libE57 – Reference Implementation
Getting Started

Welcome

Welcome to the libE57 reference implementation library of the ASTM E57.4 data interchange standard for 3D laser scanning. This document is intended as a guide to master the initial procedure of setting up the library and to prepare your environment for using it. Please also watch out for the other sources of information such as the reference documentation and release notes. Additional help may be available from the project mailing list at: https://lists.sourceforge.net/lists/listinfo/e57-3d-imgfmt-devel

What is it?

The E57 file format specified by the ASTM E57.4 committee provides a compact, vendor-neutral format for storing point clouds, images, and metadata produced by 3D imaging systems, such as laser scanners. The reference library is an implementation of this standard in C++ language, intended to lower the barrier to adoption of the standard and provide a reference to compare other implementations against. It is not expected to be the only implementation and it is not expected to be the fastest implementation that is possible.

Overview

The library provides functionality to create 3D data interchange files and to read from such files. The typical use is for sensor vendors to use the file creation or writer functionality and for software vendors to use the reader part. It is essential to obtain a copy of the standard in order to understand and make full use of the library.

The library is provided in source code form as well as a prebuilt binary for some compilers and operating system platforms. Since the library is written in C++ it is essential to use a binary version that matches your compiler and platform. If there is no version matching your compiler it might be possible to use the source code and compile the library yourself. Instructions for both uses are provided.

The library makes use of some additional libraries that need to be obtained separately:

- boost, a general purpose library
- xerces, a XML library

Building the documentation of the library is not covered in this document. You are expected to use the provided documentation set from the project website.

Prepare to use the binary distribution

Downloading

The library is hosted on sourceforge under the name e57-3d-imgfmt. A convenient address to download from is: http://sourceforge.net/downloads/e57-3d-imgfmt/ .

It is recommended to always use the latest version. As of this writing this is version 0.2.60 . For the following we assume you are using the "Visual Studio 9 2008" C++ compiler targeting 32 bit windows.

Locate the files

E57RefImpl-0.2.60-x86-windows-vc-9.0.zip

E57RefImpl-doc-0.2.60.zip

and download them.

The next step is to obtain the boost library from: http://sourceforge.net/downloads/boost/

If you do not need boost for other reasons, it is sufficient to locate and download the file

boost_1_42_headers.zip

Next is the xerces library, which is available from:http://xerces.apache.org/xerces-c/download

Locate and download the file

xerces-c-3.1.1-x86-windows-vc-9.0.zip

Installing

All that is need for installation is to extract the files to convenient place on your harddisk. There is no generally established way where to put the files on the windows operating system. If you ask me for a recommendation I would suggest to put the files under the "Program Files" folder in the following way. Put the boost headers from boost_1_42_headers.zip, so that the config.hpp file can be found at:

```
C:\Program Files\boost-1_42_0\boost\config.hpp
```

Put the xerces library from xerces-c-3.1.1-x86-windows-vc-9.0.zip so that the SAX2XMLReader.hpp can be found at:

```
C:\Program Files\xerces-c-3.1.1-x86-windows-vc-
9.0\include\xercesc\sax2\SAX2XMLReader.hpp
```

Next put the libE57 library from E57RefImpl-0.2.60-x86-windows-vc-9.0.zip so that the E57Foundation.h can be found at:

```
C:\Program Files\E57RefImpl-0.2.60-x86-windows-vc-
9.0\include\e57\E57Foundation.h
```

Using the library

In order to use the library, within Visual Studio you need to add the

"C:\Program Files\boost-1_42_0" and

"C:\Program Files\xerces-c-3.1.1-x86-windows-vc-9.0\include" and

"C:\Program Files\E57RefImpl-0.2.60-x86-windows-vc-9.0\include"

directories to the list of directories that will be searched for include files. In a similar way add the

"C:\Program Files\xerces-c-3.1.1-x86-windows-vc-9.0\lib" and the

"C:\Program Files\E57RefImpl-0.2.60-x86-windows-vc-9.0\lib" directory

to the list of directories that will be searched for library files.

The libE57 library is prepared for static linking. This requires your project to be built with the /MT (for release builds) or /Mtd (for debug builds) switch. The last step step is to specify the libraries

E57RefImpl.lib and

xerces-c_static_3.lib

on the input line of libraries to link with. The above is for release builds. For debug builds use

E57RefImpl-d.lib and

xerces-c_static_3D.lib

Proceed by reading the introductory pages from the E57RefImpl-doc-0.2.60.zip file by opening the html\index.html file with your internet browser.

Building the library from source

The instructions assume that you are using the "Visual Studio 9 2008" C++ compiler targeting 32 bit windows. To build the library with other compilers you will need to follow a similar procedure. This may work without modifications or will need modifications to the build scripts or source code, depending on your compiler. The following instructions are intended as a template to get you started.

Downloading

The library will be built with the CMake utility, which can be downloaded from:

http://www.cmake.org/

CMake comes with an installer that should be used to install the program.

Next download and install the boost library from http://www.boost.org and xerces from: http://xerces.apache.org . Follow the rules for selecting the packages to download and install as outlined in the "Prepare to use the binary distribution" section.

Locate the file E57RefImpl-src-0.2.60.zip on http://sourceforge.net/downloads/e57-3d-imgfmt/, download and unzip the the file into a convenient directory on your hard drive.

Configuration

Let us assume you have extracted the e57 library files into C:\Users\Fred\Projects\E57RefImpl-src-0.2.60 and the xerces and boost libraries as outlined in the "Prepare to use the binary distribution" section.

Start the cmake-gui.exe and browse to the e57 library source directory for the top line which specifies the location of the source. For the line below specify: C:\Users\Fred\Projects\E57RefImpl-x86-windows-vc-9.0 .

Next press the "Configure" button. You will be presented with a dialog that prompts you to choose a

compiler. Select "Visual Studio 9 2008". The process will continue and result with a message telling you to specify the location of the boost directory. Use the small button labeled with "..." right of the line BOOST_INCLUDEDIR line in red. Navigate to C:\Program Files\boost-1_42_0 . After the dialog is closed, press "Configure" again. Now you will be prompted to specify the xerces directory. Proceed as with the boost directory, but specify C:\Program Files\xerces-c-3.1.1-x86-windows-vc-9.0 .

As a finishing touch you might want to adjust the CMAKE_INSTALL_PREFIX. Select a convenient directory. This is where the binary distribution set will be copied after build.

This time pressing "Configure" should end without complaints. Proceed by pressing "Generate". This will actually generate the Visual Studio project files.

Close CMake and open the E57RefImpl.sln file from within Visual Studio.

You will find several projects. If you only want to build the binrary distribution make sure you have the debug build active. Make the install project active and build it. Then activate the release build. Proceed as with the debug build.

After the last step you should find the resulting library under the the choose CMAKE_INSTALL_PREFIX directory. The library now can be used as explained in the "Prepare to use the binary distribution" section.