

This third-party product is installed with binaries from the archive that can be downloaded from http://threadingbuildingblocks.org/. Go to “Downloads / Commercial Aligned Release”, find the release version you need (e.g. tbb30_018oss) and pick the archive for Linux platform.

The installation process is the following:

- Unpack the downloaded archive of TBB 3.0 product (***tbb30_018oss_lin.tgz***).

3.2. gl2ps 1.3.5

Download the necessary archive from http://geuz.org/gl2ps/ and unpack it.
1. Install or build cmake product from source file.
2. Start cmake in GUI mode with the directory where the source files of fl2ps are located
ccmake <GL2PS_SRC_DIR>
    2.1. Press [c] to make the initial configuration
    2.2. Define the necessary options CMAKE_INSTALL_PREFIX
    2.3. Press [c] to make the final configuration
    2.4. Press [g] to generate Makefile and exit
or just run the following command:
cmake –DCMAKE_INSTALL_PREFIX=<GL2PS_INSTALL_DIR> –DCMAKE_BUILD_TYPE=Release
3. Start building of gl2ps
make
4. Start the installation of gl2ps. Binaries will be installed according to the CMAKE_INSTALL_PREFIX option
make install

3.3. FreeImage 3.14.1

Download the necessary archive from

http://sourceforge.net/projects/freeimage/files/Source%20Distribution/
and unpack it. The directory with unpacked sources is further referred to as <FREEIMAGE_SRC_DIR>.
1. Modify <FREEIMAGE_SRC_DIR>/Source/OpenEXR/Imath/ImathMatrix.h:
In line 60 insert the following:
#include <string.h>
2. Enter the directory where the source files of FreeImage are located (<FREEIMAGE_SRC_DIR>).
cd <FREEIMAGE_SRC_DIR>
3. Run the building process
make
4. Run the installation process
4.1. If you have permissions to write to /usr/include and /usr/lib directories then run the following command:
make install
4.2. If you don't have permissions to write to /usr/include and /usr/lib directories then you need to modify the file <FREEIMAGE_SRC_DIR>/Makefile.gnu:
Change lines 7-9
from:
DESTDIR ?= /
INCDIR ?= $(DESTDIR)/usr/include
INSTALLDIR ?= $(DESTDIR)/usr/lib
to:
DESTDIR ?= $(DESTDIR)
INCDIR ?= $(DESTDIR)/include
INSTALLDIR ?= $(DESTDIR)/lib

Change lines 65-67
from:
install -m 644 -o root -g root $(HEADER) $(INCDIR)
install -m 644 -o root -g root $(STATICLIB) $(INSTALLDIR)
install -m 755 -o root -g root $(SHAREDLIB) $(INSTALLDIR)
to:
install -m 755 $(HEADER) $(INCDIR)
install -m 755 $(STATICLIB) $(INSTALLDIR)
install -m 755 $(SHAREDLIB) $(INSTALLDIR)

Change line 70
from: *ldconfig*
to: *# ldconfig*
Then run the installation process by the following command:
make DESTDIR=<FREEIMAGE_INSTALL_DIR> install

5. Clean the temporary files
make clean

4. INSTALLATION FROM OFFICIAL REPOSITORIES

4.1. Debian-based distributives

All 3rd-party products required for building of OCCT could be installed from official repositories. You may install them from console using apt-get utility:

```
sudo apt-get install \
  tcllib tklib tcl-dev tk-dev \
  libfreetype-dev \
  libxt-dev libxmu-dev \
  libgl1-mesa-dev \
  libfreeimage-dev \
```

```
  libtbb-dev \
  libgl2ps-dev
```

To launch WOK-prebuilt binaries you need install C shell and 32-bit libraries on x86_64 distributives:

```
sudo apt-get install \
  csh \
  libstdc++5:i386 libxt6:i386
```

Any compliant C++ compiler is required for building anyway:

```
sudo apt-get install \
  g++ \
```

5. REFERENCES

[1] Open CASCADE Technology web site: http://www.opencascade.org